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Institutional Structure, Perception, Efficiency and Administration of Artificial Insemination in Central Highlands of Ethiopia

Bainesagn Worku Wolelie

Ethiopian Institute of Agricultural Research, Debre Markos Agricultural Research Center, Debremarkos, Ethiopia
Dairy Cattle and Large Ruminant Breeder, Debre Markos, Ethiopia

ABSTRACT

This study was conducted to assess institutional structure, perception and administration of Artificial insemination and identify the problems associated with AI in Adea Berga, Ejerie and Metarobi districts. The study was undertaken using questionnaire-based survey and a participatory group discussion method. A total of 180 households were participated in the interview. A Structured questionnaire was used to describe qualitative and quantitative traits. Descriptive statistics, analysis of variance (ANOVA) and Frequency distribution procedures were used for statistical analysis of survey. From the result of the study about 74.8% of AI was handled by government-based AI delivery system. Similarly, 16.5% of AI service was given by private practitioners. About 95.5% of the respondents had an opportunity to access currently existing AI service. However, about 57.47% of the respondents were not satisfied with the existing AI service. Regarding AI service about 90.45% of dairy farmers were get AI service with interruption from current delivery system. Among these 94.94% of the respondents were not get AI service during weekends and Holiday. The survey shows us about 96.83% of the respondents were used Holstein Friesian for cross breeding and also Holstein Friesian breed was the most preferred breed for cross breeding. In case artificial inseminators were too late at the time of estrus sign about 47.13%, 46% and 2.30% of dairy farmers were reject the service and wait for another 21 days, use natural mating and get AI service in any way to their cows respectively. About 61.87% of respondents reported that the failure of insemination was occurred with different frequency. The failure of insemination could be expressed interms of frequency as 38.13%, 24.44%, 20% and 16.67% of respondents at once, twice, three time and more than four times respectively. Difficulty in heat detection was the first major reason for failure of AI in the study area. In addition to the above absence of AI technician was the second while inefficient technician and far distance of AI center for breeding were the third important reasons failure of artificial insemination. In

Corresponding Author: Bainesagn Worku Wolelie < baiworku@gmail.com >

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connection with the price about 97.48% the respondents were wanted to increase the price with quality AI service.

Keywords: Private based AI, Government based AI, Insemination failure, AI administration

INTRODUCTION

Ethiopia has one of the largest livestock resources in Africa with estimated national herd of 59.49 million cattle, 30.70 million sheep, 30.20 million goats and 12.22 million pack animals (CSA, 2016). In addition, livestock support and sustain livelihoods for 80% of the rural community and female cattle constitute about 55.5% of the national herd (MoARD, 2007). The livestock subsector contributes nearly 20 percent of total GDP and foreign exchange earnings of the country, and some 35 to 40 percent of agricultural GDP (World Bank, 2017).

Demand for milk is increasing globally, because of rapid population growth, urbanisation and shifts in dietary patterns. Achieving increased milk and meat production through genetic improvement of indigenous cattle have been the primary goals of the livestock development plan of Ethiopia (Heinonen, 1998). Paradoxically, though AI program continued for several decades, the genetic improvement achieved to date is very unsatisfactory due to several factors. Currently only 151,344 (0.35%) of the total cattle population are hybrids and 19,263 (0.04%) heads are exotic breeds (Shiferaw *et al.,* 2003; Demeke, 2010).

According to the report of (Chupin and Schuh, 1992), AI coverage, semen production per year and AI applications per inseminator in Africa remains low. The same report indicated that the average AI application per year per country in Africa is 30,637 which is far below the values for Asian, Latin America and Near East countries. In addition, the pregnancy rate in AI scheme does not exceed 45% in Africa and the conception rate to first service was 48% in zebu cows kept at the Ministry of Agriculture Ranch in Ethiopia (Mukasa-Mugerwa *et al.,* 1991b).

In Ethiopia, attempts to improve the productivity of cattle have been made especially in the area of crossbreeding for the last decades but with little success (Aynalem, 2006). However, AI service is weak and even declining due to inconsistent service in the small holder livestock production systems of the Ethiopian high land. The problem is more aggravated by wrong selection and management of AI bulls along with poor motivations and skills of inseminators (Gebre Medhin, 2005).

Therefore, the objective of this paper was to assess institutional structure, perception and administration of Artificial insemination and identify the problems and constraints associated with AI in central high lands of Ethiopia.

MATERIALS AND METHODS

Description of Study Area

This study was conducted in three potential districts of Addis Ababa milk shed of West Shewa Zone, Oromia, Ethiopia. The zone has 21 districts and total cattle population 2,015,696 (CSA 2013). Selected districts were Adea Berga, Ejerie and Metarobi with 70 km from Addis Ababa.

Adea Berga is found in North of the zone and located at 70 km South west of the capital Addis Ababa. It is also situated at 35km north west of Holleta at 9°12’ 0“N to 9°36’0” N latitude and 38°18’0“E to 38°33'0" E longitude. Based on the report of Central Statistical Agency (CSA, 2007) Ada Berga has an estimated total human population of 120654 of which 60366 were males and 60, 288 were females.

Ejerie district is located 70 km in the north of Ambo, the capital town of west shoa zone and 42 km south of Addis Ababa at 8°50'0” E to 9°14'0"N latitude and 38°15'0"E to 38°29'0"E longitude. It is a typical Highland and mid-land area with an elevation of 2060 to 3085 masl. It receives an annual average rainfall of 1200 mm and it’s an annual temperature range

between 9 □ - 28□. Based on the report of Central Statistical Agency (CSA, 2007) Ejerie has an estimated total human population of 86934 of which 44222 were males and 42712 were females.

Meta-Robi is located at about 100 km north-west of Addis Ababa. The district lies in a hilly landscape at elevations ranging from 1,200 to 2,900 masl and located at 9°13'0" N to 9°42'0"N latitude and 38°8'0"E to 38°22'0" E longitude. It is bordered by Ejerie in the south, by Jeldu in southwest, by Ginde-Beret in the northwest, by the Muger River (which separates it from the Semien Shewa Zone) in the north and by Adea Berga in the east (MKC-RDA 2009). The total human population of the district is 166,472 (male = 82,482 and female = 83,990) (CSA, 2013).

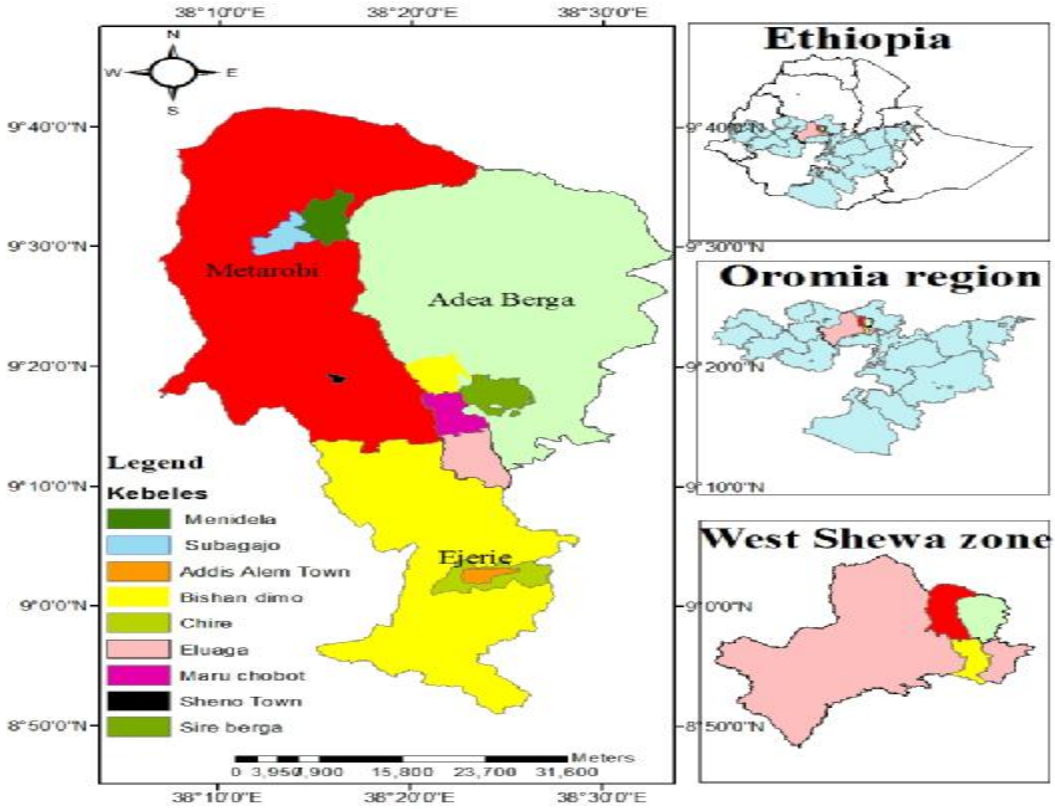

Fig. 1. Map of the study area

Sampling Methods and Data Collection

The preliminary information of the study area and farmers were taken from the report of zonal consultation meeting and rapid assessment of the selected sites which was held by LIVES (Livestock and Irrigation Value chain for Ethiopians Smallholder) Project (LIVES 2013). Secondary information from districts and Zonal Agricultural and Rural Development offices was also utilized to assist in the selection of kebeles from representative districts

To conduct questionnaire-based survey, three districts and three kebeles from each district were purposively selected from west shoa zone of Oromia region based on their dairy cattle availability and milk production potential. Simple random sampling technique was used for farmer selection in kebeles. A total of 180 households (60 from each district) were randomly selected from the dairy holding households for the interview from the selected kebeles. Total sample size was determined using (Cochran 1963),

$$\text{Total sample (N)} = \frac{Z\alpha 2 \times p\,(1-p)}{d2}$$

Where:
N=required sample size
P (expected proportion) = 0.135(by assuming the population is homogenous)
d (desired absolute precision) = 0.05
Zα = 1.96(is the abscissa of a normal curve that cuts of an area at the tails), 1-α equals to the desired confidence level, for 95%=1.96), for the survey the required sample size of the respondent with 95% confidence level was calculated as, N=Zα2×p, (1-p)/d2= [(1.96)2×0.135(1-0.135)]/ (0.05×0.05) = 3.8416×0.1168/0.0025=180 farmers

Questionnaire Administration

Data was collected from primary sources. A semi- structured Questionnaire was prepared and pre-tested before administration. Some re-arrangement, refinement and correction was done in accordance with respondent perception. A pertinent questionnaire was administered to the respective selected smallholder households in the study area. The questionnaire was filled by trained enumerators recruited for this purpose with close supervision by the researcher. During the interview process, every respondent included in the study was briefed about the objective of the study before starting the actual questions.

The information collected included issues related to perception of the farmer, institutional structure and administration of Artificial Insemination. Among the major Breeding scheme and offering organization breeding practices mating system, breed preference, Access of AI, efficiency of AI and Possible reasons for failure of AI were assessed during survey. Focus group and key informants' discussion were also conducted to strengthen the data obtained from structured and semi-structured questionnaire. The focused group was formed with 10 people and composed of youngsters, women, village leaders and socially respected individuals who are known to have better knowledge on the present and past social and economic status of the area.

Methods of Data Analysis

All data obtained from survey were fed to MS-Excel 2007. Qualitative survey data was analyzed for descriptive statistics using frequency procedure of SPSS version 20. The analysis of variance (ANOVA) procedure for quantitative data was obtained from the recall survey using SPSS Version 20 to evaluate the effect of location, breed and livestock holding of farmers. In trait preference ranking method, index was computed using weighed averages and indexes were ranked using auto ranking with MS-Excel 2007.The following formula was used to compute index as employed by (Musa et al 2006):

Index = Rn × C1 + Rn-1 × C2 ... + R1 × Cn/Σ (Rn × C1 + Rn-1× C2 + ... + R1 × Cn)

Where, Rn = the last rank (example if the last rank is 8th, then Rn = 8, Rn-1 = 7, R1 = 1).

Cn = percent of respondents in the last rank, C1 = percent of respondents ranked first.

Results and Discussion

Institutional structure, access of AI and animal health services

The provision of mating services can be broadly categorized in two based on the organization that are offering the AI service. These were government based and privately bull scheme practitioners. The bigger AI producers and importer institutions in the country are two. These were National Artificial Insemination Centre (NAIC) and Addis Livestock Production and Productivity Improvement Service (ALPPIS). NAIC is government-based institute that produces different breed sires' straws and distributes across the country. However, ALPPIS is privately owned commercial different sire straw importer (Zelalem, 2011). About 92.3%, 73.3% and 65.9% of respondents in Metarobi, Ejere and Adaberga had been provided

different breeding services from office of livestock agency respectively. Bull scheme was higher in Adaberga (29.5%) than Ejerie (8.9%) and Metarobi (7.7%). This could be related to inefficiency of semen (lower quality), lack of easy access, inefficiency of technicians etc in local area. It may be related to scarce number of technicians in districts (Sisay et al.2017). This implies that if lot of cows comes into heat at a time, the technicians unable to address all of the cows because of poor infrastructure and vehicle.

The overall breeding scheme provided by the district office of livestock agency (74.8%) was higher than private bull scheme practitioners (16.5%). The involvement Research Center in providing breeding services was limited (7%). This was due to the lowest accessibility and adoption of research and demonstration of hormonal based AI practice in the study area. In general, Natural heat-based AI, Bull service and Hormonal heat-based AI were the breeding service that are exercised as mating system in study area.

In overall about 75.9%, 15.2%, 4.5%, 3.6% and 0.9% of the respondents were reported that the breeding schemes administered by government AI technicians, private bull owners, RC, the mix of RC, AITS and bull owners and private vet assistants respectively.

Table 1: Breeding scheme and offering organization

Variables	Adab	Ejere	Metarobi	Overall
Organization offering the Breeding schemes				
Govt/livestock agency	65.9	73.3	92.3	74.8
Private Practitioner	29.5	8.9	7.7	16.5
RC	4.5	13.3	-	7.0
RC and Govt/livestock agency		4.4	-	1.7
The breeding scheme administered				
Government AI technician	68.3	73.3	92.3	75.9
Private Vet assistant	-	2.2	-	0.9
Private bull owner	26.8	8.9	7.7	15.2
RC	-	11.1	-	4.5
private bull owner & RC	-	4.4	-	1.8
Government AITS, Private bull owner &RC	4.9	-	-	1.8

Govt = Government, RC = Research Center, AITS = Artificial Insemination Technicians, AI = Artificial Insemination

In study site there were 5 main and 9 satellite AI stations for the whole study districts consisting more than 44,546 dairy cows. The majority of AI program was a government run activity under the ministry of Agriculture established with nine of (7) mid-level professionals (inseminators) and limited private based veterinary assistant and artificial insemination technicians delivering the service for 3 districts within study Area. Mostly in Adaberga and Ejerie AI was delivered at a fixed place in each district ‘s veterinary clinic. However, due to shortage of fuel for motor bicycle transport was restricted and also AI delivery on site/farm was difficult

Table 2: Main and satellite AI base station with inseminators, kebele and cow population

Variables	Adaberga	Ejerie	Metarobi	Total
Number of Main AI Base station	1	2	2	5
Number of satellite AI station	4	3	2	9
Number of inseminators	3	2	2	7
Number of private inseminators	1	1	-	2

AI = Artificial Insemination

The perception of AI beneficiaries on the time of interview was assessed and found out that 170 (95.51%) of the dairy owners reported the presence of AI service but only 4.49% were not aware about the presence of AI service. At the time interview all the respondents were interested to use AI service. Out of the dairy cows owned about 70% of the respondents have ever experienced AI service at least once a life. About 82.78%, 8.33%, 3.89%, 2.78% and 2.22% of dairy farmer respondents were heard the artificial insemination at the first time from Extension agent, Neighbors, AI technician, RC and Project agent farmer respectively. However, With the above Artificial insemination beneficiary's perception and due to many reasons about 42.53%, 27.59%, 20.69% and 9.20% of the responents were very satisfied, somewhat satisfied, somewhat dissatisfied and very dissatisfied by artificial insemination services respectively. This result was not agreed with the result of (Alazar *et al.,* 2015) who reported that 69.9% of the respondents were unsatisfied with the existing AI service. The cause for unsatisfaction might be due lower conception rate and inaccessibly of quality AI service provision (Philipson *et al.,* 2011; Mekonnen *et al.,* 2010).

Table 3: Access and Awareness of AI services in the study Areas

Variable	Category	Adaberga		Ejere		Metarobi		Overall	
		N	%	N	%	N	%	N	%
Availability of AI service	Yes	52	88.14	58	98.31	60	100	170	95.51
	No	7	11.86	1	1.69	-	-	8	4.49
Willing to use AI Service	Yes	60	100	60	100	60	100	180	100
Ever crossbreed your zebu	Yes	44	73.33	51	85	31	51.67	126	70
	No	16	26.67	9	15	29	48.33	54	30
Level of satisfaction with AITS	very satisfied	7	22.58	16	47.06	14	63.64	37	42.53
	somewhat satisfied	15	48.39	9	26.47	-	-	24	27.59
	somewhat dissatisfied	6	19.36	6	17.65	6	27.27	18	20.69
	very dissatisfied	3	9.68	3	8.82	2	9.09	8	9.20
Aware about AI at first time	Extension agent	47	78.33	45	75.00	57	95.00	149	82.78
	AI technician	3	5.00	2	3.33	2	3.33	7	3.89
	Project agent farmer	2	3.33	2	3.33	-	-	4	2.22
	Neighbors	5	8.33	10	16.67	-	-	15	8.33
	RC	3	5.00	1	1.67	1	1.67	5	2.78

AI = Artificial Insemination, AITS = Artificial Insemination Technicians, RC = Research Center

Breed preference, satisfaction and perception on efficiency of AI

About 96.83% of the respondents of dairy farmers were used Holstein Friesian for cross breeding whereas 3.18 % of the respondents were used jersey. The result showed that Holstein Friesian breed (98.38%) was the preferred breed for crossbreeding by artificial insemination in the study area. There were also some of dairy farmers from the respondent that prefer Jersey breed (1.61%) for crossbreeding. Out of the respondents about 76.6% of dairy farmers reported that artificial insemination Technicians were cooperative during insemination of their cow. However, about 23.33% of the respondents were evaluated Artificial insemination technicians as Non- cooperative during insemination of their cow. About 62.92% of respondents were not get the chance to select the sire of the future offspring. However, AI Technicians were decided the sire of future offspring by default commercially available sire straws. With regard to semen type selection about 37.08% of the respondents have the chance to select the sire of future offspring within available semen straws. About 61.27% of the respondents were satisfied with the overall AI service having its limitation. However, about 38.73% the respondents were not satisfied with the overall AI service

Table 4: Breed preference, Level of satisfaction and perception on efficiency for AI service in the study Area

Variable	category	Adaberga		Ejere		Metarobi		Overall	
		N	%	N	%	N	%	N	%
A Breed type that was used for crossbreeding	Holstein	44	95.65	49	98	29	96.67	122	96.83
	Jersey	2	4.35	1	2	1	3.33	4	3.18
Preferable Breed for crossing	Holstein	43	95.56	49	100	30	100	122	98.39
	Jersey	2	4.44	-	-	-	-	2	1.61
evaluation of the AI technician in giving the service	Cooperative	36	60.00	51	85.00	51	85.00	138	76.67
	Non-cooperative	24	40.00	9	15.00	9	15.00	42	23.33
Have chance to selection of the type of semen as farmer	Yes	30	50	32	55.17	4	6.67	66	37.08
	No	30	50.00	26	44.83	56	93.33	112	62.92
If you get the chance to choose what factors you set to choose the type of semen given to you cow	Milk production	13	41.94	10	31.25	1	20.00	24	35.29
	Breed type	2	6.45	-	-	1	20.00	3	4.41
	milk production and breed type	16	51.61	22	68.75	3	60.00	41	60.29
satisfaction with the overall AI service	Yes	35	66.04	29	51.79	23	69.70	87	61.27
	No	18	33.96	27	48.21	10	30.30	55	38.73

AI = Artificial Insemination, N = number of observations

AI service administration, problems associated AI and failure of insemination

A majority of study districts had irregular provision of AI service and about 90.45% the respondents reported that the absence of regular AI service provision. This finding was higher than (Riyad *et al.,* 2017; Yohannes and Tilahun 2018) who reported that 43.7% of Tullo district of west hararghe receiving AI service irregularly and similar with the result of (Desalegn *et al.,* 2009) which was about 93% of respondents were not receive AI services consistently. Regard to this about 88.02% of respondents also explained reason for irregularity of AI service provision was the combined effects of shortage of AITS, shortage of inputs and Absence of the service at weekends and holiday. The problems were intensified by the way that artificial inseminators communicate with dairy cow owners. With regard to this about 60.45% of respondents take their cows to the nearby AI Base station when the cow become on heat.

The present study revealed that 4.49 % of the smallholder dairy farmers have got AI service regularly and without interruption while 90.45% of them do not due to unavailability of AITs and also about 94.94% of respondent's reported that discontinuation of service on weekends and holidays. This result shows the higher proportion of dairy producers in the study area did not get the service than the study reported by (Ashebir *et al.,* 2016) in Tigray regional state.

About 53.71% and 41.14% of the respondents were reported to use natural mating and decided to pass the date without breeding the cow respectively in absence of AI service during holiday and weekends. If artificial inseminators were too late at the time of estrus sign about 47.13%, 46% and 2.30% of dairy farmers were reject the service and wait for another 21 days, use natural mating and get AI service in any way to their cows respectively. This study was similar with the result of (Zerihun Baheriw *et al.,* 2013) who reported 58.9 % of respondents pass without breeding through AI. Finally, the farmers were asked the fate of the cows which do not conceive repeatedly and reported that about 56.46%, 39.11% and 4.47% were use natural mating, use AI again and again and sale for beef respectively.

The failure to conceive in inseminated dairy cows was very high across the districts. About 61.87% of respondents reported that the failure of insemination was occurred with different frequency. The failure of insemination could be expressed interms of frequency as 38.13%,24.44%,20% and 16.67% of respondents at once, twice, three time and more than four times respectively. This show us failure might be connected with mobile AI service delivery system (Belayneh, 2018), shortage of inputs and skilled AITS (Tegegne *et al.,* 2010).

About 54.44% of the respondents reported that at least one or more animal health problems were faced so far in the period the of dairy farming. Among the health problems faced about 37.87%, 29.13%, 18.45%, 7.77% and 6.80% of respondents were reported as other problems which are not listed, mastitis, problem associated with calving, calving problems and Tuberculosis respectively. Another major problem in artificial insemination was keeping breeding cows with breeding bull and along with the herd.

The research result reveals that heat detection was the first major reason for failure of AI in the study area. This resut was similar with (Yeshitila *et al.,* 2019) who reported in south Wollo around kombucha town that heat detection problem was the highest possible reason for failure of AI. In addition to the above absence of AI technician was the second while inefficient technician and far distance of AI center for breeding were the third important reasons failure of artificial insemination

Table 5: AI service administration and fate the cows in absence and failure of AI

Variable	category	Adaberga		Ejere		Metarobi		Overall	
		N	%	N	%	N	%	N	%
Regularity of AI Provision without interruption	Yes	8	13.56	-	-	-	-	8	4.49
	No	48	81.36	54	90	59	100	161	90.45
	no practice before	3	5.09	6	10	-	-	9	5.06
Reason for interruption	Weekends and holiday	3	5.77	1	1.82	-	-	4	2.40
	Shortage of AITS	7	13.46	5	9.09	-	-	12	7.19
	Shortage of inputs	3	5.77	1	1.82	-	-	4	2.40
	Combine reasons of the above listed	39	75.00	48	87.27	60	100	147	88.02
Means to communicate AITS	AITs visit us daily	3	5.17	2	3.39	-	-	5	2.83
	We call AITs when we need them	37	63.79	26	44.07	2	3.33	65	36.72
	We take our cows to the AI station	18	31.04	31	52.54	58	96.67	107	60.45
Availability of AITS on weekends and holiday	Yes	9	15.52	-	-	-	-	9	5.06
	No	49	84.48	60	100	60	100	169	94.94
Fate of breeding cows in the absence of AI service on weekend and holiday	Pass the date without breeding the cow	27	48.21	25	42.37	20	33.33	72	41.14
	Use Natural mating (NM)	23	41.07	31	52.54	40	66.67	94	53.71
	no practice before	6	10.71	3	5.09	-	-	9	5.14
If your cows do not conceive with repeated inseminations, then the farmer do	use AI again and again	30	50.00	20	33.90	20	33.33	70	39.11
	use NM	27	45.00	34	57.63	40	66.67	101	56.43
	sale for beef	3	5.00	5	8.48	-	-	8	4.47
as the cow show sign of estrus, the AIT comes too late for insemination then will take measure to do	Get the service any way	-	-	3	5.26	1	1.67	4	2.30
	Reject the service and wait for another 21 days	35	61.40	25	43.86	22	36.67	82	47.13
	Use NM	17	29.82	26	45.61	37	61.67	80	46.00
	Do not know	5	8.77	3	5.26	-	-	8	4.60

AI = Artificial insemination, AITS = Artificial Insemination Technicians, NM = Natural Mating, N = number of observations

The perception on the fairness of currently existing government-based AI service was presented in table 8. About 87.01% of dairy farmer respondents were believed that the price of current government-based AI service was not fair. With regard to the price about 97.48% the respondents were wanted to increase the price with quality AI service. The overall mean price of reliable AI service and payable limit was 129.42 ±7.27 which is suggested by AI user dairy farmers. There was a significant suggested price difference between Metarobi and Ejere at p =0.009.

Table 6: Problems with AI service and AI related health problems

Variable	category	Adaberga		Ejere		Metarobi		Overall	
		N	%	N	%	N	%	N	%
have ever happened failure of insemination	Yes	27	55.10	40	75.47	19	51.35	86	61.87
	No	22	44.90	13	24.53	18	48.65	53	38.13
the amount of failure of insemination happened	Once	8	27.59	3	7.14	11	57.90	22	24.44
	Twice	9	31.04	22	52.38	4	21.05	35	38.89
	Three times	7	24.14	10	23.81	1	5.26	18	20
	More than four times	5	17.24	7	16.67	3	15.79	15	16.67
male animals go along with the herd	Yes	39	65	30	50.00	52	86.67	121	67.22
	No	21	35.00	30	50.00	8	13.33	59	32.78
any animal health problem faced so far in your dairy herd	Yes	37	61.67	41	68.33	20	33.33	98	54.44
	No	23	38.33	19	31.67	40	66.67	82	45.56
type health problems faced	Mastitis	10	25.00	15	35.71	5	23.81	30	29.13
	Tuberculosis	5	12.50	-	-	2	9.52	7	6.80
	Problems associated with calving	3	7.50	4	9.52	1	4.76	8	7.77
	Mastitis &problem associated with calving	6	15.00	10	23.84	3	14.29	19	18.45
	Others(disease)	16	40.00	13	40.00	10	47.62	39	37.86

AI = Artificial Insemination, N = Number of observations

Table 7: Order of possible reason for failure of AI

variables	1st	2nd	3rd	4th	5th	Index	Rank
heat detection	185	104	42	18	3	0.27	1
failure AI efficiency	40	68	78	52	12	0.19	3
distance of AI center	60	60	54	54	14	0.19	3
absence of AI technician	55	88	90	80	6	0.25	2
disease problem	80	24	3	10	53	0.13	5

AI = Artificial Insemination

Table 8: perception on current AI service price and affordable suggested price to reliable AI service

Variable	category	Adaberga		Ejere		Metarobi		Overall	
		N	%	N	%	N	%	N	%
the fairness of existing insemination fee	Yes	17	29.83	4	6.67	2	3.33	23	13
	No	40	70.18	56	93.33	58	96.67	154	87.01
If the existing insemination fee is not fair what should have to be	should increase	43	95.56	55	98.21	57	98.28	155	97.48
	Should not increase	2	4.44	1	1.79	1	1.72	4	2.52
Variable		N	Mean ±sem	N	Mean ±sem	N	Mean ±sem	N	Mean ±sem
The payable limit suggested by farmers if they get reliable AI services (birr)		48	134.58±12.58^{ab} (30-300)	55	150.35±12.87^{a} (25-300)	58	105.38±11.71^{b} (20-300)	161	129.42±7.27 (20-300)

a, b; Means within a column with different superscripts differ significantly (P<0.05). N = Number of observations, AI = Artificial Insemination AI, = Artificial Insemination

CONCLUSION

AI technology maximizes animals' productivity and harvests individual sires with traits of superior quality through: the use of outstanding males, disseminating superior genetic material, improvement of the rate and efficiency of genetic selection, introducing new genetic material by import of semen rather than live animals. Assessing institutional structure and tuning the perception, the practice administration of artificial insemination towards efficient and reliable service had prime importance to improve the production and productivity of dairy cows. From the research result, the overall breeding scheme provided by the district office of livestock agency (74.8%) was higher than private bull scheme practitioners (16.5%). The AI program is a government run activity under the ministry of Agriculture established with nine of (7) mid-level professionals (inseminators) and limited private based veterinary assistant and artificial insemination technicians delivering the service for 3 districts within study Area. However, With the above Artificial insemination beneficiary's perception and due to many reasons about 42.53, 27.59, 20.69 and 9.20 of the responents were very satisfied, somewhat satisfied, somewhat dissatisfied and very dissatisfied by artificial insemination services respectively. A majority of study districts had irregular provision of AI service and about 90.45% the respondents reported that the absence of regular AI provision. Regard to this about 88.02% of respondents also explained reason for irregularity of AI provision was the combined effects of shortage of AITS, shortage of inputs and Absence of the service at weekends and holiday. If artificial inseminators were too late at the time of estrus sign about 47.13%, 46% and 2.30% of dairy farmers were reject the service and wait for another 21 days, use natural mating and get AI service in any way to their cows respectively. The failure

of insemination could be expressed interms of frequency as 38.13%,24.44%,20% and 16.67% of respondents at once, twice, three time and more than four times respectively. About 54.44% of the respondents reported that at least one or more animal health problems were faced so far in the period the of dairy farming. The research result reveals that heat detection was the first major reason for failure of AI in the study area

CONFLICT OF INTEREST

Here I declare that there is no any conflict of interest

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