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Delivery of Animal Healthcare Services in Uttar Pradesh: Present Status, Challenges and Opportunities[§]

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Abstract

The study has assessed the status and gaps in delivery of animal healthcare services, both curative and preventive, in Uttar Pradesh, by selecting 557 livestock farmers from 5 districts, one each from five agro-climatic regions of the state. The study has revealed that the policy of delivery of subsidized animal healthcare services (AHS) does not seem to be serving its real purpose as most of the farmers in the study area have been observed to avail the services of private practitioners. The analysis of attributes associated with various AHS providers has revealed that 'proximity' is the major constraining factor in the uptake of AHS. The crossbred cattle ownership, low economic status and distance from nearest AHS centre have emerged as the most significant variables affecting the choice of AHS providers. With increasing distance from state AHS centres, farmers' preference for AHS provider shifts from government veterinary officers (GVO) to private practitioners. On the other hand, ownership of crossbred cattle has shifted the preference of farmers from other AHS providers to GVO. The odds of accessing the services of private practitioners have been found significantly higher for the poor farmers. The study has reported that the farmers are willing to pay for AHS delivery but the amount as obtained from a contingent valuation exercise has been found significantly lower for poor than rich farmers. This implies that this price differential should be kept in perspective if any policy orientation towards cost recovery for AHS provision is envisaged.

Key words: Agricultural service, preventive and curative services, animal healthcare delivery system, Uttar Pradesh

JEL Classification: D10, Q16, Q18

Introduction

The livestock sector is highly livelihood-intensive and provides supplementary income opportunities to millions of rural households, who are landless agricultural labourers or marginal or small farmers. The distribution of livestock is far more equitable than of landholding. The rising population, income growth and urbanization are fuelling the radical changes in dietary

patterns in favour of livestock food products. The distinct increase in the demand for livestock food products not only contributes to nutritional security, but also provides income growth opportunities to rural poor and hence, accelerates the pace of poverty alleviation.

In India, poor livestock health, as a technological constraint, remains one of the principal factors limiting livestock development. The Animal Healthcare Services (AHS) and disease control have been and still are in the domain of public sector in India. The delivery of AHS by the sector is justified by assuming that livestock are more important for the resource-poor

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households who are unable and unwilling to pay for these services. However, with the changing economic scenario, the policy of delivery of subsidized AHS has come under increasing pressure for not performing adequately. Trans-boundary animal diseases such as foot and mouth disease (FMD) are still prevalent in India and economic losses due to animal diseases remain significant. The value of annual economic losses due to FMD was reported to be ₹ 14000 crores (Singh *et al.*, 2013), while losses due to *Hemorrhagic septicaemia* and *Peste-des-Petits Ruminants* (PPR) were estimated at ₹ 5255 crores and ₹ 8895 crores, respectively (Singh *et al.*, 2014).

Under the above context, it becomes pertinent to take stock of the status of AHS (both curative and preventive) at the field level. It is also necessary to gain valuable insights into the micro-environment within which a farm household functions and makes decisions on the needs of animal healthcare. The perceptions of stakeholders in the delivery of services being critical to the success of any programme (Turkson, 2004), the present study has attempted to understand the behaviour and decision-making process of the poor in animal health management by assessing the perceptions of livestock farmers towards AHS providers. It has also studied whether the farmers are willing to pay for AHS and has identified the factors influencing farmers' choice of AHS providers. The study is likely to help the policymakers in better designing of an effective animal healthcare delivery system.

Data and Methodology

The study has been carried out in the state of Uttar Pradesh, which has the highest (13.42%) livestock population in the country. The state has highest share in total number of large ruminant owning rural households in the country (12.31% and 30.55%, respectively for cattle and buffalo), implying strong dependence on livestock in the rural areas (GoI, 2012). The share of the state in production of national milk (17.6%) and meat (19.1%) is highest (GoI, 2014). The state has robust infrastructure pertaining to animal healthcare delivery with the highest share (8.29%) of India's veterinary hospitals/polyclinics/dispensaries/aid-centres located in the state (GoI, 2014).

Uttar Pradesh has nine agro-climatic regions. The data on livestock population of each region were

obtained from the 19th Livestock Census (2012)-All India Report, and the regions were ranked on the basis of livestock population. A total of five regions were selected to ensure adequate representation from different regions in the sample on the basis of their livestock population. Central Plain and Central-Western Semi-arid Plains were selected as these zones, based on livestock population, were ranked first and last, respectively. Three other zones, lying at equidistant intervals in the rankings, in between the above two zones, were then selected. These regions were Tarai, Western Plains and Bundelkhand. One district from each agro-climatic region, two blocks from each district, two villages from each block and a maximum of 30 livestock-rearing households from each village were selected randomly. Thus the sample finally comprised 557 livestock-rearing households as depicted in Table 1.

The primary data were collected personally by interviewing the household-head using a well-structured and pre-tested schedule. Data were collected on personal characteristics (age, education, occupation, etc.); farm-specific characteristics (herd size, landholding, etc.) and AHS-related information like AHS providers accessed, perception towards different attributes of AHS providers, willingness to pay for delivery of AHS, etc.

Analytical Framework

Categorizing Households under Different Economic Categories

The state policy towards AHS is generally formulated based on the assumption that livestock are more important for the livelihood of the poor and also that the poor are not willing to pay for AHS. In recognition of these factors, policies of delivery of subsidized AHS and drugs/vaccines are followed. Thus, any study that assesses the perception of farmers towards AHS delivery should compare the behaviour of different economic categories of households in availing AHS. Therefore, selected households were classified into different categories based on the ranking as per index of assets given by Ahuja *et al.* (2003a). Details about construction of the index are given in Appendix 1. The number of households across different economic categories were as follows: poor, 241; medium, 227; and rich, 88.

Table 1. Distribution of sample households across blocks/districts and agro-climatic regions

Agro-climatic region	District	Blocks	Villages	No. of households
Central Western Semi Arid Plains	Bareilly	Bhojipura	Makrandapur	25
			Mirpur Baki	30
		Faridpur	Naugaon	30
Tarai	Pilibhit	Bisalpur	Gotiya	27
			Chausra	30
		Puranpur	Arjunpur	30
			Pipariya Dulai	30
			Muzzaffarnagar	30
Western Plains	Bulandshahr	Syana	Chanpur Kutthi	30
			Bara Firozpur	30
		Khurja	Bigheypur	30
Central Plains	Hardoi	Malawa	Firozpur	30
			Isharpur Sai	29
		Sahabad	Barhua	26
			Bilahari	22
Bundelkhand	Jhansi	Babina	Udharpur	30
			Khajuraha	30
		Chirgaon	Mathurapura	20
			Pahari	20
			Chiraona	28

Descriptive Analysis

Descriptive statistics in the form of mean, percentage and frequencies were carried out to ascertain the farm and household specific characteristics of the households, AHS providers accessed and frequency of availing AHS.

Assessing Farmers Attribute-wise Ratings of Different AHS Providers

The Likert's scale was used to ascertain farmers' valuation of different AHS providers on the basis of attributes, such as affordability, quality and proximity. The farmers were asked to rate different AHS providers on each of these attributes on a three-point continuum (1= low and 3=High). The mean of the ratings for each AHS provider for different attributes was then computed.

Estimation of Willingness to Pay (WTP)

To elicit the farmers WTP, the contingent valuation method (CVM) was adopted (Vanslebrouck *et al.*, 2002). The application of this approach is supported

by the fact that the government has already introduced some fees for availing livestock services like Artificial Insemination (AI). The contingent valuation scenario presented to the farmers was as follows:

Scenario 1: The government initiates a new scheme for delivery of livestock healthcare services and gives an offer for providing LHS at farmers' doorsteps. The farmers who accept the offer will be provided guaranteed service at their homes whenever they need it, for a year. How much would you pay for the offer?

Scenario 2: The government initiates another scheme for provision of livestock healthcare services at the government veterinary centers. Those who accept the offer will be assured of guaranteed service at these centers. This offer, once accepted, will be valid for a year. How much would you pay for the offer?

Before actually conducting the survey and presenting the CVM scenarios to sample respondents, focused group discussion was held at each region to ascertain the amount farmers were willing to pay in that particular region. The final bid prices that were presented to the individual respondents were based on the results of focused group discussions.

Identification of Factors Influencing Choice of AHS Providers

In this study, a multinomial logit model (as used by Pundo and Fraser, 2006) was adopted to focus on the decision of households on the type of AHS provider accessed. Three major types of AHS providers were accessed by respondents in the study area, viz. Government Veterinary Officer (GVO), Para-Veterinarians, and Private Veterinary Practitioners. The services of other AHS providers, viz. private veterinary doctor, Community Based Animal Health Workers (CBAHWs) and NGO Veterinarians were utilized sporadically and to a significantly lesser extent. Thus, the households who availed the services of these AHS providers were merged together to form 'Others' category of AHS providers.

To generate dependent variables, the farmers were classified into five groups: (i) those who did not avail the services of AHS providers, (ii) those who availed the services of GVO, (iii) those who availed the services of para-veterinarians, (iv) those who availed the services of private veterinary practitioners and (v) those who availed the services of 'Other' AHS providers.

Given the alternatives before a producer, the probability that an individual i chooses alternative j , therefore can be expressed by Equation (1):

$$Pr[Y_i = j] = \exp(\beta' j X_i) / \sum \exp(\beta' j X_j) \quad \dots(1)$$

where, $Pr[Y_i = j]$ is the probability of not availing the services of AHS providers, availing the services of GVO, availing the services of para-veterinarians, availing the services of private veterinary practitioners and availing the services of 'other' AHS providers.

$$j = 0, 1, 2, 3; i = 1, 2, 3, \dots, 557$$

X_i = Vector of the predictor variables, and

β_j = Vector of the estimated parameters.

The e^β were calculated to get the odds ratio (OR) associated with change in independent variable.

Results and Discussion

Farm and Farmer-specific Characteristics

Table 2 presents the farm- and farmer-specific characteristics of respondent households belonging to different economic categories. The landholding-size

Table 2. Farm- and farmer-specific characteristics

Particulars	Poor households	Medium households	Rich households
Size of landholding (acres)	0.54 ^a	1.75 ^b	4.10 ^c
Herd size			
Indigenous cows	0.68 ^b	0.07 ^a	0.92 ^b
Crossbred cows	0.29 ^a	0.40	0.65 ^b
Buffaloes	2.07 ^a	2.80	4.14 ^b
Occupation (% of households)			
Agriculture +Animal husbandry	63.07	94.27	96.59
Agriculture labour + Animal husbandry	25.72	1.32	1.13
Agriculture +Animal husbandry +Agriculture labour	7.88	2.20	0
Business +Animal husbandry	2.48	-	1.13
Dwelling structure*	1.97 ^a	2.55	2.69 ^b
Membership of group (%)	34.09 ^a	80.68 ^b	50.00
Credit availability**	11.61 ^a	25.99 ^b	48.86 ^c
Milk produced/household/day (litres)	2.63 ^a	3.60	6.40 ^b
Milk sold/household/day (litres)	0.65 ^a	0.98	2.45 ^b
Proportion of milk sold (%)	24.71	27.22	26.83

Note: Differences between figures, having different superscripts, across different wealth categories in the same row are significant at 5 per cent level of significance

Table 3. Different AHS providers accessed during past 12 months

AHS providers	% of respondents availing the service		
	Poor households	Medium households	Rich households
Govt. veterinary officer	4.36	5.72	10.27
Para-veterinarian	13.69	11.89	15.90
Private veterinary doctor	0.62	0.00	1.13
Private practitioner	39.00 ^a	29.59	25.00 ^b
CBAHWs	3.31	5.82	2.27
NGO veterinarian	0.20	1.32	2.27

Note: Differences between figures, having different superscripts, across different wealth categories in the same row are significant at 5 per cent level of significance

was significantly different across different household categories, which was obvious, as landholding is one of the major determinants of economic status of rural households. The ownership of crossbred cattle and buffaloes was significantly higher across rich than poor households, as expected. There was no significant difference between the number of indigenous cattle owned by the poor and rich households.

A substantially higher proportion of respondents in both medium and rich households pursued agriculture and animal husbandry as their source of livelihood as compared to the poor households. Also, the dependence on agricultural labour, as income source, was significantly more in the case of poor than rich households. A significant difference was observed in the structures of dwelling households across economic categories. Households belonging to medium and rich categories mostly resided in pucca dwellings, while poor households mostly resided in semi-pucca dwellings.

A significantly higher proportion of respondents in the medium categories reported that they were members of a group/society than the poor respondents. The proportion of respondents reporting easy access to credit increased with rise in economic status. While, only about 12 per cent of the poor respondents reported that credit availability was easy, 49 per cent of their rich counterparts reported the same. This finding clearly indicates that access to credit is easier for the rich households and poorer households are largely excluded from accessing institutional credit sources. The milk production per household was found to increase with increase in economic status. This is understandable as rich households owned a significantly higher number

of high-yielding milch animals than the poor households. Although the absolute quantities of milk marketed per day per household increased with increase in economic status, there was no significant difference in the proportion of milk marketed across different economic categories of households.

AHS Providers Accessed during Past 12 Months

The major AHS providers, whose services were availed by the respondent households, were private veterinary practitioners, para-veterinarians and GVOs (Table 3). A small number of households availed the services of other AHS providers, like CBAHWs, private veterinary doctor and NGO veterinarian. Across all economic categories, the highest proportion of respondents utilized the services of private veterinary practitioners, who practically had no formal training in veterinary healthcare.

A significantly larger proportion of poor households availed the services of private practitioners, which shows higher dependence of poor households on the services of this type of AHS provider. It was followed by para-veterinarians who are government employees attached to government veterinary hospitals and have formal training on basic animal health care. In availing their services, no significant difference was observed in the proportions of households of different economic categories. As compared to private practitioners and para-veterinarians, a lower number of respondents availed the services of GVOs, who are professionally qualified veterinary doctors. The proportion of households availing the services of GVOs increased with rise in their economic status.

Table 4. Proportions of respondents reporting vaccination of their animals during past 12 months

Economic category	Percent respondents
Poor	45.64
Medium	50.20
Rich	45.45
Overall	44.24

The state AHS are heavily subsidized, but the study has observed that providing subsidy to animal healthcare delivery system was not adequately serving its purpose as there were clear indications that these subsidies were benefitting the richer sections of the rural society more than the poorer ones. As a result, the poor households have to depend more on unqualified practitioners. In fact, a large proportion of households across all economic categories have been found dependent on such AHS providers. It indicates that government healthcare services are not reaching the intended beneficiaries.

About 44 per cent respondents reported that their animals were vaccinated by the state AHS providers during the past twelve months prior to the date of survey (Table 4). There was no significant difference in the proportions of respondents reporting vaccination of their animals across different economic categories.

Attribute-wise Evaluation of Different AHS Providers

The respondents evaluation of different AHS providers on selected attributes on a three-point

continuum (1=low; 3=High) is presented in Table 5. No significant difference was observed in the mean ratings given to different attributes across various AHS providers. Also, there was no significant difference in the mean ratings for each attribute for particular AHS providers across different economic categories. The only pattern discernable from Table 5 is that the attribute 'proximity' has consistently received a lower rating compared to 'affordability' and 'quality' across different economic status categories and across various AHS providers. This finding indicates that the real issue in availing the AHS is proximity, i.e. easy access to AHS at the time of need.

Factors Influencing Choice of AHS Provider

Table 6 presents the results of the multinomial logit regression analysis carried out to identify the factors that significantly influence farmer's choice of AHS providers. The variables associated with the choice of GVO as AHS provider were the distance to nearest AHS centre and ownership of crossbred cattle. The negative sign of the distance to nearest AHS centre variable coefficient suggests that farmers' likelihood of availing the services of a GVO declined with increase in distance from the AHS centre. The GVOs in the study area were found to mostly treat the animals at AHS centre. The services at farmers' doorsteps were mostly provided by para-veterinarians. Thus, it was obvious that with increase in distance from AHS centre would result in a decrease in the probability that the farmers would get their animals treated by the GVO. The ownership of crossbred cattle significantly increased the likelihood that the farmers would avail the services of a GVO. The crossbred cattle require

Table 5. Respondents' ratings of different AHS providers on different attributes of AHS provision*

AHS providers	Poor households			Medium households			Rich households		
	Afford-ability	Quality	Proximity	Afford-ability	Quality	Proximity	Afford-ability	Quality	Proximity
GVO	2.33	2.20	1.00	2.00	2.04	1.08	2.10	2.00	1.00
Para-vet	2.04	2.00	1.00	2.16	2.00	1.00	2.15	2.00	1.00
Private veterinary doctor	2.00	2.00	1.00	0.00	0.00	0.00	2.30	2.00	1.00
Private practitioner	2.19	2.01	1.02	2.10	1.86	1.07	1.90	2.00	1.04
CBAHWs	2.25	2.00	1.00	2.16	2.00	1.00	2.00	2.00	1.00
NGO	2.00	2.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00

Note:* Respondents' ratings on a scale of 1-3, viz. 1=Low and 3=High

Table 6. Factors influencing choice of AHS provider (Results of multinomial logit analysis)

Particulars	GVO B	Para-veterinarian β	Private practitioners β	'Others' β
Intercept	-26.105 (13234.73)	-20.212 (14043.43)	2.250** (0.980)	-21.221 (14013.70)
Age	0.033 (0.022)	-0.009 (0.13)	-0.006 (0.008)	0.005 (0.016)
Landholding	-0.011 (0.016)	-0.001 (0.001)	0.006 (0.008)	-0.053 (0.026)
Membership of group	0.600 (0.200)	-0.712** (0.343)	0.049 (0.242)	-0.737 (0.428)
Credit constraint	18.075 (28.057)	19.285 (39.486)	1.689** (0.783)	18.387 (38.456)
Market distance	- 0.134** (0.059)	0.014 (0.038)	0.091*** (0.028)	-0.012 (0.051)
Crossbred cattle holding	1.012* (0.533)	-0.658* (0.358)	-0.680*** (0.248)	0.522 (0.572)
Poor	2.049 (1.809)	-0.196 (0.537)	0.619* (0.366)	0.362 (0.678)
Medium	1.082 (0.815)	-0.036 (0.481)	-0.325 (0.331)	-0.257 (0.612)
Herd size	0.094 (0.068)	0.014 (0.061)	0.047 (0.037)	0.041 (0.081)
Cox and Snell R ²		0.211		
Nagelkerke R ²		0.234		
- 2 log likelihood		1157.96		

Notes: Reference category is non-availing of any AHS provider

***, ** and * denote significance at 1 per cent, 5 per cent and 10 per cent levels, respectively

intensive use of resources, labour and veterinary care on account of their higher susceptibility to diseases in comparison to indigenous cattle. Also, as capital assets, the crossbred cattle are valued much higher than the indigenous stock and hence farmers become more inclined to treat the crossbred cattle by a GVO. This finding was corroborated by the observation that crossbred cattle ownership negatively and significantly influenced the choice of para-veterinarian and private practitioner. This together with the positive effect of ownership of crossbred cattle revealed that ownership of crossbred cattle shifts the preference of farmers from other AHS providers to a GVO.

The credit constraint significantly and positively influenced the choice of private practitioners as AHS provider. This implies that farmers having credit constraints were more inclined to avail the services of

private practitioners for treating their animals. The poor economic status variable also significantly and positively influenced the likelihood that farmers would avail the services of private practitioners. The variable distance from AHS centre had a significant and positive influence on the choice of private practitioners. With increasing distance from the state AHS centre, the likelihood that farmers would get their animals treated by GVO and para-veterinarians declined and dependence on private practitioners increased.

Average Prices Paid by Users of AHS

Table 7 presents the average prices paid by users of AHS to different service providers per visit, irrespective of the condition for which their services were sought. The figures reveal that except private practitioners, the rich households paid significantly

Table 7. Average prices paid by users of AHS to different service providers per visit

LHS providers	Poor households	Medium households	Rich households
Govt. Veterinary Officer	366.66 ^a	256.00 ^a	564.28 ^b
Para-vet	389.52 ^a	423.88	531.25 ^b
Private practitioner	347.98	310.57	334.28

Note: Differences between figures, having different superscripts, across different economic categories in the same row are significant at 5 per cent level of significance

Table 8. Willingness to pay for AHS — Contingent valuation method

Particulars	Poor households	Medium households	Rich households	All households
Percentage of respondents WTP	17.42	23.78	36.36	23.02
WTP amount (₹)	195.23 ^a	251.85 ^b	300.00 ^b	245.31

Note: Differences between figures, having different superscripts, across different economic categories in the same row are significant at 5 per cent level of significance

higher prices per visit to AHS providers, viz. GVO and para-veterinarians. The average price paid by the poor households was substantially high. The policy of delivery of subsidized AHS has different dimension, like most of the services are to be provided at the Government Veterinary Hospitals (in-centre service). In case of emergencies, the GVO or para-veterinarians can visit the home of the livestock owners (at-home service) and the charges are to be limited to the transport/vehicle charges incurred in reaching the farmer's home. However, most of the instances of accessing AHS as observed in this study were of at-home services. The prices paid by the livestock owners to the government AHS provider revealed that the at-home services were mostly produced in private capacity. This finding is in consonance with that of Ahuja *et al.* (2003b), who reported that government veterinarians attend even ordinary sickness cases at farmers' homes and majority of these visits were undertaken in private capacity.

Willingness to Pay for AHS Delivery

Table 8 elicits the results of the contingent valuation exercise carried out on the respondents. It can be seen that both the proportion of respondents who are willing to pay and the amount they are willing to pay increased with increase in economic status. Thus, the amount farmers were willing to pay was significantly higher for rich than poor households. On an average, the respondents in the study area were

willing to pay an amount of ₹ 245. This figure is close to the amount reported by Bardhan (2010) in a study carried out in Uttarakhand. However the proportion of farmers that were willing to pay was small, only 23 per cent in this study. Ahuja *et al.* (2003b) had reported a higher amount (₹ 630-680) that farmers in Gujarat and Rajasthan were willing to pay per year for home service. The WTP amount estimated in this study is on the lower side, but it suggests a significant scope for raising revenues from AHS delivered by the government by cost recovery approach.

Conclusions

The study has taken the stock of AHS delivery system in the state of Uttar Pradesh, which is the largest milk producing state in India. It has analyzed the gaps in AHS delivery and has suggested strategies to improve the animal healthcare delivery system. In spite of the policy of delivery of subsidized AHS, the study has revealed that this policy does not seem to serve its real purpose, as most of the farmers in the study area have been observed to avail the services of private practitioners who had practically no formal training in provision of AHS.

The analysis of attributes associated with various AHS providers has revealed that 'proximity' was the major constraining factor in uptake of AHS, rather than affordability and quality. The crossbred cattle ownership, weak economic status and distance from

nearest AHS centre have emerged as the most significant variables affecting the choice of AHS providers. With increasing distance from the state AHS centres, farmers' preference for AHS provider shifted from a GVO to private practitioners. On the other hand, ownership of crossbred cattle shifts the preference of farmers from other AHS providers to GVO. The odds of accessing the services of private practitioners were significantly higher for poorer farmers.

The study has suggested that alternative models of AHS delivery, in the form of contract with membership organizations, NGOs, training of youths from villages in basic animal healthcare services in distant and marginal areas may be explored. Another model of AHS delivery could be the privatization of AHS in curative services. The mean WTP values, as obtained from the contingent valuation exercise, have been found to be lower in case of poor farmers than for rich farmers. This implies that this price differential should be kept in perspective if any policy orientation towards cost recovery/privatization for AHS provision is envisaged. The state AHS are usually heavily subsidized. However, in the face of growing budgetary constraints and inadequate cost recovery, more and more state governments are finding it difficult to sustain these services. The primary function of veterinary infrastructure remains provision of clinical veterinary services. The shortage of professional staff leads to significant economic losses due to animal diseases. The cost recovery can help in diversion of resources from veterinary departments towards provision of preventive services and disease management for improving the overall animal healthcare delivery system.

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Appendix 1

The index used a 24 asset variables divided into four categories, viz. ownership of farm assets, household assets, farm-specific characteristics and household characteristics. Appendix 1 presents the specific assets under each of these categories. The index was a weighted linear wealth index where the weights were obtained using principal component analysis. The index is of the following form:

$$A_i = \sum f_k (a_{ik} - a_k) / s_k$$

where,

A_i = Value of Index of the i^{th} household

f_k = Factor score coefficient for the k^{th} asset by the principal component method

a_{ik} = Value of the k^{th} asset for the i^{th} household

a_k = Mean of the k^{th} asset over all households

s_k = Standard deviation of the k^{th} asset over all households.

Once, the Asset index was obtained for each sample household, the cumulative square root of frequency method was used to categorize each household into one of the three wealth categories, viz. Poor, Medium and Rich on the basis of its Wealth Index.

Appendix Table 1. Asset variables used in the composite wealth index

Ownership of farm assets with Nos.	Household assets with Nos.	Farm specific characteristics	Household characteristics
Tractor	Fan	Size of landholding	Type of dwelling structure: kuccha / semi-pucca / pucca
Tresher	Television	Proportion of land irrigated	No. of rooms in house
Tiller	Refrigerator	No. of indigenous cows	
Chaffcutter	Computer	No. of crossbred cows	
Pucca animal shed	Washing machine	No. of buffaloes	
Manger	Mixer/Grinder		
Milking machine	Radio		
	Camera		
	Scooter		
	Car		