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## Direct emergent prescriptions for climate change strategies on poultry farms: A farmer perspective

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### Abstract

Heat wave like conditions prevailed during summer 2015 and 2016 across Palghat and Thrissur Districts of Kerala. Day-maxima even shot more than 40° C on several days with dry sub-humid conditions during summer months. Poultry farming was very sensitive to such weather aberrations. Keeping in mind the sensitivity of poultry to such weather aberrations, an investigation into the profile as well as the possible climate change mitigation strategies preferred by poultry farmers was conducted among an accidental sample of poultry farmers of Palakkad District. A descriptive research design with a semi- structured questionnaire was used for data collection. Preventive vaccinations against New Castle disease and Infectious Bursal disease were adopted by most of the farmers. Rises in ambient temperature were reportedly associated with increased mortality among birds. Very few farmers were advised on remedial measures to counter climate change issues through trainings and other appropriate methods. Important management interventions suggested by farmers to reduce heat stress were measures to improve the air circulation inside the sheds during summer by using fans, thatching of roofs for reducing in house temperatures, reducing the flock density to help free movement.

**Keywords:** Direct emergent prescriptions, climate change strategies, poultry farms, farmer perspective

### Introduction

Poultry are important sources of animal protein all over the world. It has been reported that poultry represents nearly one third of all animal protein consumption (Permin and Pedersen, 2000) [8]. Poultry production is however constrained by many factors among which the widespread variations in climate are critical. Variations in climate have been reported to affect fertility (Obidi *et al.*, 2008) [7], immunoresponse of chickens (Tirawattanawanich *et al.*, 2011) [10] besides increasing the incidence of mortality in chickens (Shittu *et al.*, 2014). Over the recent years climate changes have been reported in the state of Kerala. Kerala has witnessed heat wave like conditions prevailed during summer 2015 and 2016 across Palghat and Thrissur Districts of Kerala. Day-maxima even shot more than 40° C on several days with dry sub-humid conditions during summer months. Traditional knowledge of local people is an important source that could contribute to adaptation strategies (Andrea & Sundaresan, 2015) [1]. The methods employed today to arrive at climate change adaptation strategies is however generally based on knowledge and practices that have been worked out in the Western world. Worldwide there has been increasing demands as well as interest in developing proper linkages between local as well as scientific knowledge of the ecosystem as well as appropriate strategies for climate change adaptation. (Berkes, 2008) [2]. Keeping in mind the very sensitive nature of poultry and the need to arrive at farmer friendly climate change mitigation strategies a study was conducted among an accidental sample of poultry farmers of Palakkad district of Kerala state.

### Materials and Methods

An investigation into the profile as well as the possible climate change mitigation strategies preferred by poultry farmers was conducted among an accidental sample of twenty nine poultry farmers of Palakkad District. A descriptive research design was used for the study. A semi- structured questionnaire developed for the purpose of analyzing the after effects of weather extremes on poultry and the farmers' suggestions regarding management interventions to be incorporated in the response system was used for data collection.

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**Results and Discussion**

**Table 1:** General profile of farmers

Sl. No.	Variable	Category	Percent
1	Gender	Male	96.67
		Female	3.33
2	Age	Average	47.4+/- 11.8 (se)
3	Occupation	Major	55.17
		Subsidiary	34.48
4	Flock size	Average	3073.25
5	Period of rearing	3 months	55.17
		Less than one year	6.89
		One to two years	10.34
		Two or more	17.24
6	Training exposure	Yes	10.34
		No	82.75
7	Details of other animals reared	Cow	27.58
		Goat	13.79
		Dog	13.79
		Rabbit	3.44

Analysis of general profile of the farmers revealed that majority of the farmers involved in poultry rearing were male and the participation of women was altogether negligible. Average age of the respondents was 47.4 ± 11.8 (SE) which indicated a lower representation of younger members of in this sector. Keeping in mind the serious unemployment issues among the younger generation against the entrepreneurial potential of this sector, this finding indicates that there is ample scope for promotion of this sector among youth Poultry farming was adopted as a major occupation by more than half of the farmers while the rest considered it as a subsidiary occupation. The gender, age and occupational characteristics observed in this study were similar to those made by Amos (2006) [3] among the poultry producers of Nigeria. Despite the fact that trainings have been observed to be effective methods of promoting income and employment generation activities through improvements in knowledge, developing skills and changing attitudes (Jiji and Vijayan, 2012) [5], it was observed that most of the poultry farmers had no training exposure with respect to poultry production practices. Similar findings were made by Yhome *et al.* (2011) [11] among poultry farmers of Kohima and Dimapur district of Nagaland as well as by Khaleda (2013) [6] among poultry farmers of the Ghazipur, Bangladesh.

The results of this study indicated that the average flock size of holdings was 3073.25 birds and majority of farmers kept birds for three months while others kept them for more than a year. It was also observed that poultry rearing was being undertaken along with other animal husbandry activities such as dairying in more than one fourth of cases were cows were reared. A few farmers reared goats, dogs and rabbits along with poultry.

Management practices adopted by farmers were investigated and results are depicted in Table 2. Majority of the farmers were reared broiler breeds of poultry while only few reared layer birds. Indigenous poultry breeds were kept in very few households. Other poultry breeds such as fancy birds, Guinea fowl and Giriraja breed were also reared by some farmers. Feeding of readily available concentrate feed available in the market was the mode of feeding adopted by more than two third of the poultry farmers. Home food waste was used as feed by just one fifth of the farmers while cereals and grains were a less preferred choice. None of the farmers had adopted

feed mixing using locally available ingredients. Concentrate feed available in market was used by majority of the farmers while the others reared poultry on feed waste, cereals and grains. Regarding vaccination of birds, nearly three fourth of vaccinated their birds against Gumboro disease, while just over fifty percent had adopted vaccination against Ranikhet disease. Very few farmers had adopted vaccination of birds against Marek's disease and Newcastle disease.

**Table 2:** Poultry Management practices

Sl. No.	Management practices	Category	Percent
1	Breeds reared	Broiler	79.31
		Indigenous	13.79
		Layer	17.24
		Fancy chicken breed	3.44
		Guinea fowl	3.44
		Giriraja	3.44
2	Feeding	Food waste	20.68
		Market feed	62.06
		Mixing feed by own	0
		Cereals and grains	6.89
3	Vaccination	Ranikhet Disease	51.72
		Infectious Bursal Disease	13.79
		Marek's disease	13.79
		Gumboro disease	72.41
4	Practice of vaccination	Farmer	58.62
		Personnel of local Veterinary Dispensary	65.51
5	Manure Disposal	As fertilizer in own land	27.58
		Sold as fertilizer	0

More than half of the farmers vaccinated the birds themselves while the rest used the facilities for vaccination at the local government veterinary dispensaries. Poultry manure was utilized by majority of the farmers as fertilizer on their own farm land.

Almost all the poultry farmers had observed various deleterious effects of climate change on poultry. These findings are in concurrence with those of Adesiji *et al.* (2013) [4] among the farmers of Ondo State, Nigeria. In the present study, farmers reported an increased rate of mortality followed by a higher incidence of disease outbreaks as the major impacts of extreme summers while increased mortality, decreased immunity and more disease outbreaks were the major problems faced by them in rainy seasons.

**Table 3:** Effects of climatic changes on poultry

Sl. No.	Season	Effects observed	Percent
1	Summer	Increased incidence of diseases	17.24
		Increased mortality	79.31
2	Monsoon	Increased mortality	62.06
		Decreased immunity	31.03
		Increased incidence of diseases	6.89

Proposed farmer solutions for these conditions were related to stocking of birds, feeding, management and housing of birds. The increased mortality and disease outbreaks in summer could be due to increased sunshine intensity and temperature fluctuations which could cause fluctuations in the feed intake pattern of the birds thereby affecting production (Adesiji *et al.*, 2013) [4]. Important management interventions suggested

by farmers to reduce heat stress were improving air circulation in poultry sheds during summer by using fans, thatching poultry shed roofs to reduce heat conduction, reducing flock density to help free movement, supplying ad libitum water, spraying water and practicing vaccination to prevent diseases. Monsoon climate change strategies suggested included covering the sides of sheds with sheets, cleaning farm premises and purifying drinking water. Further it was also suggested that administration of indigenous remedies of pepper, adathoda and garlic mixtures to prevent the respiratory infection at times of low temperatures was effective in countering respiratory disorders.

### Conclusion

Global warming and climatic changes impacting poultry production call for special attention by various the stakeholders. Paucity of relevant data in this regard has adversely affected strategy formulation for counteracting the ill-effects till date. Hence a multidisciplinary approach for research and development and information dissemination is the need of the hour.

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