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Constraints of Artificial Insemination in South Sikkim: A Case Study of Selected Village

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Abstract

Sikkim a tiny mountainous state of India, despite its rugged terrain and remote location as compared to the mainland area has been able to achieve desired results from the AI Program. It was introduced in India for the first time almost nine decades ago and implemented in Sikkim six decades later. AI has brought about a significant change in milk productivity in the state and has helped raise the economic status of the poor and marginal dairy farmers. Like any other program it also has both advantages and disadvantages associated with it. But surely, the advantages outnumber a few disadvantages.

The paper aims to touch upon the role of AI in selected village of South Sikkim having a total geographical area of 506 Hectares. It lists out a few constraints, rank-wise, that have restrained the dairy farmers from reaping full benefits from it. It also touches upon the advantages AI delivers in dairy farming and its service satisfaction rating in the village.

Keywords: Artificial Insemination, cross breeding, constraint, dairy farming

JEL Classification: Q13, Q18, Q22, Q16, O13.

Introduction

Artificial insemination (AI) is one of the earliest perfected technologies for creating new animal breeds by transferring sperm from a superior male to a female without mating (Wilmut, 1979). The livestock industry is one of the parts of the agricultural economy that is expanding at one of the highest rates, particularly in the more developing parts of the world (Delgado *et al.*, 2009). Farmers that raise dairy cattle have been exploring for alternatives to raising bulls specifically for the purpose of breeding their cows due to the growing global population, which has led to a reduction in the amount of land that is accessible for cattle production. The use of the Artificial Insemination technology has emerged as a viable alternative. It is a flawless and inexpensive method of genetic modification, and it plays a key part in enhancing the milk giving ability of cows (Noakes, 2009). It plays an important role in preventing the spread of venereal diseases and injuries among cattle when they are mating. As a result, accurate breeding records are easier to keep up with, which is an essential component of effective herd management. (Hafez,1993: Roberts,1986: Rodring,2000).

Recent years have seen substantial economic growth in many emerging and transition countries. Increasing population, urbanisation, and personal affluence are changing lifestyles and purchasing habits for food goods, shifting global dietary protein demand from plant to animal proteins. Demand for animal products is expected to roughly treble by 2030, largely in emerging countries (FAO, 2002). In emerging countries, livestock production is one of the agricultural subsectors that is increasing at the quickest rate. It also accounts for more than a third of the agricultural GDP in these countries. It is expected that it will soon become the most important agricultural subsector in terms of added value, passing crop production as the most important agricultural subsector (FAO, 2006). Equally crucial is the minimal use of contemporary technologies in dairy cattle management, especially on small farms. AI can fix these problems if poor rural farmers are encouraged to adopt it. In affluent countries, AI has improved livestock productivity. In developing countries, however, its use is less popular, and the results are unsatisfactory (Butswat and Choji, 1995). In impoverished areas, AI conception rates are minimal, therefore animal progress hasn't been realised. AI will be more effective when farmers have more technological and organisational resources (Verma *et al*, 2012). Although Artificial Insemination (AI) is a promising approach to boost the genetic potential of dairy animals, many farmers are uninformed of the technology, with substantial regional disparities in awareness level and uptake (Foote, 2002). In cattle rearing, the producer uses a male's plentiful sperm to accelerate genetic advancement and improve reproductive efficiency. Many bulls produce enough semen for 40,000 breeding units per year (Bearden *et al.*, 2004).

Objective

To identify the role of AI and to find out the constraints associated with it.

Material and Methods

This paper uses a variety of approaches to reach its goal. In this paper, the limitations of artificial insemination in selected village of South Sikkim, are talked about. Survey data are qualitative and quantitative. Based on the theory of probability, the researcher has chosen samples at random. In 2022, people in the selected village of South Sikkim were talked to and given a standard questionnaire. 60 homes were chosen at random. In the selected village of South Sikkim, first-hand information was gathered by picking people at random. Data from the government, NGOs, local groups, and other sources have been used to supplement the findings. Frequency and percentage are used to show the results through SPSS software. Some cartographic tools, like diagrams, have also been used to show the result of the study. Finally, the average score is used to rank the constraints of 60 households. The 3-point scale used reflects the limits in order of how serious they are. Even though the topic is related to dairy science, yet an attempt has been made to highlight it from a social science perspective.

Result and Discussion

Table 1: NAIP in Sikkim

Number of Artificial Insemination (AI) Done, Farmers Benefited and Animals Inseminated under Nationwide Artificial Insemination Programme (NAIP) in Sikkim (2018-2019 to 2020-2021)			
	Achievement under NAIP		
State	Total No. of AI Done	Total Farmers Benefited	Total Animals Inseminated
Sikkim	19285	11408	17785
India	35191367	18850548	28775905

Source: Lok Sabha Unstarred Question No. 3036, Dated on 22.03.2022.

The table above shows the achievement under NAIP in the state of Sikkim alone as well as of the whole country India. The % of total farmer benefitted and the total animals inseminated is approximately 54% and 82% respectively in the whole country whereas in the state of Sikkim the total farmer benefitted is 59% and total animals inseminated is 92% showing that the state Sikkim is performing better in NAIP.

Table 2: Positive outcomes of AI

	AI improved animal health		**AI improved dairy income**		**Better animal survival after AI**		**AI improve breed of milch animal**	
	Frequency	***%***	***Frequency***	***%***	***Frequency***	***%***	***Frequency***	***%***
Yes	41	68.30	43	71.70	42	70.00	51	85.00
No	19	31.70	17	28.30	18	30.00	09	15.00
Total	**60**	**100.00**	**60**	**100.00**	**60**	**100.00**	**60**	**100.00**

Source: Field Survey, May-June 2022.

The above table 2 depicts the improvements AI has imparted in cattles. An overall improvement and positive outcome are seen be it animal health, animal survival rate, improved breed of milk animal or dairy income. majority of dairy farmers shared that AI improved breed of milch animals. This can be clearer with the help of below figure.

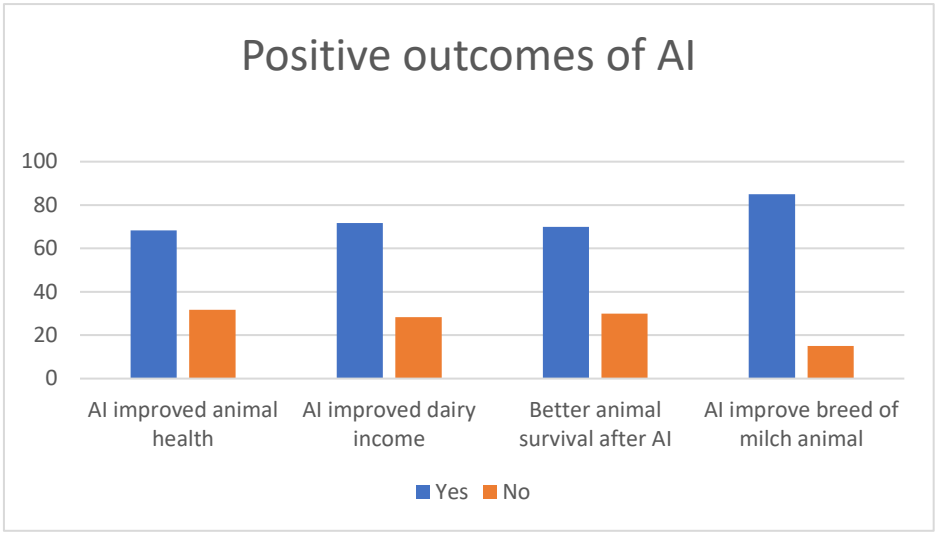

Figure 1: Positive outcomes of AI

Table 3: Service rating of AI in village

Services	**Frequency**	**Percentage**
Excellent	04	6.70
Good	44	73.30
Fair	12	20.00
Poor	00	00.00
Nil	00	00.00
Total	**60**	**100.00**

Source: Field Survey, May-June 2022.

The table 3 above shows the ratings given by the dairy farmers for services AI technology. A huge 73% found the AI services good, 20% as fair, nearly 7% excellent, none were unhappy.

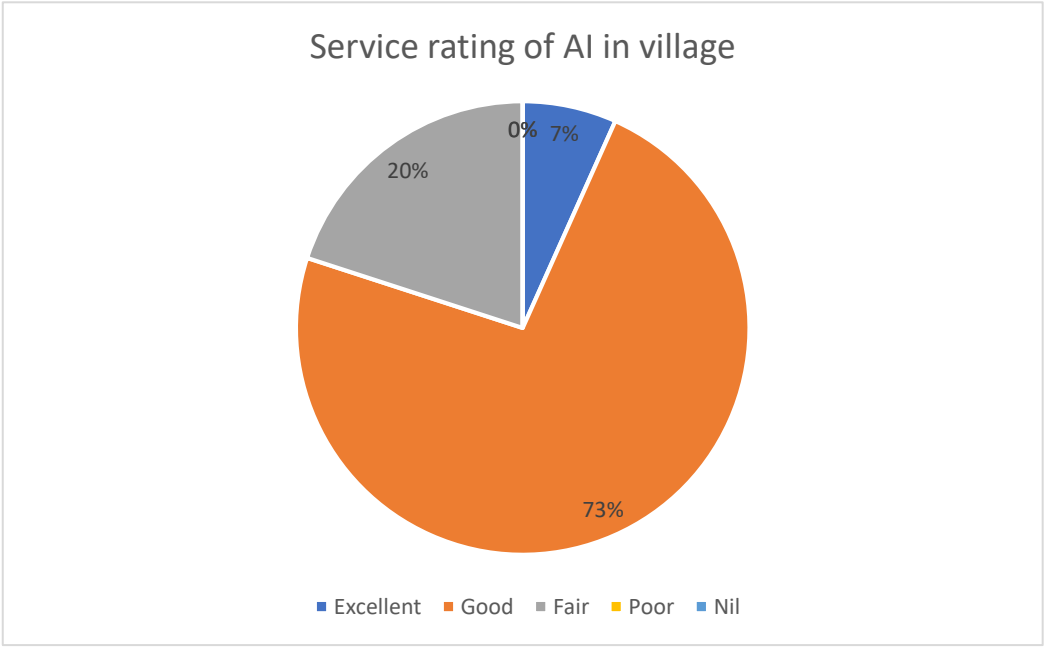

Figure: Service rating of AI in village

Table 4: Constraints in AI

Sl. No.	Constraints	Least serious		Serious		Most serious		Total Freq	Total %	Mean Score	Rank
		Freq	%	Freq	%	Freq	%				
1	Breed extinction	22	36.67	9	15.00	29	48.33	60	100	2.12	V
2	Scarcity of liquid nitrogen	12	20.00	11	18.33	37	61.67	60	100	2.42	III
3	Limited trained AI manpower	4	6.67	4	6.67	52	86.67	60	100	2.80	I
4	Meagre honorarium to private AI personnel	45	75.00	5	8.33	10	16.67	60	100	1.42	VII
5	Heavy Cryocans difficult to carry	10	16.67	5	8.33	45	75.00	60	100	2.58	II
6	Female dairy farmers reluctant to participate in the AI procedure	41	68.33	7	11.67	12	20.00	60	100	1.52	VI
7	Lack of correct breed record	17	28.33	9	15.00	34	56.67	60	100	2.28	IV

Source: Field Survey, May-June 2022, Authors calculation.

The table 4 shows the constraints which have been ranked according to their severity. The major constraint in the study area was found to be limited trained manpower, followed by heavy cryocans which were tough to be carried in remote locations. The limited trained AI manpower are due to lack to trained manpower the dairy farmers those interested to go in far AI for their cattle can't avail it. Nearly 87% dairy farmers in the study area revealed it has a most serious constraint hindering AI. The heavy cryocans are used to preserve the bull semen under extremely cold temperature are quite heavy and are difficult for headload carriage in remote areas about 75% dairy farmers reported it as a most severe constraint. About 62% dairy farmers reported that the stock of liquid nitrogen in the village centre gets exhausted due to which AI of cattle is hindered. Nearly 57% dairy farmers opined that due to non-availability of correct breeding record of their cattle which result in unable to conceive. Almost 48% dairy farmers were unwilling to adopt AI and stated it as the most severe constraint as they opined that AI would lead to local breed cattle extinction. About 20% dairy farmers opined that for a household having female dairy farmers they hesitate in opting AI to breed their cattle though they are well versed with the advantages associated with it. This is because they are reluctant or shy to be present to help the AI technician during the procedure. Lastly, meagre honorarium to private AI personal of about 17% revealed a very low honorarium is a major constraint which deters AI workers to come forward to participate in the AI technology.

Conclusion

The advantages of AI technology have been found to overshadow the few disadvantages associated with it. Through AI, the study area has been able to achieve improvement in animal health, dairy income, animal survival and breed of milch cattle too. This paper has used three-point scale to rank the constraints severity wise with the most severe ranked first.

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