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Community animal health centre approach and its impact on the delivery of animal health services

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The livestock sector has been considered as a critical component of allied sector to agriculture and one of the major pillars in doubling farmers' income. The demand for livestock products is increasing consistently due to industrialization, urbanization and rising per-capita income (Ministry of Fisheries, Animal Husbandry and Dairying 2021, Patil *et al.* 2016). In spite of the opportunities offered by livestock in enhancing livelihood security of rural poor, this sector has failed to fully capitalize these opportunities owing to number of reasons; principal among them being poor infrastructure for meeting animal health service needs.

Previous studies have shown that, the animal health service delivery in India is facing acute shortage of veterinarians (Bardhan *et al.*2015) and infrastructure (Ministry of Fisheries, Animal Husbandry and Dairying 2021) resulting in poor accessibility to animal health services, especially among the farmers living in remote locations. It is estimated that the available human resource to meet the animal health service requirements during the year 2020 will be around 28.5% lesser than actual requirement (Rao *et al.* 2011). To meet this shortage of professional veterinarians, animal health services are being rendered through para-professionals. However, the current realm of paravet functioning is unsustainable due to lack of institutional support and poor monitoring of paravet services (Sastry and Raju 2006).

To address this issue, the Bihar Agricultural University developed and implemented novel model of Community Animal Health Centre (CAHC). This model consists of developing capacity of local human resource and engaging local institutions; cost sharing for minimization of public investment; handholding support for service providers to develop entrepreneurship; and continuous monitoring for quality assurance.

Operationalization of the model: The CAHC model was implemented in three scheduled tribe (ST) dominated villages –Khirkitari (Banka Block), Budhavabaithan and Logain (Fullidumar block) – of Banka district in Bihar under the Tribal Sub Plan Scheme. From each of the selected villages, three youths were trained under Agriculture Skill Council of India (ASCI) sponsored training program of 200 hrs for developing skills to impart paravet services including vaccination, deworming, artificial insemination, diagnosis of common diseases and providing advisories regarding pre and post-natal care of ruminants. The infrastructure of village Panchayat in these villages was utilized to establish Community Animal Health Centres wherein the basic veterinary facilities like travis were established and products including veterinary medicines, feed supplements, etc. were stored. Initially, free vaccination drives, animal health camps and awareness programmes were organized to make livestock owners realize the importance of animal health care and to create congenial environment for sustainable functioning and utilization of the CAHC. Later on with mutual agreement, the livestock owners and paravet service provider of the village agreed up on to pay service charges to the trained paravet ranging between rupees 10 to 100 on the basis of type of service provided. However, initially, all the veterinary medicines and vaccinations were provided freely to the needy ones. The paravets were provided with appropriate registers to maintain the record of details of animal, diagnostics and treatment provided along with veterinary supplies utilized.

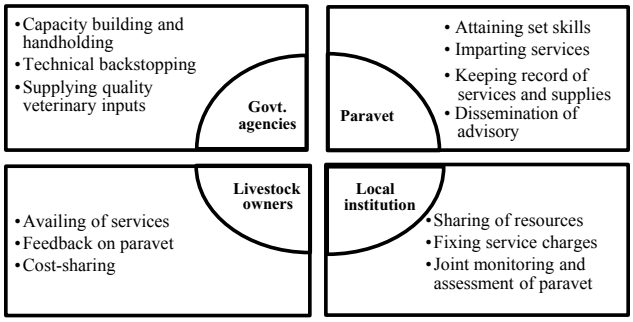

Fig 1. Role of stakeholders in Community Animal Health Centre (CAHC) model.

The present study employed *ex-post-facto* research approach to assess the impact of CAHC programme.

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Table 1. Village wise major animal health services provided by CAHCs

CAHC Location	Animals treated (including cattle, goat, poultry birds and pig)				
	Deworming	Vaccination	Disease treatment	Other services	Total
Khirkitari	618 (45.91)	425 (31.58)	295 (21.92)	8 (0.59)	1346 (100.00)
Budhavabaithan	298 (35.02)	428 (50.29)	113 (13.28)	12 (1.41)	851 (100.00)
Logain	238 (37.01)	328 (51.01)	75 (11.66)	2 (0.31)	643 (100.00)
Average	385 (40.63)	394 (41.58)	161 (17.01)	7 (0.77)	947 (100.00)
Total	1154 (40.63)	1181 (41.58)	483 (17.01)	22 (0.77)	2840

Note: Figures in the parenthesis indicate percentage of total services for given CAHC.

The study was conducted during 2016 to 2019 in the Khirkitari, Budhavabaithan and Logain villages of Banka district where the CAHC intervention was implemented. Data related to impact assessment indicators namely, accessibility, affordability, quality of services, animal health and productivity were collected before and after implementation of CAHC intervention from randomly selected 120 livestock owners in the project area. The sample was drawn from the sample frame consisting of livestock owners who showed interest in seeking the services of CAHC services in the aforementioned villages. The data were collected in two rounds (before and after CAHC intervention) from same set of respondents to overcome the limitation of recall problem. The dependent sample t-test was used to test the significance of difference in the impact indicators mentioned above.

Extent of coverage: Village wise major animal health services provided under CAHC intervention are presented in Table 1. The major services provided under CAHC intervention were deworming, vaccination and treatment of minor diseases. Rest of the animal health services provided are categorized under 'other services' category. The most frequently availed service was vaccination of animal followed by deworming of animals and treatment of diseases. Only 22 times, livestock owners sought for other services including advisories related to animal feed and fodder related issues. Across three CHACs, 40.63% of livestock owners availed deworming services, whereas 41.58% and 17.00% of the livestock owner availed vaccination and disease treatment services, respectively.

The impact of CAHC on other indicators namely, accessibility, affordability and quality of animal health services is depicted in Table 2.

Accessibility of animal health services: These CAHC can be classified as aid centers which provided animal health services like deworming, vaccination, fist-aid and disseminated of the advisories related to balanced feed, use of mineral mixture, preparation of silage, urea treatment of fodder etc. The average distance covered by livestock owners to seek animal health services before establishment of community animal health centre was 22.83 km. After establishment of community animal health center, this distance is reduced to 6.40 km (71.97%). Further it was observed that ease of access to animal health services has increased by 43.96%. Ease of access in this study refers to perceived easiness of making a successful visit to animal health service provider. A successful visit is the one where livestock owner successfully accomplishes the tasks of meeting the animal health service provider, explaining the problem and securing the required solution in understandable manner during his visit.

Affordability and effectiveness of animal health service: The average cost for each visit of the veterinary service provider has also drastically reduced from ₹320 to ₹64.92. Since the community animal health centers were established in the villages itself, farmers now rarely visit the blocker district headquarters for seeking animal health services. As a result of this, now cost associated with transportation has reduced from ₹44.17 to ₹24.33.

Further, the average number of free animal health services received in last one year hasalso increased from mere 0.56 to 2.63 services for each livestock owner. This

Table 2. Impact of CAHC intervention on accessibility, affordability and quality of animal health service

Parameter	Impact indicators	Before CAHC	After CAHC	% change	Test statistic value (*p value*)
Accessibility	Average distance covered to seek service (km)	22.83	6.40	71.97	15.21 (<0.01)
	Ease of access (on 10-point scale, 1=Highly inaccessible; 10= Highly accessible)	4.64	6.68	43.96	-20.86 (<0.01)
Affordability	Average cost paid per visit (in ₹)	320	64.92	79.71	21.29 (<0.01)
	Average transportation charges per visit (in ₹)	44.17	24.33	44.92%	7.75 (<0.01)
	Average number of free animal health services received in last one year	0.56	2.63	4.70	19.20 (<0.01)
Quality	Effectiveness of services (on 1 to 10 scale, 1= Very low, 10= Very high)	7.01	6.92	1.20	0.45 (0.650)
	Timeliness of services	4.83	7.38	52.80	10.90 (<0.01)

Table 3. Impact of CAHC intervention on animal health and productivity

Condition	Poultry		Goat		Dairy animals	
	Mortality %	Economic loss (₹)	Mortality %	Economic loss (₹)	ICP in cattle (Months)	Milk Yield (kg/day)
Before TSP	79	6807	82	7282	30	1.598
After TSP	61	4260	32	2614	24	2.044
Change	-19	-1565	-50	-4667	-6	0.447

Note: All economic losses are in ₹ per household/yr. TSP refers to Tribal Sub Plan under which CAHC were established.

increase may be attributed to ease of access and timeliness of services made available through CAHC. Previously the veterinary service providers were located in distant places as a result of which they were unable to provide services in a timely manner especially in the remotely located villages. After establishment of CAHC, livestock owners have access to animal health service providers located in their village itself. This proximity has not only reduced the cost associated with transportation for seeking animal health services, but it has also ensured availability of services in a timely manner. Lastly, on the front of effectiveness of services, it was perceived by the livestock owners that the services provided by trained paravet service providers were slightly less effective than that provided by full-fledged veterinary doctors, this difference in perceived effectiveness was statistically non-significant.

Animal health and productivity: The impact of CAHC on animal health and their productivity is depicted in Table 3 on the basis of survey conducted before and after implementation of CAHC, it was found that among poultry birds and goats, the mortality has reduced by 19% and 50%, respectively. Further, it was observed that the inter-calving period (ICP) has also decreased by six months in dairy animals and the average milk productivity has increased by 322 grams (27.97%).

The present study aimed at providing a brief conceptualization and immediate impact of the Community Animal Health Center intervention and quantifying its immediate short term impact. Findings of the study revealed that, these community animal health centers have significantly reduced the cost associated with availing animal health services and have also significantly increased the timeliness of the services. On the qualitative front, it was observed that, CAHC were successful at increasing ease of access to animal health services as well. However, the effectiveness of animal health services provided by trained paravets was slightly lesser than that of services provided by full-fledged veterinary doctors. However, this difference was found to be statistically non-significant.

It should be noted that, locally developed paravets of CAHCs are not a complete substitute to the professionally trained full-time veterinarians and the vast animal health service network of government sector. These CAHCs have limitation in terms of ability to address advanced and complex health issues, poor diagnostic abilities, and limited range of services. Therefore, further studies need to be conducted to improve the effectiveness and abilities of paravet services and make them work in total complementarity with existing public system of animal health services.

SUMMARY

The present paper documents the effect of Community Animal Health Centres (CAHCs) on accessibility, affordability and quality parameters pertaining to animal health services rendered by them and subsequent impact on livestock health and productivity. The CAHCs were established in three tribal dominated villages of Banka district (Bihar) which were operated by trained and certified local youths. *Ex-post-facto* approach was adopted in the study, and data were collected from randomly selected 120 livestock owners in the geographic area served by the CHACs. It was found that, as a result of the CAHCs, the average distance of travel for seeking animal health services has reduced by 71.97%; ease of access has increased by 43.96%; timeliness of services has increased by 44.92%; average cost of seeking each of the animal health service has reduced by 79.71% and transportation cost associated with travel requirements has reduced by 44.92%. The CAHCs have also resulted in reduction in mortality among poultry birds and goats by 19 and 50%, respectively.

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