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Review on Challenges and Opportunities Sheep Production: Ethiopia

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Abstract: These reviewing papers were conducted in Ethiopia to assess major feed resources, sheep production system and associated constraints. So work found Ethiopia is the largest in livestock population in Africa and tenth in the world. This largest livestock population contributed about 15-17% of the total GDP and 35-49% of agricultural products which helps export commodities like live animals, hides and skins. However, the production system is traditional which depends on lands and family labors. While modern practice is remain a little which characterized by large capital requirements and employ substantial amount of hired labor and distinguished through the production factors (land, labor and capital). The available feed resources of small ruminants are natural pasture, crop residue, cultivated forage and industrial by product and other by feed resources derived from herbaceous forages, trees and shrubs, food crop residues, agro-industrial by products, mineral supplements and other by products. Inadequate feed quality and quantity, diseases, poor breed potentials and inadequate sheep policies of credit, extension, marketing and infrastructure are the major limitation that affects sheep performances of Ethiopia. In Ethiopia, the traditional production system, the natural feed sources and much limitation of sheep productions is the unique characteristics of the country. Therefore, the farmers should take different measures to reduce feed shortage like store some feed for dry period, using concentrate supplements, purchase of forage and cultivating improved forage.

Key words: Production system · Feed resources · Sheep · Ethiopia

INTRODUCTION

Ethiopia is believed to be the first in livestock population in Africa and tenth in the world and containing about 53.99 million cattle, 25 million sheep, 21 million goat, 1.91million horse, 6.75 million donkeys and 5 million camel [1]. This large population livestock sector play a significant role and contributing 15-17% of the total GDP and 35-49% of agricultural GDP in the country providing through export commodities like live animals, hides and skins to earn foreign exchanges [2]. In addition, livestock sub sector is sources of food, immediate cash income and promote saving [3]. Whereas FAO [4] reported that animals are also sources of powers for cultivation and, for crop threshing and are also essential for transportation of families and agricultural products to the markets. Live stocks are also important source of farmyard manure which helping to improve soil fertility and used as a source of energy [5].

According to Tembely [6] reported that small ruminant are the major sources of livelihood for landless farmers in rural communities comparing to other livestock species. Whereas ILRI [7] reported that sheep are mostly kept by smallholders and the rural poor including women headed household stations. Nevertheless, the annual meat production from small ruminants is relatively small compared to the number of heads. The same source stated that sheep is increasing demand for its meat but cannot be met with the current inefficient production and marketing systems.

Currently, the contribution of the livestock subsector in Ethiopia is below from its potential [8]. This is because of socio economic and technical limitations like inadequate feed quality and quantity, diseases, poor breed potentials and inadequate livestock policies of credit, extension, marketing and infrastructure that affect the livestock potentials [9, 10]. In addition to these, the major production system of Ethiopia is mixed crop

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livestock with farmers keeping especially ruminants to different extents in small areas. Mostly animals are left to graze or brose in rangelands or in almost degraded grazing lands during the day time and supplemented, if at all, with hay or crop residues in backyard in the evening [11]. Similarly the above authors stated that animal production system are considered as low producing because of in sufficient feed availability, confounded with the prevalence of disease and parasitic pests.

The feasibility of cropping and the type of crops produced are depending on climatic, edaphic and biotic factors [12]. In addition to feed quality and quantity shortage improper feeding and poor performance of sheep in farmer level has an impact on production and productivity of sheep [2]. The same source indicated that in Ethiopia, feed problem is the main cause for poor performance and low productivity of small ruminants. Therefore the gap that observed in the production systems and feed availability is not clearly documented in Gondar Zaria district. Finally many authors were evaluating the feed resources and sheep production system in the specific parts of the country but not include in Gondar zuria district including associated constraints. The general objectives of these review was to assesse the feed resources, sheep production systems and associated constraints.

Sheep Production Systems in Ethiopia: Livestock production systems in Sub-Saharan Africa in general and Ethiopia in particular was classified according to a number of criteria, the main ones being integration with crop production, the animal-land relationship, intensity of production and type of product. Other criteria include size and value of livestock holdings, distance and duration of animal movement, types and breeds of animals kept, economic specialization and household dependence on livestock [13]. According to Wilson [14], Ibrahim [15] and Tibbo [16] there are two major types of sheep production system these are traditional system and modern ones. The Two groups differ essentially in their use of main factor production, with traditional system mainly rely land and family labor while modern system also have large capital requirements and employ substantial amount of hired labor and distinguished through the three production factors (land, labor and capital).

Zinash *and* Syoum [11] identified three types of livestock production systems in Ethiopia; Extensive pastoralist in arid and semi arid rangelands, integration of animals with cropping in rain-fed and irrigated areas and systems associated with perennial tree crops. Based on input-output flow, Tibbo [16] reported that sheep production system of Ethiopia was categorized into two major classifications and three different production systems. The first and the most common system is the traditional smallholder management system. Sheep are kept as an adjunct to other agricultural activities along with other livestock species. The second, which is limited in scope and area coverage, is the private commercial and parastatal production system. When closely examined, these two broad categories could be further classified as three major different production systems; highland sheep-barely, mixed crop-livestock and pastoral and agro-pastoral production systems [13,16].

Based on the prevalent agricultural activity, Getahun [17] reported four productions. System categories; sheep in annual crop-based systems (Northern, North-Western and central Ethiopia), sheep in perennial crop-based systems (mainly southern and south-western highlands), sheep in cattle-based systems (agro-pastoral and Arid areas) and sheep dominated systems (pastoral and arid eastern and North-Eastern areas). Samuel [18] reported livestock production system of Ethiopia into two broad categories; mixed crop-livestock production system in the highlands and pastoral production system in the low lands. Constrains of Sheep Production

The major constraintes of sheep production are drought, Housing and occurance of disease that affect sheep production and productivity. Feed shortage one of the constraintes of sheep production it may rise due drought means is a prolonged period of below average rainfall leading feed and water shortage. The most nutritious vegetation is soon eaten and the animals must then eat vegetation is that then would normally rejected. Feed quality and the amount of feed eaten then diminish the nutrient in take of the animals or fall below their maintenance. This mean that lambs do not grow and ewes don not get pregnant. Animals loss weight as they use up their body reserve and as body weight decrease, maintenance requirement are lowered leads production decrease due to dicrease maturity rate, extended lactation and large calving interval and absence of twin birth [19]. sheep are housed to give a better enviroment and to make management easier.The type of housing required depends on the system of production. So phisticated house for sheep are found only in intensive unit where the capital investment and high level of production, the only form of housing is simple shelter [13]. The design of the sheep house is most critical when the animals are continu-ed

with in the house and can not move to another environment. Some parts of house that include roof for protect from direct sun light and wall to protect from agine outside enviroment [20].

Occurance of dieases are the another major factor that affect productivity of sheep is lowered it they are not healthy. The disease most frequency reported by veterinarians and animals health service are hot necessarily those which cause the most economic loss. Disease usually results from a combination of factors including in adequate feeding and low standard of management. In all types of system the High mortality rate are found in young lamp, up to about one month of age. Another susceptible group is newly born lambs. Death are highest at the beginning of the rainy season when the body weight of ewes are at their 10 west when there is little good quality vegetation and environment is moist and ideal for the spread of disease microorganisms and parasites. The common parasites and disease of sheep are parasite external and internal parasites, the common are Round Warms, liver flukes, Schistosomes and tape Worms are connectively known as helminthes. Common external parasites are Ticks, lice, Mize, flied.

Major Feed Resources: In Ethiopia the major livestock feed resources are mainly natural grazing and browse, crop residues, improved pasture and agro-industrial by-products. The feeding systems include communal or private natural grazing and browsing, cut- and-carry feeding, hay and crop residues. At present, in the country sheep are fed almost entirely on natural pasture and crop residues. Grazing is on permanent grazing areas, fallow land and crop land after harvest (Stubble). The availability and quality of forage are not favorable year round. As a result, the gains made in the wet season are totally or partially lost in the dry season [21]. Inadequate feed during the dry season is a major that causes decline in the productivity of ruminants.

Natural Pasture: Natural pastures are naturally occurring grasses, legumes, herbs,trees and shrubs that are used as animal feed [22]. They comprises the largest feed resources,but estimates of the contribution of feed resource vary greately. Alemayehu [23] estimated that75-80% of the livestock feed in Ethiopia is obtained from natural pasture. Grazing land occurs on permanent grazing areas follow land and on farm land following harvest. Both follow land and crop stable provide. The total area grazing and browsing in the country is 62,280 million hectar.out of this 12% is in the farming area and the rest is aroud pastoral area [23]. Communal grazing is normal and managed as a common property resource [24]. The carrying capacity of the grazing area, if calculated on plant availability, should allow a plant use of 30–50% [25]. Hay is the most commonly stored fodder on the farmer and is one oldest system used to level out the feed supply through out of they year. It is generally the most covenant process of forage. The aim of making hay is to conserve the maximum of dry matter (DM) and nutrient at the lowest cost. Hay should be made at the optimum data to maximize yield and still have the percent age of digestible dry matter necessary to meet the nutrient need of sheep.

Crop Residues: Crop residue (CRs) are rouphages that become available to livestock after the crop have been harvested. They are grouped from agricultural by productes (bran,oil cake,etc),which are generated when crop are proccessed.Residue can be grouped along crop type –cereal,grain, legume, root and tubers and so on. Apart from being a source of animal feed, residues are sources of building, roofing and fencing materials. They are used also as fuel and as fertilizers or as surface mulch in cropland [23,25]. CRs is frequently the major enter prise on farms and the rearing of animal is only fringe activity crop products (plant) can be completely used by man and mostly by products that can be consumed by farm animal.

Cultivated Forage: Production of improved forage should focus on these species that lave high biomass yield potential such as Napier grass (pennisetu purpureum), Rhode grass (Chloris gayana) and Guinea grass (Panicum SP.) the leguminous forages are important as sources of nitrogen's fermentable organic matter and mineral in crop residues and poor quality natural pasture based dials. Among the grass species, napier grass is known for its high biomass production. However, its productivity could vary from on area to another depending up on climatic condition and fertility of the soil, nitrogen fertilizer or manure application influences the dry matter yield and crude protein content of the grass [23].

Feeding Systems of Sheep: Sheep's are selective in their feeding behavior if they have a choice of feed resource. A given choice to sheep is preter grass, there fore grazer, in which the animal obtains natural or cultivated forage directly from the filed. By partial restricting the sheep's freedom. How ever man can influence the way forage is used and the amount consume [26].

The influence is exerted on two planes: – space and time. Time aspect, sheep must have at least 8 hours spent outside a day for greazing, these does not merely mean 8 hour spent out side the night enclosure, as there are time of day when it is too not for sheep to eat and time for rumination also needed to be deducted. In the simplest system man makes on attempt to control the time or space that the sheep of its own decides to use for grazing. It is commonly employed all year round in region where large cultivation is relatively in accessible to sheep. Care fully watched during the crop growing season and is not allowed to graze freely until the crops have been harvested. In fact, how ever, in doing this the sheep adversely affect pasture quality, as it always eats the good plant species and leaves the poor ones, this implies free roaming should not be considered as an efficient system for using pasture [23].

Once the best grass or best part of the grass have been eaten the sheep will then be forced to eat what is left, thus ensuring regular regrowth and maintaining pasture quality, other grazing system require fencing, which always entails a considerable financial outlay. Thus includes continuous grazing, Rotational grazing, zero grazing, supplementary feeding and feeding mineral supplement [23].

Major Constraintes of Sheep Production: The major constraintes of sheep poduction in presented review in the western part of Ethiopia was feed shortage, disease and parasites, drought, inadequete veterinary service and lack of infrastractures. Mostly feed shortage as the first ranked sheep production constraintes whereas disease and inadequate veterinary services were the second and third constraintes respectivelly. According to the table indicated (4.2) feed shortage and disease are the major challenge for sheep production in Gondar zuria district and the pasture land mostly covered by cereal crop during wet season. Gaten [19] reported that, well feed animales are less likely to become ill than under feed animales. It was severe specially in the highlands by grazing land shrinkage due to increasing human and animal population and increase cropping. Similarly Gaten [19] reported that, well feed animales are less likely to become ill than under feed animales. Farmer also complained that to climate variety, there is no regular rain fall which aggregare feed shortage. Similar feed shortage is reported in different areas [23]. Inadquate feeding and poor quality feed are often regarded to be major factors limiting sheep and goat production in the tropics. Most of the locally available feed resources are poor in nutritive value. According to Gaten [19], the protein level required for maintainance is about 8% in the dry matter. The same sources indicated that shortage of feed and inadequate supplementary feeding were a major causes of livestock mortality and poor performance in highland agro ecologies of southern and central Ethiopia. To improve feed quality and quantity, several measure should be taken. Forage development strategies which fit the farming system are implemented. Supplementation of improved forage should be done strategically during feed and nutrient scarcity period. Inaddition to forage crops utilization of locally available by productes (Atella and feedleft over), industrial by product and indigeneous forage tree are additional alternativs to alleviate feed scarcity.

Disease Type and Measure Taken: Sheep disease and parasites were the other main constraintes for sheep productions. Especially Anthrax, Sheep and Got pox, PPR are major contributers to high mortality of sheep in the study area.The most common parasites were Mengemites, tick and fleas. Tradional medicine are generally used to cure the animal but sometimes they causes serious problem due to higher dose and lack of knowledge about the disease type [19]. The same sources indicated that disease lower the productivity of animales and it may occurs during feed shortage period and poor management of sheep. Feed shortage may predispose the animales to low disease resistance.

due to distance, awareness and cost of veterinary service, farmers are lack in get veterinary treatment for their animals. The common disease control, treatment and measurement methods are traditional, following by veterinary services. most frequently reported by veterinarian and animal science profesionals, the most economic loss is dueto veterinary services [23].

Feed Deficit Seasons of Sheep and Measure Taken: Both wet and dry season are feed shortage time in most parts of the country specially on April, May, June and Jully is the most focusing area. Lack of rainfall, over grazing, scarcity of land and drought are major causes for shortage feed in dry and wet seasons. Purchasing extra grazing land and purchase extra hay is reducing the number of sheep per house hold. During wet–season due to small grazing land, sheep are predisposed to feed shortage and the farmer purchase extra grazing land and crop residues. Hay and crop residue are also a good source of feed provision measurement during dry season. Management with respect to feeding or grazing was different for dry and rainy or cropping season [27]. Livestock largely

depend on range land grazing or crop residues that are poor nutritive value and fed is not uniformly supplied and the quality is also poor.

CONCLUSION AND RECOMMENDATION

The production system is dominantly mixed crop-livestock production system through traditional management of sheep. Livestock production and crop production is complemented each other that livestock are used as a sources for draft manure for crop production and crop production for crop residues, straw and aftermath serve as main component of livestock feeds. Presences of feed shortage, disesase and lack of capital are major constraintes which dicreases sheep production, productivity and farmers income in the areas. The major available feed resource for sheep production in our study area was natural pasture, crop residues and stuble grazing. Addtionally, indigeneous forage, locally available by products like tella and feedleft over are used for feed sources of sheep. Communal and private natural grazing are predominant feed resource for sheep. Most of the peoples in the country uses extensive feeding system or the sheep that feeds out side their home in the grazing land.

Availability of feed resources was affected by seasonal fluctuation. Feed shortage occurred in dry and wet seasons specially in April, May, June and Jully. In dry season due to lack of rainfall grazing land is poor in feed and in the wet seasone, pasture lands are covered by cereal crop. The feed dificit is solved by purchasing extra grazing land, crop residues, hay and locally available by productes. The recommendation was

- Farmers are fully involved in traditional management of sheep. However, the feasibility of intensive managements on performance of sheep need to be assessed.
- The farmers should develop the habit of cultivating improved forage following different forage development strategies and feed conservation mechanisms like silage and hay, treat crop residues by physical and chemical treatment such as Urea treatmen.
- They should give emphasis on good management of sheep because most constraintes arised by less management practices. Disease control measure accompained by better feeding and management of sheep.
- The farmer store some feed for dry period, using concentrate supplements, purchase of forage.
- Further, confirmatory and exploratory study should be employed to validate and investigate the remaining sheep production systems and its constraints in the country.

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