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FARMERS' COPING MECHANISMS TOWARDS IMPACT OF CLIMATE CHANGE ON AGRICULTURE: A STUDY IN NAGAPATTINAM DISTRICT, TAMIL NADU

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ABSTRACT

Development of coping mechanism is very essential to overcome the negative impact of climate change on agriculture. The climate change factors relating to extreme weather events, unseasonal rain, erratic rainfall, delayed monsoon, over rainfall, occurrence of droughts and desertification can significantly affect the agriculture production. Hence, the farmers are in need of effective coping mechanism. This paper deals with coping mechanism adopted by farm households in Nagapattinam district, Tamil Nadu state. It outlines the implications of various coping mechanism perceived by the farm household in the study area. This paper concludes with some interesting findings along with policy suggestions.

KEYWORDS: *coping mechanism, climate change, drought, forest fires, and flooding*,

INTRODUCTION

The problems of today, such as drought, forest fires, and flooding, will only be magnified by climate change. In India, changes in monsoon patterns will greatly exacerbate the situation of unacceptable presence of poverty and inequalities of opportunities in the country. While many Indians people are coping autonomously to current stresses, the state must design and implement effective strategies to adapt to climate change impact to achieve economic and social progress. Adapting to long and short term climate-related problems need creative engagement among government, market actors and the civic movement.

Development of coping mechanism to overcome the negative impact of climate change on agriculture is very essential among the farm households. It could be noted that climate change can adversely halt the yield of agricultural productivity. The development of various coping mechanism can drastically reduce the yield loss and ultimately protect the farm households. By realizing these points in mind the present study examine the farm households extent of adoption of coping mechanism to overcome the negative impact of climate change on agriculture in Nagapattinam district of Tamil Nadu.

METHODS AND MATERIALS

This study is conducted in Nagapattinam district Tamil Nadu. Out of the total 11 blocks in Nagapattinam district, 6 blocks viz Kollidam block, Nagapattinam block, Kuttalam block , Kilvelur block, Thalainayar block and Vedharanyam block are selected. From each block 75 farm household are selected as a sample. In total 450 farm household are selected under stratified random sampling method. The data relating to Coping Strategies against

the Impact of Climate Change on Agriculture are collected from the respondents with the help of interview schedule method. The collected data relating to 5 point rating scale are converted into mean score value. The data interpretation is done with the help of average and anova two way analysis.

COPING STRATEGIES AGAINST THE IMPACT OF CLIMATE CHANGE ON AGRICULTURE

This section deals with respondents' rating on coping strategies against the impact of climate change on agriculture. It can be assessed with the help of 24 factors on a 5 point rating scale. These include summer pouching, cultivation of traditional crop varieties, introduction of native grasses for pasture land, delayed sowing, mixed cropping, stocking food during good cropping season, stocking fodder during good cropping season, seasonal migration, rainwater harvesting, watershed management, shift to organic farming, cultivation of drought resistance crops, prevention of runoff rainwater, low input agriculture, over depletion of ground water, selling household assets, crop insurance, water rationing, tree plantation, water awareness campaign, indigenous knowledge in weather prediction, replanting failed farms, decreased food consumption and improved farm management.

Table 1 Block Wise Respondents' Adopted Coping Strategies against the Impact of Climate Change on Agriculture

variables	Kollidam block	Nagapattinam block	Kuttalam block	Kilvelur	Thalainayar	Vedharanyam	Total
Summer pouching	2.32	2.49	2.20	1.89	1.99	1.83	2.14
Cultivation of traditional crop varieties	2.80	2.97	2.68	2.25	2.35	2.19	2.56
Introduction of native grasses for pasture land	3.23	3.40	3.09	2.58	2.77	2.52	2.96
Delayed sowing	3.50	3.67	3.36	2.85	3.04	2.79	3.23
Mixed cropping	3.99	4.16	3.86	3.33	3.50	3.27	3.69
Stocking food during good cropping season	4.07	4.15	4.12	3.80	4.00	3.74	4.07
Stocking fodder during good cropping season	4.07	4.16	4.12	4.02	4.07	3.96	4.13
Seasonal migration	2.91	3.08	2.76	2.30	2.43	2.24	2.64
Rainwater harvesting	3.74	3.91	3.61	3.08	3.25	3.02	3.36
Watershed management	2.18	2.35	2.03	1.78	1.85	1.72	1.98
Shift to organic farming	3.10	3.27	2.95	2.45	2.64	2.39	2.83
Cultivation of drought resistance crops	2.26	2.43	2.11	1.86	1.93	1.80	2.08
Prevention of runoff rainwater	4.04	4.15	3.94	3.41	3.58	3.35	3.77
Low input agriculture	3.62	3.79	3.49	2.96	3.13	2.90	3.44
Over depletion of ground water	2.56	2.73	2.44	2.13	2.23	2.07	2.38
Selling household assets	4.07	4.15	4.11	3.63	3.88	3.57	3.96
Crop insurance	4.07	4.20	4.11	3.75	3.95	3.69	4.02
Water rationing	2.38	2.55	2.26	1.95	2.05	1.89	2.20
Tree plantation	3.31	3.48	3.17	2.66	2.85	2.60	3.04
Water awareness campaign	3.86	4.03	3.73	3.20	3.37	3.14	3.56
Indigenous knowledge in weather prediction	2.73	2.90	2.55	2.18	2.34	2.12	2.49
Replanting failed farms	3.04	3.21	2.89	2.42	2.56	2.36	2.77
Decreased food consumption	3.42	3.59	3.28	2.77	2.96	2.71	3.15
Improved farm management	2.47	2.64	2.35	2.04	2.14	1.98	2.29
Total	3.24	3.40	3.14	2.72	2.87	2.66	3.03

Source: Computed from primary data

ANOVA					
Source of Variation	*SS*	*df*	*MS*	*F*	*F crit*
Variation due to Coping Strategies against the Impact of Climate Change on Agriculture	60.09094	22	2.731407	357.4788	1.639884
Variation to blocks	10.25733	5	2.051467	268.4902	2.296868
Error	0.840483	110	0.007641		
Total	71.18876	137			

Data presented in table 1 indicate the village wise respondents' adopted coping strategies against the impact of climate change on agriculture. It could be noted that out of the 24 coping strategies against the impact of climate change on agriculture, the respondents rate the stocking fodder during good cropping season as their first level coping strategy against the impact of climate change on agriculture and it is evident from their secured mean score of 4.13 on a 5 point rating scale. Stocking food during good cropping season is rated at second level coping mechanism against the impact of climate change on agriculture and it is estimated from the respondents' secured mean score of 4.07 on a 5 point rating scale. The respondents rate the coping mechanism against the impact of climate change on agriculture by citing the situation of need for crop insurance as their third level. It is evident from their secured mean score of 4.02 on a 5 point rating scale. The respondents rate the fourth level coping strategy against the impact of climate change on agriculture by citing the event of selling household assets and it is observed from the respondents' secured mean score of 3.96 on a 5 point rating scale. Prevention of runoff rainwater is rated at fifth level coping strategy against the impact of climate change on agriculture and it could be known from the respondents' secured mean score of 3.77 on a 5 point rating scale.

The respondents rate the mixed cropping practice as their sixth level coping strategy against the impact of climate change on agriculture and it is revealed from their secured mean score of 3.69 on a 5 point rating scale. Water awareness campaign is rated at seventh level coping mechanism against the impact of climate change on agriculture and it observed from the respondents' secured mean score of 3.56 on a 5 point rating scale. The respondents cite the coping mechanism against the impact of climate change on agriculture by the way of practicing low input agriculture and it is their eighth level rating. It is evident from their secured mean score of 3.44 on a 5 point rating scale. The respondents have ninth level coping strategy to overcome the impact of climate change on agriculture by citing the event of rainwater harvesting as per their secured mean score of 3.36 on a 5 point rating scale. Delayed sowing is rated at tenth level coping strategy to overcome the negative impact of climate change on agriculture and it is evident from the respondents' secured mean score of 3.23 on a 5 point rating scale.

The respondents rate the decreased food consumption as their eleventh level coping strategy to escape from the negative impact of climate change on agriculture and it could be known from their secured mean score of 3.15 on a 5 point rating scale. Tree plantation is rated at twelfth level coping practice to tolerate the negative impact of climate change on agriculture and it is reflected from the respondents' secured mean score of 3.04 on a 5 point rating scale. The respondents have thirteenth level coping practice to overcome the negative impact of climate change on agriculture by citing the event of introduction of native grasses in pasture land. It is evident from their secured mean score of 2.96 on a 5 point rating scale. The respondents observe the fourteenth level coping method against the impact of climate change on agriculture by citing the need for shift to organic farming and it is clear from their secured mean score of 2.83 on a 5 point rating scale. Replanting failed farms is rated at fifteenth level observed coping practice to avoid the negative impact of climate change on agriculture as per the respondents' secured mean score of 2.77 on a 5 point rating scale.

The respondents rate the seasonal migration as their sixteenth level observed coping practice to prevent themselves against the negative impact of climate change on agriculture and it is revealed from their secured mean score of 2.64 on a 5 point rating scale. Cultivation of traditional crop varieties is rated at seventeenth level coping practice to run over the negative against the impact of climate change on agriculture and it is revealed from the respondents' secured mean score of 2.56 on a 5 point rating scale. The respondents visualize the coping mechanism against the impact of climate change on agriculture by citing the need for indigenous knowledge in weather prediction and it is evident from their

eighteenth level observation. It is known from their secured mean score of 2.49 on a 5 point rating scale. The respondents rate the nineteenth level coping strategy against the impact of climate change on agriculture by citing the event of over depletion of ground water as per their secured mean score of 2.38 on a 5 point rating scale. Improved farm management is rated at twentieth level coping practice against the impact of climate change on agriculture, and it is known from the respondents' secured mean score of 2.29 on a 5 point rating scale.

The respondents rate the coping practice against the impact of climate change on agriculture by citing the need for water rationing and it is evident from their twenty first level observations. It is known from their secured mean score of 2.20 on a 5 point rating scale. The respondents report the twenty second level coping practice against the impact of climate change on agriculture by citing the event of summer pouching as per their secured mean score of 2.14 on a 5 point rating scale. Cultivation of drought resistance crops in the soil is rated at twenty third level coping strategy to tolerate the negative impact of climate change on agriculture, and it is known from the respondents' secured mean score of 2.08 on a 5 point rating scale. The respondents report the twenty fourth level coping strategy to resist against the negative impact of climate change on agriculture by citing the need for watershed management as per their secured mean score of 1.98 on a 5 point rating scale.

The farmers of Nagapattinam block rank the first position in their overall adopted coping mechanism to overcome the negative impact of climate change on agriculture. It is evident from their secured means scoreof 3.40 on a 5 point rating scale. The farmers of Kollidam block record the second position in their overall practiced coping mechanism to escape from the adverse impact of climate change on agriculture. The farmers of Kuttallam block register the third position in their overall adhered coping mechanism to sustain against the negative impact of climate change on agriculture. It is revealed from their secured mean score of 3.14 on a 5 point rating scale. The farmers of Kilvelur block occupy the fourth position in their overall obtained mean score on coping mechanism to overcome the negative impact of climate change on agriculture. It is evident from their secured mean score of 2.72 on a 5 point rating scale. The farmers of Thalainayar block hold the fifth position in their overall adopted coping mechanism to overcome the negative impact of climate change on agriculture and it is evident from their secured mean score of 2.87 on a 5 point rating scale. The farmers of Vedharanayam block slip down to the last position in their overall adopted coping mechanism to overcome the negative impact of climate change on agriculture and it is evident from their secured means score of 2.66 on a 5 point rating scale.

The anova two way model is applied for further discussion. The computed anova value 357.47 is greater than its tabulated value at 5 percent level significance. Hence, the variation among the overall coping mechanism to overcome the negative impact of climate change on agriculture is statistically identified as significant. In another point, the computed anova value 268.49 is greater than its tabulated value at 5 percent level significance. Hence, the variation among the blocks is statistically identified as significant as per the respondents rating on coping strategies against the impact of climate change on agriculture.

Table 2 Education Wise Respondents' Adopted Coping Strategies against the Impact of Climate Change on Agriculture

variables	Primary level	Secondary level	Higher secondary level	Degree level	Total
Summer pouching	1.96	2.04	2.13	2.33	2.14
Cultivation of traditional crop varieties	2.32	2.40	2.61	2.81	2.56
Introduction of native grasses for pasture land	2.65	2.82	3.02	3.24	2.96
Delayed sowing	2.92	3.09	3.29	3.51	3.23
Mixed cropping	3.40	3.55	3.79	4.00	3.69
Stocking food during good cropping season	3.87	4.05	4.09	4.12	4.07
Stocking fodder during good cropping season	4.09	4.12	4.15	4.16	4.13
Seasonal migration	2.37	2.48	2.69	2.92	2.64
Rainwater harvesting	3.15	3.30	3.54	3.75	3.36
Watershed management	1.85	1.90	1.96	2.19	1.98
Shift to organic farming	2.52	2.69	2.88	3.11	2.83
Cultivation of drought resistance crops	1.93	1.98	2.04	2.27	2.08
Prevention of runoff rainwater	3.48	3.63	3.87	4.08	3.77
Low input agriculture	3.07	3.22	3.46	3.67	3.44
Over depletion of ground water	2.20	2.28	2.37	2.57	2.38
Selling household assets	3.70	3.93	4.10	4.12	3.96
Crop insurance	3.82	4.00	4.04	4.07	4.02
Water rationing	2.02	2.10	2.19	2.39	2.20
Tree plantation	2.73	2.90	3.10	3.32	3.04
Water awareness campaign	3.27	3.42	3.66	3.87	3.56
Indigenous knowledge in weather prediction	2.25	2.39	2.48	2.74	2.49
Replanting failed farms	2.49	2.61	2.82	3.05	2.77
Decreased food consumption	2.84	3.01	3.21	3.43	3.15
Improved farm management	2.11	2.19	2.28	2.48	2.29
Total	2.79	2.92	3.07	3.26	3.03

Source: Computed from primary data

ANOVA					
Source of Variation	***SS***	***df***	***MS***	***F***	***F crit***
Variation due to Coping Strategies against the Impact of Climate Change on Agriculture	42.03884	22	1.910857	342.4733	1.705676
Variation due to educational level of the farmers	2.839848	3	0.946616	169.6573	2.743711
Error	0.368252	66	0.00558		
Total	45.24694	91			

Table 2 presents data on the education wise respondents' adopted coping strategies against the impact of climate change on agriculture. The degree level educated respondents rank the first position in their overall adopted coping mechanism to tolerate the negative impact of climate change on agriculture and it is evident from their secured mean score of 3.26 on a 5 point rating scale. The higher secondary level educated respondents record the second position in their overall practiced coping strategies against the impact of climate change on agriculture and it is revealed from their secured mean score of 3.07 on a 5 point rating scale. The secondary level educated respondents register the third position in their overall adopted coping strategies against the impact of climate change on agriculture and it is reflected from their secured mean score of 2.92 on a 5 point rating scale. The

primary level educated respondents come down to the last position in their overall adopted coping strategies against the impact of climate change on agriculture and it is estimated from their secured mean score of 2.79 on a 5 point rating scale.

The anova two way model is applied for further discussion. The computed anova value 342.47 is greater than its tabulated value at 5 percent level significance. Hence, the variation among the overall adopted coping strategies against the impact of climate change on agriculture is statistically identified as significant. In another point, the computed anova value 169.65 is greater than its tabulated value at 5 percent level significance. Hence, the variation among the educational groups is statistically identified as significant as per the respondents rating on coping strategies against the impact of climate change on agriculture.

Table 3 Farm Wise Respondents' Adopted Coping Strategies against the Impact of Climate Change on Agriculture

Variables	Marginal farmers	Small farmers	Medium farmers	Large farmers	Total
Summer pouching	2.28	2.06	2.10	2.03	2.14
Cultivation of traditional crop varieties	2.76	2.54	2.46	2.39	2.56
Introduction of native grasses for pasture land	3.19	2.95	2.88	2.72	2.96
Delayed sowing	3.46	3.22	3.15	2.99	3.23
Mixed cropping	3.95	3.72	3.61	3.47	3.69
Stocking food during good cropping season	4.11	4.07	4.02	3.94	4.07
Stocking fodder during good cropping season	4.15	4.14	4.13	4.10	4.13
Seasonal migration	2.87	2.62	2.54	2.44	2.64
Rainwater harvesting	3.70	3.47	3.36	3.22	3.36
Watershed management	2.14	1.89	1.96	1.92	1.98
Shift to organic farming	3.06	2.81	2.75	2.59	2.83
Cultivation of drought resistance crops	2.22	1.97	2.04	2.00	2.08
Prevention of runoff rainwater	4.03	3.80	3.69	3.55	3.77
Low input agriculture	3.62	3.39	3.28	3.14	3.44
Over depletion of ground water	2.52	2.30	2.34	2.27	2.38
Selling household assets	4.07	4.03	3.99	3.77	3.96
Crop insurance	4.02	3.97	4.06	3.89	4.02
Water rationing	2.34	2.12	2.16	2.09	2.20
Tree plantation	3.27	3.03	2.96	2.80	3.04
Water awareness campaign	3.82	3.59	3.48	3.34	3.56
Indigenous knowledge in weather prediction	2.69	2.41	2.45	2.32	2.49
Replanting failed farms	3.00	2.75	2.67	2.56	2.77
Decreased food consumption	3.38	3.14	3.07	2.91	3.15
Improved farm management	2.43	2.21	2.25	2.18	2.29
Total	3.21	3.01	2.98	2.86	3.03

Source: Computed from primary data

ANOVA					
Source of Variation	***SS***	***df***	***MS***	***F***	***F crit***
Variation due to Coping Strategies against the Impact of Climate Change on Agriculture	42.01714	22	1.90987	414.6221	1.705676
Variation due to farm size	1.518835	3	0.506278	109.9102	2.743711
Error	0.304015	66	0.004606		
Total	43.83999	91			

Table 3 presents data on the farm wise respondents' realization on coping strategies against the impact of climate change on agriculture. The marginal farmer respondents rank the first position in their overall adopted coping mechanism to overcome the negative impact of climate change on agriculture impacts of climate change on agriculture and it is evident from their secured mean score of 3.21 on a 5 point rating scale. The small farmer respondents record the second position in their overall adopted coping strategies against the impact of climate change on agriculture and it is reflected from their secured mean score of 3.01 on a 5 point rating scale. The medium farmer respondents register the third position in their overall adopted coping strategies to tolerate the negative impact of climate change on agriculture and it is evident from their secured mean score of 2.98 on a 5 point rating scale. The large farmer respondents come down to the last position in their overall adopted coping strategies to overcome the negative impact of climate change on agriculture and it is estimated from their secured mean score of 2.86 on a 5 point rating scale.

The anova two ways model is applied for further discussion. The computed anova value 414.62 is greater than its tabulated value at 5 per cent level significance. Hence, the variation among the overall adopted coping strategies against the impact of climate change on agriculture is statistically identified as significant. In another point, the computed anova value 109.91 is greater than its tabulated value at 5 percent level significance. Hence, the variation among the farm groups is statistically identified as significant as per the respondents rating on adopted coping strategies against the impact of climate change on agriculture.

Table 4 Caste Wise Respondents' Adopted Coping Strategies against the Impact of Climate Change on Agriculture

Variables	Forward caste	Backward caste	Most backward caste	Scheduled caste	Total
Summer pouching	2.36	2.13	2.02	1.96	2.14
Cultivation of traditional crop varieties	2.84	2.61	2.38	2.32	2.56
Introduction of native grasses for pasture land	3.27	3.02	2.80	2.65	2.96
Delayed sowing	3.54	3.29	3.07	2.92	3.23
Mixed cropping	4.03	3.79	3.53	3.40	3.69
Stocking food during good cropping season	4.15	4.14	3.94	3.87	4.07
Stocking fodder during good cropping season	4.16	4.15	4.05	4.03	4.13
Seasonal migration	2.95	2.69	2.46	2.37	2.64
Rainwater harvesting	3.78	3.54	3.28	3.15	3.36
Watershed management	2.22	1.96	1.88	1.85	1.98
Shift to organic farming	3.14	2.88	2.67	2.52	2.83
Cultivation of drought resistance crops	2.30	2.04	1.96	1.93	2.08
Prevention of runoff rainwater	4.11	3.87	3.61	3.48	3.77
Low input agriculture	3.70	3.46	3.20	3.07	3.44
Over depletion of ground water	2.60	2.37	2.26	2.20	2.38
Selling household assets	4.15	4.10	3.91	3.70	3.96
Crop insurance	4.10	4.04	3.98	3.82	4.02
Water rationing	2.42	2.19	2.08	2.02	2.20
Tree plantation	3.35	3.10	2.88	2.73	3.04
Water awareness campaign	3.90	3.66	3.40	3.27	3.56
Indigenous knowledge in weather prediction	2.77	2.48	2.37	2.25	2.49
Replanting failed farms	3.08	2.82	2.59	2.49	2.77
Decreased food consumption	3.46	3.21	2.99	2.84	3.15
Improved farm management	2.51	2.28	2.17	2.11	2.29
Total	3.29	3.08	2.90	2.79	3.03

Source: Computed from primary data

ANOVA					
Source of Variation	***SS***	***df***	***MS***	***F***	***F crit***
Variation due to Coping Strategies against the Impact of Climate Change on Agriculture	41.66052	22	1.89366	364.7384	1.705676
Variation due to caste groups	3.345064	3	1.115021	214.7646	2.743711
Error	0.342661	66	0.005192		
Total	45.34825	91			

Table 4 presents data on the caste wise respondents' overall adopted coping strategies against the impact of climate change on agriculture. The forward caste respondents rank the first position in their overall adopted coping mechanism against the impact of climate change on agriculture and it is evident from their secured mean score of 3.29 on a 5 point rating scale. The backward caste respondents record the second position in their overall adopted coping strategies to overcome the negative impact of climate change on agriculture and it is learnt from their secured mean score of 3.08 on a 5 point rating scale. The most backward caste respondents register the third position in their overall adopted coping mechanism to overcome the negative impact of climate change on agriculture and it is revealed from their secured meanscore of 2.90 on a 5 point rating scale. The schedule caste respondents come down to the last position in their overall adopted coping strategies against the impact of climate change on agriculture as per their secured mean score of 2.79 on a 5 point rating scale.

The anova two ways model is applied for further discussion. The computed anova value 364.73 is greater than its tabulated value at 5 percent level significance. Hence, the variation among the overall adopted coping strategies against the impact of climate change on agriculture is statistically identified as significant. In another point, the computed anova value 214.76 is greater than its tabulated value at 5 percent level significance. Hence, the variation among the caste groups is statistically identified as significant as per the respondents rating on adopted coping strategies against the impact of climate change on agriculture.

Table 5 Family Size Wise Respondents' Adopted Coping Strategies against the Impact of Climate Change on Agriculture

Variables	Large	Medium	Small	Total
Summer pouching	2.10	2.14	2.18	2.14
Cultivation of traditional crop varieties	2.46	2.50	2.75	2.56
Introduction of native grasses for pasture land	2.79	2.92	3.18	2.96
Delayed sowing	3.06	3.19	3.45	3.23
Mixed cropping	3.54	3.65	3.94	3.69
Stocking food during good cropping season	4.01	4.02	4.18	4.07
Stocking fodder during good cropping season	4.09	4.12	4.15	4.13
Seasonal migration	2.51	2.58	2.86	2.64
Rainwater harvesting	3.29	3.40	3.69	3.36
Watershed management	1.99	2.00	2.13	1.98
Shift to organic farming	2.66	2.79	3.05	2.83
Cultivation of drought resistance crops	1.98	2.05	2.21	2.08
Prevention of runoff rainwater	3.52	3.73	4.02	3.77
Low input agriculture	3.21	3.32	3.61	3.44
Over depletion of ground water	2.34	2.38	2.51	2.38
Selling household assets	3.84	4.03	4.06	3.96
Crop insurance	3.86	4.01	4.10	4.02
Water rationing	2.06	2.20	2.33	2.20
Tree plantation	2.77	3.00	3.26	3.04
Water awareness campaign	3.31	3.52	3.81	3.56
Indigenous knowledge in weather prediction	2.29	2.49	2.69	2.49
Replanting failed farms	2.63	2.71	2.99	2.77
Decreased food consumption	2.98	3.11	3.37	3.15
Improved farm management	2.15	2.29	2.43	2.29
Total	2.89	3.01	3.21	3.03

Source: Computed from primary data

ANOVA					
Source of Variation	***SS***	***df***	***MS***	***F***	***F crit***
Variation due to Coping Strategies against the Impact of Climate Change on Agriculture	30.55503	22	1.388865	279.3223	1.788887
Variation due to family size	1.16802	2	0.58401	117.4535	3.209278
Error	0.21878	44	0.004972		
Total	31.94183	68			

Data presented in table 5 indicate the family size wise respondents' adopted coping strategies against the impact of climate change on agriculture. The small family size respondents' rank the first position in their overall adopted coping strategies to overcome the negative impact of climate change on agriculture as per their secured mean score of 3.21 on a 5 point rating scale. The medium family size respondents record the second position in their overall practiced coping strategies against the impact of climate change on agriculture as per their

secured mean score of 3.01 on a 5 point rating scale. The large family size respondents come down to the last position in their overall adopted coping strategies to tolerate the negative impact of climate change on agriculture as per their secured mean score of 2.89 on a 5 point rating scale.

The anova two way model is applied for further discussion. At one point, the computed anova value 279.32 is greater than its tabulated value at 5 per cent level significance. Hence the variation among the adopted coping mechanism is statistically identified as significant. In another point, the computed anova value 117.45 is greater than its tabulated value at 5 per cent level significance. Hence, the variation among the family size groups is statistically identified as significant.

CONCLUSION

It could be seen clearly from the above discussion that the respondents' have rate the high level coping strategies against the impact of climate change on agriculture by citing the events of stocking fodder during good cropping season, stocking food during good cropping season, crop insurance, selling household assets, prevention of runoff rainwater, mixed cropping practice and water awareness campaign as per their secured mean score above 3.50 on a 5 point rating scale. The respondents' have moderate level coping strategies to overcome the negative impact of climate change on agriculture by stating the event of low input agriculture, rainwater harvesting, delayed sowing, decreased food consumption, tree plantation, introduction of native grasses for pasture land, shift to organic farming, replanting failed farms, seasonal migration and cultivation of traditional crop varieties as per their secured mean score in the range of 2.50 to 3.50 on a 5 point rating scale. The respondents' report the low level coping strategies against the impact of climate change on agriculture by indicating the events of indigenous knowledge in weather prediction, over depletion of ground water, improved farm management, water rationing, summer pouching, cultivation of drought resistance crops and watershed management as per their secured mean score below 2.50 on a 5 point rating scale. It could be observed that the farmers of Nagapattinam block rank the first position in their overall coping mechanism to overcome the negative impact of climate change on agriculture, farmers of Kollidam block the second, farmers of Kuttalam block the third, farmers of Kilvelur block the fifth and farmers of Vedharanyam block the last.

The result of education wise analysis reveals that the degree level educated respondents rank the first position in their overall adopted coping strategies against the impact of climate change on agriculture, higher secondary level educated respondents' the second, secondary level educated respondents' the third and primary level educated respondents' the last. The high level adopted coping strategies against the impact of climate change on agriculture depend on high level educational attainment. It is due to possession and acquired knowledge about the climate change indicators and their consequences in contrast to the low level educated respondents. The result of farm wise analysis reveals that the marginal farmer respondents rank the first position in their overall adopted coping strategies against the impact of climate change on agriculture, small farmer respondents the second, medium farmer respondents the third and large farmer respondents the last. In general, marginal farmers and small farmers face a lot of problems consequent upon impact of climate change on agriculture in contrast to the medium farmers and large farmers. It is due to poor socio-economic status inhibit the marginal farmers and smalls farmers to diversify their occupation and also their livelihood opportunities.

The result of caste wise analysis reveals that the forward caste respondents rank the first position in their overall adopted coping strategies against the impact of climate change on agriculture, backward caste respondents' the second, most backward caste respondents' the third and scheduled caste respondents' the last. The high caste farmers are more aware of overall adopted coping strategies against the impact of climate change on agriculture, due to possession of high level educational and economic status in contrast to the low caste farmers. The result of family size wise analysis reveals that the small family size respondents rank the first position in their overall adopted coping strategies against the impact of climate change on agriculture, medium family size respondents' the second and large family size respondents' the last. The large family size farmers' with low socio-economic status are unable to take mitigation measures and coping mechanism against the impact of climate change in contrast to the small family size and medium family size group farmers.

SUGGESTIONS

The findings of the present study lead to the following policy suggestions

1. The government should conduct the awareness campaign about the coping mechanism to overcome the negative impact of climate change on agriculture.

2. The agricultural extension programme of the government should mainly focus on climate change coping mechanism for the benefit of farm households.
3. The government agricultural policies should give priority towards new ways of developing coping mechanism to overcome the negative impact of climate change on agriculture.
4. The NGOs should be motivated to conduct the training programmes focusing on ways and means of practicing coping mechanism to overcome the negative impact of climate change on agriculture among the farm households.
5. The members of women self help groups should be educated to acquire knowledge on coping mechanism against the negative impact of climate change on agriculture and they should disseminate their acquired knowledge to the farm households.

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