Skill development programs Concerning backyard poultry farming in arid regions of Rajasthan, India

Abstract

This study aimed to evaluate the influence of skill development training programs on the promotion of backyard poultry farming practices in the arid regions of Rajasthan. Data were collected from 120 respondents through a meticulously designed interview schedule and questionnaire. The findings revealed a significant positive impact on various aspects of poultry farming. Notably, 99% of respondents demonstrated an uptake in the timely treatment of sick birds, while 98% adopted practices such as feed formulation at the household level, culling and selection, use of antibiotics, rearing of quality birds, and consulting veterinary doctors. Additionally, 97% of respondents incorporated feed supplements into their practices, and a similar percentage (97%) ensured appropriate feed provision based on the age of the birds. These results underscore the effectiveness of skill development training programs in enhancing the adoption of best practices in backyard poultry farming within the challenging arid environment of Rajasthan. The analysis of the collected data further revealed a consistent adoption index across various aspects of backyard poultry farming practices. Specifically, a noteworthy adoption rate of 92% was observed for the segregation of diseased birds, record-keeping, and de-beaking. However, a slightly lower adoption rate of 88% was noted for feed supplement usage.

The data indicated that the maximum gain in adoption was observed in the practice of consulting veterinary doctors, with an impressive rate of 85%. Following closely were the practices of segregating diseased birds (84%), feed formulation at the household level, and rearing of quality birds (82%). Additionally, high adoption rates were observed for record-keeping (81%) and feed supplement use (79%). Post-mortem examinations conducted by veterinary doctors on deceased birds also showed a substantial adoption rate of 77%. It is noteworthy that while the majority of practices demonstrated significant gains, culling exhibited a comparatively lower adoption rate of 53%. This suggests that there may be factors influencing the reluctance or challenges associated with the implementation of culling practices among the respondents.

Overall, the findings underscore the positive impact of the training programs on the farmers' knowledge enhancement and their familiarity with advanced poultry farming technologies. The consistent adoption across multiple practices highlights the effectiveness of the training in empowering farmers to incorporate improved techniques into their backyard poultry farming endeavors.

Keywords: De-beaking, Poultry, Respondent, Segregation

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Introduction

Agriculture holds paramount significance in the Indian economy, with over 70% of rural households relying on this sector. Contributing approximately 19.9% to the total GDP and engaging around 58% of the population, agriculture is a cornerstone of economic activity in the country. Livestock, sustaining two-thirds of rural communities and employing 8.8% of the population, plays a pivotal role, contributing 4.11% to the GDP and 25.6% to the Agriculture GDP. The livestock and poultry sectors are vital contributors to India's economy, providing food,

nutritional security, and employment opportunities in the rural landscape (Nath *etal.*,2012).Poultry production in India, originating from traditional backyard systems, has evolved into a substantial industry. Despite the sector's importance, the accessibility of poultry products in rural areas is limited due to elevated prices. Capacity building through training becomes imperative for economic strengthening and the cultivation of a scientific approach among poultry farmers, thereby enhancing their knowledge and awareness. (Bhattarai, 2008).Acknowledging the influence of farmers' meticulousness (Rosaria,1997)and educational status on technological adoption, training programs aim to bring about a desired change in their attitude and approach. Knowledge acquisition becomes essential for optimal utilization of genetic stock, efficient resource management, economic decision-making, and implementation of sound poultry husbandry practices, ultimately contributing to increased socio-economic status.(Rosaria,1997).Themainpurposeof training is to bring desired change in the attitude/approach of farmers(Brough, 2004).Knowledgeisessentialfor theproperutilizationofgeneticstock,availableresources,economicinformation,andscientificpoultryh usbandrypracticesbythefarmerstodeveloptheirbusinesssuccessfullyandisultimatelylinkedwiththein creasedsocio-economicstatus(Boice,2005;Eade,2007;Sharma,2010).Training improves a person'sskill, andpowerofintelligenceandalso develops the desiredattituderequiredforhiswork.(Dahama and Bhatnagar 1980). Training, as a systematic process for acquiring new skills, attitudes, and knowledge, plays a pivotal role in improving farmers' capabilities. The success of these programs relies on the receptivity of the trainees, fostering the acquisition of knowledge and technological skills. Rural farmers predominantly rear indigenous or desi poultry birds with comparatively lower egg and meat production. The lack of awareness regarding optimal farm practices and challenges associated with poultry farming, especially with increasing flock sizes, necessitates basic training for making poultry farming economically viable in rural areas.This study is designed to assess the impact of training programs organized by Krishi Vigyan Kendra on the adoption of improved backyard poultry farming practices. The evaluation focuses on aspects such as the identification of improved poultry breeds, disease management, coping with climatic stresses, understanding feed ingredients, and effective poultry waste management. The findings aim to contribute valuable insights into the efficacy of training initiatives in enhancing the adoption of improved practices, thus promoting sustainable and economically viable backyard poultry farming in rural India.

MaterialsandMethods

The training program, centered at Krishi Vigyan Kendra Bikaner, an established institution for skill development in poultry farming in Rajasthan, served as the focal point for this study. The sample comprised 120 trainees who underwent scientific poultry farming training between the years 2018-19 and 2020-21.A meticulously designed interview schedule was formulated to capture comprehensive data on socio-economic characteristics, enterprise dimensions, and the performance of poultry entrepreneurs. The information was collected through structured questionnaires administered to the trained farmers via in-person visits and discussions. The data collected were subjected to thorough analysis to assess the adoption of backyard poultry structures among the participating farmers.To gauge the adoption levels of management practices by the farmers both pre- and post-training, an adoption scale was introduced. This scale featured a list of technologies adopted by the farmers, allowing them to mark their selections. The marked responses were then used to position the adoption level on the scale, enabling the identification of constraints hindering adoption.

Data analysis was conducted utilizing a combination of descriptive and inferential statistical methods, providing a comprehensive understanding of the training program's impact on the adoption of backyard poultry management practices among the farmers. The use of both types of statistics ensured a nuanced examination of the data, allowing for a robust evaluation of the training program's efficacy in influencing the adoption behavior of the participants.

Statisticalanalysis

McNemar's test, developed by McNemar in 1947, is a non-parametric statistical test specifically designed for analyzing paired nominal data. This test is particularly useful in scenarios involving 2×2 contingency tables with a dichotomous trait and matched pairs of subjects. The primary objective of McNemar's test is to assess whether there is a significant difference between the marginal frequencies of rows and columns in the contingency table.

In the context of social science research, McNemar's test finds a suitable application when investigating the impact of training programs or interventions. It is especially valuable for evaluating changes in nominal categorical variables before and after an intervention, training, or program. By examining the paired nature of the data, McNemar's test helps researchers determine whether there is a statistically significant shift in the distribution of categories.

In summary, McNemar's test is a non-parametric method well-suited for paired nominal data, making it an appropriate statistical tool for assessing the impact of training or programs in social science research, where categorical variables are involved.

H0: There is no impact of training on the Knowledge and skill of the farmer

HA: There is impact of training on the Knowledge and skill of the farmer

Under the null hypothesis, with a sufficiently large number of observations, McNemar’s test statistic follows the chi-squared distribution with 1 degree of freedom. If the result is significant, null hypothesis is rejected.

ResultsandDiscussion

The data presented in Table 1 demonstrates the age, gender, education level, occupation, and land holding.The demographic analysis reveals that a significant majority (58.33%) of the sampled poultry farmers fall within the age bracket of 31-40 years, with the subsequent age group of 20-30 years following closely. In contrast, respondents aged over 40 years constitute 16.67% of the sample. Notably, a conspicuous pattern emerges, indicating that the 31-40 years age group exhibits the highest adoption percentage of backyard poultry farming practices. This suggests a positive correlation between age and the inclination towards engaging in poultry farming.Further exploration of the data unveils a gender disparity, with a substantial majority (82.5%) of the respondents in the arid regions of Rajasthan being male. This demographic skewness implies a noteworthy gender gap in the adoption of poultry farming, with a considerably lower percentage (17.5%) of rural women participating in this agricultural endeavor. This insight underscores potential gender-specific challenges or disparities in engaging women in poultry farming activities in the studied region. Regarding educational backgrounds, the majority of respondents (50.83%) have attained a middle school education. Successive educational categories include intermediate, primary education, graduate, and illiterate. This educational distribution provides valuable context for understanding the educational landscape of poultry farmers in the arid regions of Rajasthan. In summary, the demographic findings underscore the influence of age, gender, and education on the adoption of

backyard poultry farming practices. These insights contribute to a nuanced understanding of the socio-demographic factors shaping poultry farming engagement in the studied region. Similar findings were reported by (Nath *et al.,* 2012).

Table 1 further illuminates the occupational distribution among respondents, demonstrating that a substantial majority (87.5%) identified with the farming community. Conversely, 10.0% of respondents were characterized as landless laborers, with an additional 2.5% being classified as businessmen. This indicates that the predominant occupation of the surveyed individuals engaged in backyard poultry farming is farming itself.

The findings collectively lead to the conclusion that the majority of backyard poultry farmers in the studied cohort are actively involved in agriculture. This correlation between poultry farming and traditional farming activities highlights the integral role of agriculture in the livelihoods of these respondents. Understanding the predominant occupation provides valuable context for comprehending the socio-economic dynamics influencing the adoption and practice of backyard poultry farming in the surveyed region.

Table 1: -Distribution of respondents based on socioeconomic characteristics of thebackyard poultry farmers.

Characteristics	Frequency	Percentage
Age (years)		
20-30	30	25
31-40	70	58.33
>40	20	16.67
Gender		
Male	99	82.5
Female	21	17.5
Education level		
Illiterate	3	2.5
Primary	18	15
Middle school	61	50.83
Intermediate	32	26.67
Graduate	6	5.0
Occupation		
Farming	105	87.5
Land less labours	12	10.0
Businessmen	3	2.5
Land Holding		
<2 hac	13	10.83
2-3 hac	67	55.84
>5 hac	40	33.33

Knowledge level or score of poultry farmer: -

The inadequate implementation of programs, low literacy rates, ineffective marketing systems, a dearth of scientific knowledge, and a lack of farm mechanization collectively stand as substantial constraints impeding the socio-economic advancement of farmers. Poultry, given its

physiological sensitivity to adverse climatic conditions due to feathered bodies and the absence of sweat glands, requires meticulous care. Prolonged exposure to stress can detrimentally impact production performance, leading to heightened susceptibility to stress-related diseases. Mitigating such risks involves the provision of feed supplements and the establishment of improved housing facilities.Essential prerequisites for successful poultry farming encompass well-ventilated houses, a hygienic environment, and the implementation of scientific waste management strategies. Poultry house dimensions are contingent upon flock size, and before housing birds, thorough fumigation or disinfection using approved chemicals is imperative. The utilization of materials such as wood and rice bran for creating dry and clean litter further contributes to maintaining optimal conditions. Proper placement of poultry feeders, drinkers, and other equipment, adjusted according to flock size and house area, is crucial.However, a noteworthy observation reveals that a significant proportion of farmers lack awareness, with only a limited few employing scientific management techniques in their poultry farms. This underscores the importance of training interventions, as evidenced by a substantial increase in the average knowledge score of trainees from 4.98 to 15.02. The impact of training, therefore, emerges as a significant factor in enhancing farmers' knowledge and fostering the adoption of improved poultry farming practices, thereby addressing key constraints and promoting sustainable socio-economic development. (Table 2). Similar to the present finding *Ram et al.*, 2017 assessed the importance of training and concluded thatthe farmer needs training. Chatterjee *et al.,* 2015 highlighted the importance of farmer's training and stated that the success of poultry production depends primarily on the locally adapted bird employed, favorable environment, and availability of good feed. However, Kabir *et al.,* (2015) also studied the impact of poultry farming on the socio-economic condition of Bangladeshi farmer and concluded that the 38% of the farmer's socio- economic condition got improved due to family poultry farming.

Table:-2 Knowledge level or score of poultry farmer (based on questionnaire)

S. No.	Poultry Farm Management Practices	Average Score (Out of 20)	
		Before Training	After Training
1	Housing, Sanitation, and waste management	5.76	14.24
2	Disease Management and Schedule Vaccination	3.05	16.95
	Poultry Nutrition and Feed Formulation	8.26	11.74
3	Stress Management of Poultry	2.72	17.28
4	Abnormal Behaviour of Poultry	5.11	14.89
5	Overall Average Score	4.98	15.02

Trainingneedsareasamongpoultryfarmers: -

Table 3 provides an insightful overview of the training needs identified by poultry farmers for various key activities. The areas deemed comparatively less important for training, presented in descending order, include Chicks rearing/Brooding management, Feed preparation/formulation, Vaccination & Preventive measures, Disease diagnosis & health care, Poultry shed & Housing Management, Feeding & watering management, Layer Management, Bird/meat/egg marketing, Incubation/hatching, Culling/Selection of birds, Chick purchasing, Compost preparation, Breeding/mating aspects, and maintenance of records/accounts.

Despite their perceived lower importance, it is noteworthy that knowledge in breeding/mating aspects and brooding remains crucial within the context of rural poultry farming. Adequate

understanding of these aspects holds the potential to significantly enhance productivity and contribute to the overall sustainability of the poultry system. Specifically, the selection of cockerels and the replacement of males in the flock emerge as imperative practices to mitigate the effects of inbreeding, thereby fostering the long-term health and genetic diversity of the poultry farm.

Recognizing and addressing the identified training needs in these critical areas can serve as a catalyst for improving the efficiency, productivity, and sustainability of poultry farming practices among rural communities. The findings highlight the importance of targeted training programs to equip farmers with the essential knowledge and skills necessary for optimizing their poultry farming operations. (Gawande *et al.,* 2007; Kapur, 2008).The outcomes presented in Table 3 underscore the significance of Chick rearing/Brooding management, Feed preparation/formulation, Vaccination & Preventive measures, and Disease diagnosis & health care as pivotal training areas, with high participation reflecting their fundamental nature. Training interventions play a crucial role in enhancing the knowledge and skills of farmers, fostering increased acceptability and adoption of contemporary scientific practices and interventions. Notably, a positive correlation between higher education levels and the adoption of technologies was observed, emphasizing the role of education in driving the uptake of modern agricultural practices.

The gender dimension emerges as a significant factor influencing financial activities, underscoring the need for gender-sensitive approaches in addressing financial aspects within the agricultural context. The majority of farmers express a preference for training through on-site demonstrations (64.5%), emphasizing the value of hands-on, practical learning experiences. Additionally, a notable percentage of farmers opt for exposure visits (25.5%) and lectures with field trips (10.0%), aligning with established practices highlighted by Taneja (1998). On-site demonstrations are particularly effective as they offer multiple sessions with experts directly at the farmers' own establishments, facilitating better understanding and acceptance of scientific interventions and modern practices.Preferences for indigenous poultry breeds are widespread among farmers due to their lower maintenance requirements, reduced susceptibility to diseases, and resilience to prevailing conditions. This inclination towards indigenous birds aligns with the farmers' practical considerations for sustainable poultry farming.

However, the study also reveals the historical challenges faced by rural poultry development, as the status in targeted areas continues to be notably poor several years after independence, highlighting the need for strategic planning and intervention to uplift rural poultry practices.It might be due to thereasonthattheproducersdonotadoptimprovedbreedsandtechnology at desired level because of the unavailability and inadequatesupply of chicks, the low genetic potential of birds, high mortality duringextreme winter and summer, lack of loan facilities, and high rate ofinterest, costly feed, inadequate knowledge about scientific feeding,health care, and management etc. (Mehta *et al.,* 2002; Pica-CiamarraandOtte,2009).Apartfromthisnecessaryfacilitiesregardingdiagnosis,prevention,vaccinationandcontrolmeasuresforsafeguarding the health and production of poultry need to be extended invillage areas (Katari*et al*., 2005; Dhama*et al*., 2008a, b,c; Dhama*etal*.,2011;Dhama*etal*.,2013a,b,c,d,e,f).Thiswouldhelpintheadaptation and propagation of popular poultry farming as a popularbusinessandsourceofregularandsustainedincomeinruralareas.

Table 3: -Trainingneedsareasamongpoultryfarmers

S.No.	Trainingneedarea	Trainees / Farmers	Rank
1	Chicksrearing/Broodingmanagement	120	I
2	Feedpreparation/formulation	110	II
2	Vaccination&Preventivemeasures	94	III
4	Diseasediagnosis&healthcare	92	IV
5	Poultryshed&Housingmanagement	88	V
6	Feeding&wateringmanagement	84	VI
7	Layermanagement	78	VII
8	Bird/meat/eggmarketing	76	VIII
9	Incubation/hatching	72	IX
10	Culling/Selectionofbirds	70	X
11	Chickpurchasing	63	XI
12	Compostpreparation	56	XII
13	Breeding/ matingaspect	50	XIII
14	Maintenanceofrecords/accounts	48	XIV

Adoption of improved management practices by farmers before training:-

The data presented in Table 4 offers insights into the awareness and adoption levels of various poultry farming practices among respondents. Prior to training, the awareness levels were as follows: culling (42%), use of antibiotics (32%), timely treatment of sick birds (29%), use of de-beaking (28%), frequent visits to birds (26%), providing feed according to poultry age (21%), use of disinfectants (18%), rearing quality birds and feed formulation (16%). However, lower adoption rates were observed in post-mortem of dead birds by veterinary doctors (0%), brooding management (15%), record-keeping (11%), use of feed supplementation (9%), consulting veterinary doctors (13%), and segregation of diseased birds (8%).The pre-training scenario indicates that, overall, respondents had medium to low adoption levels of poultry farming practices. Particularly, there was a lack of awareness in crucial aspects such as post-mortem of dead birds by veterinary staff, segregation of diseased birds, feed supplement uses, brooding management, record-keeping, and feed formulation at the household level.These findings emphasize the need for targeted training interventions, as they reveal a baseline scenario where poultry farmers were not well-versed in essential management practices. The low adoption rates underscore the potential impact of training programs in elevating the awareness and implementation of improved poultry farming techniques among the respondents.Similar findings were also reported by Ezeibe*et al.,* 2014.

Adoption of improved management practices by farmers after training: -

There is a significant adoption of all the improved poultry management practices after training (Table 4). The data in Table 4 reveals high adoption rates of various poultry farming practices among the respondents. Specifically, a substantial majority of respondents adopted timely treatment of sick birds (99%), feed formulation at the household level (98%), culling and selection (98%), use of antibiotics (98%), rearing of quality birds (98%), and consulting veterinary doctors (98%). Additionally, 97% of respondents incorporated feed supplements into their practices, and 96% provided feed according to the age of the poultry.

Furthermore, a commendable adoption index of 92% was observed for the segregation of

diseased birds, record-keeping, and de-beaking. A slightly lower adoption rate of 88% was recorded for feed supplement use.These findings collectively indicate a high level of awareness and adoption of various poultry farming practices among the surveyed respondents. The majority of farmers demonstrated a commitment to implementing key management practices, contributing to the overall health and productivity of their poultry operations. The high adoption rates suggest a positive inclination towards incorporating best practices, which is crucial for the sustainable and efficient management of poultry farms. The view for the above management practices was also supported by Ithika et al., 2013. The data in Table 4 reveals varying degrees of adoption rates for different poultry farming practices among respondents. The maximum gain in adoption was observed in consulting veterinary doctors, with an impressive rate of 85%. This was closely followed by the segregation of diseased birds at 84%, feed formulation at the household level, and rearing of quality birds, both registering an adoption rate of 82%. Record-keeping demonstrated a high adoption rate of 81%, while feed supplement use was adopted by 79% of respondents. Post-mortem of dead birds by veterinary doctors showed a substantial adoption rate of 77%.In contrast, culling exhibited a comparatively lower adoption rate of 53%, indicating that this particular practice had a lower level of adoption among the respondents.These adoption rates offer valuable insights into the preferences and priorities of poultry farmers in the surveyed region. The higher adoption rates in consulting veterinary doctors, segregation of diseased birds, and various management practices highlight the farmers' recognition of the importance of veterinary guidance and disease management in poultry farming. The lower adoption rate for culling may suggest potential challenges or reluctance associated with this particular practice. Overall, understanding these adoption patterns is crucial for tailoring interventions and training programs to address specific needs and enhance the overall sustainability of poultry farming practices.

Table 4: - Adoption level of improved management practices before and after the training

Sr. no	Management Practices	Adoption index (%)		Gain (%)
		Before	After	
1	Brooding management	15	79	64
2	Use of disinfectants on farm	18	74	56
3	Feed formulation at the household level	16	98	82
4	De-beaking	28	92	64
5	Timely treatment of sick bird	29	99	70
6	Culling & selection	45	98	53
7	Record keeping	11	92	81
8	Use of antibiotics	32	98	66
9	Frequent visits to birds	26	97	71
10	Post-mortem of dead bird by veterinary doctors	0	77	77
11	Feed supplement uses	9	88	79
12	Rearing of quality birds	16	98	82
13	Provide feed according to age	21	96	75
14	Segregation of diseased birds	08	92	84

15	Consulting veterinary doctors	13	98	85

Conclusion

The present study concludes that the training program exerted a substantial impact on farmers, particularly in fostering the adoption of scientific methods in backyard poultry farming. The overall adoption percentage observed among the farmers suggests that the training had a noteworthy influence on the uptake of new technologies, thereby contributing to the enhancement of their livelihoods. The training initiatives played a crucial role in elevating awareness among the beneficiaries and augmenting their knowledge base.The findings underscore the effectiveness of the training program in bridging the knowledge gap and instilling an understanding of modern technologies in poultry farming. By empowering farmers with new insights and methodologies, the training facilitated a positive shift in their approach, leading to the adoption of more scientifically informed practices. This increased awareness and knowledge are vital components in promoting sustainable and improved livelihoods within the context of backyard poultry farming.Overall, the study supports the notion that targeted training interventions can serve as catalysts for positive change, not only by imparting knowledge but also by influencing the adoption of advanced agricultural practices, ultimately contributing to the economic well-being of the farming community.

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