

**Review Article**

The Current Food Insecurity and the Need of Livestock Products for Food Security and Future Prospects of Livestock Production in Eastern Gojjam

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ABSTRACT

Food security comprises all circumstances of food including its availability, access, sufficiency nutritiousness, and healthiness for the well-being of human race in day to day activity of life. Food insecurity is a cumulative result of multi factors that can affect the economy, health, and livelihood of human beings of a nation or specific area. Among the factors human population pressure, well-being of the environment, feeding practices of people, educational background, and livestock rearing practices are the main contributing factors in the nation as well as in east Gojjam. The state of food insecurity and specific contributing factor of food and nutritional quality and security with its food diversity in east Gojjam has vital importance to know the problems and mitigate the challenges. The aim of this review is to identify and discuss the current status of food insecurity and its consequences, the role of livestock products in food/nutrition security, and future prospects of livestock production in eastern Gojjam. Among the Amhara region, East Gojjam is the one that has the highest prevalence of food insecurity ranging from 59.2% to 65.3%. Similarly, the overall agrospatial prevalence of food insecurity is 65.3%. Another study on Choke Mountain Watersheds in east Gojjam reported that Food insecurity across podoconiosis patients and the non-podoconiosis households were found 83.7% and 53% respectively. Food insecurity is highly associated with household malnutrition.

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Cite this Article: Bainesagn Worku Wolelie (2021). The Current Food Insecurity and the Need of Livestock Products for Food Security and Future Prospects of Livestock Production in Eastern Gojjam. *Global Journal of Animal Scientific Research*, 9(1), 1-20.

Retrieved from <http://www.gjasr.com/index.php/GJASR/article/view/66>

Article History: Received: 2020.12.28 Accepted: 2021.02.15

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Regarding this stunting are main indicator of malnutrition. The prevalence of stunting in eastern Gojjam ranges from 37.5 to 52.5%. out of the stunted children 48.5% and 47.7% boys and girls respectively. Similarly, another indicator of malnutrition is underweight and wasting. The prevalence of underweight and wasting also ranges from 15.3% to 24.3% and 10% to 17.1% respectively. Inadequate education, socio-economic status, and low household income have an impact on feeding habits and food diversity. Therefore, sufficient intake of Animal source food increases fat stores and provides nutrients that are essential for growth and micronutrients that support the immune system. The zone is highly endowed with diverse livestock species and breeds. Therefore the prospects of livestock production in the zone is considered as an economic driver for job, draft power for food and nutrition security.

Keywords: Food security, Livestock, East Gojjam

INTRODUCTION

Food insecurity can be described when a person lacks regular access to enough safe and nutritious food for normal growth and development and an active and healthy life (FAO, 2020). Food insecurity is a state or a condition in which people experienced limited or uncertain physical and economic access to safe, sufficient, and nutritious food to meet their dietary needs or food preferences for a productive, healthy, and active life. It is recognized that food insecurity, is a multidimensional phenomenon. Several indices measuring hunger and the progress in achieving hunger eradication helped understanding the issue and monitoring the progress in eliminating hunger as well as providing targets for national and international political action (Clay, 2002).

Food insecurity can exist in various ways in different parts of the world. It may occur as non-availability of food, lack of access, improper utilization and instability over a certain period time (Napoli *et al.*, 2011). Food insecurity and associated malnutrition result in serious health problems and loss of human potential for economic developments in developing countries(Susan *et al.*, 2014).

The world's population is expected to increase by 2 billion persons in the next 30 years, from 7.7 billion currently to 9.7 billion in 2050. The world's population continues to increase, but growth rates vary greatly across regions. Every year, the world is producing more than enough food to feed its entire population, yet food security remains elusive with hunger, a continuing epidemic, especially in developing countries (FAO, 2015). About 70% of the worlds' population are believed to living in cities with an average income almost twice as high as today. As a result, global demand for both crop based and animal products will continue to grow and play a critical role in global food security and nutrition.

The population of sub-Saharan Africa is projected to double by 2050 (99% increase)(UNDP, 2019) and the demand for cereals will approximately be tripled. Ethiopia is among the top ranked populated sub Saharan countries. Alongside, East

Gojjam from Amhara, which is second populous of the country, would have similar trend of population increase. Moreover, traditional farming practice, unstable weather conditions, recurrent drought, pests and disease, population pressure or growth, weak institutional capacity, inadequate infrastructure and social services are the other major reasons that determine food security in Ethiopia and parallelly in east Gojjam (Scrimshaw, 2003; Birhanu, 2001; Tilaye, 2004; Bogale, 2002; Mitiku *et al.*, 2012).

Access to diverse, safe and nutritious diets is necessary for health and wellbeing of human being. Since Animal source foods (ASF) are rich in micronutrients and high biological value protein. Among children, consumption of milk is associated with greater height, and consumption of meat with better cognitive development (Grace *et al.*, 2018). However, in most low-income countries, and particularly in more remote areas where populations are vulnerable, consumption of ASF is still limited (Grace, 2015).

Generally, the importance livestock products can be seen in multiple dimensions of day to day activities of human race which is impacting from different perspectives. They produce food, enhance crop production and provide additional economic goods and services as well as cash income.

The inclusion of livestock diversifies and increases total farm production and income, provides year-round employment and disperses risk. Sales of livestock products provide funds for purchasing crop inputs and for financing farm investments. Therefore, this review paper has an objective to review and discuss the current status food insecurity and its consequences, the role of livestock products in food/nutrition security and future prospects of livestock production in eastern Gojjam.

Food Insecurity Level and Indicator

Food is not a 'normal' commodity, in that it has no substitutes. If we are unable to obtain adequate food we suffer, and soon die, regardless of how much we possess of other things. There are four level of food insecurity. These are Global level food insecurity, National level food insecurity, Household level food insecurity, Individual level food insecurity (Peter, 2014). Household food insecurity is a major determinant of nutrition security that can only be fully understood through a multi-level analysis taking into account global, national/regional, as well as local, household and individual-level factors (Frankenberger *et al.*, 1996; UNDP, 2007)

There are five commonly used methods that can be used to assess food insecurity. Those were: i) the Food and Agriculture Organization (FAO) method for estimating calories available per capita at the national level; ii) household income and expenditure surveys; iii) individual's dietary intake; iv) anthropometry; and v) experience-based food insecurity measurement scales (Perez and Maria, 2008). Among the above indicators the anthropometric indicators most commonly used in national

surveys are based on weight and height (or length) of infants, young children, youth and adults.

The interpretation of the adequacy of the anthropometric indicators is based on well-established cut-off points. Anthropometric indicators measure the impact of both food insecurity and health status on the nutritional status of individuals.

Current Status of Food Insecurity, Malnutrition and Association of Health

Impact

Food insecurity is a condition in which people experienced limited or uncertain physical and economic access to safe, sufficient and nutritious food. Household food insecurity is lack of access to a diet of sufficient quality and quantity necessary for productive and healthy life (Selegman *et al.*, 2009). Limited resource and increased food price problems affecting many households of the world including Ethiopia, are the common factors that affect food insecurity (Carter *et al.*, 2010; Belachew *et al.*, 2012).

The average food insecure populations in Ethiopia were estimated to be around 37% (ICP, 2020). studies also show that some parts of Ethiopia like Addis Ababa (58.16%) Gezmu, (2012), Sidama (54.10 %) Regass, (2011) and west Ethiopia (53.62%) Seid and Biruk, (2019) were highly food insecure area. The prevalence of food insecurity in Amhara region is highest than the countries' average which is 46% (IPC, 2020). Studies show that the prevalence of food insecurity in Sekela (73.11%) Shimeles *et al.*, (2016), Farta (70.7%), Endale *et al.*, (2014) and West Gojjam (55.3%) was confirmed the high food insecurity of the region. Among Amhara region East Gojjam is the one which have highest prevalence food insecurity ranging from 59.2% to 65.3 is (Achenef *et al.*, 2016; Zewdie, 2017).

The spatial variation of household food insecurity based on agroecosystem characteristics in east Gojjam was very high as it is indicated below in the figure. As it was studied by Zewdie *et al.*, (2017) the overall prevalence of food insecurity is 65.3%. The highest prevalence household of food insecurity was from the Abay Valley lowlands. Secondly the highest prevalence of food insecurity was studied from hilly and mountainous highlands which is 69.8%. Similarly, midland sloping land with red soil, midland plains with brown soil and midland plains with black soil Agroecosystem was studied and it was about 63.5%, 61.7% and 61.5%, of household food insecurity prevalence respectively. From overall 65.3% of household food insecurity 38.1 %, 23.1% and 4.1% were mildly, moderately and severely food insecure households, respectively (Zewdie, 2017).

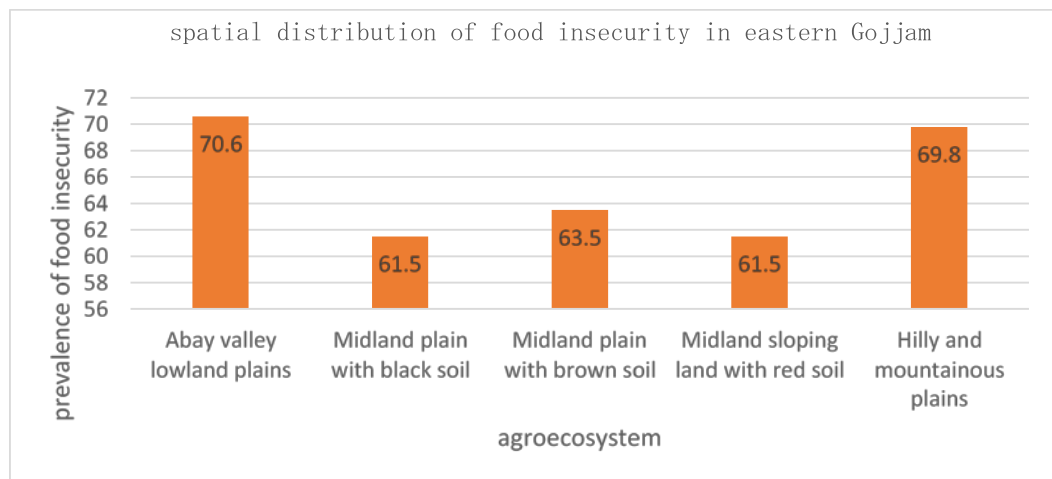


Fig. 1. Spatial distribution of food insecurity

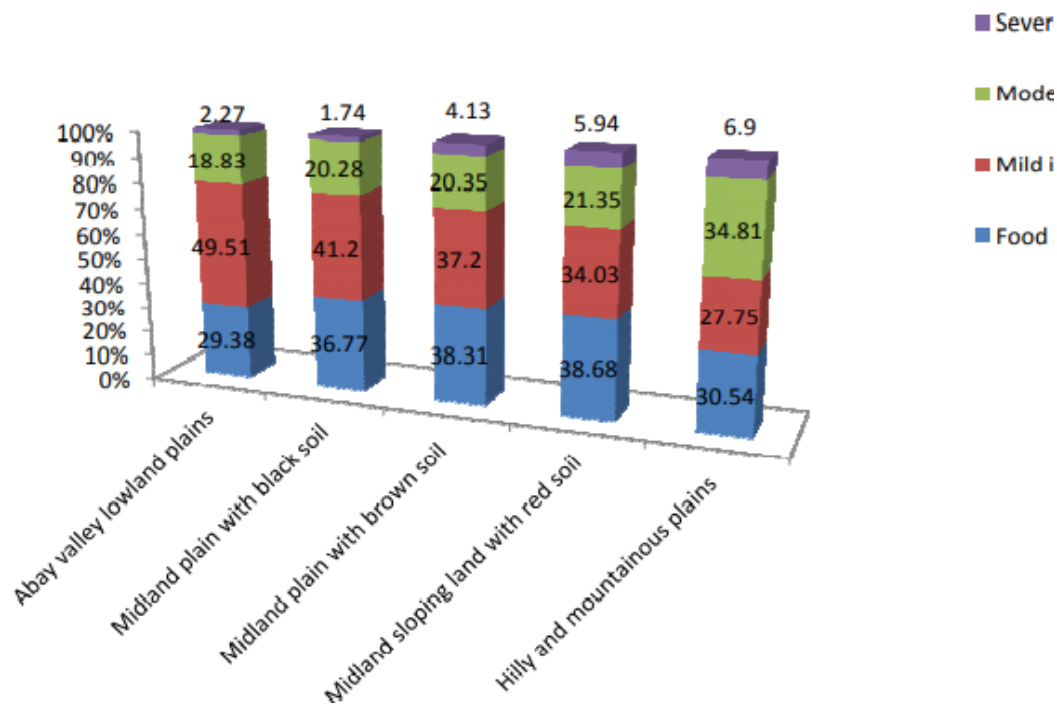


Fig 2. The severity of food insecurity through spatial distribution
Source: PhD Dissertation of (Zewdie Aderaw, 2017)

Another study on Choke Mountain Watersheds in east Gojjam show that Food insecurity across podoconiosis patients and non-podoconiosis household was 83.7%, 53% respectively (Kassahun *et al.*, 2018). In general, inadequate quality and quantity of food supply to the household members affect the nutritional status of the community (Ermiyas and Bezatu, 2017). Also, it limits growth and development of young children and infants, increases adolescent school absenteeism, lowers educational attainment, lowers cognitive and academic performance among children

and adolescents and affects psychosocial interaction (Currie *et al.*, 2011; Martorell *et al.*, 2010; Dewey and Begum, 2011).

Food insecurity has also been linked in the literature to a variety of health outcomes such as: undernutrition, iron deficiency anemia, multiple chronic conditions, obesity and poor self-rated physical and mental health (Gucciardi *et al.*, 2009). Food insecure individuals have elevated experience of anxiety, depression and other symptoms of common mental disorders compared with food secure individuals (Andrew, 2017; Mulusew *et al.*, 2016).

Studies conducted in developing countries including Ethiopia indicated that food insecurity and malnutrition have a direct association. prevalence of undernutrition can be explained by stunting, underweight wasting and other related parameters among under-five children.

The Prevalence Of Stunting, Wasting and Underweight in Eastern Gojjam

Food insecurity and malnutrition with the association of low food diversity has directed to different health problems. Studies done in Ethiopia have shown that children borne to severely and moderately food insecure households were more likely to be stunted than children borne to food secured households (Ali *et al.*, 2013; Seifu *et al.*, 2015).

Stunting is defined as the percentage of children aged 0 to 59 months whose height for age (HAZ) is below minus two standard deviations (moderate and severe stunting) from the median of the 2006 WHO Child Growth Standards (WHO, 2018).

Regarding this, more than one-quarter of under-five children in the developing world are stunted, and those with poor nutrient intake are at risk of irreversible cognitive impairment. Stunting is defined as height-for-age z-score below -2.0, using the current World Health Organization (WHO) standards from the Multi Growth Reference Study.

Stunting is a manifestation of severe, irreversible physical, physiological and cognitive damage caused by chronic malnutrition during a child's first 1,000 days or from the beginning of pregnancy until the age of two years (UNICEF, 2018; World Bank Group, 2016).

Stunted children are too short for their age. Every year, stunting is the cause of the death of one million children around the world (UNICEF, 2015). For the children who survive, stunting in infancy and early childhood causes long term effects, including poor cognition and educational performance, diminished physical development, poor health, lost productivity and low adult wages (Horton and Steckel, 2013; Martorell, 2010; UNICEF, 2015). Therefore Childhood stunting is the best overall indicator of children's well-being and an accurate reflection of social inequalities.

In Ethiopia, about two out of every five (38.4 percent) children under five years are stunted (CSA and ICF, 2016; UNICEF/WHO/World Bank, 2018). The prevalence of

stunting was taken into account to determine the sample size which is considered as the best indicator of nutritional status of the community and also since it is not affected by acute events.

According to the WHO malnutrition classification, when stunting, underweight, and wasting become more than 40%, 30% and 15% it is considered as very high or critical and high or serious when stunting, underweight and wasting become in the range of 30–39.9%, 20–29.9% and 10–14.9% in the community respectively (WHO, 1995). Therefore, the prevalence of malnutrition (stunting and underweight) in East Gojjam area was in the serious range and wasting was in the critical range.

According to Ethiopian Demographic and Health Survey (EDHS) (2016) report, compare to the previous survey report the number of stunted children under five years old showed a decreasing pattern over the last five years from 44% in 2011 to 38% in 2016 but, still 38% of Ethiopian under five children are suffering from stunting of them 18% are severely stunted (EDHS, 2011).

In Amhara Regional State, which is one of the states in Federal Democratic Republic of Ethiopia, childhood stunting and underweight are decreasing through time from 57% to 46.3% and 51.8% to 28.4%, respectively, between 2000 and 2016 (CSA, ICF International and EDHS, 2016). In the region, like the global and national trends, childhood wasting did not show improvements over time. The recent mini EDHS, (2014) and EDHS, (2016) reports indicated that childhood stunting (42.4% to 46.3%) and underweight (27.9% to 28.4%) increased between 2014 and 2016. Table 1 below shows the trends of childhood under nutrition from 2000 to 2016 in Ethiopia and Amhara Regional State.

Trends of child undernutrition in Ethiopia and Amhara Regional State, 2000- 2016

Table 1. The national and Amhara stunting, Underweight and wasting level across time series

Nutritional indices	National					Amhara Region				
	2000	2005	2011	2014	2016	2000	2005	2011	2014	2016
Stunted	58	48	44	40	38.4	57	56.6	52	42.4	46.3
Underweight	41	33	29	25	23.6	51.8	48.9	33.4	27.9	28.4
Wasting	12	12	10	9	9.9	9.5	14.2	9.9	9.7	9.8

Source: (CSA, 2014)

East Gojjam is one of zones found in Amhara region with highly cereal based cropping agriculture and highly diverse livestock composition. The prevalence of stunting in eastern Gojjam ranges from 37.5 to 52.5% (Achenef *et al.*, 2015; Zwdie, 2017). out of the stunted children 48.5% and 47.7% boys and girls. From the stunted

children about 19.3% and 28.8 were found in rural and urban areas respectively(Desalegn *et al.*, 2014).

Similarly, another indicator of malnutrition is underweight and wasting. The prevalence of underweight and wasting ranges from 15.3% to 24.3% and 10% to 17.1% respectively(Zwdie, 2017; Achenef *et al.*, 2015; Abrehet *et al.*, 2019).

In east Gojam an important study shows that stunting, underweight and wasting across different agro ecology is vital for different stockholders to meet sustainable solutions and to full fill the needs of the most vulnerable community(Zwdie *et al.*, 2017). Knowing the spatial distribution and determinant factors of child undernutrition is very crucial so as to mitigate and target nutrition intervention strategies to malnutrition based on the characteristics of agro ecological which impacts the food security and malnutrition.

This spatial variation might be attributed to agronomic related factors, community climate change vulnerability and adaptive capacity, population pressure, presence of irrigation(Seifu *et al.*, 2017) and ecosystem services to the farming community(Ngianga *et al.*, 2011). Different investigations show the ecosystem characteristics associated with the dietary diversity, which are recognized as determinant factors of child undernutrition (Johnson *et al.*, 2013).

Therefore, child undernutrition spatial variation analysis using the Biophysical elements taking agroecosystem characteristics into account is very important to target interventions focusing on resource allocation and mobilizing the community and different stakeholders.

Table 2: The spatial distribution of stunting, underweight and wasting in east Gojam

Agroecosystem type	Wasting (% < -2SD (95% CI))	Underweight (% < -2SD (95% CI))	Stunting (% < -2SD (95% CI))
Abay valley lowland plains	14.8 (12.2, 17.8)	22.9 (19.7, 26.3)	42.4 (38.5,46.6)
Midland plain with black soil	11.6 (9.3, 14.00)	22.3 (19.0, 25.5)	39.4 (35.4,43.4)
Midland plain with brown soil	10.6 (8.4, 13.2)	15.2 (12.4, 18.0)	38.5 (34.9,42.1)
Midland sloping land with red soil	8.3 (6.4,10.7)	12.2 (9.4, 14.9)	33.9 (30.0, 37.7)
Hilly and mountainous plains	15.9 (13.5, 18.8)	20.9 (17.6, 24.0)	41.1 (37.3, 44.6)

Source: (Zewdie, 2017)

Regardless of being Model or Non model household farmer in East Gojjam the extent of stunting, underweight and wasting prevalence was very high(Abrehet *et al.*, 2019). There are also factors like shortage of farm land, soil erosion, lack of oxen, poor food production system, outbreak of plant and animal diseases, poor soil fertility, poor farming technology, weak extension services, poor labor work force, poor infrastructure and pre- and post-harvest crop loss(Birara *et al.*, 2015; Diriba, 2018; Jules and Zareen, 2014). This may be related with major nutritional problems in the diets which leads to dietary diversity problem, mainly comprising plant-based food sources, but with limited intake of fruits and vegetables and animal feed sources(

Zewdie, 2017; Abrehet *et al.*, 2019). This might be contributed due to inadequate education, socio economic status and low household income and in turn have an impact on feeding habit and food diversity (Abrehet *et al.*, 2019; Desalegn *et al.*, 2014).

Therefore, sufficient intake of ASF increases fat stores and provides nutrients that are essential for growth and micronutrients that support the immune system (Zhiying *et al.*, 2016). Short supply of micronutrients was resulted on infant's poor growth. The immune system might also be depressed due to inability of low-fat mass to secrete leptin that helps stimulate immune system (Trias *et al.*, 2017; FAO, 2013).

The Role of Livestock Products on Food Security and Nutritional Security

Poor dietary quality due to limited intake of a variety of animal source foods (ASF), including milk, is a contributing factor for malnutrition and multiple micronutrient deficiencies among many of these children (Laurencia *et al.*, 2017). Micronutrient deficiencies occur in part due to consumption of diets that lack ASF and consist mainly of staple foods such as cereals and legumes that are devoid of vitamin B12 and have high fibre and phytate content, resulting in impaired bioavailability of micronutrients such as Fe and Zn (Herrador *et al.*, 2014; Charlotte *et al.*, 2002).

The typical diet in populations with a high prevalence of malnutrition consists predominantly of a starch-rich staple, such as a cereal (maize, rice) with limited amounts of fruits, vegetables, legumes, and pulses, and little or no animal-source food. Such a diet is bulky, has a low density of energy and nutrients and a low bioavailability of minerals, and will result in impaired growth, development, and host defense to infections (Michaelsen *et al.*, 2009).

Animal source foods (ASF) provide crucial nutrients in highly bioavailable forms to young children during the complementary feeding period (Iannotti *et al.*, 2018). These foods, long part of our evolutionary past, likely played a central role for increasing body and brain size at particular junctures in hominin history (Kuipers *et al.*, 2011). Iron deficiency with or without anaemia is among the most prevalent and devastating deficiencies in developing countries and results in retarded cognitive and motor development, growth, immune function and physical activity (Daniel *et al.*, 2020). The major causes of iron deficiency include poor bioavailability of iron in plant-based diets (Richard and Ines, 2010), inadequate meat consumption (which inherently contains readily absorbable haem iron), and blood loss due to parasitic infections, particularly hookworm infections (Charles *et al.*, 2018; Zhiying *et al.*, 2016).

Vitamin B12 deficiency occurs in populations consuming primarily plant-based diets and is associated with delayed development, lethargy, anaemia and poor school performance in children and adolescents (Green *et al.*, 2017). Zn deficiency is associated with the impairment of multiple biological functions, including protein synthesis, growth and cell-mediated immunity, and is associated with delays in

cognitive development, lower school scores and lower levels of physical activity (Judie *et al.*, 2014).

These are catalytic proteins that signal (or regulate) anabolic processes such as cellular growth and differentiation. One type, mechanistic target of rapamycin complex 1 (mTORC1) regulates growth in chondral plates (i.e., part of the bone where growth takes place) and in skeletal muscle growth. Essential amino acids are needed for the activation of mTORC (Semba *et al.*, 2016) and the best sources are animal source foods (ASFs) (meat, poultry, fish, and eggs). Plant sources also contain these, but typically in much lower concentrations.

In addition, ASFs are dense in a wide range of micronutrients linked to growth and cognitive development (iron, B12, choline, zinc), and cow's milk is uniquely rich in calcium and its ability to stimulate the secretion of insulin-like growth factor I (IGF-I), a hormone that stimulates bone and tissue growth (Dror and Allen, 2011). Maternal and infant fish intake may subtly enhance neuro development and the child's early development of language and communication skills (Julie *et al.*, 2004).

Diets of rural Ethiopian populations are predominantly plant based with low intakes of animal-source foods (CSA, EDHS, 2011). Rural populations of low-income countries' Diets were dominated by non-refined cereals and legumes which are rich in phytates that form insoluble complexes with iron, diminishing its bioavailability (Kishor *et al.*, 2015; Vanesa *et al.*, 2019). Consumption of animal source foods which contain readily bioavailable iron and by themselves are Fe-absorption enhancers is low in these populations (Charlotte *et al.*, 2002).

A study in Ethiopia revealed that the dietary diversity among school-aged children was low (Dawd *et al.*, 2016). Similarly intake of ASF was a protective factor against stunting and zinc deficiency (Laura, 2019).

As the overall fact Livestock's contribution goes beyond the production of meat, milk and eggs, and a number of factors determine their overall impact on food security (Smith *et al.*, 2013; Debruyne *et al.*, 2015). In general, the contributions include: the direct supply of essential macro- and micro-nutrients; the contribution of domesticated animals to agricultural productivity through manure and draught power; and the income generated by livestock production at household and national level.

Economic Contribution of Livestock for Farmers

Benefits from livestock to food and nutrition security arise both directly (by improving household diet through increasing access to animal source foods) and indirectly (by improving income and ability to purchase more diverse foods). As improved incomes and urbanisation shift diets towards high value commodities such as meat and milk, the contribution of livestock to economic growth increases through its multiplier effects with agriculture and other sectors outside agriculture (McDermott *et al.*, 2010). It is evident that livestock enable saving, provide security, allow

resource-poor households to accumulate assets, and help finance planned expenditures as well as those that are unplanned (i.e. illness). Livestock function as insurance policies and bank accounts in many parts of the developing world(Pell *et al.*, 2010).

Livestock for Crop Production and Improvement

The contribution of livestock to crop production through the provision of draught animal power and manure cannot be overemphasized(Herrero *et al.*, 2010). Animal manure increases soil fertility, soil structure and water-holding capacity. To secure soil quality, by-products could be used to feed the soil and fertilise the crop. But another option is to first feed these by-products to farm animals to produce ASF for humans, and subsequently recycle the animal and human excreta to the soil. In this way, we could produce ASF and also maintain soil quality(Stroebele *et al.*, 2010).

Current Scenario and Future Prospects of Livestock Production

Ethiopia is endowed with diverse agro-ecology with its plant and animal diversity. The country is a Habitat to different species and breeds of animal(EBI, 2014). Currently the Production systems of livestock in the country is classified by three catagories(Shapiro *et al.*, 2017; FAO, 2018). These are Mixed crop livestock production system, Pastoral production system and Specialized urban and periurban Livestock production (CSA, 2017).

Among the livestock production system East Gojjam zone is classified under mixed livestock production and characterized by extensive farming system with having indegenous livestock breeds mainly for drought power. The production system is also characterized by Low input and low output, Dependent on natural resources (free grazing) and Not market oriented(Alemu and Awoke, 2018).

In the mixed livestock-crop systems of the Ethiopian highlands and midaltitudes, livestock production is subordinate, but economically complementary to crop production. In east Gojjam, livestock, especially cattle, provide traction, which is a vital contribution to the overall farm labor requirement. Within the integrated croplivestock production systems, animals play a particular vital role, the extent of which is dependent on the type of production system, animal species and scale of the operation(Sebsibe, 2018).

Livestock feed balance at individual farmer level over the entire production year should be determined inorder to specify annual average livestock holding of farmers. Expansion of grazing land is not a practical option to increase feed supply. Therefore, increasing food feed crops production per unit area, conservation of surplus forages, strategic feeding will increseae livestock products. Currently the prospects of Livestock in the zone is considered as an economic driver for job, draft power for food and nutrition security.

CONCLUSION

Food insecurity is a broad term which can be related with food and nutritional security. Nutritional insecurity and food diversity are highly affected by different factors that connected with living standards of the society, socio economic characteristics, geographic and climate with its social politics.

Therefore Understanding and reviewing the state of food and nutritional insecurity for a nation or a particular area has prime importance to identify the gaps and challenges of countries or specific area for future mitigations and solutions. Regarding this east Gojjam Zone has diverse agroecological conditions with its diversified food crops and livestock resource. However from the review result the prevalence of food security ranges 59.2% to 65.3%. Similarly another indicator of malnutrition, underweight and wasting, was very high in east Gojjam which ranges 15.3% to 24.3% and 10% to 17.1% respectively.

This review shows us food security and malnutrition is severe and might be connected to the feeding habit and food diversity of the area. Since East Gojjam is highly cereal based crop producing area the diet of the people might lack animal source foods and vegetables. So the current prospects of the livestock, drought power, job creation and other things should have to be integrated with day to day dishes of the community.

Therefore improving and intensifying of crop farming and livestock production should be a primary task for the government institutions, research institutes and NGOs. Besides the above, working on integration of crop food and animal source foods on the communities' dishes will reduce the food insecurity as well nutritional security by increasing food diversity of the diets. Further more specific research on the real causes of food and nutritional insecurity should be done in east Gojjam.

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