Global Veterinaria 10 (5): 607-613, 2013
ISSN 1992-6197

DOI: 10.5829/idosi.gv.2013.10.5.6669

Socioeconomicand Farm Characteristics of Smallholder Cattle Producers in Ilu Aba Bora Zone of Oromia Regional State, South Western Ethiopia

TeshagerAyalew, Belay Duguma and TayeTolemariam

Department of Animal Sience, College of Agriculture and Veterinary Medicine,
Jimma University, Jimma, Ethiopia

Abstract: The aim of this study was to characterize the farm and socioeconomic characteristics of smallholder cattle producers in three districts of Ilu Aba Bora Zone of Oromia Regional State, South western Ethiopia. A stratified randomly sampling technique was adopted to sample and administer pre-tested, structured questionnaires to a total of 180 (60 from each agro-ecological zone) households. Data were analyzed using descriptive statistics such as means, percentile and GLM ANOVA.The study showed that majority (95.6%) of the respondents weremale. About 74.9% of the respondents fall within the age group of 21-50 years.Iilliteracy rate was higher in Algie(18.3%) than in Chewaka (11.7%) and Bacho (5%) districts. About 56.7, 53.3 and 61.7% respondents in Algie, Chewaka and Bacho had primary school education, respectively. The mean family size was 7.09±0.15 and no significant (P>0.05) difference was observed across the study districts. The mean land holding per household was 3.05±0.16 hectare (ha) and was differed significantly ($P\leq$ 0.05) between study districts.Livestock species owned by the respondents werecattle (48.6%), goats (4.6%), sheep (9.8%), donkey (0.4%), horse (3.8%), mule (0.6%) and chicken (32.2%). The major purpose of cattle productionwasmainly for draught power, followed by milkproduction and income generation.Crop and livestock sale arethe major source of income (72.8%). Family labour(96.1%) is the major source of labourused for animal management.Milking cows (89.4%) and dairy product marketing (80.2%) was the responsibility of women. About 50 and 49.4% ofherding is donebymen and boys, respectively. About 32.2, 29.4, 20.6 and 17.8% of barn cleaning is done by women, boys, men and daughters, respectively. The major decision making role for live animal marketing belong to men (95.6%). It is concluded that socio-economic characterization of smallholder cattle producers could assist to design and implement improved cattle development strategies through appropriate deliver of technological inputs. Women involvement in cattle management activities was found to be high;however their role in decision making was very low. Thus, strong and effective extension needs to be in place to empower women in decision making.

Key words: Cattle · Characterization · Decision Making · Smallholder · Socio-Economic

INTRODUCTION

In Ethiopia agriculture is the main economic activity and more than 80% of Ethiopian population is dependent on agriculture of which livestock play a very important role [1]. In Ethiopia agriculture contributes to 47% of the country's GDP and to more than 80% of the export and employs over 85% of the population [1]. The livestock sub sector contributes 12-16% of total and 35-40% of agricultural Gross Domestic Product (GDP), respectively. Livestock also contributes 12-15% of total export earnings. The sub sector is the second major sources of foreign currency earnings through export of live animals, hide and skins [2].

Livestock performs multiple functions in Ethiopian economy by providing food, draught power for crop cultivation, the production of milk, meat, hides and skins, manure, etc., integrated function (i.e. perform various activities in the crop production sub-sector) and soil fertility management, raw material for industries, cash income as well as promoting savings, fuel, asset function, security function and sociocultural function and employment [3].

Corresponding Author: Belay Duguuma, Department of Animal science, College of Agriculture and Veterinary Medicine, Jimma University, P. O. Box 307, Jimma, Ethiopia.

In order to meet the growing demand for milk and meat in Ethiopia, cattle production needs to grow. In order to design appropriate and sustainable cattle development strategies which is compatible with socio-cultural, socioeconomic and agro-ecological characteristics of the producers is better developed and utilized to the benefits of the farmers. The objective of this study is, therefore, to describe the socio-economic and farm characteristics of smallholder cattle producers in Ilu Aba Bora Zone, Southwestern Ethiopia.

MATERIALS AND METHODS

Study Area: The study was conducted in Bacho, Algie and Chewaka districts of the Ilu Aba Bora zone of the Oromia Regional State, South western Ethiopia. Ilu Aba Bora zone has 1633156.56 hectares (ha) of land of which 10% is high land, 67% medium land and 23% low land. The altitude of the zone ranges from 500-2575 meter above sea level. It is mostly known for its vegetation coverage, suitability for coffee, crop, livestock and bee production. The dominant crops being Maize, Teff, Coffee, Sorghum, Barley, Wheat, different pulse crops, finger millet, fruits, vegetables, spices and rice. Human population of the zone is 1,492,183 people. Out of the total population, 88% live in the rural areas. Annual precipitation ranges from 1500-2200mm with 6 to 9 months of rain fall [4].

Bacho, Algie and Chewaka are the three districts of the zone selected for this study based on variation in altitude and potential for cattle resource. Bacho, Algie and Chewaka districts represented high, medium and Low land, respectively. Bacho, Algie and Chewaka districts are located at a distance of 640, 654 and 560 km, respectively from Addis Ababa and were situated at an altitude ranging from 1650 to 2500, 1139 to 2165 and 900 to 1400 meters above sea level, respectively, with area coverage of 49,249, 94,344 and 54,220 ha, respectively. Bacho, Algie and Chewaka districts receives an average annual rainfall ranging from 1500 to 2200, 1371.6 to 2275 and 1000 to 1200 mm, respectively and the minimum and maximum daily temperature of 12 and 25°C, 14.9 and 25.1°Cand 36 and 41°C, respectively. Human population of Bacho, Algie and Chewaka was estimated to be 42,335, 90,290 and 92,027 people [4].

Sampling Procedure: A stratified sampling technique was used based to obtain the respondents for the purpose of this study based on the agro-ecological zone (high, medium and low) altitude. Bacho, Algie Sachi and Chewakadistricts represented high, medium and Lowland, respectively. A total of 180 households, 60 from each district were randomly selected using systematic random sampling method.

Sources of Data and Analytical Technique: Informal and formal survey tools were employed to gather primary data for this study. These were obtained by using pre-test, well-structured questionnaires. The respondents were smallholder cattle producers. The data collected were collected on sex, age, educational level, household size, land holding and utilization, crop production, purpose of keeping cattle, sources of income and sources of labour and its allocation for cattle production. The primary data collected for this survey were analyzed using descriptive statistics such as means, frequency distribution, range and percentages and GLM ANOVA using SPSS software version 16. Indices were calculated for major constraints to cattle production in the study area. Least Significance Difference was employed to separate means having statistically significant difference.

Statistical Model:

$$Y_{ij} = \mu + A_i + \epsilon ij$$

where

Y_{ij} = The value of the respective variable mentioned above pertaining to the i^{th}district (i=3, Bacho, AlgieSachi or Chewaka)

μ = Overall mean of the respective variable

A_i = The effect of i^{th}district (i=3, Bacho, AlgieSachi or Chewaka) on the respective variable

ϵ_{ij} = Random error term

RESULTS AND DISCUSSION

Household Characteristics: The result of the analysis on table 1 show that the majority (95.6%) of the households in the study areas were headed by male. Of the women that headed households, 21.6 and 71.4% were divorced and widowed, respectively. Results of the present study were in agreement with findings of [5-7], who reported 96.6, 96 and 96% of the respondents were male headed households in different regions of Oromia. In contrast to our result, a lower male headed household (77.8%) was reported in Darolobu district, eastern Oromia [8]. The table also shows that 48.9 and 51.1% of the respondents are Muslim and Christian, respectively.

Table 1: Socio-economic profile of the respondents in the study areas

	Districts of the study							
	Bacho		Algie		Chewaka		Total	
Parameters	N	%	N	%	N	%	N	%
Sex of the respondents								
Male	57	95	56	93.3	59	98.3	172	95.6
Female	3	5	4	6.7	1	1.7	8	4.4
Educational level								
Illiterate	3	5	11	18.3	7	11.7	21	11.7
Write and read	19	31.7	14	23.3	21	35	54	30
Primary education	37	61.7	34	56.7	32	53.3	103	57.2
Secondary education	1	1.7	1	1.7	0	0	2	1.1
Age								
< 20 years	1	1.7	2	3.3	0	0	3	1.7
21 – 30 years	10	16.7	15	25	14	23.3	39	21.7
31 – 40 years	17	28.3	11	18.3	23	38.3	51	28.3
41 – 50 years	15	25	12	20	16	26.7	43	23.9
51 – 60 years	9	15	12	20	6	10	27	15
> 60 years	5	13.3	8	13.3	1	1.7	17	9.4
Age categories								
< 15 years	3.27±0.17[a]		3.31±0.23[a]		3.93±0.17[b]		3.52±0.11	
16-30 years	2.73±0.25[a]		2.41±0.14[a]		2.38±0.18[a]		2.51±0.11	
>30 years	2.12±0.09[a]		2.16±0.19[a]		1.89±0.05[b]		2.06 ±0.05	
Family size	7.23		6.92±0.26				7.09±0.15	

Means with the same superscript within the same row are not significantly different at 5% level of significance, N = number

Table 2: Least square means for land holding and its distribution for annual crop, perennial crop and grazing land by the study areas

	Districts of the study			
Land allocation	Bacho	Algie	Chewaka	Overall
Total land holding (ha)	4.21±0.31 [a]	3.48±0.29 [b]	1.47±0.02 [c]	3.05±0.16
Annual crops (ha)	1.65±0.11 [a]	1.97±0.18 [a]	1.09±0.03 [b]	1.57±0.07
Perennial crops (ha)	1.88±0.17 [a]	1.35±0.18 [b]	0.44±0.02 [c]	1.23±0.09
Grazing (ha)	1.03±0.10	1.03±0.21	-	1.03±0.09

Means with the same superscript within the same row are not significantly different at 5% level of significance. Ha=hectare

Education empowers people, strengthens their abilities to meet their wishes and increase their productivity and potential to improve their quality of life. In terms of education, there were more illiterate in Algie (18.3%) than in Chewaka (11.7%) and Bacho (5%) districts. Contrary to our study, Belay *et al.*[9]reported that majority (42.3%) of the respondents in Ginchi watershed were illiterate. Household heads that attended adult education were comparable in Bacho (31.7%) and Chewaka (35%) unlikethat in Algie (23.3%). The results also show that 56.7, 53.3 and 61.7% respondents in Algie, Chewaka and Bacho have primary school education, respectively. The results of the respondents who had attended primary school in the present study was higher than the findings of Belay *et al*. [9], who reported that only 17.9% of household heads in the Ginchi watershed had primary school education. Majority (74.9%) of the respondents falls within the age group of 21-50, implying that majority are of potential productive age. In another study 72 and 60% of the households in OromiaandJimma zone, respectively, were headed by age classes between 31 and 50 years [5, 7].

The overall mean family size of the study areas was 7.09±0.15 and ranged from 3-14 persons. There was no significant (P>0.05) difference in family size among the three districts. However, the highest mean value for family size was found at Bacho and the lowest was in Algie. The average family size obtained in the present study was higher than the average family of 5.5 at Gomadistrictof Jimma zone [10].

Land Holding and Land Use Pattern: Land holding and its utilization in the study areas are shown in Table 2. The average land holding per household in the study area was 3.05±0.16 ha. A significantly difference ($P \leq 0.05$) was observed in mean landholding among the study districts.

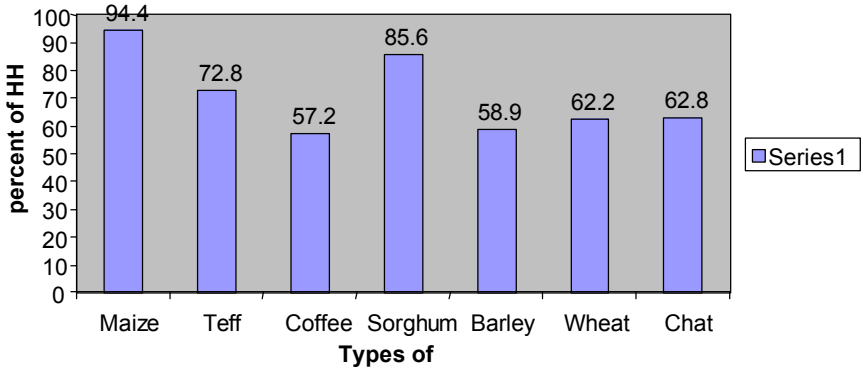

Fig. 1: Major types of crops produced in the study areas

Mean landholding in Chewakadistrictwas significantly lower than that of Bacho and Algiedistricts ($P \leq 0.05$). The observed difference was due to the resettlement program that allocated 1.5ha of land per household with additional open and forest land, which some households privatized. The other reason is probably due to the difference in the existed farming system between the study areas. The total land holding in the present study washigher than the mean of 1.93 and 2.3±0.09 ha reported for Gomma and Alabadistricts [6, 7]. On the other hand, higher land holding (5.28±0.21) was reported by Tesfaye [11] in Metema.

The results of the present study revealed that larger proportion of land was allocated for crop production than grazing land. This is in line with findings of Oumer [5] who reported more land was allocated for crop production in Jimma zone. There was a significant difference among the study areas in allocating their land for annual crop ($P<0.05$). The mean land allocated for annual crops was higher than those utilized for perennial crops and grazing. Respondents in Bacho and Algie districts used more land for annual crops than Chewakadistrict ($P \leq 0.05$) and this is probably due to the existing farming system, which is mixed crop livestock production system. According to group discussion with key informants the major means of getting cash is from the sale of crops. A significant difference ($P \leq 0.05$) was observed among the study areas in land allocation for perennial crops. Respondents in Bacho had allocated more land for perennial crop than Algie and Chewaka districts ($P \leq 0.05$). The respondents in Bacho and Algie districts allocated larger proportion of their land for coffee which is the main cash crops in the area. Due to increased human population grazing lands are converted to crop land, thus respondents allocated less land for grazing, which resulted in shortage of livestock feed especially in the dry season. According to respondents in Chewakadistrict, grazing land is completely communal and no one own private grazing land.

Crop Production: The types of crops produced in the study area are shown in Figure 1. The major crops grown in the study area are maize, teff, coffee, sorghum, wheat, barley and chat (*khatedulis*). The proportions of crops grown in the area include maize (94.4%), sorghum (85.6%) and teff (72.8%). Therewas a difference in production ofteff, coffee, barley and chat ($P<0.05$) among the study districts. Coffee is produced by respondents from Bacho and Algie districts, while coffee is not grown in Chewaka district.

Livestock Holding: The mean numbers of various livestock species per household in the study areas are shown in Table 3. The production system in the study areas was characterized by mixed crop-livestock production system. Almost all the respondents in the study area rear indigenous breeds of livestock that are non-characterized. Very few (1.1%) of the respondents had cross bred animals (Holstein Frisian X local Zebu) distributed by Ministry of Agriculture. The distribution of livestock species owned by the respondents was composed of cattle (48.6%), goat (4.6%), sheep (9.8%), donkey (0.4%), horse (3.8%), mule (0.6%) and chicken (32.2%). The study revealed that cattle are the most important species in terms of use, followed by sheep, goats and horses; however, donkeys and mules were least popular livestock. The combination of livestock species owned by respondents was similar to other findings reported in other regions of Ethiopia [7, 12]. Ccontrary to the present study, there were more numbers of goats (44%) than cattle (42%) inMieso district [13].

Table 3: Livestock composition of the sampled households

	Bacho		Algie-Sachi		Chewaka		Overall	
Variables	No	%	No	%	No	%	No	%
Cattle	872	54	696	53.45	446	36.44	2014	48.6
Shoats	231	14.3	218	16.74	148	12.09	597	14.4
Goat	48	3.0	34	2.61	110	8.99	192	4.6
Sheep	183	11.3	184	14.31	38	3.1	405	9.8
Equines	95	5.9	95	7.3	10	0.82	200	4.8
Donkey	1	0.06	5	0.38	10	0.82	16	0.4
Horse	85	5.26	73	5.6	-	-	158	3.8
Mules	9	0.56	17	1.3	-	-	26	0.6
Chicken	419	25.9	293	22.5	620	50.65	1332	32.2

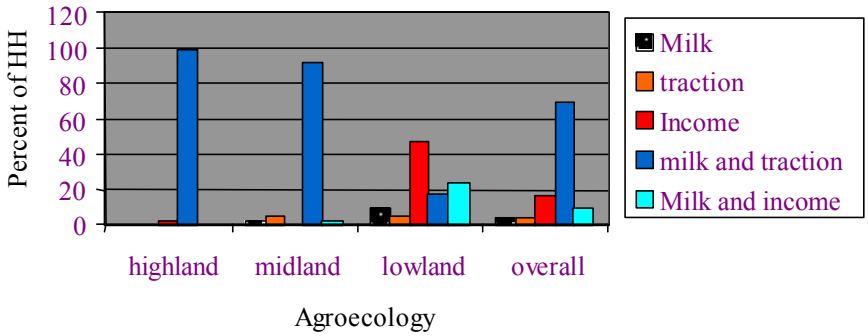

Fig. 2: Major purpose of keeping cattle in the study areas

There was significant (P<0.05) differences among the study sites in the holding of livestock species. The reason for low number of cattle per household in Chewaka district was due to recent resettlement of the respondents from drought prone area.

Purpose of Keeping Cattle: The major purposes of rearing cattle in the study areas are presented in Figure 2. The results revealed that the major objective of cattle rearing in the study areas were traction and milk, source of income and source of milk and cash in that order of importance. In most parts of Ethiopia, cattle were reared for social value (like gift intended for marriage ceremony, as wealth measurement, as copping mechanism during crop failures, draught power and as source of income [14, 15]. The result of the present study was also in agreement with the findings of previous reports in other regions of Ethiopia [16, 17].

Household Source of Income: Both crop and livestock production contributes the major source of income for farmers in the study areas. The principal sources of income include crop sales, livestock and livestock product sales, agricultural labor and self-employment. Majority (72.8%) of the respondents stated that their source of income is from both crop and livestock production. Even if the areas undertake mixed farming production system, crop sales are a major cash source with coffee constituting the majority of crop sales. Food crops including maize, teff and sorghum are sold by almost all farmers. Cattle make up the largest share of the livestock income. Shoats and chickens are also sold by almost all of the farmers. In addition to this the study areas have good potential on production of honey and farmers also used as means of generating income. As compared to Bacho and Algie district, respondents in Chewaka indicated that khat, livestock and livestock products (milk) are the major source of income in the area since coffee is not produced in the district. Poorer households supplement their annual cash income through local agricultural labor employment (weeding and harvesting) on the fields of middle and better-off households and also participate in sale of charcoal and firewood.

Labour Usefor Cattle Production: Division of labourof members of the household in cattle management is presented in table 4. Majority (96.1%) of the respondents

Table 4: Family labour allocation in cattle production (%) in the study areas

	Share of tasks by household members (%)			
Activities	Husband	Spouse	Boys	Daughter
Milking	-	89.4	-	10.6
Milk Processing	-	73.9	-	26.1
Dairy products marketing	-	80.2	-	19.8
Herding	50	-	49.4	0.6
Barn cleaning	20.6	32.2	29.4	17.8
Live animal marketing	95.6	3.9	0.6	
Decision on selling/buying	72.8	4.4	-	-

indicated that family labour is the major source of labour for animal management; while very few (3.9%) used both family and hired labour. Contrary to our findings, Belay *et al*. [18] reported that a source of labour for animal management in Jimma was hired labour (33.3%), family labour (16.7%) and both hired and family labour (50%). Majority (89.4%) of the respondents indicated that milking cows is the responsibility of women. This result is in agreement with the findings of Alganesh [19] in eastern Wollega and Lemma [20] in east Shoa zone where female members of the household entirely undertake milking. Not in agreement with ourresults, milking is done mainly by men in Bahir Dar Zuria and Mechadistricts [21]. Dairy product marketing is reported to be the activity of women (80.2%) and daughter (19.8%). This is in line with results reported in Northwestern Ethiopia [21] where marketing of dairy products are performed by female members of the household.

According to 50, 49.4 and 0.6% of the respondents herding is the responsibility of household head, male and female children, respectively. District wise, 60, 45 and 45% of the household heads in Algie, Bacho and Chewaka are responsible for herding, respectively. On the other hand, 55, 53.3 and 40% of male children in Bacho, Chewaka and Algie are responsible for herding. Regarding barn cleaning, about 32.2, 29.4, 20.6and 17.8% of the respondents indicated that it is the responsibility of women, male children, men and daughters, respectively. About 95.6, 3.9 and 0.6% of men, women and male children are responsible for live animal marketing. Majority (72.8%) of men decidefor selling or buying live animals, while 22.8% was decided by men and women together. About 4.4%offemale headed households make decision by themselves. Belay *et al*. [18] reported that in Jimma town 37% of selling live animals wasdecided by men.The involvement of women in all cattle management activities was found to be high; however their role in decision making with regard to sale of animals was very low. Thus, strong and effective extension needs to be in place to empower women in decision making.

CONCLUSION

Results of the study revealed that majority of the respondents were male. Highest percentage of the respondents in the study area were within the age group of 21-50 years. The average family size was similar across the study districts. The majority of the respondents in the study area had attended primary school education. Of the livestock species owned by the respondents, cattle constituted the major species because of their important role asmajor source of draught power for crop cultivation.Sale of crops, livestock and livestock products was the major source of household income. Family labourwas the major source of labour used for livestock management. Milking cows and marketing of dairy product was the responsibility of women. Women play a very important role in all types of animal management activities. The major decision making role for live animal marketing belong to men. It is concluded that socio-economic characterization of smallholder cattle producers could assist to design and implement improved cattle development strategies through appropriate deliver of technological inputs. Women involvement in cattle management activities was found to be high; however their role in decision making with regard to sale of animals was very low. Thus, strong and effective extension needs to be in place to empower women in decision making.

ACKNOWLEDGEMENT

The authors would like to thank Agriculture and Rural Development Office of Ilu Aba Bora Zone for financial support and study leave of this Msc study.

Staff of the Zonal and District Office of Agricultural and Rural Development, development agents, field attendants and all participating farmers deserves our deepest appreciation for their unreserved collaboration in this study.

REFERENCES

1. Bureau of Africa Affairs, 2006. http:// www.state.gov/ r/ pa/ ei/bgn/2859.htm.
2. Ayele, S., W. Assegid, H. Belachew, M.A. Jabbar and M.M. Ahmed, 2003. Livestock marketing in Ethiopia: A review of structure, performance and development initiatives. Socio-economic and Policy Research Working, 52. ILRI.
3. Bee, Y., N. Msanga and P.Y. Kavana, 2005. Lactation yield of crossbred dairy cattle under farmer management in Eastern coast of Tanzania, Tanzania Livestock Research Institute.
4. LDMA, 2010. Annual progress report, Livestock Development and Marketing Agency, (LDMA). Ilu Aba Bora Zone Department of Agriculture. Mettu, Ethiopia.
5. Oumer, S., 2011. On–farm phenotypic characterization of cattle in Jimma zone, south western Ethiopia. M.S. Thesis, Jimma Univ., Ethiopia.
6. Tsedeke, K., 2007. Production and marketing systems of sheep and goat in Alaba, southern Ethiopia. M.S. Thesis, Hawassa Univ., Hawassa, Ethiopia.
7. Workneh, A. and J. Rowlands, 2004. Design and execution and analysis of livestock breed survey in Oromiya regional state, Ethiopia. OADIS (Oromia Agricultural Bureau), Addis Ababa, Ethiopia and ILRI (International Livestock Research Institute), Nairobi, Kenya, pp: 260.
8. Dereje, T., 2011. Community based characterization of goats in Darolabu district, western Hararghe, Ethiopia. M.S. Thesis, Jimma Univ., Ethiopia.
9. Belay, D., T. Azage and B.P. Hegde, 2012. Smallholder livestock production system in Dandi district, Oromia Regional State, central Ethiopia, 2012. Global Veterinaria, 8: 472-479.
10. Belete, S., 2009. Production and marketing systems of small ruminants in Goma district of Jimma zone, western Ethiopia.
11. Tesfaye, M., 2007. Characterization of cattle milk and meat production, processing and marketing system in Metema district, Ethiopia. M.S. Thesis, Hawassa Univ., Hawassa, Ethiopia.
12. IPS, 2000. (International Project Service). Resource potential assessment and project identification study of the Somalia Region: Socio-economics assessment. Investment office of the Somalia regional state. Research Report. Vol.III. Somalia, Ethiopia, pp: 351.
13. Kedija, H., 2007. Characterization of Milk Production System and Opportunity for Market Orientation: a Case Study of Miesso District, Oromia Region, Ethiopia, Haramaya University www.ipms.ethiopia.org/ .../ Final%20 Thesis %20_Kedija%20Hussen_.pdf –
14. Asfaw, W., 1997. Livestock Development Policy in Ethiopia. In: Livestock development policies in Eastern and Southern Africa. Proceedings of a seminar organized by CTA, OAU/IBAR and the Ministry of Agriculture and Cooperatives, Mbabane, Swaziland. 28 July- 1 August, 1997.
15. Alemayehu, M., 2004. Pasture and Forage Resource profiles of Ethiopia. PP.19. Ethiopia/FAO. Addis Ababa, Ethiopia.
16. Gryseels, G. and A. Getachew, 1985. Links between livestock and crop production in the Ethiopianhighlands. ILCA Newsletter 4(2): 5-6.
17. Getachew, A., B. Hailu, N. Werkneh and A. Gezahegn, 1993. A survey of farming systems of vertisol areas of the Ethiopian highlands, pp: 29-49. In: Improved Management of Vertisols for Sustainable Crop-livestock Production in the Ethiopian Highlands: Synthesis report. Addis Ababa, Ethiopia.
18. Belay, D., K. Yisehak and G.P.J. Janssens, 2011. Analysis of constraints facing urban dairy farmers and gender responsibility in animal management in Jimma town. African Journal of Basic and Applied Sciences, 3: 313-318.
19. Alganesh, T., 2002. Traditional milk and milk products handling practices and raw milk quality in eastern Wollega, MSc Thesis, Alemaya University, Ethiopia.
20. Lemma, F., 2004. Assessment of butter quality and butter making efficiency of new churns compared to smallholders' butter making techniques in east Shoa zone of Oromia, Ethiopia, M.S. Thesis, Alemaya Univ., Ethiopia.
21. Asaminew, T. and S. Eyassu, 2009. Smallholder dairy production system and emergence of dairy cooperatives in Bahir Dar Zuria and MechaWoredas, Northwestern Ethiopia. World Journal of Dairy & Food Sciences, 4: 185-192.