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Constraints perceived by beneficiary and non-beneficiary dairy farmers of Punjab in access of livestock technology transfer services of University

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Abstract
Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), established in Ludhiana in 2006, focuses on improving livestock production, health, and disease prevention through teaching, research, and extension programs. A study was conducted in 6 districts of Punjab to assess the constraints faced by beneficiaries and non-beneficiaries in access of livestock technology transfer services of University. The study identified key challenges, including low education levels, limited direct interaction with the University, poor access to technological services, and difficulty comprehending extensive information during short training sessions. To address these, it recommends increasing in-field extension activities like training programs, awareness camps, etc. Expanding outreach by adopting more villages is also crucial for effective knowledge dissemination.

Keywords: Beneficiaries, constraints, extension services, Garrett's ranking, livestock

Introduction

Livestock sector plays an important role in Indian economy. India is a leading country in the livestock population with 535.78 million of total livestock population. (20th Livestock Census, DAHDF, 2019) [1]. Livestock farming is an ancient occupation in Punjab. Punjab has 25.31 lakh cows and 40.16 lakh buffaloes. Livestock farming is an age-old occupation in Punjab. It is renowned for its agricultural potential and is referred to as India's "Bread Basket" (Swaminathan & Bhavani, 2013) [4]. The livestock industry has offered significant employment opportunities, both part-time and full-time, to farmers and households on a large scale within the state (Singh *et al*., 2016) [3]. Punjab produces a total of 14.30 million tons of milk annually, with a per capita milk availability of 1,283 grams per day (20th Livestock Census -2019, Punjab) [1].

The provision of livestock services is becoming increasingly crucial in improving and streamlining livestock production and management (Verma *et al*., 2022) [6]. Recent advancements in animal husbandry have heightened the need for diverse services such as animal breeding, healthcare, feed production, marketing, and extension services, among others (Verma, 2021) [5]. Among them, livestock extension services hold significant importance as they empower farmers by imparting them with relevant technological knowledge and skills through various educational and training programs (Rathod *et al*., 2012) [2].

Guru Angad Dev Veterinary and Animal Sciences University (GADVASU) was established at Ludhiana in 2006 for promoting livestock production, health and prevention of the diseases by integrated approach through teaching, research and extension programs at its main campus and their various outreach centers in the state. The University has initiated various livestock based technological services to disseminate knowledge and transfer technologies to end-users. However, despite these efforts, farmers encountered certain challenges or constraints in utilizing these services. To identify the constraints faced by both beneficiaries and non-beneficiaries dairy farmers in accessing livestock based technological services, the present study was undertaken.

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Research methodology
The present study was conducted in selected districts of Punjab. Six districts of Punjab *viz;* Bathinda, SAS Nagar, Tarn Taran, Hoshiarpur, Barnala, and Ludhiana will be purposely selected on the basis of presence of existing operational extension base of GADVASU in the form of Colleges, KVKs and Regional Research Training Centers (RRTCs). Two blocks from each district and four villages (02 adopted and 02 non-adopted villages by university or its outreach centers) from each block were selected randomly. Two blocks were selected from each district. Therefore, from six districts, total twelve (12) blocks were selected randomly for the study purpose. From each selected block, four villages (02 adopted and 02 non-adopted villages by university or its outreach centers) i.e., total 48 villages were selected. From each selected village 10 dairy farmers having atleast 2-3 milch dairy animals and minimum five years of experience in dairy farming were selected randomly as respondents for data collection. Thus, 240 beneficiary dairy farmers (from adopted villages) and 240 non-beneficiary dairy farmers (from non-adopted villages) were selected randomly. Thus, the total 480 respondents will be selected for present study. The data was collected from the selected farmers by interacting with them through well-structured interview schedule Garrett's ranking technique was used to rank the constraints based on their mean score. As per Garrett's ranking technique, the respondents were asked to enumerate and assign ranks to different problems, which were used for prioritization of constraints. The orders of merit as given by the respondents were converted into ranks, by using the following formula:

Percent position = [100 (R ij - 0.50)] / N j

Where, Rij = Rank given for ith problem by jth individual.
Nj = Number of problems ranked by the jth individual.
The percent position of each rank was then converted into scores using Garrett's table. The scores of individual respondents for a particular problem were added and divided by the total number of respondents. These mean scores for all problems were then sorted in descending order, and ranks were assigned accordingly to prioritize the constraints.

Results
Constraints perceived by beneficiaries
a) Technical constraints
The results presented in the table 1 revealed that, "Use of University ICT services by illiterate/ less educated farmers is challenging" (Mean score: 75.06) was faced as most important constraint and ranked first by respondents. While, "It is difficult to understand too much information provided by training programmes of the university in short period" (Mean score: 66.26); "Difficult to locate University specific ICT tools because there are so many different ICT tools available online" (Mean score: 64.63); "Non - availability or irregular services on time" (Mean score: 56.73); "Poor internet connectivity restrict the activity of University ICT services" (Mean score: 49.31) and "University ICT services are unable to provide regional specific information" (Mean score: 40.31); were ranked 2nd, 3rd, 4th, and 5th most important constraints as faced by the beneficiaries. The other constraints includes, "Improper communication and poor extension contacts" (Mean score: 44.88); "Irregular availability of Vigyanak Pashu Palan Magazine at village level" (Mean score: 42.63); "Inadequate staff for regular follow ups after trainings/ Follow up is poor" (Mean score: 39.05) and "Entertainment programme organized during the University Pashu Palan Mela provides hinderance for interaction" (Mean score: 37.52); were ranked as 6th, 7th, 8th and 9th constraints by the beneficiaries on the basis of their mean score among the various constraints, respectively.

Table 1: Technical constraints perceived by beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Improper communication and poor extension contacts	44.88	VI
2	Inadequate staff for regular follow ups after trainings/ Follow up is poor	39.05	VIII
3	It is difficult to understand too much information provided by training programmes of the university in short period	66.26	II
4	Entertainment programme organized during the University Pashu Palan Mela provides hinderance for interaction	37.52	IX
5	Use of University ICT services by illiterate/ less educated farmers is challenging	75.06	I
6	Poor internet connectivity restrict the activity of University ICT services	49.31	V
7	Non - availability or irregular services on time	56.73	IV
8	Irregular availability of Vigyanak Pashu Palan Magazine at village level	42.63	VII
9	Difficult to locate University specific ICT tools because there are so many different ICT tools available online	64.63	III

b) Infrastructural constraints
Among the infrastructural constraints, "Inadequate vehicle parking facilities during Pashu Palan Mela at University" (Mean score: 67.88); was the most important constraint faced by respondents. "Lack of to and from transportation facilities for various outreach centers of University" (Mean score: 60.17); "No separate seating arrangement for ladies at the University Mela" (Mean score: 57.33); "Most outstations are remotely located and are out of reach" (Mean score: 55.30); "Inadequate access to basic facilities like urinals, drinking water, or food during Pashu Palan Mela" (Mean score: 48.33); "Lack of proper rest room facilities for farmers (gender specific) at University Mela" (Mean score: 45.83); "Lack of audio-visual aids at field level for educating the respondents in various extension programs" (Mean score: 44.83) "Inadequate facilities at training places including comfortable environment (A.C, chairs etc.)" (Mean score: 38.67); and "Practical demonstration facilities regarding livestock based technological services were inadequate" (Mean score: 37.67) were the 2nd, 3rd, 4th, 5th, 6th, 7th, 8th and 9th other important constraints perceived by beneficiaries, respectively (Table 4.2).

Table 2: Infrastructural constraints perceived by beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Lack of audio-visual aids at field level for educating the respondents in various extension programmes	44.83	VII
2	Lack of to and fro transportation facilities for various outreach centers of University	60.17	II
3	Practical demonstration facilities regarding livestock based technological services were inadequate	37.67	IX
4	Most outstations are remotely located and are out of reach	55.30	IV
5	Inadequate facilities at training places including comfortable environment (A.C, chairs etc.)	38.67	VIII
6	Inadequate access to basic facilities like urinals, drinking water, or food during Pashu Palan Mela	48.83	V
7	Inadequate vehicle parking facilities during Pashu Palan Mela at University	67.88	I
8	No separate seating arrangement for ladies at the University Mela.	57.33	III
9	Lack of proper rest room facilities for farmers (gender specific) at University Mela	45.83	VI

c) Economic constraints
Among the economic constraints, "Poor financial condition" (Mean score: 61.08) was ranked first important constraint. "High cost of input services like mineral mixture, by-pass fat, uromin lick etc." (Mean score: 45.25); was ranked 2nd important constraint whereas, "Low economic gain compared to current practices" (Mean score: 43.67) was ranked least important constraints among the others economic constraints. (Table 3)

Table 3: Economic constraints perceived by beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Poor financial condition	61.08	I
2	High cost of input services like mineral mixture, by-pass fat, uromin lick etc.	45.25	II
3	Low economic gain compared to current practices	43.67	III

d) Socio-psychological constraints
Table 4 showed that "Lack of time to attend any training programme or Pashu Palan Mela" (Mean score: 71.70) was ranked first most important constraint. While, "Preference for jobs rather than dairy-based self- employment" (Mean score: 69.28); "In the era of nuclear family, its very difficult to attend the University training programmes, mela etc." (Mean score: 61.69) "Mela/ camp/ meetings organized by the University can possess a serious risk of disease spread" (Mean score: 51.31); were ranked 2nd, 3rd, 4th important constraints by beneficiaries. Whereas, "Least participation in various extension programs conducted by University outreach centres" (Mean score: 49.17); "Lack of decision-making ability about the use of technological services" (Mean score: 42.83); "Lack of faith in livestock based technological services" (Mean score: 41.53); "Lack of cooperation with other progressive farmers" (Mean score: 34.17); "Favoritism for big/ resourceful farmers" (Mean score: 29.33); were faced as 5th, 6th, 7th,8th and 9th important constraints by respondents among other socio- psychological constraints, respectively.

Table 5: Socio-psychological constraints perceived by beneficiaries

Sr. No.	Statements	Mean Score	Rank
1	Lack of cooperation with other progressive farmers	34.17	VIII
2	Least participation in various extension programs conducted by University outreach centres	49.17	V
3	Lack of faith in livestock based technological services	41.53	VII
4	Lack of time to attend any training programme or Pashu Palan Mela	71.70	I
5	Lack of decision-making ability about the use of technological services	42.83	VI
6	Preference for jobs rather than dairy-based self- employment	69.28	II
7	Favoritism for big/ resourceful farmers	29.33	IX
8	Mela/ camp/ meetings organized by the University can possess a serious risk of disease spread	51.31	IV
9	In the era of nuclear family, its very difficult to attend the University training programmes, mela etc.	61.69	III

e) Miscellaneous constraints
Table 5 revealed that "Lack of direct contact with resource persons" (Mean score: 78.00); was ranked as the most important constraint. While, "Routine work become disturbed by attending University Mela or training program (Mean score: 56.20); "Facebook, You-tube etc. encourage time wastage since they are more habit forming" (Mean score: 53.42); "Poor accessibility to technological services" (Mean score: 45.89); "Concerned personnel at outstations are unable to provide proper information about different technological services" (Mean score: 43.25) were ranked as 2nd, 3rd, 4th, 5th important constraint. Whereas, "Lack of awareness about the livestock based inputs and utility services provided by University and outreach centers" (Mean score: 42.42) and "Lack of trained and experienced extension personnel at field level for technical hand holding in future" (Mean score: 29.83) were ranked as 6th and 7th constraint by beneficiaries among other miscellaneous constraints, respectively.

Table 5: Miscellaneous constraints perceived by beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Lack of awareness about the livestock based inputs and utility services provided by University and outreach centres	42.42	VI
2	Lack of trained and experienced extension personnel at field level for technical hand holding in future	29.83	VII
3	Concerned personnel at outstations are unable to provide proper information about different technological services	43.25	V
4	Routine work become disturbed by attending University Mela or training program	56.20	II
5	Poor accessibility to technological services	45.89	IV
6	Lack of direct contact with resource persons	78.00	I
7	Facebook, You-tube etc. encourage time wastage since they are more habit forming	53.42	III

Constraints perceived by non-beneficiaries
a) Technical constraints
The results presented in the table 6 revealed that, "Improper communication and poor extension contacts" (Mean score: 77.33) was faced as most important constraint and ranked first by non-beneficiaries. While, "Use of University ICT services by illiterate/ less educated farmers is challenging "(Mean score: 67.00); "Difficult to locate University specific ICT tools because there are so many different ICT tools available online" (Mean score: 58.00); "Poor internet connectivity restrict the activity of University ICT services" (Mean score: 50.00) and "Entertainment program organized during the University Pashu Palan Mela provides hinderance for interaction" (Mean score: 46.00); were ranked 2nd, 3rd, 4th and 5th other important constraints as faced by the non-beneficiaries. The other constraints includes, "It is difficult to understand too much information provided by training programs of the university in short period" (Mean score: 42.00); "Non - availability or irregular services on time" (mean score: 37.00); "Irregular availability of Vigyanak Pashu Palan Magazine at village level (Mean score: 33.00)" and "Inadequate staff for regular follow ups after trainings/ Follow up is poor" (Mean score: 26.00) were ranked as 6th, 7th, 8th and 9th by the non-beneficiaries on the basis of their mean score among the various constraints, respectively.

Table 6: Technical constraints perceived by non-beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Improper communication and poor extension contacts	77.33	I
2	Inadequate staff for regular follow ups after trainings/ Follow up is poor	26.00	IX
3	It is difficult to understand too much information provided by training programmes of the university in short period	42.00	VI
4	Entertainment programme organized during the University Pashu Palan Mela provides hinderance for interaction	46.00	V
5	Use of University ICT services by illiterate/ less educated farmers is challenging	67.00	II
6	Poor internet connectivity restrict the activity of University ICT services	50.00	IV
7	Non - availability or irregular services on time	37.00	VII
8	Irregular availability of Vigyanak Pashu Palan Magazine at village level	33.00	VIII
9	Difficult to locate University specific ICT tools because there are so many different ICT tools available online	58.00	III

b) Infrastructural constraints
Among the infrastructural constraints, "Most outstations are remotely located and are out of reach" (Mean score: 67.67); was the most serious constraint faced by non-beneficiaries. While, "Lack of to and from transportation facilities for various outreach centers of University" (Mean score: 65.67); "Inadequate vehicle parking facilities during Pashu Palan Mela at University" (Mean score: 65.17); "No separate seating arrangement for ladies at the University Mela" (Mean score: 53.00); "Lack of proper rest room facilities for farmers (gender specific) at University Mela" (Mean score: 51.00); "Inadequate access to basic facilities like urinals, drinking water, or food during Pashu Palan Mela" (Mean score: 42.00); "Inadequate facilities at training places including comfortable environment (A.C, chairs etc.)" (Mean score: 38.33); "Practical demonstration facilities regarding livestock based technological services were inadequate" (Mean score: 37.33) and "Lack of audio-visual aids at field level for educating the respondents in various extension programs" (Mean score: 29.33) were the 2nd, 3rd, 4th, 5th, 6th, 7th, 8th and 9th other important constraints perceived by non-beneficiaries, respectively (Table 7).

Table 7: Infrastructural constraints perceived by non-beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Lack of audio-visual aids at field level for educating the respondents in various extension programes	29.33	IX
2	Lack of to and from transportation facilities for various outreach centers of University	65.67	II
3	Practical demonstration facilities regarding livestock based technological services were inadequate	37.33	VIII
4	Most outstations are remotely located and are out of reach	67.67	I
5	Inadequate facilities at training places including comfortable environment (A.C, chairs etc.)	38.83	VII
6	Inadequate access to basic facilities like urinals, drinking water, or food during Pashu Palan Mela	42.00	VI
7	Inadequate vehicle parking facilities during Pashu Palan Mela at University	65.17	III
8	No separate seating arrangement for ladies at the University Mela.	53.00	IV
9	Lack of proper rest room facilities for farmers (gender specific) at University Mela	51.00	V

c) Economic constraints
Among the economic constraints, "Poor financial condition" (Mean score: 61.08) was ranked first important constraint. "High cost of input services like mineral mixture, by-pass fat,

uromin lick etc." (Mean score: 45.25); was ranked 2nd important constraint whereas, "Low economic gain compared to current practices" (Mean score: 43.67) was ranked least

important constraint among the others economic constraints (Table 8).

Table 8: Economic constraints perceived by non-beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Poor financial condition	61.08	I
2	High cost of input services like mineral mixture, by-pass fat, uromin lick etc.	45.25	II
3	Low economic gain compared to current practices	43.67	III

d) Socio-psychological constraints
Table 9 showed that "Lack of time to attend any training programme or Pashu Palan Mela" (Mean score: 72.67) was ranked first most important constraint. While, "Least participation in various extension programs conducted by University outreach centers" (Mean score: 64.33); "Preference for jobs rather than dairy-based self-employment" (Mean score: 58.33) and "Lack of faith in livestock based technological services" (Mean score: 56.33) were ranked 2nd, 3rd and 4th important constraints by non-beneficiaries, respectively. Whereas, "Favoritism for big/ resourceful farmers" (Mean score: 50.17); "Lack of decision-making ability about the use of technological services" (Mean score: 45.83); "In the era of nuclear family, its very difficult to attend the University training programs, mela etc." (Mean score: 39.67); "Lack of cooperation with other progressive farmers" (Mean score: 36.50) and "Mela/ camp/ meetings organized by the University can possess a serious risk of disease spread" (Mean score: 26.17); were faced as 5th, 6th, 7th, 8th and 9th important constraints by non-beneficiaries among other socio-psychological constraints, respectively.

Table 9: Socio-psychological constraints perceived by non-beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Lack of cooperation with other progressive farmers	36.5	VIII
2	Least participation in various extension programs conducted by University outreach centres	64.33	II
3	Lack of faith in livestock based technological services	56.33	IV
4	Lack of time to attend any training programme or Pashu Palan Mela	72.67	I
5	Lack of decision-making ability about the use of technological services	45.83	VI
6	Preference for jobs rather than dairy-based self- employment	58.33	III
7	Favoritism for big/ resourceful farmers	50.17	V
8	Mela/ camp/ meetings organized by the University can possess a serious risk of disease spread	26.17	IX
9	In the era of nuclear family, its very difficult to attend the University training programmes, mela etc.	39.67	VII

e) Miscellaneous constraints
Table 10 revealed that "Lack of awareness about the livestock based inputs and utility services provided by University and outreach centres" (Mean score: 76.72) was ranked as the most important constraint. "Poor accessibility to technological services" (Mean score: 60.62); "Lack of direct contact with resource persons" (Mean score: 54.05);" Concerned personnel at outstations are unable to provide proper information about different technological services" (Mean score: 51.83) and

"Routine work become disturbed by attending University Mela or training program (Mean score: 44.78); were ranked as 2nd, 3rd, 4th and 5th important constraints, respectively. Whereas, "Facebook, You-tube etc. encourage time wastage since they are more habit forming" (Mean score: 34.34) and "Lack of trained and experienced extension personnel at field level for technical hand holding in future" (Mean score: 26.55) were ranked as 6th and 7th least important constraints among other miscellaneous constraints, respectively.

Table 10: Miscellaneous constraints perceived by non-beneficiaries

Sr. No.	Statements	Mean score	Rank
1	Lack of awareness about the livestock based inputs and utility services provided by University and outreach centres	76.72	I
2	Lack of trained and experienced extension personnel at field level for technical hand holding in future	26.55	VII
3	Concerned personnel at outstations are unable to provide proper information about different technological services	51.83	IV
4	Routine work become disturbed by attending University Mela or training program	44.78	V
5	Poor accessibility to technological services	60.62	II
6	Lack of direct contact with resource persons	54.05	III
7	Facebook, You-tube etc encourage time wastage since they are more habit forming	34.34	VI

Conclusion
The current study found that less education of the respondents, lack of direct contact with the University, poor accessibility to technological services, difficulty in understanding the vast amount of information provided by the University's training programs in a short period, etc. were the major constraints perceived by respondents. To overcome these constraints, there is need to organize more in-field

extension activities such as training programs, awareness camps, regional melas etc. Engage local leaders, progressive farmers in spreading awareness, as they hold influence and trust in rural areas. Also, there is need to adopt more and more villages.

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