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Adoption of beneficiaries and non-beneficiaries about recommended goat farming practices under attracting and retaining youth in agriculture (ARYA) project

Sonika Sharma and RS Rathore

Abstract
Krishi Vigyan Kendra, Banswara was locale of the study because initially Attracting and Retaining Youth in Agriculture (ARYA) project was implemented through KVKs in 25 states of the country. In Rajasthan, Banswara is the only district in which this project was initiated. Under, ARYA project, Goat farming is the major aspect chosen for the present study. Total 120 respondents were taken for the study. With this context, the present study has been carried out to know the adoption of beneficiaries and non-beneficiaries about recommended goat farming practices under ARYA project. Results show that 50.00 per cent of beneficiaries and 65.00 per cent of non-beneficiaries belong to medium level of adoption followed by low level and high level of adoption category. Among recommended goat farming practices, breeding practices got first rank with MPS 74.00 and MPS 70.83 by beneficiary and non-beneficiary followed by housing practices (MPS 73.50 and MPS 68.50 by beneficiaries and non-beneficiaries) and feeding practices (MPS 70.17 and MPS 65.33 by beneficiaries and non-beneficiaries).

Keywords: beneficiaries, non-beneficiaries, goat farming, ARYA

Introduction
Agriculture and allied sectors are the heart of social growth of our country. It has significant importance because it provides livestock for majority of our population and is highly contributing to national income and for gainful employment. Goats are the poor man's cow, and they play an important role in generating money and work for rural people. The rural population of Rajasthan's desert zone relies on cattle to meet their milk and meat needs. The majority of small ruminants in the hamlet were fed natural accessible feed resources such as tree leaves, grasses, vegetable crop wastes, and food grain crops. Livestock, mostly bovine and ovine, has a complementary, supplementary, and long-term relationship with our country's crops and mixed farming system. The majority of agricultural households are only employed during the ploughing, planting, harvesting, and threshing seasons. It is common practice to raise animals as a source of additional income in such circumstances. Despite the fact that goat husbandry appears to make a significant contribution to the agricultural and national economies, farmers who rear goats are still unaware of scientific management approaches. It would be possible to achieve the necessary amount of milk and meat output if feeding, breeding, and other management procedures were integrated into the right operation. In agricultural system, many agricultural universities and research institutes can be seen constantly working on increasing the adoption of different technologies, still there is a wide gap in the adoption level. This wide gap might be due to some of social, economic factors as well as at the same time farmers might have strong conviction towards the traditional practices which they have been practicing for the last several years. Therefore, degree of adoption of recommended goat farming practices has been made to figure out the situation. Given the importance of the aforementioned facts, the current study was conducted with the goal of determining the extent to which goat keepers have adopted improved goat production procedures.

Research Methodology
To select the respondents, a complete list of beneficiaries was obtained from the records available at the KVK. From the list, 60 beneficiaries from goat farming were selected purposively who have obtained training on goat farming under ARYA project. 60 non-

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beneficiaries were selected randomly in same number from the same villages of beneficiaries of the study area. Thus, a total of 120 respondents will be included in the study.

For measuring the extent of adoption of recommended practices of goat farming by beneficiaries and non-beneficiaries of ARYA project, 5 practices *i.e.* housing, feeding, breeding, health and marketing practices were identified with help of available review literature, experts of colleges as well as KVK staff of Animal Husbandry and Extension Education Department. After certain modifications, the responses of respondents were recorded on 3 point continuum *viz.,* fully adopted, partially adopted, and not adopted.

Measurement of adoption

To measure the extent of adoption, a three point continuum scale viz., fully adopted, partially adopted and not adopted with 2, 1 and 0 was developed. All the major practices of goat management technology were included in the scale.

To find out the level of adoption, overall score for each respondent was calculated and respondents were categorized into three groups on the basis of overall score obtained by each respondent:

i.   Low level of adoption = < ($\overline{X}$ - S.D.)
ii. Medium level of adoption = ($\overline{X}$- S.D. to ($\overline{X}$ + S.D.))
iii. High level of adoption = > ($\overline{X}$ + S.D.)

Frequency and percentage of respondents in each category *i.e.* low, medium and high were calculated. The adoption index for each respondent was calculated by using the following formula:

$$\text{Adoption index} = \frac{\text{Total adoption score obtaied by an individual}}{\text{Maximum obtainable score}} \times 100$$

To determine the extent of adoption mean per cent score for each practice was worked out and ranked accordingly. In order to find out whether or not there was any difference in the adoption level between beneficiaries and non-beneficiaries of goat farming under ARYA project, 'Z' test was applied and then inferences were drawn accordingly.

Mean per cent score (MPS)

Mean percent score were obtained by multiplying total obtained score of the respondents by hundred and divided by the maximum obtainable score under each practice. Formula of MPS is given as under:

$$\text{MPS} = \frac{\text{Total score obtained by the respondent}}{\text{Maximum obtainable score}} \times 100$$

'Z' test (Standard Normal Deviate test)

This test was used to observe significance of difference between two sample mean for large sample (i.e. n>30). Formula for 'Z' test is as under

$$Z = \frac{\left|\overline{X}_1 - \overline{X}_2\right|}{\sqrt{\dfrac{S_1{}^2}{n_1} + \dfrac{S_1{}^2}{n_2}}}$$

Where,
$\overline{X}_1$ = Mean of first sample
$\overline{X}_2$ = Mean of second sample
S_1 = Standard deviation of first sample
S_2 = Standard deviation of second sample
n_1 = Size of first sample
n_1 = Size of first sample

Results and Discussion

For getting an overview about adoption of recommended practices of goat farming by beneficiaries and non-beneficiaries of ARYA project, the respondents were classified into three categories *i.e.* low, medium and high level of adoption and these categories were formulated by using mean and standard deviation of the total obtained adoption score by the beneficiaries and non-beneficiaries.

Table 1: Distribution of beneficiaries and non-beneficiaries according to extent of adoption of recommended goat farming practices

n= 120

S. No.	Adoption level	Beneficiary respondents		Non-beneficiary respondent		Total	
		f	%	f	%	f	%
1.	Low level (<30.33)	10	16.67	16	26.67	26	21.67
2.	Medium level (30.33 to 37.15)	30	50.00	39	65.00	69	57.50
3.	High level (>37.15)	20	33.33	5	8.33	25	20.83
	Total	60	100	60	100	120	100

f = frequency,% = percentage

Analysis of data shown in Table 1 reveal that out of 120 respondents, more than half of respondents (57.50%) belong to medium level of adoption category followed by 21.67 per cent of respondents fell in low level of adoption category. Remaining 20.83 per cent of respondents had high level of adoption regarding recommended goat rearing practices.

A close observation of Table 1 clearly shows that 50.00 per cent of beneficiaries and 65.00 per cent of non-beneficiaries belong to medium level of adoption category, whereas 16.67 per cent of beneficiaries and 26.67 per cent of beneficiaries had low level of adoption of improved practices of goat farming. On the other hand, 33.33 per cent of beneficiaries and 8.33 per cent of non-beneficiaries were found to have high level of adoption of improved practices of goat farming.

It is concluded from the Table 1 that farmers had adopted goat farming practices in varying degree. The main reason for the medium adoption of goat farming practices might be due to the their increased knowledge during training and inclination towards new and scientific goat farming technologies along with traditional goat farming practices by the farmers. In recommended goat farming technologies, some of the practices are closely associated with the indigenous practices of goat farming which were passed from the ancestors to their younger generation and these practices were mostly adopted by the beneficiaries as well as non non-beneficiaries as they were easily available and less expensive. The possible reason for low adoption level may be due to their financial problems, lack of conviction and lack of interest in skill trainings about

goat farming practices conducted under project.

The findings demonstrated in this portion of dissertation are supported by the studies of Meena *et al.* (2011) [5], Koli and Koli (2016) [3], Pandey *et al.* (2017) [9] and Gunaseelan *et al.* (2018) [2] who also explored that majority of the respondents had medium level of adoption regarding goat rearing practices.

Aspect wise adoption of beneficiary and non-beneficiary respondents about recommended goat farming practices

The analysis of data presented in the Table 2 exhibits that extent of adoption among beneficiaries and non-beneficiaries

regarding breeding practices were 74.00 MPS and 70.83 MPS with first rank respectively. In case of the extent of adoption of housing practices among beneficiaries and non-beneficiaries were 73.50 MPS and 68.50 MPS with second rank accordingly. Whereas, beneficiaries with 70.17 MPS and non-beneficiaries with 65.33 MPS secured third place regarding adoption feeding practices. While in case of health practices, extent of adoption among beneficiaries and non-beneficiaries were 69.67 MPS and 62.17 MPS respectively. Extent of adoption among the beneficiaries and non-beneficiaries regarding marketing practices were 62.33 MPS and 58.33 MPS respectively.

Table 2: Extent of adoption level of beneficiary and non-beneficiary respondents about   recommended goat farming practices

n= 120

S. No.	Adoption level	Beneficiary respondents (n=60)		Non-beneficiary respondents (n=60)	
		MPS	Rank	MPS	Rank
1	Housing practices	73.50	II	68.50	II
2	Feeding practices	70.17	III	65.33	III
3	Breeding practices	74.00	I	70.83	I
4	Health practices	69.67	IV	62.17	IV
5	Marketing practices	62.33	V	58.33	V

MPS= Mean Per Cent Score

Adoption of breeding, housing and feeding practices is medium due to the fact that they had acquired more knowledge and become more aware about importance of these practices by attending training session regularly. Training might have covered all kind of information regarding breeding, housing and feeding practices. Adoption of health and marketing practices is quite low due to lack of veterinary and marketing facilities in the study area. Lack of adequate information provided during project regarding knowledge as well as skill related to health and marketing practices could be a possible reason.

Results of present study are similar with the findings Rashmi (2010) [10], Thombre (2010) [17], Tanwar and Rohilla (2012) [16], Senthikumar *et al.* (2014) [12], Singh *et al.* (2017) [13] and Gunaseelan *et al.* (2018) [2] who also found breeding, housing,

feeding as major aspects of goat farming enterprise.

i) Sub-aspect wise adoption by beneficiary and non-beneficiary respondents about housing practices

Analysis of data presented in the Table 3 reveals that extent of adoption of practice "Proper ventilation facilities are provided" with 85.00 MPS and 76.67 MPS got first rank by beneficiaries and non-beneficiaries respectively, as this practice was adopted by most of the goat farmers under housing practices. Whereas, the extent of adoption of "Closed housing system is preferred to protect goats from adverse weather condition" practice got second rank with 83.33 MPS by beneficiaries and third rank with 71.67 MPS by non-beneficiaries.

Table 3: Extent of adoption level of beneficiary and non-beneficiary respondents about   housing practices

n=120

S. No.	Adoption level	Beneficiary respondents (n=60)		Non-beneficiary respondents (n=60)	
		MPS	Rank	MPS	Rank
A.	**Housing practices**				
i	East-west direction for housing is adopted	68.33	IV	65.00	V
ii	Minimum floor space requirement is fulfilled	66.67	V	69.17	IV
iii	Closed housing system is preferred to protect goats from adverse weather condition	83.33	II	71.67	III
iv	Proper ventilation facilities are provided	85.00	I	76.67	I
v	Cleaning of housing/shed regularly	76.67	III	72.50	II

MPS= Mean Per Cent Score

Further analysis of Table 3 depicts that "Cleaning of housing/shed regularly" practice secured third place with 76.67 MPS in beneficiary category and in non-beneficiary category, this practice secured second place with 72.50 MPS. Fourth rank was assigned to practice "Minimum floor space requirement is fulfilled" in non-beneficiary category with 69.17 MPS. In beneficiary category this practice secured fifth place with 66.67 mean per cent score.

In beneficiary category "East-west direction for housing is adopted" practice secured fourth place with 68.33 MPS and non-beneficiary category this practice secured fifth place with

65.00 MPS.

Similar conclusion was drawn by Sorathiya *et al.* (2016) [15] who stated that most of the respondents were high adopters of ventilation, cleanliness and drainage in goat shed.

ii) Sub-aspect wise adoption of beneficiary and non-beneficiary respondents about feeding practices

Data shown in the Table 21 reveal that extent of adoption regarding "Graze your animal daily for 6-8 hours" ranked first with 77.50 MPS by beneficiaries and 71.67 MPS by non-beneficiaries whereas, the extent of adoption of "Feed

colostrums to kids within one hour" practice with 75.00 MPS and 70.00 MPS in case of beneficiaries and non-beneficiaries

got second rank respectively.

Table 4: Extent of adoption level of beneficiary and non-beneficiary respondents about feeding practices

n=120

S. No.	Adoption level	Beneficiary respondents (n=60)		Non-beneficiary respondents (n=60)	
		MPS	Rank	MPS	Rank
B.	**Feeding practices**				
1.	Graze your animal daily for 6-8 hours	77.50	I	71.67	I
2.	Feed 200-250 gm of concentrate per day per doe	70.00	IV	60.83	V
3.	Feed 3-5 kg green fodder and 1kg dry fodder per day for adult goats	71.67	III	69.17	III
4.	Feed colostrum to kids within one hour	75.00	II	70.00	II
5.	Offer 10% of milk of body weight of kids up to the age of 15 days	69.17	V	67.50	IV

MPS= Mean Per Cent Score

Further exploration of Table 4 depicts that "Feed 3-5 kg green fodder and 1kg dry fodder per day for adult goats" practice ranked third in both beneficiaries and non-beneficiaries category with 71.67 MPS and 69.17 MPS respectively. Practice "Offer 10% of milk of body weight of kid up to the age of 15 days" was assigned fourth rank by non-beneficiary category with 67.50 MPS. In beneficiary category this practice secured fifth place with 69.17 MPS as this practice was least adopted by the beneficiary farmers.

Fourth rank was secured by "Feed 200-250 gm of concentrate per day per doe" practice with 70.00 MPS in beneficiary category and this practice secured fifth place with 60.83 MPS in non-beneficiary category as this practice was least adopted by the non-beneficiary farmers.

Soni *et al.* (2011) [14], Narmatha *et al.* (2013) [6], and Mandavkar *et al.* (2015) [4] also mentioned that daily grazing and feeding colostrums to new born kid is very important practices under goat farming.

iii) Sub-aspect wise adoption of beneficiary and non-beneficiary respondents about breeding practices
Data shown in the Table 5 reveals that extent of adoption of practice "Verification of pregnancy" with 81.67 MPS and 78.33 MPS by beneficiaries and non-beneficiaries respectively ranked first as this practice was adopted by most of the goat farmers among all breeding practices while, the extent of adoption of "Selection of male and female goats on the basis of genetic potential and health" practice with 80.00 MPS and 75.00 MPS was ranked second in case of both beneficiaries and non-beneficiaries respectively.

Table 5: Extent of adoption level of beneficiary and non-beneficiary respondents about breeding practices

n=120

S. No.	Adoption level	Beneficiary respondents (n=60)		Non-beneficiary respondents (n=60)	
		MPS	Rank	MPS	Rank
C.	**Breeding practices**				
1	Selection of male and female goats on the basis of genetic potential and health	80.00	II	75.00	II
2	Verification of pregnancy	81.67	I	78.33	I
3	Allow mating of does at 18 hours after heat	71.67	IV	73.33	III
4	Adoption of breeding method (natural)	78.33	III	70.83	IV
5	Breed your doe first time at age of one year	70.83	V	69.17	V

MPS= Mean Per Cent Score

Further exploration of Table 5 depicts that "Adoption of breeding method (natural)" practice secured third place with 78.33 MPS in beneficiary category and in non-beneficiary category, this practice secured fourth place with 70.83 MPS. Fourth rank was assigned to practice "Allow mating of does at 18 hours after heat" with 71.67 MPS in beneficiary category and in non-beneficiary category, this practice secured third place with 73.33 MPS.

Fifth rank was secured by "Breed your doe first time at age of one year" practice as this was least adopted by the goat farmers among all breeding practices. In case of beneficiaries and non-beneficiaries, this practice got fifth rank in both categories with 70.83 MPS and 69.17 MPS respectively.

These findings are in accordance with the findings mentioned by Neha *et al.* (2017) [7] and Nirmala *et al.* (2017) [8], Singh *et al.* (2017) [13]. They also stated that these practices under

breeding management are important part for more improvement in overall goat farming enterprise.

iv) Sub-aspect wise adoption of beneficiary and non-beneficiary respondents about health practices
Data presented in the Table 6 reveals that extent of adoption of "Follow sanitary practices for animal shelter and standing place" practice ranked first as this practice was adopted by most of the goat farmers among all health practices. In this practice, extent of adoption of beneficiaries and non-beneficiaries were 75.83 MPS and 70.83 MPS with first rank in both categories respectively whereas, extent of adoption of practice "Consult the veterinarian for treatment of sick goats" with 74.17 MPS and 66.67 MPS was ranked second in case of beneficiaries and non-beneficiaries respectively.

Table 6: Extent of adoption level of beneficiary and non-beneficiary respondents about health practices

n=120

S. No.	Adoption level	Beneficiary respondents (n=60)		Non-beneficiary respondents (n=60)	
		MPS	Rank	MPS	Rank
A.	**Health practices**				
1	Deworming after every 3 month for preventing and controlling internal parasites	67.50	V	59.17	V
2	Spraying of insecticides to destroy and prevent external parasites	72.50	III	64.17	III
3	Consult the veterinarian for treatment of sick goats	74.17	II	66.67	II
4	Follow sanitary practices for animal shelter and standing place	75.83	I	70.83	I
5	Vaccination of animals against contagious disease	70.83	IV	62.50	IV

MPS= Mean Per Cent Score

Further exploration of Table 6 depicts that "Spraying of insecticides to destroy and prevent external parasites" practice ranked third in both beneficiaries and non-beneficiaries category with 72.50 MPS and 64.17 MPS respectively. Fourth rank was assigned to practice "Vaccination of animals against contagious disease" with 70.83 MPS and 62.50 MPS in both beneficiaries and non-beneficiaries category.

Fifth rank was secured by "Deworming after every 3 month for preventing and controlling internal parasites" practice as this was least adopted by the goat farmers among all health practices. In both beneficiaries and non-beneficiaries category, this practice secured fifth rank with 67.50 MPS and 59.17 MPS.

The above findings are in line with the study conducted by Narmathaa *et al.* (2013) [6], Roy and Tiwari (2017) [11] and Singh *et al.* (2017) [13] who also concluded that sanitation of animal shelter and veterinarian consult as important among all under health practices.

v) Sub-aspect wise adoption of beneficiary and non-beneficiary respondents about marketing practices
Data shown in the Table 7 reveal that extent of adoption of practice "Selling of goats at 6-8 month of age for more profit" ranked first as this practice was adopted by most of the goat farmers among all marketing practices. In this practice, extent of adoption of beneficiaries and non-beneficiaries were 70.00 MPS and 65.00 MPS with first rank in both categories respectively whereas, extent of adoption of "Culling of non-productive animals for profitable goat farming" practice with 66.67 MPS and 62.50 MPS was ranked second in case of beneficiaries and non-beneficiaries respectively.

Table 7: Extent of adoption level of beneficiary and non-beneficiary respondents about marketing practices

n=120

S. No.	Adoption level	Beneficiary respondents (n=60)		Non-beneficiary respondents (n=60)	
		MPS	Rank	MPS	Rank
A.	**Marketing practices**				
1	Record keeping	62.50	IV	58.33	IV
2	Selling maximum goats at huge demand in market	65.00	III	61.67	III
3	Selling of goats at 6-8 month of age for more profit	70.00	I	65.00	I
4	Culling of non-productive animals for profitable goat farming	66.67	II	62.50	II
5	Insurance of goat	60.00	V	56.67	V

MPS= Mean Per Cent Score

Further exploration of Table 7 depicts that extent of adoption of "Selling maximum goats at huge demand in market" practice with 65.00 MPS and 61.67 MPS in both beneficiaries and non-beneficiaries category secured third place. Fourth rank was assigned to practice "Record keeping" with 62.50 MPS and 58.33MPS in beneficiaries and non-beneficiaries category respectively.

Fifth rank was secured by "Insurance of goat" practice as this was least adopted by the goat farmers among all marketing practices. In both beneficiaries and non-beneficiaries category, this practice secured fifth rank with 60.00 MPS and 56.67 MPS.

Singh *et al.* (2017) [13] and Chaturvedani *et al.* (2018) [1] also found that selling goat at 6-8 month age is important to fetch more profit.

Comparison of extent of adoption between beneficiaries and non-beneficiaries about recommended goat farming practices
In relation to the extent of adoption of respondents about improved goat farming practices, it was also felt necessary to notify the difference between beneficiary respondent and non-beneficiary respondent. To find out the variation in the degree of adoption of the respondents, 'Z' test was applied. The results are presented in the Table 8.

Hypotheses
NH_{03}: There is no significant difference between beneficiary and non-beneficiary respondent with respect to adoption of recommended practices of goat farming.

RH_3: There is significant difference between beneficiary and non-beneficiary respondent with respect to adoption of recommended practices of goat farming.

Table 8: Comparison of attitude possessed by goat beneficiaries and non-beneficiaries

S. No	Category of sample	Mean	S.D.	'Z' value
1.	Beneficiary respondent	34.96	3.02	4.209**
2.	Non-beneficiary respondent	32.51	3.36	

**Significant at 1 per cent level of significance

The data exhibited in the Table 8 indicate that calculated 'Z' value was found to be greater than its tabulated value at 1 per cent level of significance. Thus, null hypothesis (NH_{03}) was rejected and alternate hypothesis (RH_3) was accepted, which leads to the conclusion that there was significant difference regarding adoption of recommended goat farming practices among beneficiary and non-beneficiary respondent.

Further analysis of Table 8 further depicts that mean score value of beneficiaries in most of the practice is more than non-beneficiaries, which clearly indicates that beneficiary respondents had more adoption level than non-beneficiary respondents regarding goat farming practices. It might be due the fact that beneficiary respondent had more knowledge regarding goat farming practices.

Conclusion

According to the findings of this study, goat rearers' attitudes toward the adoption of improved goat production technologies could be improved by demonstrating efficient technologies required for healthy goat rearing, which not only raised awareness but also improved goat rearers' attitudes. According to the study data, the tribal group in Banswara district continues to utilize traditional goat husbandry methods. Adoption of overall scientific techniques was poor. As a result, in this tribal region, these procedures must be strengthened to a higher level. Extension services in the region might be improved to encourage people to use scientific management approaches to boost goat output.

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