Knowledge Level of *Kanni Adu* Goat Farmers towards Climate Change in Southern Region of Tamil Nadu

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ABSTRACT

Goat farming is a significant source of income for the poor, particularly for disadvantaged farmers who rear goats in a traditional system with little to no inputs. Goats are a climate-adaptable species that can provide food security in the future. In this background current study was conducted to know about the goat farmers' knowledge on climate change through pre-tested interview schedule, data were collected from 381 Kanni Adu goat farmers in southern region of Tamil Nadu. The findings of this study revealed that 75.33 per cent of the respondents had knowledge on rainy season begins in the month of October under individual statement wise knowledge category. In component wise knowledge level, nearly half of the respondents had knowledge on weather items such as rainy season, southwest monsoon and northeast monsoon whereas knowledge gap has been observed in understanding the meaning of climate change (96.59%) and causes of climate change (90.60%). Under overall category, the majority of farmers (85.04%) had a medium to low level of knowledge. Under these circumstances, raising awareness about the negative effects of climate change is unquestionably warranted through a variety of approaches to be taken by the Government Institutions concerned.

Key Words: Climate Change, Kanni Adu goat, Knowledge, Tamil Nadu.

INTRODUCTION

Livestock, which includes cattle, buffaloes, sheep, goats, horses, and country chicken, is important for human survival as they provide milk, meat, eggs, manure, hide, and facilitate transportation. Livestock could be termed as energy source for the rural economy and an emergency friend for farmers during vagaries of nature. The negative effects of climate change are affecting livestock health, production, farmers' economy and multiple stresses (Sejian *et al,* 2012). In developing countries, the goat population has gradually risen in comparison to developed countries, owing to the goat's ability to live in harsh climates with limited input and it is a significant source of income for the poor, particularly for disadvantaged farmers who rear goats in a traditional system with little to no technological inputs. Indigenous breeds can endure all forms of climatic stress because they have lived in specific geographical areas for a longer period of time and have had repeated exposure (Aleena *et al,* 2018; Sejian *et al,* 2018; Savitha *et al,* 2019). Small ruminants, especially goats, are thought to be the optimal climate animal model owing to its high thermo-tolerance, ability to function on limited pasture and water supplies, and increased disease resistance capability (Sophia *et al,* 2016; Pragna *et al,* 2018; Savitha *et al,* 2019). Goat species would be crucial to future food sustainability. Farmers need adequate awareness as a prerequisite and

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basic requirement for dealing with adverse weather conditions. However, numerous studies have focused on knowledge level of farmers involved in crop cultivation about climate change, while there have been scarce studies pertaining to small ruminant farmers' knowledge level on climate change. Keeping this perspective, the study was conducted with the objective of assessing the knowledge level of farmers rearing Kanni Adu goats in Tamil Nadu towards climate change.

MATERIALS AND METHODS

Virudhunagar, Thoothukudi, and Tirunelveli Districts in Tamil Nadu were included as the study field. Farmers in these areas mainly depend on agriculture, livestock, fire crackers office work and migration to city for work. Agriculture is predominant rainfed cultivation in these districts. These districts are unsuitable for major agriculture activities due to poor irrigation facilities and ground water level. In the study area, majority of the farmers raise indigenous livestock *viz.,* Kanni Adu goats, Vembur, Kilakarsal and Pattanam sheep breeds, a sizable number of farmers rear crossbred Jersey cattle and a limited number of farmers have non-descriptive buffaloes. The study area serves as a hub for the rearing of small ruminants due to its unique geographical dry region nature with sufficient grazing areas. Kanni Adu goat rearing provides a means of employment for the majority of farmers in the study area.

Sampling Procedure

The Kanni adu goat breeding tract was chosen for the study because it is one of the identified goat breeds in Tamil Nadu. The true type of Kanni adu goat breed is found in Tirunelveli, Thoothukudi and Virudhunagar districts of Tamil Nadu (Thiruvenkadan *et al,* 2011). Using the sample estimation formula, the sample size was determined by the proportionate random sampling method to select respondents from each taluk *viz*., Sattur – 110, Sivakasi – 88, Kovilpatty – 61, Vilathikulam – 48 and Sangarankovil – 74. Respondents with at least

15 yr of experience in raising goats were selected for the study. Totally 381 respondents from 25 villages were selected. Data were collected qualitatively and quantitatively during 2019 to January, 2021 by using a pre-tested interview schedule and the data were analyzed using appropriate statistical tools.

A total of 18 statements were finalized based on the judge's opinion. The minimum and maximum knowledge scores for an individual Kanni Adu goat farmer were 0 and 18, respectively. Every knowledge statement was measured independently, as well as component wise and an overall knowledge which included all of the statements was calculated through the knowledge index, percentage, mean and standard deviation.

RESULTS AND DISCUSSION

Individual statement wise knowledge level of respondents on climate change

The results of individual statements wise knowledge level of the respondents on climate change are presented in the Table 1. Out of the eighteen statements posed for answering by the respondents, only one statement *i.e.,* Rainy season begins in the month of October was known to three-fourth (75.33%) of the respondents which was ranked first. The seasonal forecasting behavior might be the reason for the high rainfall knowledge. The second ranked statement Southwest monsoon starts in the month of June was agreed by majority (61.68%) of the respondents. Farmers in this season only they harvest millet crops, procure dry fodder and other inputs. The statement on Winter season runs from October to February has been aware by one-half (50.39%) of the sample farmers securing third rank. They remember the season based on traditional tamil proverbs.

Further, around two-fifth (43.83%) of the respondents had agreed about the statements Climate change leads to high temperature, less rainfall and Indigenous goat breed can withstand the extreme climate than cross breed (38.06%). Goats seek shade for shelter during hot weather, and farmers

Table 1. Individual statement wise knowledge level of respondents on climate change   n=381

Sr. No.	Statement	Agree		Disagree		Rank
		No.	(%)	No.	(%)	
1	Rainy season starts in the month of October	287	75.33	94	24.67	I
2	South west monsoon starts in the month of June	235	61.68	146	38.32	II
3	Winter season occurs between October to February	192	50.39	189	49.61	III
4	Climate change leads to high temperature, less rainfall	167	43.83	214	56.17	IV
5	Indigenous goat breed (Kanniadu goat) can withstand the extreme climate than cross breed goats	145	38.06	236	61.94	V
6	Prevention of deforestation reduces the incidence of climate change	89	23.36	292	76.64	VI
7	Industrialization is a threat to goat rearing	81	21.26	300	78.74	VII
8	Dissemination of weather information to the farmers in advance can help to reduce the effect of climate change	46	12.07	335	87.93	VIII
9	Carbon dioxide, methane, nitrous oxide are the major gases responsible for climate change	39	10.24	342	89.76	IX
10	High use of automobile is a major source of green house gas	35	9.19	346	90.81	X
11	Burning of crop residue is also responsible for climate change	17	4.46	364	95.54	XI
12	Climate change increase the incidence of vector born diseases in goat farming	19	4.99	362	95.01	XII
13	Reduction in food grain production may occur due to climate change	16	4.20	365	95.80	XIII
14	Extreme hotness adversely affects the reproductive performance of goats	16	4.20	365	95.80	XIII
15	Climate change and global warming carry same meaning	13	3.41	368	96.59	XIV
16	Animal agriculture is a major contributor of climate change	7	1.84	374	98.16	XV
17	Extreme climate results in floods	7	1.84	374	98.16	XV
18	The amount of moisture present in the air is called humidity	0	0.00	381	100.00	XVI

have more experience in this region because they are constantly affected by this problem each year. Nguyen *et al,* (2019) reported similar results that most sheep farmers and horticulturists reported a rise in the primary temperature effect. Kumar (2011), Yadav (2017), Ramkumar *et al,* (2020) reported similar kind of results.

Apart from the above, all other statements have been disagreed by three-fourth majority of the sample goat farmers. Poor knowledge level shown by the sample respondents towards climate change may be due to the poor socio-economic status which compels the farmers to look for bread-winning jobs to fulfill their hunger needs than knowledge update.

The above results indicate the fact that, still the sample farmers could not be able to perceive the threats of climate change seriously. Even though discernible changes have been happening in the society pertaining to climate, high temperature days, scanty rainfall etc, it has not been comprehended well by the farmers because of their poor socio-economic and educational background.

Extent of Knowledge and knowledge gap of respondents on climate change

It can be summed from Table 2 that nearly half of the farmers (46.90%) had knowledge on the component of weather items such as rainy season, southwest monsoon, winter and moisture level. One–fourth (24.50%) had knowledge about mitigation component items such as dissemination of weather, reforestation, and indigenous goat breeds. Only one-tenth (11.80%) of the farmers had knowledge regarding climate change effects statements, namely the adverse effect of climate on livestock reproduction, high temperature, low rainfall, floods, food grain reduction and increased vector born diseases. Less than one-tenth (9.4%) of the respondents had knowledge on causes of climate change component statements, viz, gases responsible, the use of an automobile, burning of crop residues, animal agriculture contribution, and industrialization. Further, a negligible (3.41%) had knowledge of the statement on the meaning of climate change.

Further, it could be observed that knowledge gap has been estimated to 96.59 per cent in case of meaning of climate change, followed by 90.6 per cent towards cause of climate change, 88.2 per cent in respect of impact of climate change, 75.50 per cent for mitigation of climate change and 53.10 per cent in case of weather aspects respectively. Farmers' understanding of climate is important because all major activities are carried out by them and they must be informed of and prepared in this environment in order to sustain their livelihood. The reason for knowledge gap could be due to illiteracy, low social participation, low mass media contact, complex phenomena, poor exposure, and multiple cause of climate. Dympep and Singh (2017), Nguyen *et al* (2019), Joshi *et al* (2018) Nanlohy *et al* (2015) reported similar results.

Table 2. Component wise extent of Knowledge and knowledge gap of respondents on climate change.

(n= 381)

Sr. No.	Knowledge level	Maximum obtainable score	Extent of Knowledge (%)	Knowledge gap (%)
1.	Climate	04	46.90	53.10
2.	Climate change	01	3.41	96.59
3.	Causes of climate change	05	9.40	90.60
4.	Impact of climate change	05	11.40	88.20
5.	Mitigation	03	24.50	75.50

Table 3. Overall Knowledge level of respondents about climate change.   **(n= 381)**

Sr. No.	Category	Frequency (No.)	Percentage (%)
1	Low level	84	22.05
2	Medium level	240	62.99
3	High level	57	14.96

Overall Knowledge level of respondents about climate change

As indicated in the Table 3, the majority of the farmers (85.04%) had a medium to low level of knowledge, while only 14.96 per cent had a higher level of knowledge on climate change. The results conclude that majority of the farmers did not have an adequate level of knowledge to handle climate change. Inability to obtain climate change information from available sources and lack of knowledge acquisition on climate change might be the reason having medium to low level of knowledge. These findings were in agreement with results of Parameswaranaik *et al,* 2017; Sarkar and Padaria, 2015; Sarkar *et al,* 2014 and Ramkumar *et al,* 2020.

CONCLUSION

Appropriate knowledge application is critical for mitigating the adverse effects of climate change. The study found that Kanni Adu goat farmers had poor knowledge of climate changes occurring in the environment. Under these circumstances, creating awareness on detrimental effects of climate change is certainly warranted by means of various approaches to be through the government institutions concerned.

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