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Assessment on Socio-Economic Characteristics of Urban and Peri-Urban Dairy Production Systems in Central Highlands of Ethiopia

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Abstract: This study was initiated to assess socio-economic characteristics of urban and peri-urban dairy production in and around Assela, Bishoftu, Holleta and Sululta towns, Oromia regional state, central highlands of Ethiopia. Overall, 160 dairy farmers (40 from each site) were randomly selected for individual interviews using a pre-tested semi-structured questionnaire. The highest educational level (diploma and above) of respondents was reported in Bishoftu town. The age group of most of the respondents was 40-59 years. Most of the dairy farms were male headed and dairy production was their main occupation. The proportion of crossbred animals kept by farmers was higher than that of local cattle. Farmers in Bishoftu were more experienced (>15 years) in crossbred dairy production than other areas. The main purpose of rearing crossbred dairy animals was to produce milk for income generation. Thus, as most farmers' rear crossbred dairy animals we recommend that there must be continuous professional and technology supports to improve production for better profitability. Additionally, in urban and peri-urban areas land for dairy production is becoming scarcer and therefore, better attention must be given by the government to minimize the existing problem.

Key words: Cattle · Dairy · Ethiopia · Peri-Urban · Socio-Economy · Urban

INTRODUCTION

Livestock production represents a major contribution to the physical and economic access to sufficient food for productive and healthy life universally [1]. Moreover, livestock is a fastest growing sector of agricultural economy in developing countries with 40% contribution to the global value of agricultural output and as such supports the livelihoods and food security of almost a billion people [2]. Ethiopia is the leading African country in livestock population but this sector contributes only 16% of the national GDP, 13% of the country's export earnings [3] and 45% of the agricultural GDP [4]. Therefore, much more efforts are required to increase the contribution of livestock to the national economy and food security.

In urban and peri-urban areas there is a shortage of land and space due to expansion of towns, as a result of crop production and keeping of large ruminants is likely to be more difficult than other small ruminants. Similarly, FAO [5] reported that even if keeping animals in urban and peri-urban areas is not new, the experience of keeping animals in urban and peri-urban areas is increasing in many developing countries.

Also, Sabine and Wyn [6] argued that due to higher return per unit of land from livestock compared to crops, urban livestock keeping benefits the poor in terms of diversifying livelihood activities. Urban and peri-urban agriculture can be a significant entry point for poverty alleviation including the provision of employment to the household family members [2].

Gündel [7] and van Veenhuizen and Danso [8] have tried to clearly distinguish between urban and peri-urban agriculture based on geographical location and spatial land use. Urban agriculture includes farming activities taking place within the inner cities and major towns, utilizing vacant and under-utilized land areas not suited for construction, home and institutional gardens. On the other hand, peri-urban agriculture includes farming in the urban periphery; this type of agriculture tends to undergo dramatic changes over a given period of time, as there is an influx of people from both rural and urban areas.

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In Ethiopia, urban and peri-urban dairying constitutes an important sub-sector of the agricultural production system. The production systems involve production, processing and marketing of milk and milk products that are channeled to urban centers. It plays a vital role in the lives of the urban and peri-urban poor by providing a source of subsistence through household nutrition (milk and meat), supplementary income and generating employment opportunity.

Although, urban and peri-urban dairy production is known to contribute to food security, continuous research on socio-economic characteristics of urban and peri-urban dairy production is critical for dairy development in Ethiopia. Understanding the dairy production systems and economic contribution of a certain locality can help researchers and development practitioners to revise and implement appropriate technology.

Moreover, since the production systems and economic contribution of the dairy animals are dynamic, it is essential to understand the changes that might have taken over time. The increased demand for dairy products and human population pressure the importance of dairy sector in the Ethiopian economy and increased dairy productivity through good management practices is important. Therefore, the present study was initiated to assess socio-economic characteristics of urban and peri-urban dairy production in Assela, Bishoftu, Holleta and Sululta towns.

MATERIALS AND METHODS

Descriptions of the Study Areas: Assessment of dairy production systems was conducted in Assela, Bishoftu, Holetta and Sululta towns which are considered to be the major dairy production belt areas of the central highlands of Ethiopia.

Assela town is located in Oromia region, Central Ethiopia and the capital of Arsi zone. It is located at about 175 km Southeast of Addis Ababa at 7°57'N and 39°7'E with an altitude of 2430 meters above sea level. Agricultural production system of the study area is of mixed crop and livestock production. Dairy farming using improved breeds is a common practice in urban and peri-urban areas [9].

Bishoftu is located 45 km south east of Addis Ababa, at an altitude of 1900 meters above sea level and at 8.44° N latitude and 39.02° E longitude. The area has a rainfall pattern with a long rainy season from June to October and a short rainy season from March to May. The average annual rainfall and average maximum and minimum temperature for the area are 1100 mm and 28.3°C and 8.9°C, respectively [10].

Holetta is among the places that are known to be potentially high for dairy production, located between 38.5°E longitude and 9.8°N latitude and an elevation of 2400 meters above sea level. It is situated in the central highlands of Ethiopia. The average annual rain fall and temperature is about 1200 mm and 18 C and the average monthly relative humidity is 60%. The seasons are classified into dry, short rainy and long rainy which last from October to February, March to May and June to September, respectively [11].

Sululta district is one of the six districts of Oromia Special Zone Surrounding Finfinne of Oromia National Regional State. The districts' capital town, Chancho, is 40 kms away from Addis Ababa towards the North-west. It lies on the geographical coordinates of 9° 11' 0" N latitude, 38°45' 0" E longitude. The area is characterized by shallow valley with an elevation of 2500 meters above sea level, almost completely surrounded by mountains with numerous small rivers which drain into the Muger. The average annual temperature in Sululta is 14.7 °C with an average rainfall of 1119 mm [12].

Study Design and Sampling Procedures: A cross sectional study involving purposive (non probability) selection of study sites but random selection (probability type) of dairy farms and farm owners from the urban (city) and peri-urban (around the city) areas were conducted. The four study sites, namely Asella, Bishoftu, Holetta and Sululta towns and their peri-urban areas were purposively selected as they have large number of dairy farms. The frame lists of Kebles and dairy farms were obtained from respective Woreda/district livestock and agriculture development offices of the respective sites. Additionally, information was collected from the respective Woreda/district livestock and agriculture development experts about the available dairy farms in each Keble found in both production systems of the study areas. Depending on the frame lists and information obtained two Kebles form each production system were purpesively selected based on the availability of crossbred dairy animals and dairy production experiences. Dairy farms were then randomly selected from each Keble and questioned about socio-economic characteristics of dairy production. The sample size was determined according the formula given by Arsham [13] for survey

studies: $N=0.25/SE^2$ Where, N = sample size; SE = Standard error of dairy farms. Accordingly, by considering standard error of 3.95% with 95% CI as follows, $N=0.25/ (0.0395)^2 = 160$; a total of 160 dairy farms were selected by random sampling method from all study sites.

Before the formal survey, a pre-test survey was conducted to collect general background information about the study areas. The information that was collected in the pre-test survey helps to guide the development of actual survey questionnaire.

Data Collection: A comprehensive open-ended and close-ended type semi-structured questionnaire was prepared and used to collect the desired farm information. The information that was collected during the actual interview was supported by farm observations and discussions. Information on socio-economic characteristics of urban and peri-urban dairy production such as household characteristics, land holding, purpose of keeping dairy cows and livestock species and herd size characteristics were the main issues to be addressed in the survey. Additionally, the questionnaire was also designed to obtain information on experience in dairy production, source of crossbred cows and ways of differentiating dairy animals.

Data Analysis: The collected survey data was analyzed using statistical procedures for social science [14] version 20. Descriptive statistics such as mean, percentage and standard deviation were used to present the results.

RESULTS AND DISCUSSION

Household Characteristics: The educational level of the respondents involved in dairy cattle production in the study areas was diverse from literate to illiterate. In urban Sululta more respondents (25%) were illiterates. The highest educational level achieved by household heads was diploma and above (40%) in urban areas of Bishoftu followed by secondary school (40%) in urban Bishoftu and Holetta and primary school (55%) in peri-urban areas of Assela and Sululta. In Holetta, all the respondents were above read and write (Table 1). The highest educational level of the respondents in Bishoftu might be related to the existence of different agricultural institutions in the area and is near to the capital Addis Ababa.

Similar to the current results, Abebe *et al.* [15] reported that first degree (6.58%) was the highest educational level achieved by household heads in central highlands of Ethiopia. When farmers have higher educational level it helps for better understanding and easily adoption of new farm technologies. As reported by Lemma *et al*. [16], farmers who have better education level adopted improved dairy husbandry practices faster than those with low educational level. Additionally, Gizaw *et al*. [17] also revealed the evident role of higher education level to better husbandry practices.

In peri-urban areas of Assela (95%) of the household heads were male. In Holetta and Sululta peri-urban areas there were no female household heads. But in peri-urban Bishoftu (40%) of the household head were female. In the current study, the highest percentage of household heads was male which implies that higher proportions of males were occupied in dairying than the females and also most of the respondents were married. Most of the respondents in urban areas of Holetta 65% were in 50-59 years age group, followed by 45% respondents in peri-urban Assela and Holetta under the age group of 40-49. Results indicated that the age group of majority of the dairy producers in the study sites was between 40-59 followed by 30-39 and 60-69 years old (Table 1). The current age distribution pattern reflects that young people are less depended on urban and peri-urban dairy production which might be due to financial and experience problems. Family sizes in peri-urban Assela, urban and peri-urban Bishoftu and urban Sululta were almost similar. Furthermore, family size in urban Assela and peri-urban Holetta was also similar. Urban Holetta and peri-urban Sululta have relatively higher family size than other study sites (Table 1).

Male household heads were dominant as reported by Azage Tegegne [18] for Addis Ababa (Ethiopia), Swai *et al.* [19] for Tanzania and Thys *et al.* [20] for West African situation which was similar to our results. In the central zone of Tigray, Gebrekidan *et al*. [21] indicated that the proportion of male household heads were higher than female heads. Age and family size are indicators of household working age groups and family labor situations. The mean family size reported in the current study was inconsistent with Abebe *et al.* [15] who reported 4.4 persons per household in different areas of central Ethiopia which might be due to time and sampling differences. A study in Hawassa by Ike [22] indicated that majority of the interviewed households (33.3%) and (30%) were in the age group of 41-50 and 51-60 years, respectively which was comparable to our results. In the current study, the mean family size in urban Assela and peri-urban Holetta was consistent with the national average (5.2) [23]. The larger family sizes in urban Holetta,

Table 1: Educational level, gender of the HH, age of the respondents and family size crosstabulation

		Study site							
		Assela		Bishoftu		Holetta		Sululta	
Measured variables (%)		U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20
Educational level of the respondents	Illtrate	15	15	15	15	0.0	0.0	25	10
	Read and write	20	0.0	0.0	5	20	5	10	25
	Primary school	20	55	5	30	15	45	40	55
	Secondary school	25	20	40	20	40	30	20	10
	Diploma and above	20	10	40	30	25	20	5	0.0
	Overall	100	100	100	100	100	100	100	100
Gender of the HH head	Male	75	95	80	60	85	100	90	100
	Female	25	5	20	40	15	0.0	10	0.0
	Overall	100	100	100	100	100	100	100	100
Age of the respondents (yrs)	20-29	0.0	5	0.0	15	5	10	5	20
	30-39	10	30	15	10	0.0	5	40	5
	40-49	25	45	15	35	15	45	25	30
	50-59	30	5	35	25	65	30	25	20
	60-69	25	10	25	10	10	5	5	20
	Above 70	10	5	10	5	5	5	0.0	5
	Overall	100	100	100	100	100	100	100	100
Family members	Mean ±SD	5.1±1.6	6.1±2.2	6.0±2.2	6.0±2.2	7.2±2.2	5.4±1.7	6.0±2.2	6.9±2.9

n = number of respondents; U= Urban; PU= Peri-urban; HH= house hold

peri-urban Sululta, peri-urban Assela, urban and peri-urban Bishoftu and urban Sululta were comparable with 7.4 and 6 persons per household reported by Sintayehu *et al.* [24] in Shashemene and Dilla and Belay *et al.* [25] in Jimma areas, respectively. The larger family size in urban Holetta compared to other study sites indicates that these households have adequate sources of family labor to use for different routine dairy farm activities such as feeding, cleaning, herding, milking and milk processing.

Occupational Status and Land Holding: In urban and peri-urban areas of Sululta the occupational status of most of the interviewed dairy farms owners 65% and 75%, respectively was dairy production. Additionally, the occupational status of respondents in urban (60%) and peri-urban (45%) Bishoftu, peri-urban Assela (50%), peri-urban Holetta (55%), respectively was also dairy production. Furthermore, in urban Holetta, 40% of the interviewed dairy farm owners were government employees (Table 2). The higher involvement of farmers in dairy production in the current study might be related to attractive demand in the areas. Generally, the result of this study indicates that dairying is the major occupation for majority of the interviewed dairy producers.

The involvement of farmers in dairy production in the current study was higher than 13.7% reported for Sebeta Awsa area [26]. Girma, Yoseph and Mengistu [27] also reported that 29.2% of interviewed dairy farm owners in Shashamane were dairy cow producers. The differences indicates that the increasing demand for dairy production.

As indicated in Table 2, in per-urban Assela and Sululuta land holdings in hectare was higher than other dairy production areas. Interviewed dairy producers in peri-urban Bishoftu have the smallest land holdings (ha) which might be due to continuous urbanization of the town. Generally, in the current study peri-urban areas have higher land holdings than urban areas.

The current land holdings are by far less than the land holdings of 2.0 to 5 ha for 32.6% and 16.2% of the smaller farmers in the country and SNNPRS, respectively [23]. The peri-urban land holdings of the current study were similar with Sintayehu *et al.* [24] who reported land holdings of 1.1 ha in Shashemene-Dilla area.

Livestock Species and Herd Size: The average numbers of livestock owned are presented in Table 3. In prei-urban Bishoftu the total number of local cattle per farm was higher followed by peri-urban Sululta and Assela, respectively. Local cows were mainly kept on peri-urban dairy farms, while in the other locations and production systems mainly crossbred cows were kept. But in peri-urban Holetta the total number of crossbred cattle per farm was higher than other peri-urban production systems (Table 3). Urban areas of Bishoftu town were more dense in crossbred cows and chicken. Local oxen in peri-urban

Table 2: Occupational status and land holdings of the respondents' crosstabulation

		Study site							
		Assela		Bishoftu		Holetta		Sululta	
Measured variables (%)		U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20
Occupational status	Dairy owner	35	50	60	45	20	55	65	75
	Business man	25	20	10	25	20	20	30	20
	Non government employee	5	5	10	20	0.0	0.0	0.0	0.0
	Retired personnel	10	5	10	0.0	20	5	0.0	0.0
	Government employee	20	15	10	10	40	20	5	0.0
	Daily laborer	5	5	0.0	0.0	0.0	0.0	0.0	5
	Overall	100	100	100	100	100	100	100	100
Land holding (ha)	Mean ±SD	0.64±1.2	1.9±2.0	0.03±0.1	0.19±0.4	0.16±0.5	0.9±1.6	0.19±0.7	1.7±2.0

n = number of respondents; U= Urban; PU= Peri-urban; ha= hectare

Table 3: Livestock species and herd size (Mean±SD) in the study areas

	Study site							
	Assela		Bishoftu		Holetta		Sululta	
	U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20
Measured variables	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Milking cows[a]	0.0±0.0	0.1±0.2	0.0±0.0	0.35±1.1	0.0±0.0	0.0±0.0	0.0±0.0	0.15±0.7
Milking cows[b]	1.3±0.7	1.35±0.8	5.2±3.7	2.0±1.5	2.7±2.3	4.0±1.8	3.7±2.7	2.95±1.6
Pregnant cows[b]	0.45±0.7	0.3±0.7	2.1±2.2	0.75±1.1	1.2±0.9	1.8±1.7	0.65±0.9	0.40±0.7
Dry cows[b]	0.15±0.5	0.25±0.6	0.80±1.2	0.55±0.8	0.50±0.9	0.85±1.1	0.45±0.7	0.35±0.9
Oxen[a]	0.0±0.0	1.85±1.8	0.0±0.0	0.45±1.2	0.0±0.0	0.55±1.2	0.15±0.5	1.2±1.5
Heifers[a]	0.0±0.0	0.1±0.2	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
Heifers[b]	0.30±0.7	0.7±0.9	2.45±1.4	1.2±1.2	1.65±1.4	1.25±1.4	1.45±1.5	1.5±1.8
Bulls[b]	0.0±0.0	0.1±0.3	0.10±0.3	0.0±0.0	0.0±0.0	0.0±0.0	0.2±0.4	0.35±0.6
Female calves[a]	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.10±0.5
Female calves[b]	0.80±0.6	0.6±0.6	1.55±1.8	0.8±1.0	1.15±1.4	1.50±1.1	1.60±1.6	1.55±1.9
Male calves[a]	0.0±0.0	0.1±0.2	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
Male calves[b]	0.45±0.6	0.6±0.5	0.35±0.7	0.4±0.9	0.60±0.8	1.10±1.2	0.85±1.1	1.50±1.7
Sheep	0.85±1.2	1.3±2.5	1.25±5.6	1.8±5.0	2.65±4.5	0.60±1.9	0.70±1.7	6.20±9.1
Goats	0.15±0.7	0.1±0.5	0.0±0.0	0.2±0.9	0.05±0.2	0.20±0.9	0.1±0.2	1.40±5.4
Chicken	0.50±1.7	0.8±1.5	100.2±447.2	52.4±223.1	0.65±1.95	0.75±2.5	0.95±2.7	14.2±43.7
Horses	0.1±0.5	0.2±0.5	0.0±0.0	0.0±0.0	0.1±0.2	0.1±0.2	0.0±0.0	0.1±0.2
Donkeys	0.05±0.2	0.6±1.3	0.0±0.0	0.5±1.0	0.0±0.0	0.0±0.0	0.1±0.2	1.5±2.2
Mules	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0

n = number of respondents; U= Urban; PU= Peri-urban; a= local; b= crossbred

Assela and Sululta, respectively were higher than others. The highest number of replacement heifers was in urban Bishoftu followed by urban Holetta with the smallest number in Assela area. The average number of male calves was lower than female calves due to early culling of male calves. The number of livestock owned by the respondent farmers varied between locations and the farming systems which could be related to several factors such as feed inavailability and cost, land scarcity, disease and objectives of livestock raising. Generally, crossbred milking cows comprised a relatively larger percentage of the dairy herd in all the study areas which indicates as they are playing significant role in the farmers' economy (Table 3). In some of the study sites small numbers of bulls were used for natural service. Similar to our results, Abebe *et al.* [15] reported greater percentage of milking and crossbred cows than other livestock species in different parts of central Ethiopia. The same author further noted small proportion of male calves. Unlike to the current results, lower numbers of milking cows (0.1-1.7 per household) were reported in different parts of Ethiopia [28, 29]. In Bahir Dar and Hawassa also higher numbers of crossbred cows/household (5.4-11) were reported by Haile *et al.* and Dereje and Yoseph [30, 31].

Table 4: Experience in dairy production (years) and source of crossbred cows crosstabulation

		Study site							
		Assela		Bishoftu		Holetta		Sululta	
Measured variables (%)		U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20
Experience in crossbred dairy keeping (yrs)	1-3	15	20	0.0	15	5	25	25	35
	4-7	35	40	10	15	20	10	45	20
	8-11	20	35	35	35	25	35	10	25
	12-15	5	0.0	15	10	20	5	5	20
	>15	25	5	40	25	30	25	15	0.0
	Overall	100	100	100	100	100	100	100	100
Source of crossbred dairy cows	Ranch through agricultural office	0.0	0.0	25	45	60	5	0.0	5
	Gift from family	5	0.0	5	0.0	0.0	0.0	5	0.0
	Purchased from local market	95	100	65	50	25	80	95	95
	Given from relatives and/or friends	0.0	0.0	5	0.0	0.0	0.0	0.0	0.0
	Ranch through agricultural office and purchased from local market	0.0	0.0	0.0	5	15	15	0.0	0.0
	Overall	100	100	100	100	100	100	100	100

n = number of respondents; U= Urban; PU= Peri-urban

Table 5: Purpose of keeping dairy cows and ways of differentiating dairy animals' crosstabulation

		Study site							
		Assela		Bishoftu		Holetta		Sululta	
Measured variables (%)		U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20	U n=20	PU n=20
Purpose of keeping dairy cows	Milk to generate income	100	80	100	100	100	100	100	100
	Milk for home consumption only	0.0	20	0.0	0.0	0.0	0.0	0.0	0.0
	Overall	100	100	100	100	100	100	100	100
Ways of differentiating dairy animals in a herd	Color	80	80	15	60	35	10	65	40
	Ear tag	0.0	15	25	10	25	50	10	30
	Local name	15	0	60	15	30	20	5	25
	Color and local name	5	5	0.0	5	0.0	5	15	5
	Color and ear tag	0.0	0.0	0.0	10	10	10	5	0.0
	Ear tag and local name	0.0	0.0	0.0	0.0	0.0	5	0.0	0.0
	Overall	100	100	100	100	100	100	100	100

n = number of respondents; U= Urban; PU= Peri-urban

Experience in Dairy Production and Source of Crossbred Dairy Cows: Respondents in peri-urban areas of Assela and in urban Sululta 40% and 45%, respectively have dairy rearing experiences of 4-7 years. In urban Bishoftu about 40% of the dairy farms owners have greater than 15 years experience in crossbred dairy production. Most respondents 95% and 100% in urban and peri-urban Assela the source of their crossbred dairy cows was from local market. About 60% of the respondents in urban Holetta got crossbred cows from agricultural office. Furthermore, in urban and peri-urban areas of Sululta 95% of the respondents' source of crossbred dairy cows was through local market (Table 4).

In Bangladesh, 280 dairy farmers households were questioned and the majorities of the farmers had 10 to 19 years of experiences in dairy farming and most of the highly experienced farmers reared crossbred cattle [32].

Purpose of Keeping Dairy Cows and Ways of Differentiating Dairy Animals: In the current study, in urban Assela, urban and peri-urban Bishoftu, Holetta and Sululta all (100%) of the interview respondents said that the primary purpose of keeping crossbred dairy animals was milk to generate income. But in peri-urban Assela, 80% and 20% of the respondents said that the purpose of

keeping dairy animals was to generate income as well as milk for home consumption and milk only for home consumption, respectively.

Results indicated that in peri-urban Holetta relatively higher proportion (50%) of the respondents used ear tag to differentiate their dairy animals in comparison to other study sites. In urban and peri-urban Assela, 80% of the respondents differentiate their animals by color. Furthermore, 65% in urban Sululta and 60% in peri-urban Bishoftu of the respondents differentiate animals using color. In urban Bishoftu most of the interview farmers (60%) said that as they differentiate their dairy animals using local name. Generally, majority of the interview respondents in the study sites use color, local name and ear tag, respectively to differentiate their dairy animals.

As reported by Sintayehu *et al.* [24] in Ethiopia, market-oriented urban and peri-urban milk productions are flourishing as main suppliers of milk and milk products to cities. Similar to our results, a study by Belay and Geert [33] in Jimma town also indicated that majority of the respondents (94.4%) stated that the primary reason for keeping dairy cattle was milk production for income generation.

CONCLUSIONS

The study identified socio-economic parameters of urban and peri-urban dairy production systems including household characteristics, occupation and land holding, livestock species and herd size, experience in dairying and purpose of dairy production. From the results, it is concluded that educational level of the dairy producers was diverse among respondents. Majority of the respondents in the study areas were male headed and majority of them were not young. In most of the study sites, the family size was above the national average and majority of the respondents were involved in dairy production. Peri-urban areas have better land holdings than urban areas. Respondents kept larger number of crossbred animals than indigenous cattle and the highest experience in crossbred dairy production was in urban Bishoftu. Farmers' main reason of rearing crossbred dairy animals was to produce milk for income generation.

Generally, the current results highlighted that in majority of the dairy farms there were gender and age gaps in the farming systems as most farms were male headed and young people were not participating in the production systems. Dairy production was the main occupation and there was high crossbred cows preference by respondents mainly for generating income even though land is very scarce. Therefore, the great potential of urban and peri-urban dairy production in sustaining food security of the farmers, generating family income and creating job opportunity will be better realized if respective experts, institutions and policy makers work together in filling the existing gaps, bring technologies, creating awareness and knowledge transfer to dairy farmers.

REFERENCES

1. FAO (Food and Agriculture Organization of the United Nations), 2011b. World livestock food security, FAO, Rome, Italy.
2. FAO (Food and Agriculture Organization of the United Nations), 2009. The state of food and agriculture: livestock in the balance. FAO, Rome, Italy.
3. MoARD, 2007. Livestock Development Master Plan Study. Phase I Report-Data Collection and Analysis, Volume N-Apiculture. Addis Ababa, Ethiopia, Ministry of Agriculture and Rural Development.
4. MOFED, 2010. Ministry of Finance and Economic Development. Sustainable development and poverty reduction program, Addis Ababa.
5. FAO (Food and Agriculture Organization of the United Nations), 2011a. The place of urban and peri-urban agriculture in national food security programmes. Rome, Italy.
6. Sabine, G. and R. Wyn, 2002. Peri-urban and urban livestock keeping in East Africa-A coping strategy for the poor? Technological and Institutional Innovationsfor Sustainable Rural Development.
7. Gündel, S., 2006. A synthesis of urban and peri-urban agriculture research commissioned by the RNRRS (Renewable Natural Resources Research Strategy) programme, 1995-2006. Final report. Edinburgh, U.K.
8. Van Veenhuizen, R. and G. Danso, 2007. Profitability and sustainability of urban and peri-urban agriculture. Agricultural Management, Marketing and Finance, 2007 (Food and Agriculture Organization of The United Nations, Rome, Italy; Occasional Paper 19) pp: 95.
9. KARC, 2008. Kulumsa Agricultural Research Center (KARC). Annual report, Ethiopia, pp: 6.
10. DZARC (Debre Zeit Agricultural Research Center), 2003. Annual Research Report 2002/03, Ethiopian Institute of Agricultural Research, Debre Zeit, Ethiopia.

11. Tadesse, M., J. Thiengtham, A. Pinyopummin and S. Prasanpanich, 2010. Productive and reproductive performance of Holstein Friesian dairy cows in Ethiopia. Livestock Research for Rural Development, 22(2). Available at http://www.lrrd.org/lrrd22/2/tade22034.htm.
12. SDAO (Sululta District Agricultural Office), 2012. Annual report. Chancho, Ethiopia.
13. Arsham H., 2007. Business statistical decision science and systems stimulation Merric School of business Charles at Mount Royal, Baltimore, Maryland, 2120, University of Baltimore, UAS, pp: 100. Baltimore, Maryland, 2120, University of Baltimore, UAS, pp: 100.
14. IBM Corp, 2011. IBM SPSS (Statistical Packages for the Social Sciences) Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.
15. Abebe, B., Y. Zelalem, E. Mitiku, Y. Mohammed and A. Getenet, 2017. Socio-economic characteristics of dairy production in the selected areas of Ethiopian central highlands. Journal of Veterinary Medicine and Animal Health, 9(8): 193-203.
16. Lemma, F., M.M. Trivedi and T. Bekele, 2012. Adoption of improved dairy husbandry practices and its relationship with the socio-economic characteristics of dairy farmers in Ada'a district of Oromia State, Ethiopia. Journal of Agricultural Extention and Rural Development, 4(14): 392-395.
17. Gizaw, K., A. Habatamu, E. Sisay, M. Tesfaye, G. Tegegn and S. Birhanu, 2012. Enhancing the productivity and profitability of crossbred and local cows in urban and peri urban centers of Bako and Nekemt, proceedings of the 19th annual conference of Ethiopian Society of Animal Production, 15-17 December 2011. Addis Ababa, Ethiopia.
18. Azage Tegegne, 2004. Urban livestock production and gender in Addis Ababa, UA-Magazine, 4, 30-31.
19. Swai, E.S., E.D. Karimuribo, L. Schoonman, N.P. French, J. Fitzpatrick, D. Kambarage and M.J. Bryant, 2005. Description, socio-economic characteristics, disease managements and mortality dynamics in smallholder's dairy production system in coastal humid region of Tanga, Tanzania, Livestock Research for Rural Development, 17(41). Available at http://www.lrrd.org/lrrd17/4/swa17041.htm.
20. Thys, E., M. Oueadraogo, N. Speybroeck and S. Geerts, 2005. Socio-economic determinants of urban household livestock keeping in semi-arid Western Africa. Journal of Arid Environments, 63: 475-496.
21. Gebrekidan, T., M. Zeleke, S.K. Gangwar and H. Aklilu, 2012. Socio-Economic characteristics and purpose of keeping dairy cattle in Central zone of Tigray, Northern Ethiopia. International Journal of Advanced Biological Reasearch, 2(2): 256-265.
22. Ike, A., 2002. Urban dairying in Awassa, Ethiopia. MSc thesis, University of Hohenheim. Instititute of Animal production in the tropics and sub tropics. Stuttgart Hohenheim, Germany, pp: 113. ILRI (International livestock research Institute) Nairobi, Kenya, pp: 462.
23. CACC (Central Agricultural Census Commission), 2003. Ethiopian Agricultural sample Enumeration, 2001/02. Results of country level: Statistical Report on socio-economic characteristics of the population in agricultural household, land use, area and production of crops. Part I. (July, 2003), Addis Ababa, Ethiopia.
24. Sintayehu, Y., B. Fekadu, T. Azage and G.M. Berhanu, 2008. Dairy production, processing and marketing systems of Shashemene-Dilla area, South Ethiopia. IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project Working Paper 9, ILRI (International Livestock Research Institute), Nairobi, Kenya, pp: 62.
25. Belay, D. and P.J. Geert, 2016. Smallholder Dairy Farmers' Breed and Cow Trait Preferences and Production Objective in JimmaTown, Ethiopia. European Journal of Biological Sciences, 8(1): 26-34.
26. Dereje, S. and M.Yoseph, 2016. Performance evaluation of crossbred dairy cows in urban and peri-urban dairy systems of Sebeta Awas wereda, oromia, Ethiopia. Academic Research Journal of Agricultural Science and Research, 4(5): 184-196.
27. Girma, C., M. Yoseph and U. Mengistu, 2014. Feed resources quality and feeding practices in urban and peri-urban dairy production of Southern Ethiopia. Tropical and Sub-tropical Agroecosystems, 17: 539-546.
28. Binyam, K., 2008. Cottage cheese production in Shashemane and the role of Rue (Rutachalepensis) and garlic (Allium sativum) on its quality and shelf life. MSc Thesis, Hawassa University, Hawassa, Ethiopia.
29. Samson, G., Y. Zelalem and B. Sandip, 2012. Assessment of quality and marketing of milk and milk products in the central highlands of Ethiopia. Lambert Academic Publishing. Saarbrucken, Germany.

30. Haile, W.A., Y. Zelalem and T.G. Yosef, 2012. Challenges and opportunities of milk production under different urban dairy farm sizes in Hawassa City, Southern Ethiopia. African Journal of Agricultural Research, 7(26): 3860-3866.
31. Dereje, S. and M. Yoseph, 2014. Evaluation of crossbred heifer calves rearing practices and growth performance in urban and peri-urban dairy systems of Sebeta woreda, Oromia. Ethiopian Journal of Animal Production, 16(2): 121-132.
32. Quddus, A., 2017. Performance and perceptions of adoption of crossbred cattle by smallholder in Bangladesh. International Journal of Agricultural Policy and Research, 5(3): 63-69.
33. Belay, D. and P.J. Geert, 2016. Smallholder Dairy Farmers' Breed and Cow Trait Preferences and Production Objective in JimmaTown, Ethiopia. European Journal of Biological Sciences, 8(1): 26-34.