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Save the Children



LAND O'LAKES, INC.
INTERNATIONAL DEVELOPMENT
Innovative Solutions for Global Prosperity

Reproductive Performance assessment of Sheep and Goats distributed for most vulnerable households

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BACKGROUND

ENGINE being committed to promote the consumption of animal source foods along income generation by the poor, targeted most vulnerable households (MVHs) received productive livestock of sheep, goat, heifer or chicken of their choice. Livestock distribution for MVHs started a year ago and will continue over the months of the project life. There were feedbacks from the field which indicated the distributed animals for MVHs have continued giving birth. But the field report was not comprehensive enough to inform the general reproductivity status of animals distributed; particularly the sheep and goats which are massively purchased and distributed. Therefore, a structured data collection format was developed and circulated in all the operation areas to generate data on distributed animals' status. Out of the total sheep and goats distributed since program start to end of June 2013, data on **4382** sheep and goats' distributed for 1099 MVHs were generated for analysis. In this data the longest rearing period (distribution to analysis) is 17 months while the shortest is for a month while the significant portion of them reared for 5-12 months. Accordingly, important reproductive performance status of fertility, reproductivity and flock increasing rates were calculated. In addition the male effect and the comparative advantage of distributing heifer at late pregnancy over young aged heifer for the economically poor households were assessed.

This report of sheep and goats reproduction status includes **operational definition, data collection and analysis methods, major findings, conclusion and recommendation for next steps.**

OPERATIONAL DEFINITION

Parameter	Definition
Sheep and goats gave birth per female animals at reproductive age (referred to as “Fertility”)	Number of females give birth divided by the number of female at reproductive age (all distributed female animals considered being at their reproductive age of 10 months – 5 years at time of distribution)
Live births per female animals of reproductive age (referred to as “Reproductivity”)	Number of offspring at birth per female of reproductive age (all distributed female animals considered being at their reproductive age of 10 months – 5 years at time of distribution)
Flock size growth rate (referred as “flock increasing rate”)	Total current flock of breeding stock and newborns minus total flock distributed divided by total flock distributed
Breeding stock mortality rate	Number of breeding stock died divided by total breeding stock distributed
Newborn mortality rate	Number of newborn (s) died divided by total live births
Breeding stock	All sheep and goats distributed for MVHHs in the period

METHOD OF DATA COLLECTION AND ANALYSIS

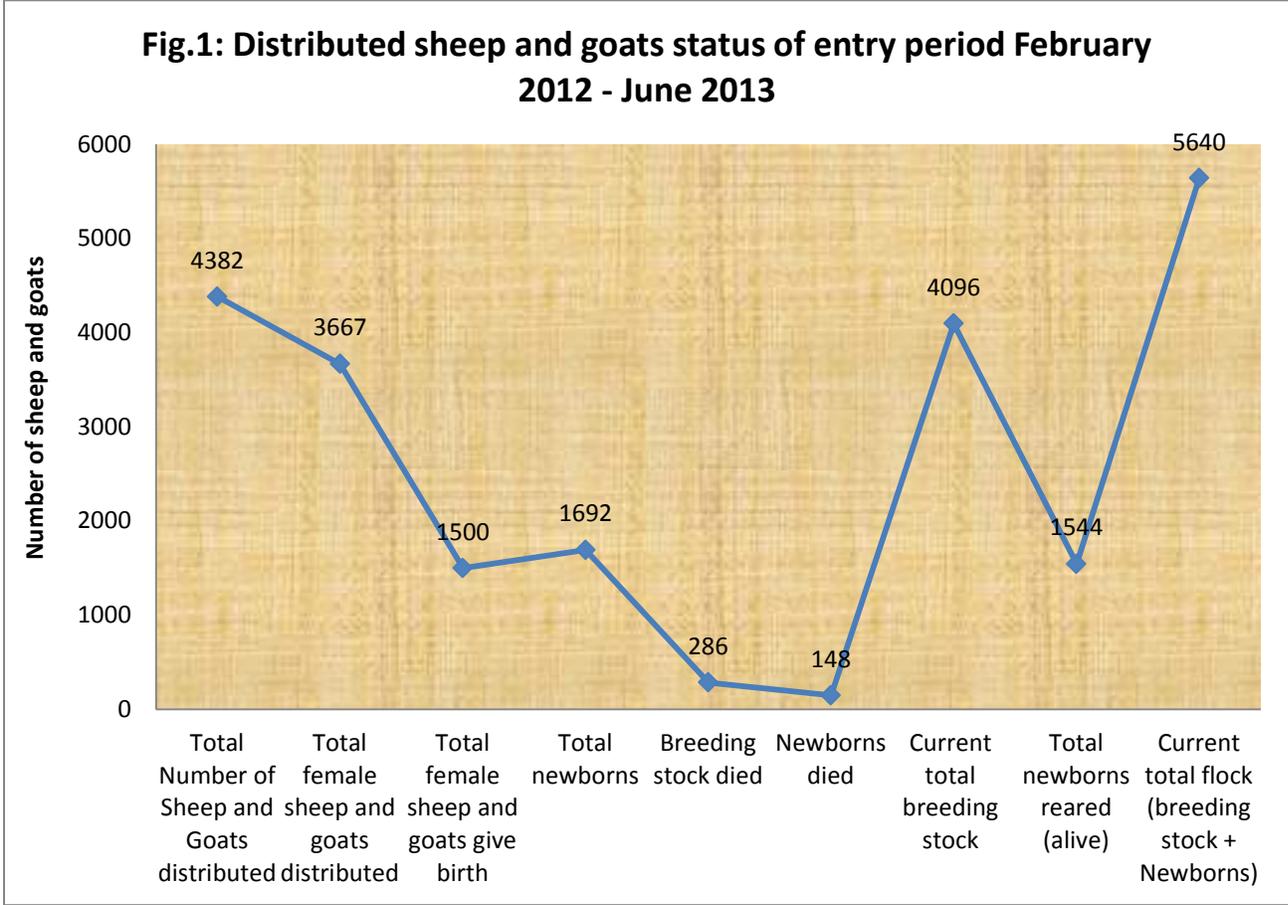
ENGINE supported MVHHs were communicated through DAs stationed in the respective kebeles to collect data on the status of ENGINE distributed sheep and goats’ reproduction at HHs level. Distributed sheep and goats’ reproduction performance over the months of distribution commenced on early February 2012 to the date of reporting marked 30 June 2013 filled-out in a format developed as a livestock productivity tracking sheet. The reported data is not inclusive of all distributions but it captured quite significant portion of the program support on livestock. Data collected from DAs’ validated by the respective zonal coordinators in charge and later sent for analysis. To avoid value far from others, data from one Woreda where outbreak report received were not included. Heifer and chicken distribution were quit minimal compared to the sheep and goats; hence the reproductive performance analysis skewed to sheep and goats except employing preliminary studies on distributed heifers.

The general status of sheep and goat distribution assessed as aggregated data ranging from distribution to date of analysis. But, to assess the effect of entry period longevity (distribution to date of analysis) on reproduction, data were disaggregated based on length of entry period.

Finally, the distributed heifers' current reproductive performance was assessed to suggest other available options and considerations for upcoming heifer provisions (if any).

MAJOR FINDINGS OF THE ASSESSMENT

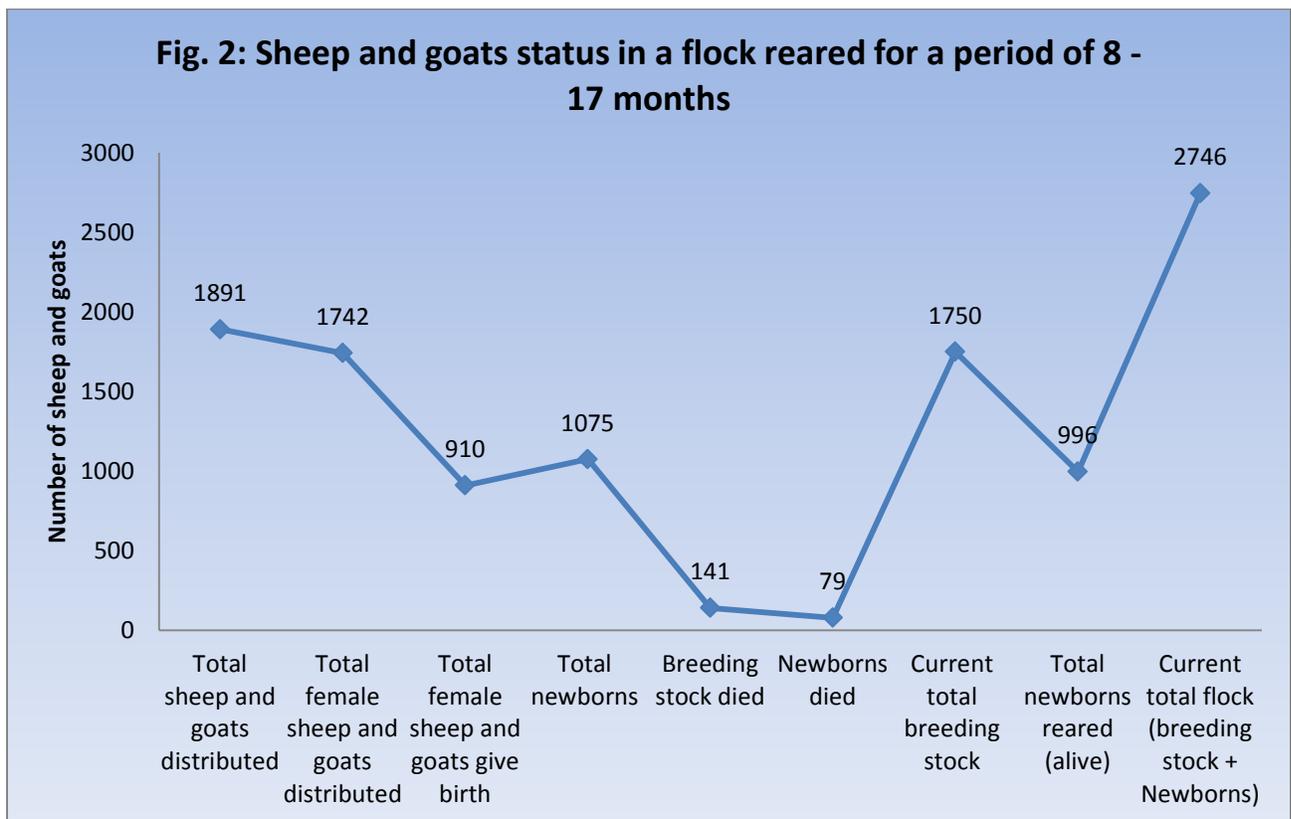
The aggregated data of 4382 sheep and goats reared for 1 – 17 months from distribution to analysis; the least reared for a month while the highest reared at most 17 months increased to 5640 heads at the time of analysis. This indicates a birth of 1692 heads of newborns from 1500 female sheep and goats gave birth during the rearing period; out of them, 192 gave twins; accounted 13% of the birthing females (see figure 1 below).



Source: ENGINE's own data

Taking into consideration the current market price of ETB 650.00 per marketable size (20 kg) of sheep or goat newborn; livestock recipients could fetch a market value of a million birr (650 *1544 ≈1,003,600 ETB); which can be translated into purchasing nutrient dense food as well to initiate saving.

Sheep and goats flock increase is anticipated along the rearing period since distribution. This is because usually purchased animals for distribution are young aged or non-pregnant which requires at most 8 months to get served and give birth; considering the sheep and goats normal birthing interval of 3 births per 2 years. To see time effect, distributed sheep and goats' reproduction status assessed and the available data indicated a positive trend of more female animals gave birth; out of 910 birthing females, 165 of them gave twins (See figure 2 below).

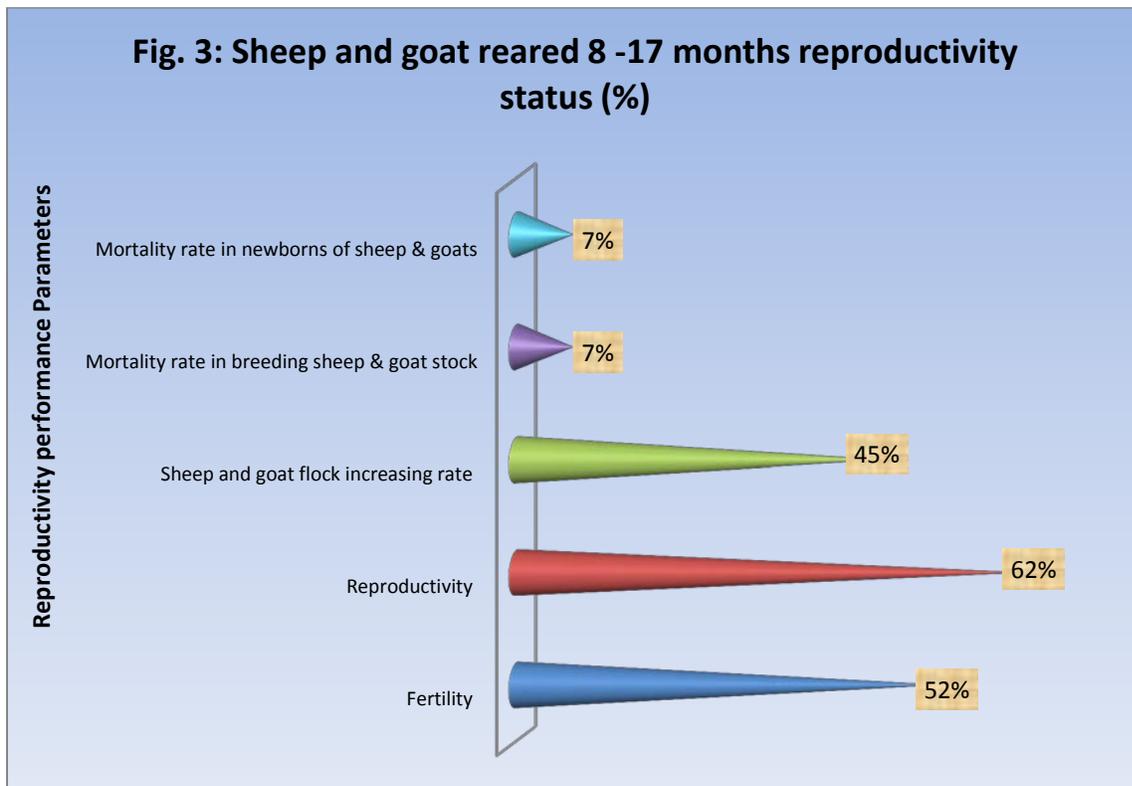


Source: ENGINE's own data

Mortality rates of both breeding stock and newborns in a flock of sheep and goats reared for a period of 8 – 17 months reported 0.07 (7%); average distribution per HH is 4 heads, from which 7% mortality signifies few number of HHs only encountered the death of both breeding stock

and newborns. Similarly, 52 % of female animals distributed gave birth with a lamb or kid cropping rate of 62% and flock increasing rate of 45 % (See figure 3 below).

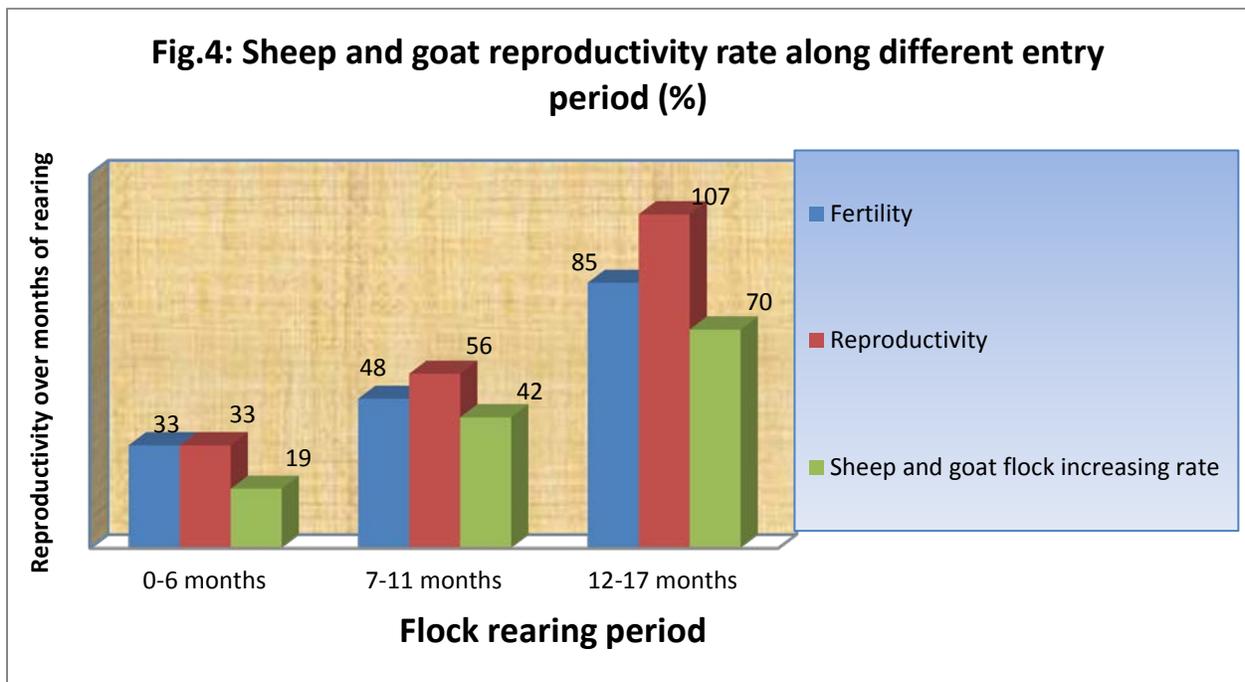
As seen in figure 3 below, among the distributed female animals more than half of them gave birth; out of them 18% delivered twins. The newborn (lamb or kid cropping) yield per female of reproductive age is accounted 62 % at birth.



Source: ENGINE's own data

Data disaggregated along entry period (distribution to analysis) longevity indicated that sheep and goats' reproduction rate as a measure of fertility, reproductivity and flock increasing rate showed remarkable increase; the highest rate observed in a flock reared for a period of 12-17 months (see figure 4 below).

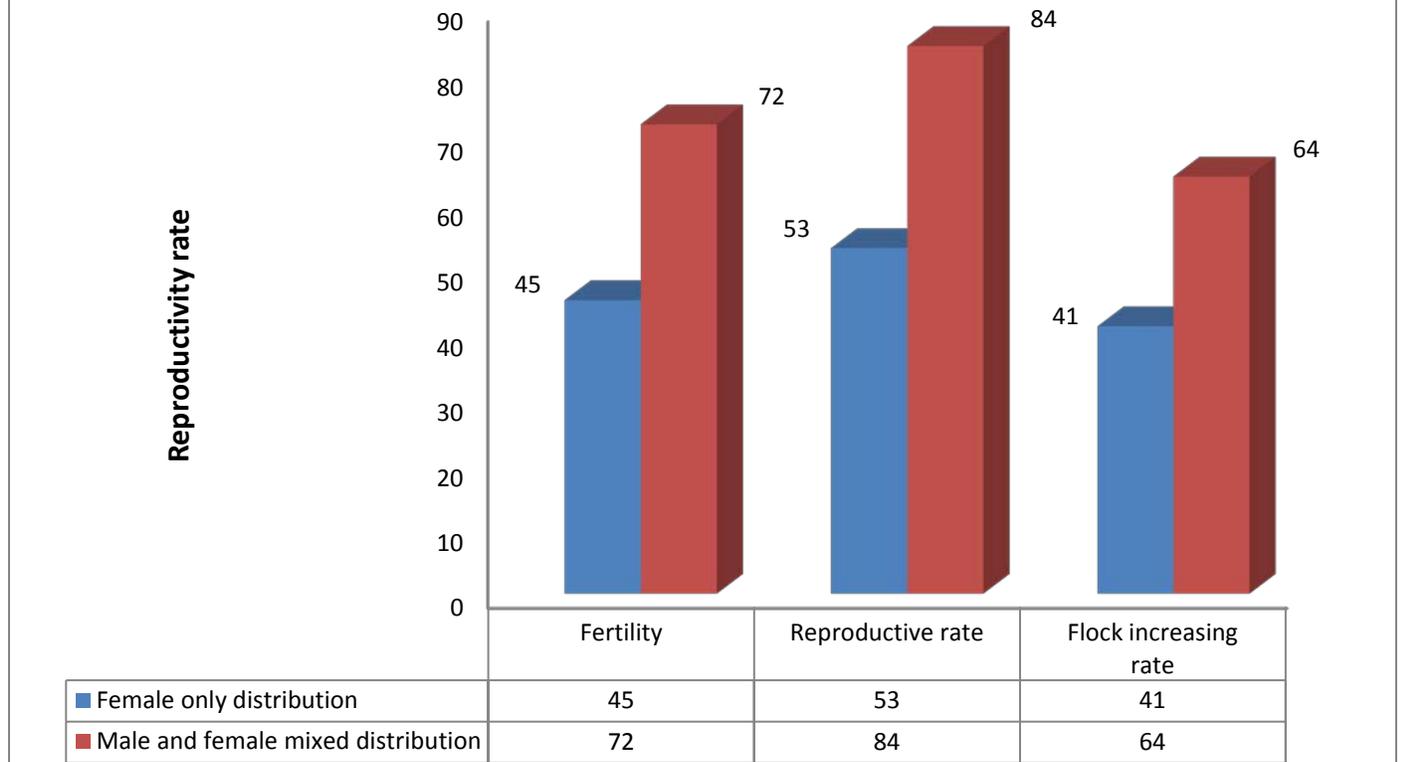
As indicated in Fig.4 above, the flock increase in the period (12-17 months) is comparably largest to the other two short rearing periods (both 0-6 months and 5-11 months) which indicates a positive trend in the sheep and goats reproduction. The minimum reproductive performance during the short rearing period which is becoming better in the coming rearing periods, indicates the purchase and distribution of young sheep and goats (sexually immature) which are not ready to get served and give birth even reared for one reproductive season (8 months).



Source: ENGINE's own data

To ensure informed decision on the inclusion of male in livestock distribution, the effect of male assessed taking data from both female only distribution and male-female mixed distribution reared for a period of 7-17 months; this period is preferred because this is the period where data on female alone and male-female mixed types of distribution is sufficient for analysis. The information generated showed that reproduction status as a measure of fertility, reproductivity and flock increasing rate of male-female mixed distribution significantly exceed that of female only distribution (See figure 5 below).

The male effect on a sheep and goats reared for a period of 7-18 months (%)



Source: ENGINE's own data

Birthing animals and newborn cropping yield is significantly higher in male-female distribution compared with female only distribution. The female only distribution was with the idea of getting male service from neighbors' male animal while grazing together during the day. But this idea can be challenged when land is occupied by crop and by the short life span of sheep and goats' sexual desire (heat) lasts usually for hours; animals show heat in late afternoon finish early in the morning before released for grazing with neighbor animals.

In this preliminary assessment, it was learned that 10 heifers distributed for 10 MVHHs in Gorche Woreda of SNNPR region 8 months before. As part of the heifer provision, supported HHs received improved heifer management training and capacitated to prepare improved feed reserve. In addition, Artificial Insemination (AI) service in a system of bringing all heifers into

sexual desire (heat) at the same time (synchronization) facilitated to all heifers to get served with improved genetic material which later on improve milk yield in the newborns (Calf). Unlikely, the AI service was not successful and 7 of the 10 heifers conceived from a local bull; all pregnant heifers are at their 3rd trimester.

Is true that milk impact on human nutrition and health is massive but young aged heifer provision is hardly affect under-nutrition as anticipated since heifer took longer time to reach reproductive age as well as to reach age of first birth. Therefore, heifer distribution should clearly defined feed source, efficient AI service in the locality where heifer recipients are living and most importantly the age of heifer should be at least sexually matured age (3 years); whenever possible heifer at late pregnancy is much preferred.

CONCLUSION

ENGINE distributed productive livestock reproduction status has indicated promising result; although, the effect on household nutrition is too early to assess as the majority of animals distributed to households were recent. The observed mortality on both breeding stock and newborn is below the national average; which is encouraging. The newborn yielding of the female animals upgraded along the rearing period; significant increase in flock size observed in a male-female mixed distribution. Likewise, heifer distribution need critical considerations of basic inputs of feed source and AI service in the locality and most importantly purchased should be at least 3 years old or being at late pregnancy. Moreover, is true that there is a huge potential to increase the livestock reproduction to the level of all distributed female animals are birthing to offspring of at least equal to their number; doubling the distributed flock size in 8 months of rearing period (fertility = 1, Reproductivity ≥ 1 and flock increasing rate ≥ 1). Therefore, the below mentioned next steps should be considered.

NEXT STEPS

- Orient livestock recipient on the measures of reproductive status and motivate them to work against the measures (***ENGINE IR:3 sub activity 8: Initiate group meeting to promote horticultural and livestock production***)

- Purchasing of sheep and goats for breeding stock advised to focus on animals of first time pregnancy or gave birth once, if not sexually matured (yearling and above)
- Livestock recipient should be advised to store local feed reserve and plant at least 5 multipurpose tree and if possible improved grass should be planted in their backyard
(ENGINE IR:3 Sub activity 42: Provide technical support on forage development)
- Since stress induced respiratory disorder (stress induced pneumonia) is the major cause of mortality, emphasis should be give to initiate prophylactic treatment using antibiotics as well as anti-parasitic treatments on purchased animals followed by vaccination against major diseases 2 weeks after treatment
- All animals should receive vaccination against major disease (s) at least once in a year, treated against internal parasites twice a year; before and after rainy season **(ENGINE IR:3 sub activity 41: facilitate vaccination and treatment service and get signed document)**
- To reduce newborn mortality the livestock husbandry training provided for MVHs should focus on newborn management
- Inclusion of male in livestock distribution should be considered
- The provision of young heifer need revision as making benefit out of it is time taking
- In some pocket areas, ENGINE sheep and/or goats supported HHs encountered death of all or 50% or more of the initial flock. This necessitates replacement following further validation