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Dairy farmers' knowledge on climate variability in Southern Telangana Zone

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Abstract

Dairy farmers' Knowledge on Climate Variability in Southern Telangana Zone, Data was collected by using the structured interview schedule. Six mandals from each district of Mahabubnagar and Nalgonda were selected purposively based on climate variability data and two villages from each mandal were selected by simple random sampling technique. Based on the available dairy farmers' population in the selected villages, 10 percent of the sample size (254 respondents) from 24 villages in 12 mandals of Southern Telangana zone was selected for the study. The study revealed that majority (49.60%) of the dairy farmers had medium knowledge level on climate variability. All the farmers opined that the annual mean temperature and occurrence of droughts had been increased, annual average rainfall and ground water level had been decreased from the past 10 years. Majority (87.01%) of the dairy farmers indicated that cross-bred cows were more affected due to heat stress than local breeds.

All the farmers in the study area articulated as "True" with regards to "climate variability is a serious problem", "body temperature of the animal would be increased during heat stress" and "decreased availability of water for irrigation due to climate variability". Similarly farmers also agreed that buffaloes are more affected than cattle due to heat stress (59.45%), severe heat stress causes abortions and retention of placenta in dairy animals (52.36%), respiration rate of the animal would be increased during heat stress (46.46%), human activities are also responsible for climate variability (42.52%), because of heat stress milk production will be reduced in crossbred cattle followed by buffalo and indigenous cattle (31.1%) and occurrence of rain in the presence of sunshine is an indicator of poor rainfall in the near future (5.12%).

Keywords: Dairy farmers, knowledge on climate variability, Southern Telangana Zone

Introduction

The Intergovernmental Panel on Climate Change (IPCC, 2007) ^[1] suggests that within the agricultural sector livestock are among the most climate sensitive economic areas. Climate variability is already a hard reality for a majority of Indian farmers. It is also recognized as the greatest challenge for societies in the 21st century. The phenomenon of climate variability is often less understood and more experienced, especially in the context of rural communities. India, which faced drought conditions at least once in every three years over the last few decades, is amongst the most vulnerable and drought prone countries in the world. Climate variability could produce drier conditions in arid and semi-arid regions like Telangana state leading to more severe droughts, and is more dynamic and adapting to this is more challenging. Indian agriculture is an economic symbiosis of crop and dairy population. Millions of rural smallholder milk producers dominate India's dairy industry. Dairy farming is a profitable enterprise as well as a promising livelihood maker for most of the farming community. Moreover, milk is a cash crop for smallholders, converting low-value agriculture by-products and crop residues, and using family labour as a value-added market commodity. But, it would be challenging, if nutritional requirement of the dairy animals is not met, as the health and their productive capacities are highly dependent on their nutrition. The limited herbaceous production, heat stress from higher temperature, and limited water intake due to the decrease in rainfall could cause reduced milk yields in animals and an increased incidence of some diseases. In some areas, climate variability may also cause new disease transmission models, these effects will be felt mostly by developing countries because of lack of resources, knowledge, veterinarian extension services and research technology development (FAO, 2008) ^[2]. Upadhy *et al.*, (2007) ^[3] stated that thermal stress on Indian livestock particularly cattle and buffaloes reported to decrease estrus expression and conception rate.

Heat stress on animals reduces the rate of animal feed intake and causes poor performance growth (Rowlinson, 2008) [4]. In this context, Dairy farmers’ knowledge on climate variability plays a paramount importance. Keeping in view of all these, a research study was undertaken.

Methodology

India’s youngest state “Telangana” was selected purposively for the present study because it is a semi-arid area and has a predominantly hot and dry climate. The severe drought in Telangana has caused acute shortage of water which worsened the agriculture and animal husbandry. As per the data collected from Telangana State Development Planning Society, In between 2010 to 2015, 8 out of 64 mandals in Mahabubnagar district and 7 out of 59 mandals in Nalgonda district were drought declared continuously for three times out of six spells of drought. Among these droughts hit mandals, six mandals from each district were selected by simple random sampling method by using lottery method, thus a total of twelve mandals, namely Keshampet, Madgul, Uppununthala, Kodangal, Waddepalle, and Aiza in Mahabubnagar district and Yadagirigutta, Munugode, Narayanapur, Chandur, Chinthapalle and Devarakonda in Nalgonda district were selected for the study. Based on the

available dairy farmers’ population in the selected villages, 10% of the sample size (254 respondents) from 24 villages in 12 mandals of Southern Telangana zone was selected for the study.

Knowledge on climate variability is operationally defined as the condition of knowing or level of factual information possessed by the dairy farmers on climate variability. The schedule was developed after consultation with literature, scientists, and veterinary extension faculty. Data was collected by using pre-tested structured interview schedule. For assessing the knowledge level of the farmers 16 statements included in the schedule and the responses were obtained in terms of “Yes” or “No” for first four questions and “True” or “False” for next twelve questions. A score of “1” was given to each correct answer and a score of “0” was given to each incorrect answer said by the respondent. Thus, the maximum and minimum scores obtainable by a respondent were “16” and “0” respectively. The collected data was tabulated and analyzed by using suitable statistical tools and the results were presented in percentages and frequency.

Results and Discussion

Distribution of respondents according to knowledge on climate variability is presented below:

Table 1: Distribution of respondents according to response to knowledge on climate variability (n = 254)

S. No.	Statements	Yes		No	
		F	(%)	F	(%)
1.	The annual mean temperature in your area during the last 10 years has been increased.	254	100.00	0	0.00
2.	The annual average rain fall in your area during the last 10 years has been decreased.	254	100.00	0	0.00
3.	The occurrence of droughts in your area has been increased.	254	100.00	0	0.00
4.	Ground water level in your area has been decreased.	254	100.00	0	0.00

S. No.	Statements	Yes		No	
		F	(%)	F	(%)
1.	Climate variability is a serious problem.	254	100.00	0	0.00
2.	Body temperature of the animal would be increased (>102.5 °F) during heat stress.	254	100.00	0	0.00
3.	Respiration rate of the animal would be increased (>70-80/min) during heat stress.	118	46.46	136	53.54
4.	Buffaloes are more affected than cattle due to heat stress.	151	59.45	103	40.55
5.	Crossbred cows are more affected due to heat stress than local breeds.	221	87.01	33	12.99
6.	Because of heat stress milk production will be reduced in crossbred cattle followed by buffalo and indigenous cattle.	79	31.1	175	68.9
7.	Severe heat stress causes abortions and retention of placenta in dairy animals.	133	52.36	121	47.64
8.	Decreased availability of water for irrigation due to climate variability.	254	100.00	0	0.00
9.	Dairy animals are also contributing to climate variability.	0	0.00	254	100.00
10.	Human activities are also responsible for climate variability.	108	42.52	146	57.48
11.	If dark clouds are observed throughout the day while the night sky remains clear, a drought is indicated.	0	0.00	254	100.00
12.	Occurrence of rain in the presence of sunshine is an indicator of poor rainfall in the near future.	13	5.12	241	94.88

F - Frequency, % - Percentage

The results presented in Table 1 revealed that all the farmers in the study area had knowledge on increase in mean temperature, occurrence of drought, decrease in rain fall trends, and ground water level from the past 10 years. All the farmers in the study area articulated as “True” with regards to “climate variability is a serious problem”, “body temperature of the animal would be increased during heat stress” and “decreased availability of water for irrigation due to climate variability”. Similarly farmers also agreed as “True” to the statements like crossbred cows are more affected due to heat stress than local breeds (87.01%), buffaloes are more affected than cattle due to heat stress (59.45%), severe heat stress causes abortions and retention of placenta in dairy animals (52.36%), respiration rate of the animal would be increased during heat stress (46.46%), human activities are also responsible for climate variability (42.52%), because of heat

stress milk production will be reduced in crossbred cattle followed by buffalo and indigenous cattle (31.1%) and occurrence of rain in the presence of sunshine is an indicator of poor rainfall in the near future (5.12%).

According to the score obtained related to knowledge on climate variability the frequency and percentage were calculated and the respondents were categorized into following categories based on mean and standard deviation.

Table 2: Distribution of respondents according to knowledge on climate variability (n = 254).

S. No.	Category	Frequency	Percentage (%)
1.	Low	83	32.68
2.	Medium	126	49.60
3.	High	45	17.72

$\bar{x} = 10.24 \sigma = 1.24$

Perusal of Table 2, revealed that that the majority (49.60%) of the respondents were with medium knowledge levels, followed by 32.68 percent and 17.72 percent were with low level and high level of knowledge on climate variability. This might also be due to the fact that majority of the respondents were illiterates, had medium dairy farming experience and had medium information seeking behaviour and they were more concerned about production rather than climate variation. Knowledge on Climate variability is often depending on human memory and this tends to focus on extreme events like prolonged droughts. These results were in line with the findings of Nwobodo and Agwu (2015) ^[5], Sarkar and Padaria (2016) ^[6], Preethi (2012) ^[7] and Kharumnuid (2011) ^[8].

Conclusion

Climate variability is already a hard reality for a majority of dairy farmers. Climate variability cannot be stopped but it can be controlled, as the study shows that, majority of the respondents were with medium followed by low and high level of knowledge on climate variability. Hence, knowledge of dairy farmers on climate variability need to be given special emphasis with various useful extension approaches. A large-scale climate variability literacy programmes has to be developed, in which farmers can participate, learn and adapt effective coping strategies to increase farm production as well as their livelihood security.

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