SUSTAINABILITY OF ARTIFICIAL INSEMINATION TECHNOLOGY

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Animal Agriculture in the main source of sustenance and an important component of farming in India. It provides Milk, Meat, Wool, Skin and Work as a flexible financial reserve throughout the year during crops failure. It also play a critical role in the agricultural intensification process by providing draft power and manure in the forum of fertilizer and fuel for crop production (Winrock International 1992; Fitzhugh *et al,* 1992). Above all the animals convert vast quantities of crop residus of little value into valuable milk, meat and other products for human use. The animals have thus rightly been called to act as food factories, the powerhouses, the fertilizer plants and mobile banks for vast majority of poor and landless labourers of the country (Sharma, 2000). With increasing human population and economic changes, Cultivated area in many sub-areas of countries have expanded on to marginal lands and fallow periods are being shortened. As a result large area of land are being degraded and crop and animal yield have been fallen (IBRB, 1989; Ehui and Hertet, 1989). Where both crops and livestock are raised, technology is low, inputs Scarce, and markets poorly developed, population pressures lead to the evolution of crop-livestock system as the most efficient and sustainable means off-take from a fixed land base (McInitre *et al.,* 1992).

Improved corp-livestock production systems and technologies are currently being developed in response to the growing demand for food and the degradation of the natural resource base (ILCA, 1993). These technologies must not only enhance food production but also maintain ecological stability and preserve the natural resource base, i.e. they must be sustainable. However, the notion of sustainability is defined as the ability of an agro-eco-system to maintain productivity when subjected to a major disturbing force. Therefore, the present study was undertaken to know the perception of profitability and sustainability of artificial insemination technology.

METHODOLOGY :

The study was confined to the Artificial Insemination Technology users of a cluster of six villages of Bareilly district of U. P. from each selected village, a maximum of 40 and minimum of 10 respondents were selected purposively from among those who had been using the Artificial Insemination technology which have been disseminated by various agencies since last five years regularly (1994-98). Thus, 200 livestock owners comprised/constitute for the study. Simultaneously, 50 scientists were also selected purposively as respondents to obtain their opinion for the comparison. Data were collected through personal interview as well as through PRA technique, group meeting and analysed by different statistical methods. The response of profitability was taken on a 5 point scale viz-a-viz highly profitable, profitable, some what profitable, least profitable and not at all profitable by livestock owners and Scientist. As such the opinion of sustainability related to 14 dimension as suggested by Dr. M.S. Swaminathan and selected 63 statement after testing and refinement by the 60 judges on the basis of "important" and "not important" to sustainability of AI Technology. Finally response was taken on 5 point measurement viz-a-viz highly agree, agree, some what agree, least agree and not at all agree.

RESULTS AND DISCUSSION :

1. Sample of The Respondents : Majority of the technology users (57·5%) belong to

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middle age group followed by young (23·00%) and old (19·50%). Most of the users (46·10%) were from OBC category while 33% respondents were from general category. Rest of the respondents belong to schedule caste and schedule tribes category. Further, 64·00% respondent, had low family education status where as only 5·00% respondents, had low family education status where as only 5·00% respondents had high level of family education status. Most of them (45·00%) had marginal land holdings followed by small (36·5%) and large (18·5%). The data reveal that very few respondents (4·5%) had large size of heard, whereas (51·150%) respondents had small size of heard. Majority of the house holds (63·00%) had less than 5 animal husbandry workers in their families only (2·50%) respondents had more than 8 effective family workers involved in animal husbandry activities.

2. Accessibility of Technology : Any technology can only be adopted if it is easily accessible or obtainable to the farmers. It was intended to know as to what extant of the technology are accessible to the users. The technology loas perceived by the respondent on a four point continue on the basis of their accessibilty. The four point continue user fully accessible, to a greater extent to some extent, to a little extent not at all accessible.

(a) Level of the Perceived Accessibility : Table 1. revealed that majority (67·5%) of the farmers had low accessibility of technology followed by (23·5%) with medium accessibility is technology. Only (9·0%) farmers had high accessibility to technology.

Table 1. Distribution of respondents according to the extent of accessibility of the selected AI Technology.

Sl. No.	Extent of access Score	No. of respondents N=200	Percentage
1.	Low (1-2)	135	67·5
2.	Medium (3)	47	23·5
3.	High (>4)	18	9·0

Figures in Parenthesis Indication Percentage.

Table 2. Extents of accessibility of selected AI Technology

Sl. No.	Extent of sustainability	Frequency of respondents N=200
1.	Fully accessibilty	18 (9·00)
2.	To a greater extent	47 (23·50)
3.	To some extent	79 (39·50)
4.	To a little extent	56 (28·00)
5.	Not at extent	

Figures in Parenthesis Indicate Percentage.

(b) Extent of Perceived Accessibility : Table 2 indicate that the selected technology artificial insemination was accessible only to some extent by the majority of respondents followed by those for whom the technology are accessible only to a little extent.

3. Perception of Scientists and Farmers about the Profitability of Artificial Insemination Technology : The profitability of AI technology can be judged through their better utilization at farm and giving higher net income to the farmers from the crop and livestock avacation. The extent to which the farmers efficiently and effectively utilize the selected animal science technology under available

Table 3. Categories of the Respondents According to perceived profitability of AI Technology.

Sl. No.	Profitability (Score)	Farmers (N=200)	Scientists (N = 50)
1.	Low (<1)	108 (54·00)	6(12·00)
2.	Medium (2-3)	55 (27·50)	12(24·00)
3.	High (>3)	37 (18·50)	32 (64·00)

Figures in Parenthesis Indicate Percentage.

resources in crop and livestock farming in refected in the income/profit with regards to the profitability of the artificial insemination technology. The farmers perceived view was obtain on a five point continnum were highly profitable, profitable, some what profitable, least profitable and not at all profitable. Level of perceived profitability score of AI technology, Table 3 revealed that majority of farmers (54·00%) had low score on perceived profitability followed by medium (27·50%) and high (18·50%) whereas majority of Scientists (64·00%) had high score on perceived profitability followed by medium (24·00%) and low (12·00%).

4. Perception of Farmers and Scientists about the Sustainability of Artificial Insemination Technology :–

(a) Level of the perceived sustainability : Table 4 revealed that majority of farmers (52·50%) had low score on perceived sustainability followed by medium (28·00%) and high (19·50%) where majority of Scientists (56·00%) had high score on perceived sustainability followed by medium (28·00%) and low (16·00%) level.

Table 4. Categories of the Respondents According to perceived of Sustainability of AI Technology.

Sl. No.	Sustanaibility (Score)	Farmers (N=50)	Scientists (N = 200)
1.	Low (0–84)	8 (16·00)	105 (52·00)
2.	Medium (85-170)	14 (28·00)	56 (28·00)
3.	High (170-252)	28 (56·00)	39 (19·50)

Figures in Parenthesis Indicate Percentage.

(b) Perceived sustainability score of artificial insemination by scientists and farmers on various dimensions : Table 5 data manifested that the perception of scientists on sustainability of artificial insemination technology on all dimensions was significantly ($P<0·01$) higher than those of farmers as indicated in the table '*t*' values significant at 0·01 level, except for social acceptability and social sustainability where '*t*' value are significant only at ($P<0·05$). A critical observation of the table further reveals that the difference in the perception of scientists and farmers were more in case of technical appropriability economic feasibility and economic viability and lowest in case of social acceptability and social sustainability and temporal stability. In other words the farmers differs from the scientists on technical appropriability, economic viability and economic feasibility most and on social acceptability and social sustainability and t emporal stability least. The pooled data indicated at the perception of scientists and farmers regarding the sustainability of artificial insemination technology. The difference between the perception of

Table 5. Perceived sustainability scores of AI by Scientists and farmers on different dimensions

Sl. No.	Dimensions	Max. Possible Score	Perceived Sustainability		score t-test
			Scientists Mean	Farmers Mean	
1.	Technical Appropriability	24	20·38	13·18	9·55**
2.	Economic Feasibility	20	18·02	11·64	10·03**
3.	Economic Viability	16	14·58	10·01	9·74**
4.	Environment Soundness	20	17·54	11·05	9·24**
5.	Temporal stability	16	12·32	10·14	4·13**
6.	Local Adoptability	20	16·26	11·56	6·92**
7.	Resources use Efficiency	16	12·92	10·13	5·11**
8.	S.A. and S.S.	16	11·72	10·10	3·36**
9.	Political Tecitness	24	20·08	13·44	8·00*
10.	Administrative Managebility	16	13·32	10·11	6·18**
11.	Cultural Desirability	12	9·72	7·41	4·87**
12.	Renewability	16	15·94	11·34	6·46**
13.	Equity	16	11·90	9·57	4·74**
14.	Productivity	16	13·46	9·72	8·09**
	Pooled data	**252**	**206·94**	**148·46**	**7·74****

* *Significant at P<0·05* ** *Significant at P<0·01*

scientists and farmers was found highly significant indicated that perceived scores of sustainability for artificial insemination was higher based on '*t*' valus in case of Scientists than farmers.

CONCLUSION :

It can be concluded that artificial insemination technology was not easily perceiable and accessible to the desired extent to majority of the middle aged belonging to backward cast with low family education status and with marginal land holdings and had small size of herd. The adoption of technology by the farmers depend on the accessibility of it. Farmers were having low level of perceived profitability and sustainability score whereas scientists were having high level of perceived profitability and sustainability score, Significant difference was found between the perceived profitability and sustainability of artificial insemination by the farmers and scientists. The perception were the ranked according to the *t*-test of each dimensions of sustainability. Artificial insemination technology could be sustainable absolutely, if the perceived sustainability score of farmers will be analoguous to perceived sustainability score of scientists over the different dimensions if sustainability.

As found in the study, the farmers perception of sustainability in comparision to scientists, is very low over various dimensions of sustainability. The alarming gap/differences apperars to be an impediment for adoption of artificial insemination technology. The appropriate interventions are requested to be constitute so that the differences in the perception of profitability and sustainability about artificial insemination are minimised. A general view of peoples that once the perception, any entity is improved, the technology adoption will be improved automatically which is very imparative. The study on the other hand, draws the attention of the scientists to assess and verify the technology before corresponding to villagers.

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