Full Length Research Article

Evaluation of Oestrus Synchronization Program on Dairy Cattle in South Ari District, South Omo Zone, Southern Ethiopia

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ABSTRACT

This study was conducted in South Ari District, South Omo Zone, Ethiopia from 2017-2018 with the objectives of evaluating the performance of hormonal oestrus synchronization program and exploring beneficiaries' perception. Data on 3881 synchronization records from the year 2011 to 2017 were used to evaluate its effectiveness trend. In addition, 2017 estrus synchronization record data of 408 cows and heifers were collected and used for analysis. Single dose prostaglandin (PGF2α) was administrated to the animals and hormone response and conception and/pregnancy rate was measured. All synchronized cows/heifers showed estrus responses were inseminated on natural heat using frozen semen of Holstein Frisian and Jersey breed bulls. Pregnancy diagnosis was carried out at day 90 post AI by rectal palpation. Furthermore, 138 selected respondents from 4 beneficiary kebeles were interviewed on their perception hormonal oestrus synchronization . The collected data were analyzed using descriptive statistics and Chi-Square test. The results showed that 91.2% of cows and heifers were responding to the hormonal treatment. However; the overall pregnancy rate observed was only 11.02% and this is by far below the reported pregnancy rate at the national level (60%). About 73.9% of the respondents had a low perception concerning estrus synchronization practiced in the area. This was because of problems associated with low awareness of farmers on heat detection, subjectivity on screening of animal for synchronization, distance of AI service centers, timing of insemination and poor feeding and management practice of animals. Since the South Ari district is one of the agro-pastoral areas in the region; continual supply of facilities, awareness on the estrus synchronization technology, improvement on cattle management practices and active involvement of stakeholders hormonal oestrus synchronization are necessary for the effectiveness of estrous synchronization program in the study area.

Keywords: Pregnancy rate, Farmers' perception, Oestrus Synchronization, South Ari

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1. INTRODUCTION

In Ethiopia, cattle contribute about 30% of agricultural gross domestic product, with a projected increase to about 40% by 2030 (FAO, 2010). The current cattle population of Ethiopia is estimated to be about 65.35 million; of which 12.40 million cattle are located in Southern Ethiopia (CSA, 2020). On the other hand, the majority (97.76 %) of the cattle in the country is local breeds and, they are characterized by disease resistance, heat tolerance, ability to produce under poor quality feed and soundly fit with farmers farming condition which they have acquired through natural selection for generations (Tadesse *et al*., 2014). In addition; scanty information is available on the status of the national dairy cattle genetic improvement program that guide policy makers, development planners and breeders to redesign appropriate breeding programs that respond to the current scenarios in Ethiopia (Kefena *et al*., 2013).

Many attempts have been made to improve the productivity of cattle especially crossbreeding using AI for the last decades but with little success (Aynalem, 2006). Low pregnancy rate following artificial insemination in most African countries is attributed to poor semen quality, poor semen handling procedure, inadequate insemination skill, poor estrus detection and wrong time of insemination (Azage *et al.,* 1995). To improve efficiency of artificial insemination practice, hormonal synchronization of oestrus has been available for the past few years and have enjoyed success as a tool to make artificial insemination more practical (Azage *et al*., 2012; Gizaw *et al*., 2016). However, research reports indicate that farmers pointing low satisfaction with the service, although evaluation of the technology by farmers is confounded with low conception rates (Gizaw *et al*., 2016).

South Ari, the current study area, is potential for livestock production. The indigenous cattle are dominant and known for low production rate. On the other hand, there were many attempts made to improve their performance by crossbreeding using selected crossbred bulls and AI service. Starting from 2011, hormonal oestrus synchronization program was launched by the regional government. However, the effectiveness progress of the program and beneficiaries view has not been dealt. During formal and informal communications with farmers, they are complaining on low conception rate and high return rate of synchronized cows and its unsustainability. Thus, it is good to timely assess the effectiveness of oestrus synchronization program in the study area so as to set an appropriate

intervention. Therefore, this study was intended to assess effectiveness of hormonal oestrus synchronization program and farmers perception in South Ari district.

2. MATERIALS AND METHODS

2.1 Study Area

South Ari district is located in South Omo Zone, SNNPs' Region. It is located between 5º67 'North to 6º19' North latitudes and 36º30' East to 36º73' East longitude with altitude ranging from 1, 200 to 3,418 meters above sea level. The district is bordered with North Ari district in the North, Benatsemay district in the south, Malle district in the east and Salamago district in the West. The capital city of the district "Gazer" is 17 km from Jinka town, the zonal capital and 530 km away from Hawassa the capital city of the SNNPR. According to the report of South Ari Livestock and Fishery resource Development office, the district consists of 46 rural and 4 peri-urban kebeles with total population of 257,200. The district has diverse agro-ecological zones, classified as highlands, mid-altitude and semi-dry lowlands covering 20%, 70% and 10%, respectively (Gezahegn *et al*., 2018).

The major farming practice of the district is mixed crop and livestock farming. Rainfall pattern of the district is bimodal type with small rainfall duration from March to May followed by the main rainy season from July to September which ranges from 190 mm to 1450 mm.The average temperature is 20ºC.

The district is endowed with large number of livestock population. According to South Ari district livestock and fishery resource office (2017), total number of livestock of the district is 269,613 cattle; 12, 4249 sheep; 33,331 goat; 23,596 equine; 180,084 poultry; and there are about 16,964 of honey bee hives.

2.2 Sample size and Sampling Procedures

Adopting from (Cochran, 1977) probability proportional to size sampling technique, a total of 138 cattle keepers who are beneficiary of synchronization and farmers having long experience on dairy cattle rearing were selected from 4 *kebeles* of the district namely, Sida, Mama, Shishir and Senigal *kebeles.* To evaluate hormonal synchronization efficiency trend, recorded data on 3,473 cows and

heifers from year 2011-2016 were used for evaluation of general hormonal response and pregnancy rate of cows and heifers. About 408 cows and heifers of the year 2017 estrus synchronization campaign were used for this study. Questionnaire survey and focused key informant discussion was made by the researcher together with the livestock experts, artificial insemination technicians (AITs) and development agents from the respective *kebeles* on farmers' perception on mass estrus synchronization. The total respondents used for interview and discussion was determined as follows (Cochran, 1977).

$$no = \frac{Z^2(p)(q)}{d^2}$$

Where;

- no = desired sample size, when population is greater than 10,000
- Z = standard normal deviation (1.96 for 95% confidence level)
- P = 0.1 (proportion of population to be included in sample i.e. 10%)
- q = 1-P i.e. (0.9)
- d = degree of accuracy desired (0.05) or 5% error term.

2.3 Animals and Synchronization Protocols

Cows/heifers used for hormonal synchronization were typically selected based on their body conditions, history of breeding soundness, body size and body weight. Then, they were inseminated according to AM/PM method. Four well trained inseminators were assigned for insemination. Inseminators checked stage of follicles through rectal palpation when the cattle were brought to the artificial insemination center. All animals on standing estrus were inseminated without hormone injection. Prostaglandin hormone (synchromate) PGF2α (5 ml) was used in the study. Frozen semen of Holstein Friesian, Jersey and crossbred bulls which was taken from National Artificial Insemination Center, Kality, Addis Ababa was used for insemination. The cows/heifers brought to AI center were inseminated after they showed standing estrus (peak heat) which ranged from 3 to 5 days post PGF2α administration. Pregnancy diagnosis test were done by rectal palpation of the growing embryo at 90 days of post insemination.

2.4 Data Analysis

All the data collected were fed to Ms-Excel and were analyzed using SAS software (SAS, version 9.0). Descriptive statistics were employed to summarize the results. Data on the estrous rate and conception rate were analyzed using frequency distribution. The efficiency of estrus synchronization and the association between conception rate and its determining factors such as parity, breed, body weight, bull breed and efficiency of AITs were analyzed using chi-square test. The variation between groups was considered significant when the P-value was ≤ 0.05. The conception and pregnancy rate were calculated according to the method suggested by Sharifuzzaman *et al*. (2015) as shown below.

$$CR = \frac{No.of\ cows/heifers\ pregnant}{No.of\ cows/heifers\ inseminated}$$

The appropriate statistical model used for evaluating the effect of parity, breed, body weight of the cow, bull blood level and efficiency of AITs on conception rate is:

$$Y_{ijklm} = \mu + p_i + c_j + w_k + b_l + t_m + e_{ijklm}$$

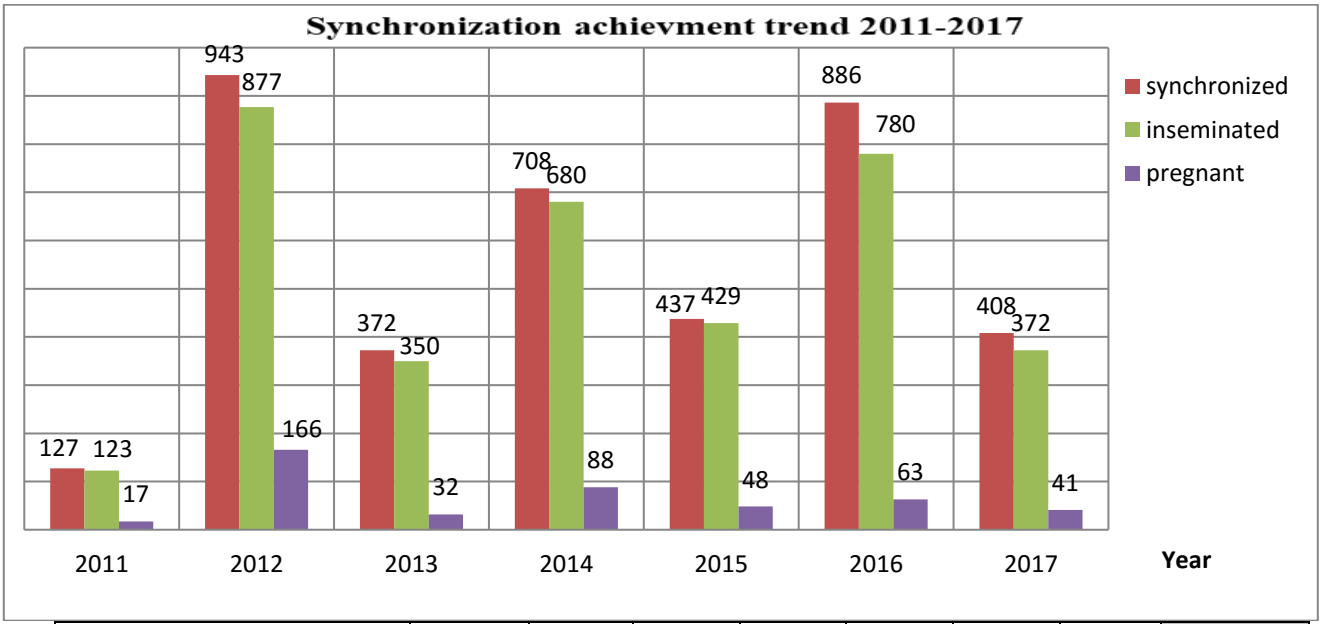
Where;

- Y_{ijklm} = Rate of conception/pregnancy rate due the effect of "i^{th} parity, j^{th} breed of cow, k^{th} body weight of cow, l^{th} bull blood level and m^{th} artificial insemination technicians.
  - μ = overall mean
  - p_i = effect of i^{th} parity 0 (heifer) to above 4
  - c_j = effect of j^{th} breed of cow (indigenous and crossbred of Holstein or Jersey)
  - w_k = effect of k^{th} body weight class of cow (200-250, 251-300, 301-350, above 350 kg)
  - b_l = effect of l^{th} bull blood level (100% HF, 100% Jersey and cross of 75% HF & 25% boran)
  - t_m = effect of m^{th} AITs (Yohannes, Yimam, Abreham and Yitagesu)
  - e_{ijklmn} = random error associated with $ijklm^{th}$ observation

3. RESULTS AND DISCUSSION

3.1 Estrus Synchronization effectiveness Trend

As presented in the figure 1, in the South Ari district, the implementation progress of the program in terms of estrus response to hormone was very high, but the pregnancy rate was very low (ranging from 8.08% to 18.93%).



Year	2011	2012	2013	2014	2015	2016	2017	Overall
Hormonal response rate (%)	96.85	93.00	94.09	96.05	98.17	88.04	91.18	93.91
Pregnancy rate (%)	13.82	18.93	9.14	12.94	11.19	8.08	11.02	12.16

Figure 1: Estrus Synchronization Trend of the study area from year 2011-2917

The pregnancy rate reported in this study (11.02%) is very low as compared to the national rate(60%) reported by Azage (2016). Discussions with farmers and experts revealed that inappropriate timing of insemination, failure to timely detect estrus, feeding management, skill of producers and inseminator, quality and proper semen handling are the major causes for the failure and low pregnancy rate. According to several authors (Azage *et al*., 2012; Hamid, 2012; Destalem, 2015; Tadesse 2014; Bainesagn, 2015; Samuel *et al*., 2015; Debir, 2015; Tewodros *et al*., 2015), Synchronization in dairy cattle was evaluated in four different regions of Ethiopia namely Oromia, Amhara, Tigray and SNNP. Accordingly, variation was observed in the performance of estrous synchronization across the regions

(Gizaw *et al.*, 2016). The author indicated that exotic crossbred cows/heifers showed higher estrus response rate (86.7%) than the local cows/heifers (78.4%) to PGF2α treatment. For local cows/heifers, the estrus response rate varied form 68.8% (in the West Shoa, Oromia) to 88.2% (in the Southern Ethiopia). Similarly, the highest response rate (92.7%) for exotic crosses was observed in SNNP and the lowest (77.4%) in Oromia (Gizaw *et al*., 2016). Plasse *et al.* (1972) reported that duration of sexual receptivity in B. taurus females varied from 4 to 48 hrs with means reported between 13.60 and 19.30 hrs, while in B. indicus cows the mean duration of estrus was short (6.70 hrs) which also vary from 2 to 22 hrs. The variations in Estrus Synchronization achievement across regions and breed of cow could be due to the fact that oestrus duration in exotic breeds is longer, so response to hormone treatment is higher.

3.2 Estrus Response Rate

The overall estrus response to single injection of PGF2α (Synchromate®) in this study was 91.2% (table 1). The result indicated, there is no significant difference in estrus response rate across local and crossbred cows/heifers, but the response was higher in crossbred cows/heifers. However, parity of cows significantly affected (*P <0.05*) estrus rate. The highest estrus response rates were observed in parity 1-2 whereas, the lower response rate were observed in parity 4 and above 4 which indicates estrus response rate is higher in primiparous cows and decreases as the parity numbers increases. This might be due to reduced risk of metabolic disorder in early lactation.

Table 1 Estrus response of cows/heifers for single dose of $PGF_{2\alpha}$ injection

Variables	**No. of Cows/heifers Treated**	**No. of Cows/heifers Responded**	**Estrus response Rate**	χ^2	**P-value**
Parity					
0/Heifer	37	34	92.89	10.24	0.016
1-2	218	205	94.04		
3-4	110	99	90		
>4	43	34	79.07		
Breed					
Local	402	366	91.04	0.58	0.443
Cross	6	6	100		
Overall	408	372	91.2		

χ2 = Chi-square test

The oestrus response rate to $PGF_{2\alpha}$ in the present study was higher than the report of Bainesagn (2015) who revealed 72.3% of estrus rate in West Shoa Zone, Oromia Region. The result agrees with the report of Debir (2016) in Sidama zone of Southern Nations Nationalities and Peoples' Region and Samuel *et al.* (2015) in West Gojjam who reported 90% and 88.9% oestrus response rate in a similar OSMAI campaign, respectively. Studies by Azage *et al*. (2012) in Awassa-Dale milk shed and Girmay *et al*. (2015) in and around Wukro kilte Awulaelo district indicated that the rate of estrus response in a single injection of prostaglandin protocol at the farmer level was 97.7% and 91.3%, respectively. Other study conducted by Bekana *et al*. (2005) on Fogera heifers indicated that, the effectiveness of single injection of PGF2α used to synchronize heifers was 82% within 82 hrs from the time of injection.

A study by Adebebay *et al*. (2013) in Bahir Dar milk shed indicated that the average response rate of the cows to prostaglandin (PGF2α) injection or its analogue was 89.3%. Results of a study by Diskin *et al*. (2001) indicated oestrus synchronization with PGF2α, results in expression of heat among 85% of the cows within 36 and 60 hours post injection, while Tewodros *et al.* (2015) reported that PGF2α when administered to cows with a functionally mature corpus luteum 98.9% of them show signs of estrus.

A study conducted by Million et al. (2011) using the PGF2α protocol based on estradiol benzoate (EB) or gonadotrophin releasing hormone (GnRH) indicated that the average oestrus interval varied between genotypes while it was 70.67 hrs. for Boran cows it was observed that the time was 54.58 hrs., and for Boran and Holstein Frisian crossbred. The author suggested that the use of EB with Controlled Internal Drug (CID) and PGF2α was more effective than GnRH for increase the number of cows showing estrus behavior and creating tight synchrony. The results from a study by Adebebay *et al.* (2013) using prostaglandin (PGF2α) alone indicated that the average duration of hrs to estrus interval in cows and heifers post injection was 51 and 50 hrs, respectively in Bahirdar, Azage *et al*. (2012) 13 to 154 hrs in Dale milk shed, Hamid (2012) 58 hrs in Siltie zone. The use of Prostaglandin or its analogue (PGF2α) in a synchronization protocol shortens the estrous cycle when used alone and estrus is observed within 2 to 7 days post injecting the hormone (Gupta *et al*., 2008).

According to Debir (2016) and Samuel (2015), the estrus response of synchronized dairy cattle in Sidama zone of SNNP region and west Gojjam zone of Amahara region was 90% and 88.9%, respectively, under research condition. Similarly, Azage *et al*. (2012) reported that, the estrus response

of synchronized dairy cattle in Awassa-Dale Milkshed and Adigrat-Mekelle Milkshed were 97.7% and 100%, respectively, under IPMS project work. However, different estrus response results were reported between synchronized dairy cattle in Sidama zone of SNNP region (87.2%) and west Gojjam zone of Amahara region (66.2) under regular extension service (Debir, 2015; Samuel, 2015). However, some authors (Bainesagn, 2015; Debir, 2015; Destalem, 2015), had revealed that the oestrus response of different breeds found in Oromia, SNNP and Tigray region were not considerably different. But Bainesagn (2015) reported that, in South Shoa zone of Oromia region, cows/heifers with body condition score of 3 and 4 had higher rate of estrus response (92.3% and 84.2%, respectively) compared to cows/heifers with body condition score of 2 (76.3%).

3.3 Pregnancy Rate

Pregnancy rate refers to the percentage of cows or heifers diagnosed pregnant from the total number of cows/ heifers inseminated (Miah *et al*., 2004). The overall pregnancy rate of the cows in the current study is 11.02%. This result was much lower than the report of Debir *et al.* (2016) and Azage *et al*. (2015) who observed 60.4% and 57.7% pregnancy rate, respectively, followed by prostaglandin F2α injection under smallholder conditions in Ethiopia. Moreover, Girmay *et al*. (2015) obtained 32.17% pregnancy rate in Awulaelo District of Northern Ethiopia. Similarly, an average conception rate of 27.1% at national and 33.3% at regional level (SNNPR) was reported by Azage (2015) at ILRI institute planning meeting.

On the other hand, Tegegn and Zelalem (2016) observed 24.69% pregnancy rate in Mizan Aman area of South West Ethiopia from the same OSMAI campaign. Desalgn (2008) also reported that the average national conception rate in Ethiopia is 27%. On the other hand, conception rate found in Bangladesh was 46.2% that was reported by Shamsuddin *et al.* (2001), 54.3% in Senegal by Abonou (2007), 51.5 % by Hossain (2013) in Bangladesh, 57.3% by Paul (2011) in Sirajgonj district. The low pregnancy rate observed in the current study might be due to inappropriate timing of insemination, errors associated with detection of estrus, body condition of the animal, nutrition and management, early embryonic death, insemination techniques, skill of inseminator, proper semen thawing procedure, placement of semen in the uterus, quality and handling techniques of semen, reproductive disorders, long calving interval and age of the cow.

Table 2 Pregnancy Rate Due to Parity, Breed, Bull ID and AITs

Variables	No. of Cows/heifers Inseminated	No. of Cows/heifers Conceived	Pregnancy Rate	χ^2	P-value
Parity					
0/Heifer	34	5	14.7	2.7	0.44
1-2	205	20	9.76		
3-4	99	14	14.14		
>4	34	2	5.89		
Breed					
Local	366	41	11.2	0.75	0.385
Cross	6	0	0		
Bull ID/breed					
Holstein	110	11	10	1.34	0.511
Jersey	120	11	9.16		
Cross	142	19	13.38		
AIT					
Yohannes	190	27	14.21	4.05	0.256
Yimam	95	7	7.37		
Yitagesu	24	2	8.33		
Abreham	63	5	7.94		
Overall	372	41	11.02		

PR = Pregnancy Rate, $\chi 2$ = Chi-square

The results of this study indicate that PR was not significantly different across parities (table 2). However, the value is greater in heifers and parity 3-4 than cows with parity above 4. The least pregnancy rate was recorded at parity above 4 (5.89%). This advocates that the pregnancy rate has an inverse relationship with the increments of parity. The current findings are in contrary with the reports of Samuel *et al*. (2015) who revealed an increasing trend of pregnancy rate as parity of cows increased. However, it was in line with the findings by Bainesagn (2015) and Debir (2016). As parity associated to age; the variation in pregnancy rate among parities may be related with lactation stress and also that older cows reducing the chance of fertility and tend to gain weight.

The results shown in Table 2 further indicated that breed of cows/heifers, bull ID/breed and AIT did not significantly ($p>0.05$) influence pregnancy rate. However, there was slight difference in first service pregnancy rate in terms of artificial insemination technicians. The greater conception success was achieved by Yohannes (14.21%) whereas the lowest value was recorded by Yimam (7.37). The variation might be due to work experience differences. Some authors (Destalem, 2015; Debir, 2015;

Bainesagn, 2015) reported that, conception rate of hormone treated and inseminated cows/heifers affected by skill of AI technicians, bull efficiency and age of cows.

However, conception rates of estrus synchronized and inseminated cows/heifers did not show considerable variation among breeds. The findings of Samuel (2015) in Amhara region shows conception rates of hormone treated and inseminated Holstein-Friesian, Jersey crosses and local cows/heifers were 70.4%, 78.2% and 71.5%, respectively. Similarly, conception rates of Holstein-Friesian, Begait local and a non-descript local cows/heifers in Tigray region were 38.4%, 39.7% and 37.7%, respectively (Destalem, 2015).

In SNNP region, exotic crosses had also higher (68.4%) conception rate than local cows/heifers (53.3%). However, in Oromia region, the local cows/heifers had higher (77.4%) conception rate than the exotic crossbred cows (68.8%) (Bainesagn, 2015). Recent results reported by Hamid (2012) in Siltie zone, Adebebay *et al.* (2013) in Bahir Dar milk shed and Tewodros *et al.* (2015) in Fogera woreda indicated that an average of conception rate was 48.1%, 13.7 % and 31.29%, respectively. A study conducted by Yeshimebet *et al.* (2017) in North Shoa Zone, showed that high pregnancy was obtained in the double injection of PGF2α treatment (63.1 %) than animals treated with one shot protocol 55.8 % and there was statistically significant difference between treatments ($P < 0.05$).

3.4 Effect of Body Weight on Pregnancy Rate

The effect of body weight of cows/heifers on conception/pregnancy rate in this study was highly significant ($P < 0.01$). The conception/pregnancy rates were different in most of the weight classes. At body weight class of 200-250kg, the pregnancy rate were 2.7% and pregnancy rate at body weight class of 251-300 and 301-350 was 6.82% and 14.86% respectively. The highest pregnancy rate was found to be recorded at weight class of greater than 350kg, which was 54.55%. This means that body weight had a direct relationship with pregnancy rate. The results of the current finding have much similarity with the report of Samuel *et al*. (2015) who observed an increasing trend of pregnancy rate with increased body weight of cows/heifers in West Gojjam Zone of Amhara Region. Destalem (2015) also indicated that, body condition score (BCS) of cows had significant effect on conception rate and cows with BCS of 4 showed higher conception rate and lower number of service per conception than BCS of 3 and 5.

Table 3 Pregnancy Rate Due to Body Weight of Cows/Heifers

Body weight (kg)	No. of Cows/heifers Inseminated	No. of Cows/heifers Conceived	Pregnancy Rate	χ^2	P-value
200-250	37	1	2.70	29.26	0.000
251-300	176	12	6.82		
301-350	148	22	14.86		
>350	11	6	54.55		
Overall	372	41	11.02		

3.5 Farmers' Perception on Oestrus Synchronization and Mass Artificial Insemination

The satisfaction of the participants' involved with estrus synchronization and mass artificial insemination program in the study area is presented in (table 4). The results revealed that most of the respondents (73.9%) were not satisfied with the mass synchronization campaign. The major causes of dissatisfaction of the program as reported by the respondents in the study area were high return rate with very low pregnancy rate. The result of the current study is supported by the findings of different authors (Tadesse *et al*., 2014; Nuraddis *et al*., 2014; Zerihun *et al*., 2013 and Hayleyesus, 2006). Moreover, Nuraddis *et al.* (2014) and Shiferaw *et al*. (2003) also indicated that poor semen handling practices, discontinuation of incentives to AI technicians, season of breeding, management factors, and timing of insemination are some of the factors which contribute for increased numbers of services per conception. According to findings of Azage *et al.* (2013), there is a serious gap in the effectiveness and efficiency of such services in spite of the expansion of AI services in the highland areas of southern region.

Table 4: Farmers' perception on mass synchronization and constraints of AI service

Variables	Frequency	Percent
Low	102	73.9
Medium	34	24.6
High	2	1.4

Number of services for successful insemination depends largely on the breeding system used and influenced by both genetic and non-genetic factors viz. season; that related to availability of feed, semen quality, lactation length and milk yield and parity (Gebrekidan *et al*., 2012). According to Quintela *et al.* (2004) fertility of the bulls is commonly measured by calculating the percentage of cows

those are pregnant after a single service. Teddy (2017) observed that only few AI technicians were serving large population of cattle and there were no effective regular AI service in South region. Farmers, in the area, were not aware of hormonal estrus synchronization protocols and AI technology, which contributed in the poor efficiency of the services. Lack of awareness of associated with some farmers were immediately mix cows and heifers with other herds after hormonal injection, long distance trucking of cows and heifers, cows and heifers were not brought at the right time for insemination and poor management practices.

The report of Bainesagn (2015) indicates that the half of the respondents in Adaberga and Ejere aware of the technology, 66.7% and 21.1% had been responded negative and positive perception about estrous synchronization in Adaberga and 61.7% and 8.3% negative and positive perception in Ejere about estrous synchronization respectively. Destalem (2015) in his finding showed that 68% were not participating in OSMI and poor estrus response and poor pregnancy, 61.2% were not satisfied; while 38.8% were satisfied with positive estrus response and positive pregnancy. According to Bainesagn (2015); no response after treatment, no conception after insemination and no pregnancy after treatment were the major reason for low perception in Adaberga and Ejere district. Furthermore, Gizaw *et al*. (2016) observed farmers expressed low satisfaction with the service provided under development intervention by the regular extension of regional Bureau of agriculture, since; they obviously evaluate the technology based solely on successful breeding leading to calf production.

4. CONCLUSIONS

According to the findings of this study, the overall estrus response rate to single shot $PGF_{2\alpha}$ was high (91.2%), but the pregnancy rate was very low 11.02%. In addition; the study revealed that majority of respondents (73.9%) were not satisfied with the service, but voluntary to continue using it if the existing challenges would be solved to manageable level. During discussion and interview; farmers said "insemination of animals after hormonal administration should not be the final goal, but the program should be monitored till birth of productive calf and supported for its sustainability." Many previous and this evaluation studies confirm that at national to farm level, immediate need of intensive follow-up for successful continuity of the program is mandatory. Therefore, estrus synchronization campaign should be well-planned, organized and sought for different technical and management gaps.

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Conflict interest

The authors claim not to have any competing interests.

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