RESEARCH ARTICLE

Farmers' Willingness to Pay to Women Community Animal Health Workers (CAHWs): A Study of the *Pashusakhi* Model in Bahraich District of Uttar Pradesh, India

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Abstract

Community Animal Health Workers (CAHWs) play a crucial role in delivering basic animal healthcare services in rural areas across many countries particularly in Asia & Africa. The *Pashusakhi* model in India equipped women from local communities to provide preventive veterinary services, including vaccination and deworming. Understanding livestock farmers' willingness to pay (WTP) for these services is essential for assessing the economic sustainability and long-term viability of the *Pashusakhis*. This study aimed to analyse the WTP of livestock farmers for *Pashusakhis'* services and identify socio-economic and perception-based factors influencing WTP in Bahraich district of Uttar Pradesh, India. A total of 100 livestock farmers from 10 villages in Chitaura block were randomly selected. WTP was assessed using the Contingent Valuation Method (CVM) under two service delivery scenarios: common village centre and doorstep services. Data were analysed using frequency, mean, percentage, and multiple regression to identify determinants of maximum WTP for doorstep services. Initial willingness to pay was reported by 74 % of respondents for village centre services and 91 % for doorstep services. Mean maximum WTP was ₹ 56.28 for village centre services and ₹ 93.79 for doorstep services. Regression analysis indicated that formal education, annual household income, and income from livestock had a significant positive influence on maximum WTP. Livestock farmers demonstrated clear willingness to pay for preventive healthcare services for animals, with higher value attributed to doorstep delivery due to convenience, time saving, and reduced animal stress.

Key words: Community Animal Health Workers (CAHWs), Doorstep Services, *Pashusakhi*, Willingness to Pay.

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Introduction

According to World Organisation for Animal Health (WOAH, 2024) – A Community Animal Health Worker (CAHW) is a person selected from or by their own community and provided with short, initial or recurring vocational training to perform basic animal health and animal husbandry-related services, in line with national animal welfare standards. CAHWs operate on a fee-for-service basis or some other means, are accountable to a registered veterinarian, a registered veterinary paraprofessional or an appropriate official and are active in their community. CAHWs can also play an important role in a range of sanitary tasks such as disease reporting (*WOAH CAHWs ad hoc Group working definition, 2024*). CAHWs are members of the same local community who receive training lasting only 5-10 days or often few weeks. They provide essential animal health services like deworming, vaccination and advising livestock farmers about best and latest animal husbandry practices for achieving the goals of low mortality and high productivity in livestock sector.

In India, the National Rural Livelihood Mission (NRLM, 2025) started the expansion of the *Pashusakhi* model after its success in Jharkhand. It is one of the unique model which focused mainly on livelihood generation of women so that they can contribute to their household income and it provided a base for inclusion of women in the workforce. With assistance from Government of India (GOI), Bill & Melinda Gates Foundation, World Bank and several other organisations more than 60,000 women have been trained to deliver primary animal health care services at the doorstep of rural livestock farmers, contributing a significant increase in population of small ruminants in various states of India. A *Pashusakhi* is a woman around 20-45 yrs of age, having fundamental literacy skills like addition, subtraction, reading, writing etc (Vikaspedia. (2023). *Pashusakhis* belong to the

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local village community usually selected by the locals among them. They provide their services, which includes vaccination, deworming and basic animal healthcare to households ranging 100-200 in their own village, usually rearing small ruminants like goat and sheep, or may be engaged in backyard poultry farming. These *Pashusakhis* are generally trained in basic ethno-veterinary treatment practices.

Considering its growing acceptance, the *Pashusakhi* model's long-term sustainability is dependent on the livestock farmers' willingness to pay for their services. The availability of free or subsidised free veterinary services have limited the development of fee-based community services. Understanding farmers' willingness to pay is therefore of paramount importance for determining the viability, scalability and contribution of CAHWs models like *Pashusakhi* in rural areas lacking the access to conventional veterinary services. Bahraich district of Uttar Pradesh, which is a leading district in terms of goat population, offers a one of its kind set-up for studying the willingness to pay, since, models like *Pashusakhi* has focussed mainly on goat health management under the leadership of women. Assessing the WTP gives policy makers and NGOs with insights regarding the training needs and institutional support needed for long-term sustainability of *Pashusakhi* model. This study has analysed the willingness of the farmers to pay for preventive animal healthcare services delivered by women CAHWs in Bahraich district of UP and identified socio-economic and perception-based determinants influencing the WTP.

Materials and Methods

Informed verbal consent was obtained from all the respondents prior to interviews. The data collection was done using structured interview schedule. A total of 100 respondent livestock farmers were randomly selected across 10 villages in Chitaura block of Bahraich district.

For estimation of Willingness to Pay (WTP) among the respondents to CAHWs (*Pashusakhis*) Contingent Valuation Method (CVM) was used. A hypothetical scenario was presented to the respondents receiving the services from *Pashusakhis*. The following two types of service delivery models were presented to the respondents:

Common Point or Village Centre Service

- Respondents were asked if they would be willing to pay to *Pashusakhi* for services like basic treatment, vaccination and deworming delivered at a central location within their village
- A stepwise price approach was used- Initial willingness, followed by price points of ₹ 50, ₹ 100, and ₹ 150 per animal per year to check price sensitivity
- At last an open-ended question was asked to elicit the maximum WTP value

Doorstep Service

- Respondents were asked if they would be willing to pay to *Pashusakhi* for services like basic treatment, vaccination and deworming delivered directly at their doorstep
- A stepwise price approach was used- Initial willingness, followed by price points of ₹ 150, ₹ 200, and ₹ 250 per animal per year
- An open-ended question was asked to elicit the maximum WTP value

Data analysis using frequency, mean, percentage and regression analysis was performed for maximum willingness to pay at the doorstep for basic healthcare services as it is the main mode through which *Pashusakhis* operate in the real world.

Results and Discussion

The educational background of the respondents revealed that 22 % had no formal education, whereas, the remaining 78 % reported some form of formal education. The annual household income averaged ₹ 1,00,715. Annual income from livestock averaged ₹ 12,863. Majority (67%) of the respondent livestock farmers reported to own goats exclusively and by 90 % in total when combined with other livestock species. Services most commonly received by the respondents were vaccination (91%), deworming (82%), and first-aid (70%), followed by primary animal health care (56%), livestock management advice (44%), castration (43%), mineral mixtures (23%), and heat detection (20%). A smaller share reported receiving support in animal sale and purchase (10%) and livestock insurance advice (1%).

Common Point or a Village Centre

The analysed data for the *Pashusakhi* services at the common point or village centre revealed the following findings (Table 1):

The findings on willingness to pay (WTP) for *Pashusakhi* services at a common village centre revealed both the presence of demand and the role of affordability in shaping farmer responses. A majority (74%) of respondents first showed readiness to pay, indicating understanding of the use and relevance of the services provided by CAHWs. However,

Table 1: Willingness to Pay for *Pashusakhi* Services at the Common Point or Village Centre (n=100)

Criteria	Category	Frequency	%	Mean (₹)
Willingness to Pay	Initial Willingness	74 /100	74.00	
	Willing to Pay ₹100	35 / 74	47.30	-
	Willing to Pay ₹150 (if yes to ₹100)	07 / 35	20.00	-
	Willing to Pay ₹50 (if no to ₹100)	66 / 74	89.19	-
Maximum Willingness to Pay (n=74, Open-ended)	Mean ± Standard Deviation	-	-	56.28 ±22.01

the data revealed a sharp fall in acceptability as prices rise. At a price point of ₹ 100 per animal per year, willingness to pay reduced to 47.3 %, reaching barely 20 % at ₹ 150. This suggests that services provided by *Pashusakhis* are appreciated but rising price level outstrip farmers' perceived affordability, making price sensitivity an important consideration for creating sustainable service delivery models. A majority of the respondents (89.19%) accepted the lower price point of ₹ 50 per animal per year. The open-ended responses supported this, with the mean maximum WTP at ₹ 56.28 (SD ±22.01). This suggests that approximately ₹ 50 represents an equilibrium level that aligns with farmers' ability to pay and their valuation of preventive animal healthcare. The moderate variability also points to diversity within the community where most farmers cluster around the lower price point, some are willing to pay more, likely influenced by annual household income, income from livestock and educational level. These results suggest that a sustainable economic model for common point *Pashusakhi* services can be built at the lower price point of around ₹ 50 per animal per year.

Doorstep *Pashusakhi* services

The analysed data for the *Pashusakhi* services at the doorstep revealed the following findings (Table 2):

The analysis of willingness to pay (WTP) for doorstep services delivered by *Pashusakhis* demonstrated a strong demand for convenient animal healthcare, and a clear variation in farmers' ability to pay. A majority of respondents (91%) initially expressed willingness, highlighting that doorstep services are perceived as highly valuable. This preference for doorstep delivery reflects time saving, and the avoidance of stress to animals, all of which make such services particularly attractive for small livestock farmers. The variation of responses across different price points revealed a challenge regarding affordability. At a price point of ₹ 200 per animal per year, WTP dropped drastically to only 6.59 %, suggesting that this price level exceeds what most farmers consider affordable. A small segment (3 respondents, or half of those accepting ₹ 200) expressed willingness to pay even ₹ 250, indicating that while the majority of farmers are highly price-sensitive, a niche group attached a premium value to the convenience of doorstep services by CAHWs (*Pashusakhi*). A moderate threshold observed at price point of ₹ 150, with 37.36 % of initially willing respondents agreeing to pay this amount. This suggests that while farmers recognize the value of doorstep animal healthcare compared to village-centre services, their willingness to pay a premium was bounded within affordable limits. The open-ended responses confirmed this trend, with the mean maximum WTP recorded at ₹ 93.79 per animal per year. The relatively high standard deviation (±30.97) reflected substantial variation, pointing to differences in income levels, herd size, and risk perception within the community. Overall, the findings suggested that doorstep services represent a preferred mode of delivery but are financially sustainable only at a price closer to ₹ 100 per animal per year.

The comparative analysis of both market scenarios highlights a clear trade-off between accessibility and affordability of preventive animal healthcare services. While attracting wide participation at a lower equilibrium price of approximately ₹ 50 per animal per year, doorstep delivery of the services by *Pashusakhis* was more appreciated for its convenience and time saving benefits, but remains viable at a cost of around ₹ 100 per animal per year. The dramatic fall in willingness at higher thresholds in both situations demonstrates livestock producers' great price sensitivity, influenced by income, herd size, and educational levels. These findings suggest that a differentiated pricing strategy may be most effective for retaining lower prices for common point services to promote inclusiveness while delivering doorstep services at a little premium to households who value convenience.

The findings presented in Tables 1 and 2 indicate that farmers are indeed willing to pay for veterinary services; however, this willingness is not uniform and is strongly influenced by affordability, income levels, and perceived value. Similar trends have been reported in earlier studies. Kumar *et al.* (2011) in India and Amsalu *et al.* (2023) in Ethiopia both documented high overall WTP among livestock farmers. In India, 79 % of farmers expressed willingness to pay for a veterinary services package, while in Ethiopia WTP was even higher 93.3 % in mixed crop-livestock systems and 91.5 % in urban or peri-urban systems. In contrast, Van Aken (2023) reported a much lower positive WTP (47%) among dairy farmers in Switzerland for a subsidized Veterinary Herd Health Management (VHHM) program, suggesting that willingness levels differ substantially across socio-economic contexts. The difference of over ₹ 37 between village centre and doorstep reveals the premium farmers are willing to pay for convenience, reduced time costs, and the avoidance of animal handling stress. These results resonate with Kumar *et al.* (2011), who also found farmers willing to pay for both

Table 2: Willingness to Pay for *Pashusakhi* services at the Doorstep (n=100)

Criteria	Category	Frequency	%	Mean (₹)
Willingness to Pay	Initial Willingness	91 / 100	91.00	
	Willing to Pay ₹200	6 / 91	06.59	-
	Willing to Pay ₹250 (if yes to ₹200)	03 / 6	50.00	-
	Willing to Pay ₹150 (if no to ₹200)	34 / 91	37.36	-
Maximum Willingness to Pay (n=91, Open-ended)	Mean ± Standard Deviation	-	-	93.79 ±30.97

Table 3: Regression Results for Determinants of Willingness to Pay (Doorstep Services) (n=91)

Predictor Variables	B (Coefficient)	t	p-value
Intercept	23.68906	3.07	0.002856
Education level	23.50761	3.15	0.002220
Annual household Income	0.000261	3.44	0.000906
Annual livestock Income from Livestock	0.001982	3.37	0.001139
Model Fit: R = 0.756, R^2 = 0.572, Adjusted R^2 = 0.557, F(3, 87), p < 0.005			

common point and doorstep services, underscoring a general readiness to invest in quality veterinary care irrespective of location. At the same time, the pattern observed here aligns with Amsalu *et al*. (2023), who emphasized that farmers with lower incomes often expressed reluctance to pay, largely due to affordability constraints and prior dependence on free government services. The average maximum WTP of ₹56.28 at the village centre and ₹93.79 for doorstep services follows the pattern of Yadav *et al*. (2021) in Gujarat, but at a lower price point. This disparity is likely due to regional economic differences and farmers' reliance on government subsidies. Even in such situations, farmers valued the reliability and convenience of services, indicating that affordability rather than lack of appreciation is the main factor limiting their willingness to pay to *Pashusakhi* for preventive animal healthcare services.

Multiple Regression Analysis of Maximum Willingness to Pay to *Pashusakhis* for their Services at Doorstep

Regression analysis (Table 3) was done with maximum willingness to pay (Max. WTP) for doorstep services as the dependent variable, and educational level (formal education or no formal education), annual household income, and annual livestock income as independent variables. The sample size was 91 as only those respondents expressed initial willingness to pay for doorstep services to *Pashusakhis* were included. The model was found to be statistically significant, F (3,87) = 38.74, p < .005, explaining 57.2% of the variance (R^2 = 0.572, Adjusted R^2 = 0.557) in Maximum WTP at doorstep to *Pashusakhis*. These findings are consistent with Kumar *et al*. (2011) and Van Aken (2023), who also identified a positive relationship between WTP and socio-economic factors like education and income. The coefficient for education level (β = 23.50761) indicates that having any level of formal education substantially increases a farmers' WTP.

Regression Equation

$Y = 23.689 + 23.508(X1) + 0.00026(X2) + 0.002(X3)$

Where,

- Y is the dependent variable (Maximum Willingness to Pay at doorstep)
- 23.689 is the intercept or the predicted value of Y when all independent variables are zero.
- X1, X2, and X3 are three independent variables Education level, Annual household Income, Annual livestock Income from Livestock respectively
- 23.508, 0.00026, and 0.002 are the coefficients for each independent variable, indicating the change in Y for a one-unit increase in that variable, holding all other variables constant

This may be because educated farmers have a better understanding of the long-term benefits of preventive animal health care, which are central to the services offered by *Pashusakhis*. Similarly, the positive coefficients for annual household income and annual livestock income highlight that the economic sustainability of the *Pashusakhi* model is closely related to the broader economic well-being of rural households. Farmers with higher incomes are better able to afford and appreciate the value of doorstep services, reflecting both their capacity and willingness to invest in livestock health. This finding also reinforces the idea, emphasized by Amsalu *et al*. (2023), that livestock serves as a vital income source for rural communities, and that, farmers are prepared to allocate resources towards improving animal health to secure productivity and livelihood benefits.

Conclusion

The study demonstrated that livestock farmers expressed clear willingness to pay for preventive veterinary services provided by *Pashusakhis*, but willingness was strongly influenced by affordability, income, and education. Farmers valued doorstep delivery more due to its convenience, time savings, and reduced animal stress. Regression results confirmed that factors such as education and household income significantly shape willingness to pay. These findings align closely with Government of India's A-Help (Accredited Agent for Health and Extension of Livestock Production) initiative, launched by the DAHD (2024). Evidence from this study suggests that integrating *Pashusakhis* within such national initiatives would not only improve accessibility of veterinary services but also contribute directly to women's economic empowerment and rural livelihood security.

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