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Full Length Research Paper

Analysis of goat production situation at Arsi Negele Woreda, Ethiopia

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The study was conducted at Arsi Negele District of Oromia Regional Administrative Zone with objectives of: (1) Assessing goat production situation of the area (2) identifying problems limiting goat production of the area, (3) Generating information for development practitioners working in the area to improve the situation. The sampled kebele were selected based on the potential of goat production and suitability of the area for transportation. Fifteen to twenty key informant farmers were identified with development workers for group discussion per the sampled kebele. Both female and male households were invited for group discussion. Participatory rural appraisal (PRA) techniques and methods were employed for data collection. A mix of PRA tools like group discussion, pair wise ranking, seasonal calendar and secondary data reviews were employed during data collection. The study is based on qualitative data analysis using descriptive statistics. From the current study it was realized that goat production is one of the major livelihood options for the goat keepers of the area. The study also identified that goat production plays a pivotal role in many ways for the goat keepers of the area. Its significance includes; serving as a source of milk, butter, and meat as well as income generation. In addition to this, it is considered as wealth and has contributed to social values. Furthermore, farmers also consider it as a risk mitigation strategy to cope with adverse environmental effects; this is mainly when shortage of rain occurs at the area or when scarcity of production occurs. Farmers also identified that goat production is advantageous because of having short generation intervals which give quick production for market. These huge contributions are also considered as the major reasons behind for keeping goat in the study area. Despite these benefits, goat rearing practices of the area have been constrained by many factors which can be categorized under genetic and non-genetic categories. The major non-genetic factors identified include; diseases like sheep and goat pox, diarrhea, ecto-parasite, circling disease, mastitis, anthrax, and pasteurellosis, shortage of feeds, weak extension services, and market related problems. Genetic related factors are mainly associated with lack of breed improvement interventions. Therefore, the study recommends that goat production extension package generation, development and popularization for the study area needs to be giving due attention by the stake holders working in the area.

Key words: Arsi Bale goats, Oromia, Ethiopia.

INTRODUCTION

Ethiopia has a larger livestock resource base than most countries in Africa. It is estimated that 84% of the 70 million people live in rural areas and depend on agriculture for their livelihoods and the sector contributes 41.4% of the Gross Domestic Product of the country (World Bank, 2006).

Mid-rift valley area is known to have a high population of sheep and goats. The environment is much more conducive for rearing of small ruminant animals. Though there is no latest and up to date information on the current small ruminants' population, Abule et al. (1998) reported that there are about 653,940 sheep and 1.8 million goats in the mid-rift valley area. Despite such

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Abbreviation: DA, Development agents; **EARO,** Ethiopian Agricultural Research Organization; **Oard,** office of agriculture and rural development; **MOA,** Ministry of Agriculture and Rural Development, **PA,** Peasant Association; **PRA,** participatory rural appraisal.

Table 1. Goat population size of the area.

Numbers	Type of ruminants	Number(heads)
1	Goats	82,211
2	Sheep	38,651
Total		120, 862

Source: Arsi Negele oARD, 2010.

huge potential, farmers in the area could not realize the expected benefit from small ruminant rearing. Poverty and food insecurity are the major phenomenon in the area. Farmers are still relying on traditional type of production system which is characterized by poor feeding, housing, breeding, and health management. As a result of this, production and productivity as well as income from sale of the animals are very low. This implies the urgent need to work toward the improvement of the conditions.

Other contributing factors also include low genetic potential; policy issues (Zinash et al., 2001) market and institutional problems and problem of credit facilities and others (Berhanu et al., 2006). Although various research and development activities have been carried out in the past, no significant increase in productivity was achieved. Therefore, improvement programs are necessary to increase productivity and sustainable development of small ruminants in different farming systems of the country innovative approach so as to meet the demands of the human population.

However, such development achievement for sheep and goats will only be successful when accompanied by a good understanding of the different farming systems that simultaneously addresses several constraints: feeding, health control, general management, cost and availability of credit as well as marketing infrastructure (Workneh, 2003). Adami Tulu Agricultural Research Center conducted Participatory rural appraisal with multidisciplinary team combined from extensioninst, economist, geneticians and nutritionists with the following objectives.

General objective

1. To assess goat production situation of the district.

Specific objectives

1. To identify problems constraining goat production of the study area;
2. To assess role of goat production for the livelihood of goat keepers;
3. To generate a piece of information on goat production situation of the area which finally contribute for the improvement of the existing situation.

METHODOLOGY

The study area and characteristics of sampled house holds

The study was conducted at the Arsi Negele district of West Arsi Zone. West Arsi zone is one of the administrative zones of Oromia region. Two kebele were selected based on the potentiality of the kebele for goat production and suitability for transportation. Based on this, Daka Dalu Harangema and Ali Wayo kebele were selected for the study purposively. Fifteen to twenty key informant farmers per the kebele were selected for group discussion. Multidisciplinary team combined from animal health, extensionists, economists, breeder and nutritionists were organized and participated on data collection. Key informant farmers who are expected to know goat production situation of the area were identified and invited with development agents. Both men and women farmers were involved during group discussion.

Method of data collection and analysis

Participatory rural appraisal (PRA) technique was employed for data collection and analysis. The term PRA refers to a series of techniques, many of them developed in India, for using local knowledge and skills to learn about local conditions, identify local development problems and plan responses to them. Using of PRA methods for research purpose has three main advantages. First, the information it provides tends to be highly accurate. This is partly because; local people's knowledge of local condition is often greater than had been supposed, as is their capacity to map, model, estimate, rank, diagram and plan. This is also because participatory approach to describing local conditions and planning allow local people discuss and cross check each other's knowledge on the spot. Secondly, plans drawn up by local people are more likely to work than plans drawn by outsiders. The third and most important of all, the participatory nature of the process is a development benefit in itself, in terms of empowering local people (Richards, 1992). The current study therefore employed PRA techniques and methods. The PRA methods employed here includes; group discussion, secondary data reviews, analytical games like pair wise ranking and scoring of results.

RESULTS AND DISCUSSION

Goat production situation of the Woreda

The goat breeds found in the study area is Arsi-Bale goat breeds. Arsi-Bale goat is distributed in the high lands of Arsi, Bale, Hararghe and mid rift valley of Ethiopia and characterized by small body size, short legs, short ears, both short and long hair as well as their glossy, wavy and gray color natue (Worknesh, 1992). Goat production system of the area is characterized by mixed farming system. Goat production system of the area is also under traditional management system. Goat production is one of the livelihood strategies for the farmers of the area. According to data taken from the districts' office of Agriculture and Rural development shows, huge numbers of goat population size are found in the district (Table1).

This somehow indicates their significance since goat production in the area is one of the livelihood strategies for the goat keepers of the area. Goat production has been serving different purposes including ensuring food

Table 2. Farmers' production objectives/ reason for keeping goats at Daka Dalu Harangema PA.

Number	Production objectives/reason for keeping goats	Rank in order of importance
1	Used as a source of milk	2nd
2	Used as a source of meat	5th
3	For income generation	4th
4	Due to having short generation interval	3rd
5	Considered as drought tolerant	1st

Source: Own PRA result.

security, considered as wealth storage and source of income for the goat keepers of the area. Despite such a huge contribution, goat production extension packages available for the goat keepers are weak which could be associated with lack of attention given for the sector by oARD compared to other sectors like crop production. The major goat production extension services available for the goat keepers of the study area is mainly veterinary services which invariably means giving less attention to other aspects of goat production extension packages like breed improvement, improved management practices like housing, feeds and feeding development and managements, marketing aspects like improved access to effective marketing information and improved fattening practices. Farmers also indicated that, the existing veterinary services available like vaccination and treatment of sick animals is not effective.

Farmers' production objectives

According to some study conducted in other parts of Ethiopia, it indicates that goat production is an important component of the livestock subsector and it is also a source of cash income, meat, milk and wool for smallholder keepers in different farming systems and agro-ecological zones of the country (Tekelye et al., 1993; EARO, 2000). The current study is also employed to see farmers' production objectives/ reasons for keeping goats in the study area. The result of the study therefore indicates that farmers have been rearing goats for different reasons/purposes. These include; they considered as a source of meat, income, milk, butter (in rare cases). On the other hand farmers indicated that, goat production is advantageous over other livestock components due to having short kidding intervals. Farmers also expressed that, goat production objective at the area is positively associated with agro- ecologies, that is, goat is considered to be drought tolerant. For social value/gathering, farmers have been using it as a gift which they call 'gegawo' during wedding. Also farmers indicated that goat production in the area is considered as wealth storage which can be served as risk mitigating strategies especially when there is shortage of rain and/ or when scarcity of food production occurs in the area (Table 2). To analyze these production objectives, pair wise ranking methods was employed as indicated in Table 2.

Among the different reasons/objectives for producing the goat; milk production, ability to withstand drought and having of short generation interval was ranked as first, second and third respectively at this kebele. This indicates that, farmers' in the study area keeps their goats mainly for these purposes other than for other reasons. Also other study conducted by Asfaw, 1997 is in agreement with this finding. He argued that goat production is considered as investment and insurance due to their high fertility, short generation interval, adaptation in harsh environment and their ability to produce even with limited feed resources. They can tolerate drought and can feed on different leguminous trees such as acacia pods and acacia leaves. In addition, they explained that it can reach for markets within a short period of time and also, it is considered as medicinal value.

The other sampled kebele was Ali Wayo kebele. Respondents at this Kebele identified five production objectives/ reasons for keeping goats, namely; for milk consumption, considered as a source of meat, for income generation purpose, sometimes considered as a social value and used as wealth storage (Table 3).

The three production objectives namely source of milk; income generation purpose and wealth storage were ranked as first indicating that goat production plays almost equal roles with regard to the above indicated purposes. The next production objective which ranked as second was social values/gatherings. This indicates that, goat production objectives can go beyond direct benefits since it can be used for some social gatherings. Generally, goat production plays significant roles in terms of ensuring food self sufficiency and one of risk mitigation strategy for the community of the area.

Place of goat production in terms of generating income for the farmers of the study area

Farmers' livelihood strategy of the area depends on different activities. Among these, non-farm and agricultural activities are the major one. From agriculture related

Table 3. Farmers' goat production objectives at Ali Wayo PA.

Number	Production objectives/reason for keeping goats	Rank in order of importance
1	Used as source of milk	1st
2	Used as source of meat	3rd
3	For income generation	1st
4	For social value/gatherings	2nd
5	Considered as wealth storage	1st

Source: Own PRA result.

Table 4. Ranks for respondents' sources of income at both kebele.

Number	Major source of income	Rank at Daka Haregema kebele	Rank at Ali Wayo kebele
1	Crop production	2nd	1st
2	Sheep production	5th	5th
3	Poultry production	6th	6th
4	Cattle production	1st	2nd
5	Donkey cart	4th	4th
6	Selling of wood	9th	-(*)
7	Charcoal making	8th	-(*)
8	Selling of mineral soil	7th	-(*)
9	Goat production	3rd	3rd
10	Honey production	-(*)	7th
11	Horse cart	-(*)	8th

(*) Indicates the activity was not mentioned by farmers at respective kebele. Source: Own PRA result.

activities livestock production such as cattle, small ruminant, poultry rearing, bee keeping, and crop productions are the major activities identified from group discussion.

This study was therefore evaluated the place of goat production in contributing to farmers' livelihoods. Pair wise ranking was employed to identify and prioritize livelihood strategies of the farming community of the area (Table 4).

As explained by matrix ranking, cattle production was placed at first in generating of income at Daka Dalu Harangema kebele followed by crop production and goat production. This shows as that, goat production plays pivotal roles in generating income for the farmers of the study area. This contribution in more or less indicates that goat production is important and plays significant roles for livelihood improvement of the farmers of the area. Therefore, the sector need to be giving due attention by the stakeholders working in the area to develop and popularize goat production extension packages.

Problems constraining goat production in the study area

As identified by the current study, goat production of the study area is constrained by a couple of problems. These problems are multidimensional in its scope that include; feeds related problems, disease related problems, and market related problems. Respondent farmers from Daka Dalu Haregema kebele identified different problems like shortage of feeds, occurrence of disease, predators, lack of market information, long kidding interval and shortage of water. From these problems, disease problems was found to be the most serious problems ranked first whereas shortage of labor and long kidding interval was ranked second indicating that shortage of labor and long kidding interval are the other major problems associated with goat production of the area which has almost equal negative impacts (Table 5).

As explained by Table 5, disease problem was ranked first. Group discussion was also held with farmers to identify type of diseases available in the area. During disease identification, farmers were asked to list up all type of diseases available in the area. Then, the diseases symptoms were also identified by farmers. Finally name of diseases were identified by the team of researchers based on the symptoms indicated by farmers. The major diseases identified at Daka Dalu Harengema kebele were; sheep and goat pox, Diarrhea, ecto-parasite, anthrax, circling disease and mastitis. Anthrax and diaharea was found to be the most serious disease ranked by farmers as first and second, respectively. The

Table 5. Problems constraining goat production at Daka Dalu Harangama PA.

Number	Type of problems	Rank in order of importance
1	Shortage of feeds	4
2	Lack of market information	4
3	Disease related problem	1
4	Predators	3
5	Shortage of labor	2
6	Long kidding interval	2
7	Shortage of water	7

Source: Own PRA result.

Table 6. problems constraining goat production at Ali Wayo PA.

Number	Type of Problems	Rank in order of importance
1	Shortage of feeds	2
2	Lack of market information	5
3	Disease	1
4	Predators	6
5	Shortage of labor	4
6	Long kidding interval	3
7	Shortage of water	7

Source: Own PRA result.

other problem mentioned by farmers is copper deficiency. As indicated by sampled respondents, there is few veterinary services/controlling mechanisms/available which is not effective for the treatments of copper deficiency. Farmers indicated that kids born from copper deficiency often born swaybacked, the kid stands unsteadily or cannot stand, displays muscle tumors and head shaking, and may grind its teeth. Farmers at Ali Wayo kebele stated same problems that constraining goat production and productivities but they ranked differently. Accordingly, disaease prevalence, shortage of feeds and long kidding interval was ranked first, second and third respectively (Table 6). The type of diseases mentioned by farmers at this kebele is similar with Daka Dalu Harengema kebele. Also the two diseases namely anthrax and diaharea was found to be the most serious diseases ranked first and second respectively.

Weak extension services

The fattening extension components include, purchased or farmer owned indigenous cattle and small ruminants, animal feed and feeding system, animal health, housing, selection of fattening animals, fattening period and marketing of fattened animals (MOA, 1990 E.C). This study attempted to examine type of technologies used by farmers. According to the result of group discussion made indicates, two fattening options are available in the area; (1) improved practices and (2) fattening practices through own practices/indigenous knowledge. Under improved practices, different fattening packages like use of industrial by-products, feeding management and housing managements, and veterinary services for sick animals as well as for preventive services/vaccination services are available. The main source of the technology for improved practices was Adami Tulu Agricultural Research Center. The use of improved practices was reported only at Daka Dalu Harangema PA but farmers from Ali Wayo PA responded that there was no improved goat fattening technologies introduced at the area. For indigenous practices, farmers have been using the locally available feed supplements like beans, crop after math and acacia pods/leafs. The duration of fattening periods through farmers' own practices takes more than three months as indicated by group discussion.

These farmers' own fattening practices lacks different aspects of goat fattening extension packages including improved managements practices like housing, use of industrial by-products. In addition to these, the duration of fattening periods is longer when compared with the available improved fattening packages. Generally, goat production management systems of the area are under traditional management systems. This situation is also one of the gaps identified by this study.

Mitigation strategies used and recommended to minimize the existing problems

In participatory research like the current study, farmers can also be considered as investigators since their contribution in identifying and prioritizing the existing situation is strong in PRA principle. The current study identified different problems which have been negatively influencing goat production of the area and farmers' mitigation strategies that has been used to minimize the identified problems related with goat production. The gap existing between farmers' mitigation strategies and improved mitigation options was also identified by this study which can be an input to improve the situation. After identifying farmers' mitigation strategies, possible intervention areas were identified (Table 7). With regard to these mitigation strategies, nearly similar results were reported by Gurmesa et al. (2011) in his studies conducted at East Showa Zone (in the process for publication).

Gender participation in goat production activities

Sex and gender

Sex refers to the biological differences between men and

Table 7. Summary of mitigation strategies used by farmers and possible intervention areas identified from the study with regard to goat production.

Types of problem associated with goat production	Farmers' mitigation strategies used to stand with the existing problem	Gaps identified and intervention area to be made to improve the existing situation
Shortage of feeds	-Migration(moving to other places in searching of feeds) -Grazing in the crop/crop after math -Using house west -Reducing of flock size -Feeding of trees leafs/pods -Allocation and conservation of feeds at back yard	-Development of improved forage -Awareness creation on adoption of concentrate supplementation/agro-by product and improved feeding managements -Feed conservation -Reducing flock size -Improving the indigenous breeds by crossing/ through selection
Disease	-Using homemade medication like salt and pepper, drenching local alcohol (catikala), tobacco and other traditional healers -Medication(purchased form market) -Migrating to other places in searching of water because they perceive that if goats frequently used the available water, it will be exposed to especially Cu-deficiency -Vaccination (which could be associated with weak veterinary services, being far from veterinary site and weak awareness by farmers about the severity of disease)	-Establishing of veterinary clinic -Regular vaccination based on frequent assessment of disease occurrence -Awareness creation on disease -Monitoring of the flock
Predators	-Burning of living habitat(hole) of predators -Using bait -Shepherding	-Close supervision of the goats -Appropriate housing
Shortage of labor	-Selling -Hiring of labor -Migration(moving to other places in searching of feeds) -Tying -Keeping the goats by shifting(darabee)	- Making semi intensive by enclosing grazing area -Strengthening of group work on conservation of local forest, feeds and common managements
Water shortage	-Moving to other watering point	-Use of water harvesting
Market related problems	-Searching, waiting and selling of their goats when market price is getting better -Refusing to sell to brokers	-Improving of market information delivering systems -Linking of farmers with potential buyers - Establishing of group work(Farmers' extension groups) especially for fattening - Linking farmers with micro credit institutions -Improving infrastructure like roads
Long kidding interval	-Replacing existing breeds by well performing animal -Migration(moving to other places in searching of feeds) -Borrowing of breeding bucks	-Feed Improvement -Breed improvement -Natural resource conservation - Participatory monitoring of the flock

Source: Own PRA result.

Table 8. Gender participation in goat production activities at the study area.

Number	Type of goat production activity	House hold members			
		Husband	Wife	Son	Daughter
1	Feeding	√	√	√	√
2	Housing	√	√	√	√
3	Who is looking for	√	√	√	√
4	Who sells	√	√	√	√
5	Who control over cash	√	√	√	√
6	Who take to vaccine	√	√	√	√

Source: Own PRA result.

Figure 1. A sample of picture showing when group discussion was undertaken with farmers.

women and is genetically determined. Gender refers to the socially determined differences between women and men, such as roles, attitudes, behaviors and values. Gender roles are learnt and can vary across cultures over time and are therefore amenable to change. Sex is therefore universal while gender is a socially defined category that can change. The concept of gender is vital because, applied to social analysis it reveals how women's subordination (or men's domination) is socially constructed. As such, the subordination can be changed or ended. It is not biologically predetermined nor is it fixed forever (Figure 1).

Women constitute half of the world's population, they do two third of the world's work, they earn one tenth of the world's income and they own one hundredth of the world's property including land (United Nations, 1979). Women involved in different agricultural activities in the area. But most of the time their contribution is undermined/under-valued. Women's participation in livestock production activity in general and goat production activity specifically, were also assessed to identify their contribution and related issues like control over benefits that is related to goat production (Table 8).

The current study result shows that all house hold members had participated in all activities related to goat production (Table 8). But their frequency of participation varies for house hold members. For example, in most cases it is husband who took to markets and control over the benefits. Also, other family member participation is sometimes strong for some activities. This somehow indicates that, participation of household members; men and women is critical in all aspects of goat production activities. This on the other hand indicates that both men and women should be encouraged in adopting of goat production extension packages. Furthermore, the goat production extension packages including breed development activities, fattening activities, and related aspects of extension packages like capacity development through training, visits and demonstration needs to consider both men and women.

CONCLUSION AND RECOMMENDATION

Goat production is one of the major livelihood activities for the goat keepers of the study area. The contribution of goats can be viewed in multidimensional views like income generation, wealth storages, and risk mitigation strategies in case of adapting to adverse harsh environments. It can also be considered as source of meat and milk for the farmers of the area. Despite such a huge contribution, goat keepers of the area are still working under traditional production systems which will finally influence the maximum possible outputs that can be achieved from the sector. Extension services like breed improvement, promotion of improved fattening technologies, improved market services like access to market information, effective veterinary services and other management aspects is very weak. Generally, goat production packages needs to be promoted in the area to increase the production and productivity of the goat keepers of the area which can finally contribute to the overall economic development of the region as well as the country. Also, actors working in the area including research centers, oARDs and other development practitioners needs to do much to improve the existing situation related to goat production.

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