Bhartiya Krishi Anusandhan Patrika, 36(2): 92-99 DOI: 10.18805/BKAP298

# Farmer's Willingness-to-Pay for Animal Health and Livestock Insurance Services in Milking State of India: Empirical Findings from Rural Areas of Gujarat

**Pushpa Yadav, B.S. Chandel[1], Punit Agarwal[2], Smita Sirohi[1], Prem Chand[3]**

College of Agriculture, Junagadh Agricultural University, Junagadh-362 001, Gujarat, India.

Received: June 2021 Accepted: July 2021

## ABSTRACT

This paper presents the results of a referendum-style contingent valuation survey conducted in one of the richest milking states of India. 200 households were surveyed to study the farmer's preferences and choices for the health, breeding and insurance services. The objective of the survey was to assess the preference structure and the willingness of poor farmers to pay for veterinary health and insurance services. It is a comparative study between the existing situation and improved situation, that how the willingness to pay (WTP) will change if the quality of the health, breeding and insurance services will improve. The results show that farmers are willing to pay for assured access to veterinary services. Majority of the households value these services tremendously and are not looking for subsidies provided by the government institutions. It was noticed that farmer's willingness to pay was much higher than the amount government institutions were presently charging for improved livestock support services, *e.g.* health and AI services. Though the coverage of Livestock insurance was low but it was found that farmers were ready to pay high amount of premium charges if the insurance services are easily available to the farmer's door step with very less paper work and other formalities. Combining the findings of this survey with other closely related studies and the changing structure the input and output markets for livestock sector, the paper suggests specific policy measures to more effectively meet the expanding livestock services needs of poor livestock farmers.

**Key words:** Artificial insemination (AI), Contingent valuation (CV), Health services, Livestock insurance, Willingness to pay (WTP).

## INTRODUCTION

Gujarat is the second name of dairy cooperative and it is famous for world's largest daily cooperative network working for livestock farmers in Gujarat. Gujarat is having a network of 1377 veterinary institutions (comprising primary veterinary hospitals, dispensaries, polyclinics, aid centres and sub centres) under the State Animal Husbandry Department. In addition to, cooperatives and to a limited extent private practitioners were also participating in provision of livestock support services in Gujarat. Micro evidence shows in Gujarat, the leader of the dairy cooperatives movement in India, there was only 47 per cent access to cooperative veterinary services (Ahuja *et al.,* 2003a). Access to a whole range of good quality services is crucial to enhance the productivity of livestock and to enable the benefit from the potential offered by the sector. It seems unlikely that the current model of service delivery where in the State Animal Husbandry Departments provides most of the services will be sustainable and capable of supporting the livestock sector in the future, especially where there is an increasing trend towards commercialization in livestock production. Livestock owners are willing-to-pay for effective services, rather than use poor services at lower cost. Hence, the rational for heavy subsidization of services to enable their access may not be sound policy for improving the productivity of livestock (Sirohi, *et al.,* 2008). The services are delivered to the livestock owners with heavy subsidies. Till now the government did not charge for these services.

The provision of subsidised services by the government is founded on the concern that a vast majority of livestock farmers are poor and would hence be deprived of the services if fees were charged or costs recovered. A study by Ahuja *et al*. (2001), however, showed that a significant amount of this subsidy does not necessarily reach to the poor. The household survey carried out by the study showed that close to 60 per cent of the veterinary cases are attended to at home and the farmers incurred expenditures of `100 to `200 per home visit. Nearly all these visits were

*Corresponding author's E-mail: pushpayadav@jau.in
[1]National Dairy Research Institute, Karnal-132 001, Haryana, India.
[2]Kulbhaskar Ashram P.G. College, Allahabad State University, Prayagraj-211 002, Uttar Pradesh, India.
[3]ICAR- NIAP, Pusa-110 012, New Delhi, India.

undertaken by the government veterinary surgeons and para-veterinary surgeons in private capacity. From these points, need a policy to encouraging the development of private services and the encouragement of competition among service providers, especially in areas of high production potential. The role of government should be to facilitate the appropriate environment and to provide regulatory framework.

From the policy point of view, a crucial issue is how much a service is worth to the users. A measure to the users' valuation can provide important clues to designing the cost recovery measures or deciding whether the government should provide these services at all. If the users value these services highly and if the goods and services are private goods with no externalities, there is no rationale for using public funds for delivering these services. In the context of developing countries where the governments are often concerned about the welfare of the poor in particular. In a fully private market, the prevailing market price reflects the value to the user. But, in situations where the services are either free or heavily subsidized, the market does not send any signal regarding the true benefit to the consumer. Although the preceding chapter argued that there was relatively well functioning market for veterinary services in Gujarat. The analysis in this section considered only those households who actually participated in using the livestock support services namely, health services and artificial insemination and livestock insurance services.

**Methodology**

The study was conducted in the state of Gujarat both at macro and micro level. The state of Gujarat was selected purposively keeping in view the dairy development and multi-agencies involved in providing the livestock services. At macro level, status of the livestock services and total factor productivity of livestock sector was estimated for the state as a whole. At micro level, the study evaluates the effectiveness, efficiency, utilization pattern and willingness to pay for livestock support services, namely health services, artificial insemination services and livestock insurance services. The districts selected for primary data were Anand, Junagadh, Sabarkantha and Surat districts each from four broad regions in the state of Gujarat.

**Willingness to pay for health services**

The existing scenario of the study area shows that there was basically three kinds of providers were prevailing namely, government, cooperatives and private practitioners also. Government were providing two types of services, at centre as well as doorstep service. After knowing the existing situation of health services in the study area the new improved health services was proposed to the farmers. The detail of the proposed scheme was given below:

**Scheme A (In-centre service)**

The government is starting a new scheme to provide services at the government veterinary clinics centres. The farmers will be given all the services to their animal and all the medicines, which will be needed for the treatment, will be included in the prescribed charges. After taking the animal to the veterinary centre, farmers need not have to wait much for the doctor to attain his animal. The veterinary health consultancy will also be provided to each service user by the doctors of clinics to have better recovery of the animals.

**Scheme B (Door step service)**

The government is starting a new scheme for door step service by government veterinarians. The veterinarian's service will be available at door step of the farmers around the clock at their phone calls. The prescribed charges will also include charges for all types of medicines, whichever is required for the particular treatment.

After describing the scenario, farmers were asked a set of questions given below:

(1) Have you understood the scheme? Do you have any question regarding the scheme?
(a) Understand-- (b) Does not understand---(Repeat the scheme).
(2) Will you pay for availing this kind of services?
(a) Yes---- (b) No----- (c) Can't decide.

If Yes then which scheme you will choose and how much amount you are willing to pay for availing this kind of service.

**Willingness-to-pay for artificial insemination (AI) services**

In Gujarat, artificial insemination service was provided by three types of agencies namely, government, cooperatives and private. Government agency was providing in-centre as well as doorstep services, whereas cooperatives and private were delivering doorstep services only. Farmers were availing A.I. services for their animals from all these three agencies, sometimes they were calling cooperatives, sometimes government practitioners and when these both were not available at that time they were taking service from private providers also at a very high charges. The farmers were presented with two scenarios for eliciting their WTP as narrated below:

**Scheme A (In-centre service)**

The government is starting a new scheme to provide services at the government veterinary clinics centres. The farmers can avail A.I. service for the desired quality of semen for their animal. After taking the animal to the veterinary centre, farmers need not have to wait much for the doctor to attain his animal. No charges for repeat A.I.

**Scheme B (Door step service)**

The government is starting a new scheme for door step service by government veterinarians. The veterinarian's service will be available at door step of the farmers around the clock at their phone calls. The desired quality of semen for the A.I. will be available. No extra charges for pregnancy diagnosis and repeat A.I. if the farmers is availing this scheme. After describing the scenario, farmers were asked a set of questions given below:

1. Have you understood the scheme? Do you have any question regarding the scheme?
(b) Understand----- (b) Does not understand----(Repeat the scheme).
2. Will you pay for availing this kind of services?
(b) Yes---- (b) No---- (c) Can't decide.

If Yes then which scheme you will choose and how much amount you are willing to pay for availing this kind of service.

**Willingness-to-pay for livestock insurance services**

The existing scenario of the livestock insurance shows that there were different kind of charges and expenses, which was born by the farmers, the description of these charges and liability of insurance is given below in Appendix II.

After studying the details of existing livestock insurance scheme and various charges for availing per animal insurance (Appendix I), the new improved livestock insurance scheme was proposed to know the interest of the farmers in this new hypothetical version of livestock insurance scheme. The detail of the scheme is given below:

**Improved livestock insurance scheme**

The government is starting a new scheme to provide livestock insurance services to the farmers at minimum cost. All the charge, which were born by the farmers in existing livestock insurance scheme, like ear tagging charges, policy charges, transportation charges, post mortem charges, health certificate charges and transfer of policy charges etc will be borne by the insurance agency itself. The insurer will be liable to have 65 per cent of the sum insured or market value of animal, whichever is less. To avoid the more paper work the now farmers have to just make a call to the insurance company about the loss of animal and he will get the post mortem report within 2 or 3 days.

After describing the scenario, farmers were asked a set of questions given below:
1. Have you understood the scheme? Do you have any question regarding the scheme?
(c) Understand---- (b) Does not understand---- (Repeat the scheme).
2. Will you pay for availing this kind of services?
(c) Yes---- (b) No---- (c) Can't decide.

If Yes then which scheme you will choose and how much premium you are willing to pay for availing this kind of service.

After getting the data from the farmers then average value of willingness to pay was calculated for all the three types of services. Based on the above methodology, the results and discussed below.

## RESULTS AND DISCUSSION

**Willingness-to-pay for animal health services**

For the purpose of this study, two schemes were constructed. One was for the farmers who want to take their animal to the government veterinary centres and another for door step services from veterinarians. Before discussing about the amount farmers are willingness-to-pay for availing health services, having a look at the existing rates prescribed for availing health services from different agencies is relevant.

**Existing amount paid for availing health service**

This sub-section delineates the rates charged by different agencies in providing the animal health services in Gujarat. As it was already discussed in previous chapters that in the study area there was a good network of agencies providing livestock services, the amount charged by these agencies for the same service was different keeping aside the quality aspect. Though the prescribed rates per service are same across state in government and cooperative institutions but charges for door service may differ on the basis of distance. Table 1 shows the existing charges for availing the health services from different service providers. The government institutions were providing health services at the doorstep of the farmers as well as at the centre. Overall, the average amount charged at the doorstep was `201 by the

**Appendix I:** Existing scenario of livestock insurance scheme (2015-16).

| Items/districts | Anand | Junagadh | Sabarkantha | Surat | Overall |
|---|---|---|---|---|---|
| Tagging charges (`/Insurance) | 15 | 15 | 15 | 15 | 15 |
| Retagging charges (`/Tagging) | 50 | 50 | 50 | 50 | 50 |
| Transportation charges (For more than 80 Km.) | 1% | 1% | 1% | 1% | 1% |
| Transfer of policy (`/Policy) | 15 | 15 | 15 | 15 | 15 |
| Minimum premium (`/Policy ) | 50 | 50 | 50 | 50 | 50 |
| Issuing health certificate (`/Animal) | 25 | 25 | 25 | 25 | 25 |
| Conducting post mortem and preparing PM report (`/PM) | 75 | 75 | 75 | 75 | 75 |
| Issuing death certificate (`/Animal) | 20 | 20 | 20 | 20 | 20 |
| Waiting time to get health certificate/death certificate (In days) | 15 | 15 | 15 | 15 | 15 |
| Premium for 3 years | 5 | 5 | 5 | 5 | 5 |
| Rate 4 to 5 years | 12 | 12 | 13 | 12 | 12 |
| (%) more than 5 years | 15 | 15 | 15 | 15 | 15 |
| Liability for claim amount | 50% of sum insured or market value of animal at the time of loss, whichever is less | | | | |

Source: New India Insurance Company Ltd. Gujarat, National Insurance Company Ltd. Gujarat.

**Table 1:** Existing charges for availing health services from different service providers in selected districts of gujarat.

| Districts | Sample size (no.) | Household availing health services (no.) | Agencies/ service providers (` / Service) | | | |
|---|---|---|---|---|---|---|
| | | | Government | | Coop. | Private |
| | | | At centre | At doorstep | At doorstep | At doorstep |
| Anand | 50 | 50(100) | 60 | 200 | 80 | - |
| Junagadh | 50 | 47(94) | 60 | 224 | - | 677.60 |
| Sabarkantha | 50 | 49(98) | 60 | 200 | 80 | 369.00 |
| Surat | 50 | 50(100) | 60 | 180 | 80 | 375.00 |
| Overall | 200 | 192(98) | 60 | 201 | 80 | 355.40 |

Note: Figures in parentheses are the percentage of sample size.

# The existing charges taken by different agencies have been taken from given below secondary sources:-

1. Annual Report of Anand Milk Union Limited (AMUL)-2014-15, AMUL Research and Development Association (ARDA), Anand, Gujarat, India.
2. Dairying in Gujarat, A Statistical Profile 2013, National dairy development Board, Anand, Gujarat, India.
3. Annual Report of Dairy Cooperatives Research and Development Association Gujarat 2014-15, India.
4. Gujarat Cooperative Milk Marketing Federation, Research and Development Department, Anand, Gujarat, India.
5. Bulletin of Animal Husbandry and Dairying Statistics (2016-17). Directorate of Economics and Statistics, Krishi Bhavan, Gandhinagar, Government of Gujarat.

government department. It was `60 for cooperatives and `355.40 for the private agencies.

The prescribed charges for health services by different service providing agencies were also including charges for medicines and it depends on the availability of medicines with the doctor. If the prescribed medicines were available at that particular time then with the same charges farmers were getting medicines also for their animals. The farmers in most of the districts were having various choices for availing health services form different service agencies except in Junagadh district. In Junagadh, the coverage of cooperative societies was very low or negligible in terms of health services and farmers were having alternatives of the government and private agencies for health services. At centre service, the farmers were preferring government agencies due to lesser cost. Nevertheless, at doorstep services were more prompt from cooperative and private agencies. It was observed in the study area that there was almost one government veterinary clinic in each village, but one veterinary doctor was covering 5 to 6 villages. This was another reason for not going for government agencies for doorstep services that one veterinary was serving more than one veterinary institution.

There were variety of animal health services availed by the farmers *e.g*. illness, mastitis, morbidity, skin and stomach infection and treatments related with other productive and reproductive problems (Sirohi S. *et al.* 2008). After analysing the existing scenario of the provision of health services in the study area, the improved veterinary health services under scheme A (In-centre service) and Scheme B (Door step service) were proposed to the farmers for their response on WTP as per the details given in the methodology and the results obtained are summarised in Table 1.

The findings of the study shows that after explaining both types of scheme to the respondent, there were 140 (70%) respondent out of 200, who showed their interest in the scheme and were ready to pay for availing the kind of services explained to them. There were still 60 respondents who were negatively interested to have this scheme.

**Table 2:** Willingness-to-pay for improved veterinary health services.

| Districts | Respondents (%) | WTP (`/Service) | |
|---|---|---|---|
| | | Scheme A (In centre) | Scheme B (Door step) |
| Anand | 64 | 73 | 212 |
| Junagadh | 78 | 76 | 190 |
| Sabarkantha | 72 | 85 | 213 |
| Surat | 66 | 65 | 209 |
| Overall | 70 | 74 | 206 |

The finding of the study area shows that the overall WTP was about `74 and `206 for animal health services at centre and at doorstep, respectively, which were higher than the existing prescribed charges for the services by the government agency (Table 2). It can be inferred from the results that there was not much difference between the prevailing charges and willing amount to pay, as the farmers of the study area were already availing doorstep services from different service providers around the clock so this may be the reason that the amount willingness-to-pay was not be much higher than the existing prescribed charges. The results from one the similar study conducted by Ahuja (1998) showed that the proportion of respondent fell from 70 per cent to 28 per cent when the amount of contingent valuation scheme was raised from `100 to `500.

Larger difference was found between the existing amount and willingness-to-pay amount for in-centre service. As the respondent were ready to pay `14 more than the existing rate because quality of the service at centre was

poor and the respondent were ready to pay higher amount for an improvement in quality of health service. The district wise variation in willingness-to-pay shows that the highest amount of willingness-to-pay was found in Sabarkantha district, it was about `85 for scheme A and `213 for scheme B. The animal health services were scanty in the later district as appear from the number of veterinary institutions and doctors given in section on status of livestock services and the farmers are willing to pay higher amount for better services (Ahuja, V. *et al*. 2003a). This clearly indicates that farmers prefer better services at higher price than poor services at lower price.

**Willingness-to-pay for artificial insemination (AI) services**

Gujarat has good network of artificial insemination centres and sub centres, including government, cooperatives as well as private. In cooperative sector, Anand Milk Union Limited (AMUL), Sorath Dairy Milk Cooperative Limited (SORATH), Sabarkantha District Milk Cooperative Limited (SABAR) and Surat Milk Union Limited (SUMUL) dairy societies were working not only as a milk collection and processing units, but they were providing AI services to their member farmers. The only exception was Junagadh where SORATH dairy society has started providing AI services recently and has very low or negligible coverage of villages as compared to other dairy cooperative societies. The existing scenario two types of services were provided by the government department namely doorstep service and in-centre services. Dairy cooperatives were providing door step services. Private veterinary doctors were also prevailing in the study area and providing door step service at a very high cost. The detail of existing AI charges by the different service providers and the willingness-to-pay (WTP) are given below (Table 3). The existing charges for AI per service were `20 at the centre and `50 at the door step by the government agencies. The charges were the cost of that of semen straw and the conduct of AI was free. For doorstep service, the cooperative agencies were charging `60 and private agencies were charging `200. The rates were found uniform across the selected districts and state.

For calculating WTP, technique similar to the estimation of WTP for animal health services was followed by proposing improved AI services with scheme A (at-centre ) and Scheme B (at doorstep). The details of the schemes are given in methodology. After explaining both types of scheme to the respondent, there were 69 per cent (138) of the respondents out of 200 who showed their interest in the willingness-to-pay for these schemes for artificial insemination. District wise variation was found in the willingness-to-pay. For example the largest proportion of respondents from Junagadh district was willing to pay for change in the kind of services. The average amounts that the respondent were willing to pay were `54.28 and `76.40 per AI for at centre and at doorstep service, respectively and certainly, it was higher than the existing amount farmer were charged by the government agency as well as cooperative societies (Table 3).

The findings indicate that farmers were ready to pay even more than double charges for quality AI services so that number of AI per conception can be reduced. If the government agencies provide semen of desired quality and breed for AI and no charges for repeat breeding, then the farmers were willing to pay higher amount than the existing charges (Ahuja, V. *et al*., 2000). The district wise variation shows that the WTP varied from `47.50 in Surat to `58.54 in Junagarh for per service at centre while for the doorstep service, the WTP varied between `71.50 in Sabarkantha to `76.81 in Anand for per service. This variation was there due to existence of severity of problem related with getting the AI service. The willingness-to-pay was highest in Junagarh for AI service at centre and in Anand for AI service at doorstep.

**Table 3:** Existing charges for AI by different service providers and willingness-to-pay (WTP).

| Districts | Willingness-to-pay (WTP) for AI | | | Existing charges by different service providers (`/Service) | | | |
|---|---|---|---|---|---|---|---|
| | Respondents | WTP (`/Service) | | Government | | Cooperative | Private |
| | (%) | Scheme A (At centre) | Scheme B (At doorstep) | At centre | At doorstep | At doorstep | At doorstep |
| Anand | 70 | 57 | 76 | 20 | 50 | 60 | - |
| Junagadh | 76 | 59 | 75 | 20 | 50 | - | 200 |
| Sabarkantha | 60 | 51 | 71 | 20 | 50 | 60 | - |
| Surat | 70 | 47 | 81 | 20 | 50 | 60 | 200 |
| Overall | 69 | 54 | 76 | 20 | 50 | 60 | 200 |

Note: The existing charges taken by different agencies have been taken from given below secondary sources:-

1. Annual Report of Anand Milk Union Limited (AMUL) -2014-15, AMUL Research and Development Association (ARDA), Anand, Gujarat, India.
2. Dairying in Gujarat, A Statistical Profile 2013, National Dairy Development Board, Anand, Gujarat, India.
3. Annual Report of Dairy Cooperatives Research and Development Association Gujarat 2014-15, India.
4. Gujarat Cooperative Milk Marketing Federation, Research and Development Department, Anand, Gujarat, India.
5. Bulletin of Animal Husbandry and Dairying Statistics (2016-17). Directorate of Economics and Statistics, Krishi Bhavan, Gandhinagar, Government of Gujarat.

The WTP at the centre was more than 2.5 times higher than the existing charges. This was due to the reason that taking animal to the centre bears additional efforts and time and also there was fear of losing the heat time and no availability of semen straw or doctor. Therefore, taking animal to the centre for AI carries more cost and risk as compare to doorstep service.

**Willingness-to-pay (WTP) for livestock insurance**

The livestock insurance coverage was provided for various livestock species by the four public sector insurance company in Gujarat Namely National Insurance Company Ltd., New India Insurance Company Ltd., Oriental Insurance Company Ltd. and United India Insurance Company Ltd. The existing premium amount, premium rate and willingness-to-pay for livestock insurance in the study area are given in Appendix II.

In the existing conditions, all the charges including tagging of ears charges, health certificate charges, transportation charges and insurance policy charges all were born by the insurer itself. Insurance company was not bearing any kind of charges with respect to insurance. After the loss of animal to get the claim amount, whatever charges was taken by doctors for post mortem and issuing death certificate, these charges were also born by the insurer only. The cost in terms of waiting time to get health certificate or death certificate for claiming the amount was at least 15 days (Appendix I). The premium rate was increasing with the increase in the age of the animal and for the duration of insurance. The premium rate was 5 per cent for up to three years of insurance, 12 per for 4 to 5 years of insurance and 15 per cent for more than 5 years of insurance. The insurer was liable to get the 50 per cent of insured sum or the market value of animal at the time of loss, whichever is less (Appendix I).

After analysing the existing scenario, the improved livestock insurance services were proposed to the farmers in details. The detail of the scheme is given below:

**Improved livestock insurance scheme**

The government is starting a new scheme to provide livestock insurance services to the farmers at minimum cost. All the charge, which were born by the farmers in existing livestock insurance scheme, like ear tagging charges, policy charges, transportation charges, post mortem charges, health certificate charges and transfer of policy charges etc will be borne by the insurance agency itself. The insurer will be liable to have 65 per cent of the sum insured or market value of animal, whichever is less. To get animal autopsy report will be the responsibility of insurance company not the farmers. To avoid the more paper work, the farmers have to just make a call to the insurance company about the loss of animal and he will get the post mortem report within 2 or 3 days. After explaining the scheme to the respondents, responses were recorded on WTP and the results are presented in the Table 4.

47 per cent of the respondents showed positive response to willingness-to-pay for livestock insurance, whereas the existing number of people, who were having livestock insurance scheme was only 26 per cent. Among the districts, the proportion of respondents for WTP in livestock insurance was the highest (50 per cent) in Anand. Due to poor planning and complex socioeconomic conditions, the overall performance of livestock insurance has been slow and poor in India. In 1988- 89, only 4.2 per cent livestock population was insured in India which marginally increased to 6.09 per cent in 2002-03 (Raju and Chand, 2007).

The average annual amount that the respondents were willing to pay was `4558, `4339, `4255 and `4385 per annum in Anand, Junagadh, Sabarkantha and Surat districts, respectively. The average overall annual amount of willingness-to-pay for livestock insurance came to `4273 per animal per household in the study area (Table 4). The existing premium rate for livestock insurance in the study area was 5 per cent per of the market value of animal per annum, whereas the imputed premium rate came up to 8.10

**Table 4:** Existing premium rates and expenditure for livestock insurance and willingness-to-pay.

| Districts | WTP for improved livestock insurance (`/policy) | | | Existing premium amount and rate | | |
|---|---|---|---|---|---|---|
| | Respondents (%) | Premium (`) | Imputed rate (%) | Government agency | | |
| | | | | Premium (`) | Premium rate (%) | Expenditure (`/policy) |
| Anand | 50 | 4558 | 8.40 | 2966 | 5.00 | 90 |
| Junagadh | 46 | 4339 | 7.44 | 2791 | 5.00 | 90 |
| Sabarkantha | 46 | 4255 | 7.59 | 2946 | 5.00 | 90 |
| Surat | 44 | 4385 | 7.51 | 2955 | 5.00 | 90 |
| Overall | 47 | 4273 | 8.10 | 2885 | 5.00 | 90 |

Note: The existing charges taken by different agencies have been taken from given below secondary sources:-

1. New India Insurance Company Ltd. Gujarat, National Insurance Company Ltd. Gujarat.
2. The Oriental Insurance Co. Ltd., Gujarat, India.
3. United India insurance Co. Ltd. Gujarat, India.

per cent of the market value of animal on an average. It clearly indicate that if the insurance agency are ready to bear all the extra charges, reduces the paper work and the liability ratio of claim is increased from 50 per cent to 65 per cent of the sum insured, the farmers were ready to pay premium at higher rate (more than 8 per cent) of the sum insured. Challenges faced by insurance providers and livestock insurance buyers in India were high transaction costs in getting assessment and identification of animal, claim settlement process and other administrative processes; premium pricing marked by absence of historical data and lack of awareness and non-standardized risks reducing practices (Sharma, 2009, Thomas Dufhues 2004).

The results on WTP can be summarized as that the amount farmers were willing to pay was higher than the amount government institutions were presently charging for livestock support services- health, AI and insurance. For animal health services, the overall WTP was about `74 per service at the centre and `206 per service at doorstep, which were 1.23 times and 1.02 times higher than the existing charges per service, respectively. Similarly, farmers' WTP was observed about `54 per AI at centre and `76 per AI at doorstep which were 2.7 time and 1.5 times higher than the existing charges per AI, respectively.

In case of insurance, if insurance agencies were ready to bear all the extra charges, reduce the paper work and the liability ratio of claim is increased from 50 per cent to 65 per cent of the sum insured, the farmers were willing to pay premium at rate more than 8 per cent while the existing rate of premium was five per cent. This clearly indicates that farmers prefer better services at higher price than poor services at lower price. The district wise variation in WTP also indicates the severity of the problems existing related with particular service and the risk involved. In Sabarkantha, due to less number of veterinary institutions and doctors, the WTP per animal health service was observed to be the highest among districts. Similarly, the WTP per AI was the highest in Junagarh due to absence of AI services from the cooperative agencies. The challenges faced by insurance providers and livestock insurance buyers in India were high transaction costs in getting the policy and settling the claim. This has been observed as one of the main reason for lack of adoption in spite of the fact the state and centre government is providing lot of subsidy on premium. The present study found that farmers were willing to pay higher premium rate for livestock insurance in case hazels in getting the policy and claim were removed.

## CONCLUSION AND POLICY RECOMMENDATION

The results and finding of the present study shows that there is significant willingness to pay for animal health services in all the regions of the Gujarat. The households value these services tremendously and are not looking for subsidies provided by the government institutions. It was further discussed that farmers were willing to pay was much higher than the amount government institutions were presently charging for livestock support services, *e.g*. health, AI and insurance. For animal health services, the overall WTP was about `74 per service at the centre and `206 per service at farmer's doorstep, which was 1.23 times and 1.02 times higher than the existing charges per service, respectively. Similarly, farmers' WTP was observed about `54 per AI at centre and `76 per AI at their doorstep, which were 2.7 time and 1.5 times higher than the existing charges per AI, respectively. This clearly indicates that farmers prefer better services at higher prices than poor services at lower prices. These results underline the need for creating awareness among livestock farmers and linking them to urban markets for enhancing the value of livestock keeping and creating sustained demand for these services. In case of livestock insurance, if insurance agencies were ready to bear all the extra charges, reduce the paper work and the liability ratio of claim is increased from 50 per cent to 65 per cent of the sum insured, the farmers were willing to pay premium at rate more than 8 per cent while the existing rate of premium was only five per cent. The challenges faced by insurance providers and livestock insurance buyers in India were high transaction costs in getting the policy and settling the claim. This has been observed as one of the main reason for lack of adoption in spite of the fact the state and centre government is providing lot of subsidy on premium.

This requires a re-examination of the government's current strategy and plans for livestock service delivery and for overall development of this sector. In particular, this will require providing room for private practitioners in high potential areas with relatively good access to markets. In the low potential backward areas, government will have a more direct role. In the long term, as the livestock services sector develops and service delivery becomes more commercial and selfsustainable, the government will need to dedicate itself towards public good provision such as disease surveillance, disease prevention and food hygiene, zoonosis control, sanitary control, compliance monitoring, market regulation and so on.

## REFERENCES

Ahuja, Vinod. (Ed). (1998). Workshop on Commercialization of Livestock Health and Breeding Services in India: Papers and Proceedings, IIM, Ahmedabad; The World Bank, Washington DC and SDC, Bern.

Ahuja, Vinod, P.S., George, Sunil Ray, Kenneth McConnell, Vasant Gandhi, Dina Umali-Deininger and Cees de Haann. (2000). Agricultural Services and the Poor: Case of Livestock Health and Breeding Services in India, Indian Institute of Management, Ahmedabad; The World Bank and Swiss Agency for Development and Cooperation.

Ahuja, Vinod and Elizabeth Redmond. (2001). Livestock Services and the Poor, Paper Presented at the International Symposium on Tropical Dairy Production, University of Utrecht, Netherlands.

Ahuja, V., Kenneth, E., McConne, Dina-Umali, D. and Hann, C. (2003a). Are the Poor Willing to Pay for Livestock Services? Evidence from Rural India. Indian Journal of Agriculture Economics. 58(1): 84-99.

Annual Report of Anand Milk Union Limited (AMUL) -(2014-15). AMUL Research and Development Association (ARDA), Anand, Gujarat, India.

Annual Report of Dairy Cooperatives Research and Development Association Gujarat 2014-15, India.

Bulletin of Animal Husbandry and Dairying Statistics (2016-17). Directorate of Economics and Statistics, Krishi Bhavan, Gandhinagar, Government of Gujarat.

Dairying in Gujarat: A Statistical Profile (2013). National Dairy Development Board, Anand, Gujarat, India.

Gujarat Cooperative Milk Marketing Federation, Research and Development Department, Anand, Gujarat, India.

New India Insurance Company Ltd. Gujarat, National Insurance Company Ltd. Gujarat.

Raju, S.S. and Chand, R. (2008). Agricultural Insurance in India: Problems and Prospects. National Centre for Agricultural Economics and Policy Research, New Delhi.

Sharma, A.C. (2009). Livestock Insurance: Lesson from the Indian Experience. Policy paper, Institute for Financial Management and Research.

Sirohi, S., Kumar, A., Gokhale, S., Elumalai, K., Sinha, G. and Wright, I., (2008). Livestock Support Services in India, Report to The World Bank, International Livestock Research Institute, New Delhi.

The Oriental Insurance Co. Ltd., Gujarat, India.

The United India Insurance Co. Ltd. Gujarat, India.

Thomas Dufhues (2004). New Ways for Rural Finance? Livestock Insurance Schemes in Vietnam. Paper presented in a Conference on International Agricultural Research for Development, Berlin. 5(7): 2004.