ADOPTION OF IMPROVED SHEEP PRODUCTION TECHNOLOGIES IN ARID WESTERN PLAIN ZONE OF RAJASTHAN

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ABSTRACT

The study was conducted in arid western plain zone of Rajasthan. A total of 240 sheep farmers constituted small, medium and large flocks were selected for the study purpose. Results indicated that more than half of the respondents possessed medium level of adoption. They had higher adoption about improved feeding technologies followed by management and breeds and breeding technologies. There also existed a significant difference with regard to adoption levels of small, medium and large sheep farmers.

Key words: Adoption, Sheep breeding, Sheep feeding, Sheep Production Technologies.

INTRODUCTION

Sheep is an important species of livestock in India for utilization of available sparse vegetation and owing to their multifaceted utility (wool, meat, skin, milk and manure). They contribute greatly to the agrarian economy especially in the areas where crop production and dairy farming are not economical and play an important role in livelihood of a large number of small, medium and land less labourers. According to livestock census 2002 there are about 10.05 million sheep in Rajasthan, which is 16.34 per cent of India’s sheep population (61.50 million). Rajasthan sheep population is second highest after Andhra Pradesh (21.30 million). More than two lac farm families depend upon sheep farming for their livelihood in Rajasthan. India ranks fourth in sheep production in the world. Wool production of country was 45.00 million kg with an average of 0.90 kg wool per sheep against the world average of 2.40 kg, which is very low (Anonymous 2007).

The productivity of this kind is mainly contributed to poor genetic potential, poor feeding schedule, lack of sound management practices and poor health care. Hence, there is a lot of scope to increase the productivity of sheep in terms of wool production in the state. But sustainability of wool production of the sheep depends on the adoption of improved sheep production technologies by the sheep farmers. Several development programmes are in operation throughout the country to help the farmers to adopt new technology; still there existed a wide gap between the technology available and its ultimate adoption by the client system. Therefore, it is necessary to know the adoption level of sheep farmers. Keeping this fact in view the present investigation was undertaken with an objective to study the extent of adoption of improved sheep production technologies by sheep farmers in arid western plain zone of Rajasthan.

MATERIALS AND METHODS

The study was conducted in Arid Western Plain zone (I-a) of Rajasthan. It includes Barmer and Jodhpur districts. Two tehsils from each district and four villages from each selected tehsils were selected randomly. Hence, sixteen villages in all were taken up for the study. A comprehensive list of all the sheep farmers engaged in sheep farming for last 5-10 years of the selected villages was prepared with the help of concerned persons. Then all the sheep farmers from selected villages were pooled separately district wise. On the basis of the number of sheep possessed by the sheep farmers they were categorized into three groups of small, medium and large sheep farmers. More than half of the respondents possessed medium level of adoption. They had higher adoption about improved feeding technologies followed by management and breeds and breeding technologies. There also existed a significant difference with regard to adoption levels of small, medium and large sheep farmers.

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large sheep farmers having the flock size of 1-50, 51-100 and more than 100, respectively. From these identified categories, 120 sheep farmers were selected proportionately on the basis of random sampling from each district, thus making a total sample of 240 sheep farmers.

To measure the extent of adoption of improved sheep production technologies, an adoption index was developed. The important practices of improved sheep production technologies were included in schedule viz., breeds and breeding, feeding and management (housing, shearing, health care and hygiene). Each selected practice was further divided into several questions and scores were assigned on multiple choice. On the basis of the scores obtained, Adoption Index (A. I.) for each respondent was computed by the following formula:

\[
\text{Adoption} = \frac{\text{Total adoption score obtained by an individual}}{\text{Maximum obtainable score}} \times 100
\]

RESULTS AND DISCUSSION

To get an overview of the sheep farmers with respect to level of adoption, the sheep farmers were categorized into low, medium and high adopter groups. This categorization was based on the mean and standard deviation of the adoption scores obtained by the sheep farmers. Further, to find out whether there existed a significant difference among three categories of sheep farmers, the chi-square test was applied. A significant difference was observed among all the categories of sheep farmers related to their extent of adoption about improved sheep production technologies.

It is evident from Table 1 that majority of the total sheep farmers (59.17 per cent) had medium level of adoption, whereas, 23.33 and 17.50 per cent respondents had low and high adoption level about improved sheep production technologies, respectively.

Sheep farmers’ extent of adoption about improved breeds and breeding technologies

Table 2 depicts that there was significant association in extent of adoption among different categories of sheep farmers with regard to scientific breeds and breeding technologies. Comparative look at the data in Table 2 revealed that the large sheep farmers had higher mean per cent score (MPS) of adoption (41.24) as compared to the medium (38.07 MPS) and small (32.26 MPS) sheep farmers.

Adoption in large categories of sheep farmers was higher about breeds and breeding technologies than small and medium sheep farmers. This might be due to the fact that large sheep farmers had higher knowledge about the improved breeds of wool production, required proportion of ewes and rams in the flock, flushing, symptoms of heat detection, appropriate age of puberty, appropriate time to conceive the sheep after lambing and the number of services taken from the breeding ram for

<table>
<thead>
<tr>
<th>Level of Adoption</th>
<th>Small sheep farmers (up to 50 sheep)</th>
<th>Medium sheep farmers (51-100 sheep)</th>
<th>Large sheep farmers (above 100 sheep)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low level of adoption</td>
<td>33</td>
<td>14</td>
<td>09</td>
<td>56</td>
</tr>
<tr>
<td>(Less than 38.95)</td>
<td>(13.75)</td>
<td>(05.83)</td>
<td>(03.75)</td>
<td>(23.33)</td>
</tr>
<tr>
<td>Medium level of adoption</td>
<td>48</td>
<td>52</td>
<td>42</td>
<td>142</td>
</tr>
<tr>
<td>(Between 38.95 to 49.57)</td>
<td>(20.00)</td>
<td>(21.67)</td>
<td>(17.50)</td>
<td>(59.17)</td>
</tr>
<tr>
<td>High level of adoption</td>
<td>13</td>
<td>16</td>
<td>13</td>
<td>42</td>
</tr>
<tr>
<td>(More than 49.57)</td>
<td>(05.42)</td>
<td>(06.66)</td>
<td>(05.42)</td>
<td>(17.50)</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>82</td>
<td>64</td>
<td>240</td>
</tr>
</tbody>
</table>

\[\chi^2 = 12.264^*\]

Note: Figures in parentheses are the percentage of total respondents.
natural service and exchange the breeding ram after every two year as they knew about the deterioration of breed through inbreeding as compared to medium and small sheep farmers due to higher education, more participation in trainings and other sheep related activities, regular contacts with veterinary extension personnel, more exposure to mass media and had good economic condition. However adoption of improved breeds and breeding technologies was not upto the desired extent in all categories of sheep. This might be due to sheep farmer’s inadequate knowledge about breeding technologies, non-availability of improved rams in the close vicinity of the villages, lack of knowledge about the frequencies of services of ram, distant location of A.I. centres / sheep health centres.

On the basis of the findings, it could be concluded that majority of the sheep farmers were not following scientific breeding practices. The findings are in line with that of Agarwal and Choudhary (2003) who reported that goat keepers had only 8.93 MPS which was very low regarding adoption of improved breeding practices of goat keeping.

**Sheep farmers’ extent of adoption about improved feeding technologies:** It is apparent from Table 2 that there was significant association among different categories of sheep farmers about improved feeding technologies. The respondents belonging to large category had higher mean per cent score of adoption (53.35 MPS) as compared to the medium (MPS 44.08) and small category (MPS 41.49), respectively.

An in-depth analysis of practices followed under feeding aspect revealed that all the respondents fed *Pala* or *Khejri* leaves to lambs and only 43.33 per cent respondents fed *Pala* or *Khejri* leaves to their sheep along with grazing in lean period but during the monsoon season and the crop harvesting season in which sufficient grazing is available they avoid feeding the sheep in paddock. Majority of the sheep farmers (76.25 per cent) did not feed the green fodder, concentrates and mineral mixture to sheep due to lack of irrigation facility to cultivate the fodder crops, unawareness about the importance and benefit of concentrate and mineral mixture as well as proportion and required quantity of concentrates, salt and mineral mixture. However the respondents (7.08 per cent) having big size of land holding and irrigation facility cultivated bajra and cowpea as a green fodder and fed to sheep but not upto the desired extent because they gave priority to large animals (cow and buffalo). It was encouraging to note that majority of the respondents (36.67 per cent) giving more emphasis to provide energy rich feed to breeding ram in breeding season and were feeding special ration Gruel mixture *viz- Gur* sharbat, *Methi* and *sesame* to sheep after lambing to recover the loss of energy during lambing. Yet the adoption of the feeding practices was not upto the expectation, this might be due to the unawareness about the benefits of balanced feeding, non availability of green fodder due to lack of rainfall, irrigation facility and small size of land holding and unawareness about the cultivation practices of green fodder. High cost of concentrates and mineral mixture and lack of good quality feed in the market were some reasons due to which they could not adopt the improved feeding practices.

The major hindrance in adoption of feeding technologies responded by all the sheep farmers was
nomadic nature (moving from one place to another in their locality) and migration during the lean period / shortage of fodder. Majority of the sheep farmers migrate with their flocks from the native place in search of grazing during the months of September-October to April – May and come back after first monsoon shower.

Similar findings have also been reported by Daniel (1999) who concluded that 13.56 per cent large sheep farmers, 12.25 per cent medium and 11.13 per cent small sheep farmers adopted the improved sheep feeding technologies.

Sheep farmers’ extent of adoption about improved sheep management technologies:

Data presented in Table 2 clearly reveal that there was significant association among different categories of respondents with respect to adoption of improved sheep management technologies. Critical examination of the data in same table revealed that the large sheep farmers had better adoption score (53.55 MPS) as compared to the medium and small sheep farmers whose mean adoption score was only 48.23 and 44.00 MPS, respectively.

The higher adoption by large sheep farmers was found in all the management technologies viz., housing, shearing, health care and hygiene which could be due to their better knowledge regarding these technologies.

The similar findings were also reported by Daniel (1999) who expressed that the large sheep farmers possessed maximum adoption with MPS 13.12, as compared to adoption by medium (12.78 MPS) and small sheep farmers (MPS 12.48).

Sheep farmers’ extent of adoption about improved housing technologies: Table 2 depicts that the large sheep farmers had high mean per cent score of adoption (61.16 MPS) as compared to the medium (51.31 MPS) and small (46.73 MPS) sheep farmers about improved housing technologies.

During investigation it was observed that more than half (57.50 per cent) of the respondents had fully open area locally called ‘Bada’, whereas only 12.92 per cent had fully covered shed and used it only for the lambs. The sheep farmers who had very small flock size of sheep (less than 20) they housed the sheep with goat in partially covered (thatched) shed. Majority of the respondents who had large flocks cleaned the houses for sheep once in a month in summers, and once in six months during winter while, the respondents who possessed small size of flock cleaned the shed once or twice in a week during summer and winter season. About 15.00 per cent of the respondents who had good knowledge about sheep housing, housed all the categories of sheep (sheep, lamb and ram) separately, whereas, majority of the respondents kept all categories of sheep together. Not a single farmer adopted the practice of weaning and they allow the lambs with their mother till sheep is in milk.

Similar, findings were reported by Daniel (1999) who reported that the large sheep farmers had higher adoption of scientific housing (21.00 per cent) as compared to medium (14.19 per cent) and small (13.23 per cent) sheep farmers.

Sheep farmers’ extent of adoption about improved shearing technologies: Data in Table 2 indicate that there was no significant association in adoption of improved shearing technologies among the three categories of respondents. The large sheep farmers had relatively better adoption score (MPS 49.69) as compared to the medium (MPS 46.22) and small (MPS 42.34) sheep farmers.

In-depth assessment of the shearing practices revealed that majority of the respondents (more than 80.00 per cent) knew about clean wool production and also adopted at large scale to wash the sheep before shearing. Even though majority of sheep farmers had awareness about machine shearing but due to lack of technical skills, negligence, high cost of machine and its unavailability in surrounding area discouraged the respondents to adopt. Majority of the sheep farmers (67.92 per cent) sheared the wool twice in a year that fetched more prices in market due to good staple length as compared to the wool that was sheared thrice in a year. Majority of the large sheep farmers (70.00 per cent) clipped the wool of lambs after one year of age at full staple length whereas; majority of medium and small sheep farmers clipped the wool of lambs before one year of age. Due to non-existence of wool mandi/market in the nearby area, majority of small and medium sheep farmers sold their wool to middle men/private traders at lower price whereas, large sheep farmers sold the wool
directly in mandi (Bikaner, Beawer and Kekri) and got good price.

The findings are in line with that of Daniel (1999) who revealed that the large sheep farmers had higher adoption with regard to improved shearing technologies as compared to medium and small sheep farmers.

Sheep farmers' extent of adoption about improved health care and hygiene technologies: Data presented in Table 2 show that large sheep farmers possessed relatively higher mean per cent score (MPS) of adoption (51.16) as compared to the medium (44.07 MPS) and small (41.93 MPS) sheep farmers.

The reason for low adoption by small and medium sheep farmers might be the lack of veterinary hospitals in/around the village and timely vaccination facilities. Majority of the respondents were unaware about the Pestesdes Petitis Ruminants and Foot and Mouth Diseases, their preventive and control measures. They consulted quacks (ojha) for treatment of diseases rather than consulting the veterinarian because they were easily available and charged less as well as poor economic status did not allow them to take help of veterinary doctor. They knew about sheep pox and Enterotoxaemia (locally called mata and pharkiya) but did not follow the vaccination timely due to negligence on the part of sheep farmers. At the time of severity of sheep pox and Enterotoxaemia and occurs death in series and when the veterinary personnel visited the village they availed the facilities of vaccination regarding ET and sheep pox. Majority of the respondents did not isolate the sick animals from healthy ones and not follow the scientific method of disposing the dead animals. The small and medium sheep farmers followed the practice of culling as and when required to fulfill the family needs and to meet out unforeseen expenses like illness, purchase of the feed and fodder for large animals etc.

This might be due to the illiteracy, lower socio-economic status, lack of participation in sheep development activities and poor contact with veterinary extension personnel, they were unaware about improved health care and hygienic practices. The findings are in line with the findings of Daniel (1999), Mathur (2001) and Meena (2005) who reported that large category of respondents had higher adoption as compared to medium and small respondents regarding improved health care and hygiene practices in sheep, cattle and buffalo.

Overall Sheep farmers extent of adoption about improved sheep production technologies: Table 2 shows that large category of sheep farmers had better adoption score (49.51 MPS) as compared to medium and small sheep farmers who had 44.24 and 39.77 MPS, respectively regarding improved sheep production technologies.

Regarding the technologies of breeds and breeding (Table 2) the adoption scores were found to be low because the sheep farmers usually followed the natural service for breeding their sheep with local ram due to non-availability of improved ram and A.I. facilities, lack of knowledge about number of service by breeding ram. Due to lack of veterinary facilities they were not in position to approach any trained person or veterinarian for the problem of anoestrus. The results are in conformity with that of Daniel (1999) and Mathur (2001) who found that there was poor adoption of improved breeding in case of sheep and cattle, respectively.

Results further showed that in feeding technologies, the small, medium and large categories of sheep farmers had 41.49 per cent, 44.08 per cent and 53.35 per cent level of adoption, which was comparatively higher than the breeding practices. Results also indicated that majority of sheep farmers did not feed green fodder, concentrates, mineral mixture and salt to their sheep due to unawareness about improved feeding practices and its benefit. However, colostrum feeding to newborn lamb was a common practice. The results are in line with that of Sihag et al. (1996) who reported that the respondents had 51.40 per cent of adoption level regarding recommended feeding practices of live stock.

Regarding extent of adoption of management technologies it was found that respondents had poor adoption of technologies like weaning, paddock or pen system of sheep raising, recommended space, shearing by machine, wool utilization, vaccination against common disease like sheep pox, ET, P.P.R. and FMD, dipping, and deworming. Majority of the sheep farmers had also not adopted the correct method of disposing off the carcass of dead animals. On the basis of findings it could be
concluded that sheep farmers adopted only 39.77 to 49.51 per cent improved sheep production technologies. Hence there is a vast scope to increase the adoption level of the respondents in breeding, feeding and management aspects. This could be achieved by effective transfer of technical know-how with extrinsic motivation to sheep farmers by the extension workers and Government and the time bound strict follow up action by the authorities involved in sheep development.

Similar results were also reported by Daniel (1999), Mathur (2001) and Meena (2005) who observed that large categories of respondents had higher adoption as compared to medium and small respondents.

**CONCLUSION**

With the results, it could be concluded that more than half of the sheep farmers possessed medium level of adoption whereas, rest of the respondents were more or less distributed in low and high adoption groups. It could be observed from the findings that large sheep farmers had higher adoption level as compared to small and medium sheep farmers with respect to improved sheep production technologies. A significant difference could also be observed in small, medium and large sheep farmers with respect to improved shearing technologies of sheep production. Sheep farmers adopted only 39.77 to 49.51 per cent improved sheep production technologies.

**REFERENCES**


