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Role of Camel for livelihood of poor pastoralist in Ethiopia

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ABSTRACT

Camels represent a valuable source of roles for the pastoralist and adapted to the local environmental condition and selection pressure. Camels play many socio-economic key roles in traditional festivals and other customs, food security, income sources, as gift payment and serve as an important source of animal protein for pastoral communities in the country. It is therefore important due to the valuable traits of camel such as adaptation to harsh environment and ability to consume low energy feed. The characteristics have a significant contribution in performing sustainability in arid and semi-arid production system. The degree of women involvement relative to men in husbandry practice of camel is low rather than caring of calf, sick animal near the homestead aeras and sometimes selling of milk and its by product. Camel milk is unique in terms of curing different diseases traditionally such as jaundice, tuberculosis, asthma, diarrhea, constipation, respiratory disease and some viral diseases. Camels fulfill many communities need that are cultural, economic and social. However, the contribution of camel at the national level is not that much prominence. Thus, detailed information is need to develop appropriate intervention in strengthen the productivity of camel in the country.

Keywords: Camel, climate change, livelihood, pastoralist.

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Introduction

Camel is one of the most important livestock species in arid and semi-arid areas of the country. The total population of camels in Ethiopia is estimated to be 8.1million (CSA, 2019/2020), which provides milk, meat and medicinal value (particularly their milk, meat and urine) for the community than other animals under harsh environment. Camel is a main livelihood option in arid and semi-arid areas that other livestock species are less adapted to the harsh and dry environment (Aklilu et al., 2019; Faraz et al., 2021). The contribution of camel population to subsistence and the national economy tends to be totally undervalued due to lack of regular census, their products seldom enter a formal marketing system (Ahmed *et al*., 2010). Camel contributes livelihood of the poor pastoralist community (Abbas *et al.,* 2000; Tura *et al*., 2010) and also building of assets, insurance against unexpected events, spiritual and social values, traction and movements of goods, food supply and income (Ali *et al*., 2004; SOS Sahel-Ethiopia, 2007).

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In a country like Ethiopia which has arid and semi-arid areas attempt to secure food at household level, any development action that promote the smallholder camel production system in one way or another helps to secure food at household level. The pastoral camel in Ethiopia believed to be a variable and promising sole source of home consumption and cash income for the pastoral resource poor communities. Recently, the importance of camel is going to rapid, due to land degradation and rapid human population growth (Berhanu, 2015), they are now a part of modern life in the desert (Breulmann et al., 2007) and the high added value of their product (Tefera and Gebreah, 2001; Kurtu, 2004 and Musaad et al., 2013). At community level camel keeping is always coined as a livelihood activity preferential by the pastoralist due to its high heat resistance, cope up with feed shortage and tick tolerance (Berhanu, 2015). In the arid and semi-arid parts of Ethiopia, camel represents a significant component of the pastoral household livelihood as a source of cash income and nutrition (Kebede et al., 2015; Elhadi et al., 2015; Wako, 2015). Besides this, some specific types of camel may be kept for the

purposes of drought power, breeding and wealth status indicators (Berhanu et al., 2018). Within this straight forward understanding, the objective of the study to review the role of camel for poor pastoral livelihood and the essentiality of camel for diversified livelihood in Ethiopia

Camel ensures food security and cash income

Camel sector constitutes significantly to human livelihood and food security of poor people who are live in pastoralist area (Beruk and Tafesse, 2000; Yosef et al., 2014; Tura et al., 2010; Abbas et al., 2000; Faraz et al., 2019 and Faraz, 2021). In arid and semi-arid areas of Ethiopia, camel milk plays a significant role for the livelihood of the pastoral people as a source cash income, food and nutrition (Kebede et al., 2015; Elhadi et al., 2015; Wako, 2015), generate employment (Patil, 2011) and building assets, insurance against unexpected event, spiritual and social values, traction and movement of goods (Ali et al., 2004; SOS Sahel-Ethiopia, 2007). It contains vitamin C and mineral contents (particularly, sodium, potassium, iron, copper, zinc and magnesium) which is a good source of nutrition for building of human body who are living in arid region (Alhaj and Alkanhal, 2010 and Yadav et al., 2015). In addition to this, camel milk surges livelihoods of the household and it contribute significantly the national and global economy (Faye et al., 2011). Camel sector constitutes vital contribution to human livelihood by being reasonable source of protein and a great economic role to poor pastoralist of securing food security. Similarly, they involve to household food security through meat and milk (Ahmad et al.,2010; Yosef et al., 2014; Faraz et al., 2019) and also used for transport of people, fuel wood, agricultural products and households' goods as well the hides and wool (Aujla et al., 2013; Faye etal.,2010; Mwinyikione et al., 2016; Faraz et al., 2019). Besides, they are a cheap source of power for drawing water from wells, ploughing and leveling of land. Camels play a valuable contribution in the food security of arid and semi-arid areas of the country which is not suitable for agricultural production. In this harsh area, camels are considered as a cherished to other livestock in terms of food security through the use of meat, milk and milk products and income for a sale. It is a source of cash in milk shed areas that enables households to buy other food and the income they get from camel milk sales allows them to covers most of the households' daily needs. The cash return from milk enables most households to preserve their assets as livestock which is play a vital role in enhancing the economic wellbeing of pastoralist people., otherwise they have sold to access food. People earn around 4.6 times more from camel milk sales then other source (Sisay et al., 2015).

Moreover, camel in arid and semi-arid area in Ethiopia provides 1-12 kg of milk daily which indicates that camels are the frontline animal which is preferred in the pastoral area. In shinile and Jijiga zones camels provide on average 5.2 kg of milk yield daily (Eyasu, 2009),10.5 kg in Haramaya university, Easter Ethiopia (Moges et al.,2016),7 kg in Afar (Simenew et al., 2013),6 kg in borana (Megersa et al., 2008) and 4 kg in Jijiga (Sisay et al., 2015) which much higher than the daily milk yield obtained from local zebu cattle (1.5-2 kg) raised in similar environments (Felleke, 2003). Moreover, camel in Ethiopia has13.38 months of lactation length on average which higher any other milk livestock rear under the same fragile environment. Similarly, the study of Farah et al. (2007) indicated that camels produce more milk for a longer period of time than any other milk animal which held under the same harsh condition. Many scholars identified and prioritized the purpose of keeping came for milk production (Eyassu, 2009; Berhanu et al, 2021; Sisay et al.,2 015; Berhanu et al 2015; Simenew et al., 2012; Belets et al.,2019). In the same circumstance, camel milk contributed significantly as source of income and creates job opportunities in households (seifu,2007; Kebede et al., 2015; Wako, 2015; Noor et al., 2013; Elhadi et al., 2015 and El-malky et al., 2018) and for the purpose of wool (Brigitte, 2005). According to Dejene (2015) milk and meat production (98.9% and 96.7%) was the first important function of keeping camel followed by income generation (92.4%) and transportation (83.7%) in Borna zone. Further, camel used minor purpose like that of drought power, breeding/mating, wealth status indictors and as banking system against the harsh condition (Berhanu et al., 2018). This shows that camel is a promising livestock species which satisfied the demand of the communities in the pastoral areas.

Socio cultural value as reciprocity and social network

Ahmed (1989) and Hussein (1993) reported that camels are needed at a first priority in the community is to provide services such as monetary income and fulfillment of social

obligations such as wedding, holiday, religious ceremony and means of payment of blood money to the lineage of the deceased. The communities believed that camel is strengthens social linkage, used as bridges of marriage linkage, compensation of injured parties in the tribe disputes and social offering in guest among the communities and also camel is slaughter for socio-cultural purpose like festivals, wedding, mourning and religion gust to solidify brotherhoods of the communities.

Across the pastoral communities, camels' meat is used mostly for the feasts held during festival time, funerals, wedding ceremonies, religious festivals or when camels are accidentally injured (Wolde, 1991 and Eyasu, 2009); unless they are not slaughtered for home consumption. Similarly, in Dire Dawa, Jiliga, Harar, Deghabur, Kebridehar and Gode camels are slaughtered during festival times and on daily basis they slaughtered at abattoir for local consumption (Bekele and Kebebew, 2002 and Eyasu, 2009). Slaughtering of camel take place as the permitted of Halal slaughtering procedure for the sake of binding requirement for follower of Muslim communities' faith since meats from animal that have not been religiously slaughtered are always rejected (Schyff, 2014). Camel milk and meat are the stable diet for the pastoralist people (particularly Muslim) but other people are not consuming both camel milk and meat due to cultural taboos against consumption of camel. In eastern Africa, milk is used as a gift, as part of a system of maintaining family ties and mechanism of social support in the arid areas (Nori et al., 2018). According to Yohannes (2006) reported that family gift from 4-10 range of camels which is similar Randille and Gabra community in Kenya (Sato, 1998). The reason of gift might be to build capacity of youngsters' and the family or the tribe/clan who affected by natural disaster and disease. The increment of aridity in pastoral areas of southern Oromia is shifted the type of primarily valuable livestock (cattle and small ruminants) to camel and the social-cultural values of the communities increased based on the increment of camel number (Berhanu et al., 2018).

Gender Participation on camel husbandry practices

Gender related decision making which is often linked to intrahousehold resource allocation is an important determinant of enhancing the productivity of livestock and as well as adoption of technologies by both men and women. There is considerable evidence that women decision making power in household is limited to caring of caves, sick animals near the homestead and sometimes selling of milk and its byproducts. In southern Ethiopia, husband, as the head of household, has control of the responsibility of decision regarding sales of livestock, mobility and restocking (Adugna and seleshi,2013) besides this, the scholars indicted that woman are participated in livestock activities such as grass collection and feeding, watering, milking and processing milk by products in to food items. This work in agreement with the study of Awoke et al. (2015) reveled that gathering cut and carry forages and hauling water for relatively immobile young calves which are kept in near the homestead are the responsibility of women members of the household.

In the same way, Kassahun (2011) reported that female only involved in calf rearing activities and apart from this woman has no role milking, herding and marketing of camel. The wife is therefore expected to seek the decision of her husband and ultimately his consent before going ahead with any plans that may bring about any changes in the allocation of household resources. According to Tangaka et al. (2000) reported that for animal serving purpose that are within the domain of women responsibility such as milking animals that feed families, women will have greater influence on decision making regarding animals. Similarly, Simenew et al. (2013) and Yohannes et al. (2015) reported that husband and sons are responsible members of the families to manage camels in the Afar society. Likewise, Tadesse (2019) showed that livestock husbandry practices (breeding objectives, herding, milking and marketing) were decided by men or both. In some area of Oromia and Somali region of the country, both husband and wife were together deciding the sale and purchase of animals and camel milk (Taddese, 2019). This work in consent with the report of Tangaka et al (2000) disclosed that husband and wife make joint decision on the purchase and sale of livestock in the Ethiopian highlands. Study conducted by Fiona (2011) in Borena zone indicated that decision to dispose livestock is made by both husband and wife. On the other hand, the study of Seid (2011) showed that both male and female undertake calf caring if it is around their homestead especially during wet season however in herding the major

activities for young male and also responsible in taking animal to veterinary and market.

A woman tends to have greater control over livestock by products that is given to her through a gift. In accordance, in Northern Kenya and southern Ethiopia women participation is increased decision making on targeted livestock products markets (McPeak et al., 2012). In addition, the authors observed that women own all types of livestock including cattle and camels and they are increasingly involved in herding activities. However, women are not allowed herding camels since it is difficult duty and camels browse until night time, if women keep camels which will cause a risk (Yohannes et al., 2015). In similar manner, female in Afar, Boran and Somali are not involved in milking camel (Kassahun, 2011; seid, 2011; Simenew et al., 2013; Tafesse et al., 2002; Eyasu, 2009; Keskes et al., 2013 and Sisay et al., 2015; Tadesse et al., 2015). In Afar and Somali communities, camels are highly valued and sacred animals so that it is not permitted to women to milk and do not let down adequate milk for women milkers (Tadesse et al.,2015). This due to that the communities believed that lactating camel would die if milking is carried out by women as scholars reveled in this study areas. And also, females are not allowed to drink camel milk until some days after birth of pregnant women and could not touch milking and drinking equipment, it showed that the custom is deep rooted. On the contrary, Borna women are mainly involved in milking activities (Bekele, 2010). Females have a vital role as livestock herder, natural resource managers, income generators, and service providers, tasks which by themselves are influenced by gender norms, values andrelations (Ridgewel et al., 2007).

Women participate all the work sharing activities in pastoral livestock management practices except breeding objectives, health management and marketing activities and also the decision-making power of women is showing an increment in the sedenterization of Borena areas (Yosef et al., 2015) due to dispelling the impact of elders on the community to rule and define the implementation resources to individuals' properties. Therefore, play a vital role to increase livestock productivity in the pastoral areas of Ethiopia, with a dramatic involvement of women of productivity such type has economic meaning and push up the positive role of women for transformation (Yosef et al., 2015).

Camel on the Resilience of Drought

Recurrent and prolong drought has negative impact in the pastoral area through climate variation by induced shock (United nation Development program, 2009) which scarce access to water and pasture for livestock. Recurrent droughts lead to increases in coincidence of some livestock disease and health, deterioration of livestock conditions at times force pastoralists to alter their herd structure and a collapse of livestock market (Opiyo et al., 2015). And its common in pastoral areas, but the frequency and severity of drought in the area has increased the face of climate change (PFE, 2010). This is drive to change the ecological systems and survival rates of the pastoralist communities (IPCC, 2014). Climate variability manifested in the form of recurrent drought is making it increasingly hard for cattle the most important livestock species in African dry lands to survive in the arid and semi-arid areas (Kagunyu and Wanjohi, 2014). Traditionally, communities in this area resilience or survive the effect of long drought through breeding locally adapted livestock species and diversifying livestock species kept. The numbers of camels in Ethiopia increased from 1 million (FAO, 2002) to 8.1 million (CSA, 2019/2020). This digit indicated that pastoral communities in the arid and semi-arid areas that they manage, substituting them for ruminants in order to have more drought resilience livestock. Camels have ability to resist drought than ruminant, performing well in adverse conditions and have low energy requirement (Maloiy et al., 2009).

Camels present a unique opportunity for adaptation to drought and varying pasture quality due to their morphology and physiology which help them to withstand harsh environmental condition (Yosef et al., 2014; Kagunyu and Wanjohi, 2014) and through monoculture (camel culture) which is expressed as an adaptation to arid ecology, it dependance on the camel based on uniform husbandry methods and mobility (Tefera, 2012). This unique adaptation capacity of camels be able to survive on very low protein and low energy diets feed resource and convert in to milk, meat and fiber. This secret is because of the physiological digestibility of camel meaning ability to reused nitrogen, slow transit and ruminal flora, allows

the camel to utilize low energy diet feed and this give an opportunity to more superior feed efficiency than other livestock species. In Ethiopia camel production management practices is basically traditional and the pastoralist only practiced extensive production system with no improved forage production for milk, meat and draft purpose (Eyasu, 2009; Yosef et al., 2014; Yohannes et al., 2015). Camels are interesting as a biological model for food supply in remote areas, combat the growing desertification and attaining food security of millions of people (Bernard, 2008; Raziq et al., 2008).

In addition to this, camels almost have no competition for feed with other livestock, as they are hardy, comparatively eat less, sleep for short intervals and have a lifelong memory (Khan et al., 2003) and also, they survive with no water unbelievable period of time and tolerate expansion of bush encroachment of this fragile areas. For that matter, camels has ability to browse a variety of plant than other ruminant animals such as halophyte grass, bush, tree and therefore they have low impact on floristic biodiversity of the arid areas(Laudadio et al., 2009). The pastoral areas are keeping cattle for the aim of improving milk production, growth and improved adaptation to the local environmental challenges (Endashaw et al., 2012) but livestock species could not cope with up the calamities and natural disaster like disease and drought than camel (Mochabo et al., 2005),so the communities tend to bend camel rearing partly due to climate change particularly in Africa (Faye et al., 2012).Similarly, changes in ecology, changes in socio-cultural habits and increased frequencies of drought their importance by itself are giving an opportunity behind the expansion of camels into the southern Oromia as well as the fragile area of the country(Biffa and Chaka,2002 and Berhanu et al., 2018). Correspondingly, camel management has been newly adopted by the pastoral communities in shinile and Guji zones, in Ethiopia (Riche et al., 2009 and Wako, 2015).

Recently, camel contribution is going to increase following land degradation and rapid human population growth (Berhanu, 2015) to fulfill the demand of the communities in pastoral area. High potential of milk production and their capacities to resist harsh environmental condition are the most preferred trait that contributed to the adaptation of camel in pastoralist areas in southern Ethiopia (Wako et al., 2017). The most important coping strategies used by the pastoral and agro pastoral communities are faced with drought through mobility, raiding of animals and species diversification (Wako et al., 2017). Also, the contribution of camels has risen as a result of an increasing gratefulness of their potential of milk production and adaptability to climate change (FAO, 2010). This indicated that the communities practiced camel management as an adaptation strategy to climate change with the response to the impact of recurrent and severe drought.

Camel milk for traditional disease treatment

Pastoral communities used camel milk as a traditional medicine to treat several diseases and also builds the immune system of human beings when they consumed (Kumar et al., 2004; Sharma and Singh, 2014; Yadav et al., 2015 and Jilo, 2016). It is the core of some pastoralist culture, life and health and considered as white gold of the desert (Gul et al., 2015). Camel milk has been believed to provide potential treatment for disease such as jaundice, malaria, constipation, stomach ulcers, postpartum of women, snake bite and flatulence (Seifu, 2007). Alemayehu (2001) and Tezera (1998) reported that camel milk has special properties to cure jaundice, dropsy, gastro-intestinal disorder and strong cough. In Babilie aera camel milk used for the treatment of gastritis (17.5%), asthma (7.5%), constipation (7.5%), stomach discomfort (2.5%), HIV (7.5%), hamot/kar (12.5%), tuberculosis (12.5), fever (2.5%), urinary problem (5%) and hepatitis (yewef beshita) (2.5%), where as in Kebribeyah it used for constipation (41.7%), jaundice (18.3%), hepatitis (6.7%), common cold (1.7%), diarrhea (1.7%), vomiting and diabetics (Zeleke et al., 2007). Similarly, in Somali region reported that camel milk treats diabetics (Bussa et al., 2017), jaundice, malaria and constipation in Kenya (Akweya et al., 2012), diarrhea, constipation, stomach ulcers, wounds and liver disorder in Pakistan (Abbas et al., 2013).

According to Yagil (2013) camel milk is used for the treatment of diarrhea and autism in Iseral. Likewise, Nori et al (2018) reported that camel milk used to cure tuberculosis and HIV/AIDS related problem in hospitals of Arab countries. And also study in India indicated that gastroenteritis, tuberculosis, diabetics, allergies, autism, liver inflammation, arthritis and cancer could be treated by camel milk (Kumar et al., 2004 and Ilse, 2004). The potential of camel milk to curing diseases might be due to browse on

various plant species and active agents with therapeutic properties secreted in to the milk (Seifu, 2007 and Bussa et al., 2017) and also the presence of bioactive substance in the milk indicated by many studies. Children who drink camel milk are grow faster and strong and it is important to balance malnutrition who suffered by it (Amante, 2014) and have had tremendous improvement in their behavior and diets (Abbas et al., 2013). It is playing a great role for whom suffering of lactose intolerance individuals and it can be digested easily because of similar lactose content with human mother milk (Lvy et al., 2011). In the same way, camel meat has relatively more polyunsaturated contents than cattle meat and has remedial purposes in the treatment of many diseases like jaundice, long bone pain, arthritis, diabetes, spleen infections and liver disorders (Kadim et al., 2008) and aphrodisiac (Kurtu, 2004).

According to Zeleke et al. (2007) reported that camel meat used to treat fracture, asthma, HIV, tuberculosis and gastritis. In accordance, Kurtu (2004) reveled that camel meat has a remedial effect on hyperacidity, hypertension, pneumonia and respiratory diseases and aphrodisiac. In addition to this camel urine is useful for treating scabies, ekek, yewef beshita through washing, semiring the injured area and drinking it by mix with milk (Zeleke et al., 2007).

Conclusion

Camel has significant potential to offer great roles to the pastoral communities. Camel is a promising livestock species to secure food in the arid and semi-arid areas of pastoralist in the country. They represent substantial potential source for future food production following climate Change, decreased production of the other animals and increment of human population growth. Camel milk and meat, even urineis playing a pivotal role in the traditional treatment of disease of the pastoralist and nomads' communities. Camel husbandry practices is a livelihood activity mainly carried out by men of the household to meet their immediate consumption and cash expenditure needs. These shows, there is no intra-household gender equality to decide the importance of camel in arid and semi-arid areas of the region. Therefore, attention is need to increase the involvement of women for the development outcome where incomes managed by females have been found to result in improved outcomes in the family. Generally, profound research is need to dig out the performance of camel for design appropriate intervention and genetic improvement to enhance their productivity in the country.

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