Livestock Production System of the Western Region of Ethiopia

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The author would also like to acknowledge the input by the staff of the Animal Production Division and the Agricultural Economics Division of the Bako Agricultural Research Center in putting the raw data in an appropriate order for analysis.
The design of research and development plans for a given area presupposes a thorough knowledge of the natural resources of that specific region. Without a prior understanding of the nature and magnitude of production impediments, it is seldom possible to develop appropriate research programs that would help solve these impediments.

No attempt has so far been made to study the livestock species and production systems of the western region of Ethiopia apart from very scant information available on a few cattle breeds (Alberro and Solomon 1982). Earlier animal research endeavors at Bako Research Center were confined to on-station activities with apparently no or little attempt to address problems specific to this region. The irrelevance to the region of the past experiments largely stems from their origin, as most experiments had been proposed at Holetta Research Center, the coordination center of livestock research and were sent to Bako for execution. Following the decentralization of research programs of IAR since 1986 and in light of the mandate of the Animal Production Division of Bako Research Center to serve the western region, the importance of identifying livestock breeds and production constraints became clear. Consequently, this two-phase survey was proposed in late 1986. The survey would not only help the division better understand the livestock production systems in the region but would also aid in knowing the potential resource endowment upon which future short- and long-term regional research programs should be based.

Methodology

As surveys are expensive, it is difficult to carry out a detailed survey at one time in a vast area like this region. It was thus felt important that primary information be gathered through a questionnaire in this first phase of the study. Hence, the questionnaire was developed and handed over to the regional office of the Ministry of Agriculture to be dispatched to as many as farmers possible. For various reasons, only about half of the farmers in the region (62 out of the then 121 weredas) were able to fill out the questionnaire. The papers were filled out by wereda development agents rather than by farmers themselves, and thus the information obtained is secondary, which makes it somewhat less reliable. Nevertheless, the primary objective of the first phase of this study was to have an overall view that would lead to the identification of breeds or production constraints that warrant further investigation in the second phase in a better designed study. It is the belief of the author that the information obtained served to achieve that goal. The portion on the diseases of livestock species is deficient, however, mainly because of the existence of various local names for the same disease in different localities and the distorted answers received in most cases, both of which resulted in discarding data from the analysis. Data were analyzed using the frequency distribution method.

This report is in six parts. Following the introduction covering the resource endowments of the region, livestock production systems are defined under cattle, small ruminants, poultry, and equines. The report ends with final conclusions.

Natural resources

The western region includes Assosa, Welega, Ilubabor, Gambela, and Kefa administrative regions.

Climate. Temperatures in the region vary because of differences in altitude—300 m to 3000 m. From February to May, the hottest season, mean temperatures range from 20°C to 25°C. Rain falls throughout the year; annual fall varies from 800 mm to 2800 mm. The highest annual rainfall in the country is received in this region.

Land use and vegetation. Nearly 16% of the region is estimated to be under rainfed peasant subsistence crop cultivation with 12% annual and 3.6% perennial crop coverage. Large state farms, covering 2.9% of the region, have recently been established to produce cereals, coffee, and tea to meet both domestic use and export demands. The soils of Ilubabor, Kefa, and southwestern Welega are predominantly Nitosol. These soils are clayey, porous, and well drained; they have good potential for agriculture, and they are easily workable. The other type of soil in the region is Vertisol, found on the colluvial slopes and alluvial plains that border the Sudan line. Because of its drainage problems, this soil has no vital importance for crop cultivation; therefore, it is predominantly used for grazing. Major crops of the region include maize, tef, sorghum, wheat, barley, finger millet, noug, faba bean, peas, coffee, and enset.

Forests, woodland, bushland or shrubland cover 19.8% of the region; the grass cover is predomi-
nantly *Hyparrhenia* associated with savanna. Almost half the existing patches of forests of the country are found in the sparsely populated and inaccessible parts of the western region (ONCCP 1986).

**Human population**

The total population of the region is about 6.2 million, 95% of which lives in rural areas. The average population density is 35.5:36.1 for Welega and Asosa, 20.4 for Illubabor and Gambela, and 51.4 for Kefa. Most people live in places above 1500 m and the lowland areas and the main river valleys are sparsely populated. Average household size for the region varies from 3 to 5.6 with a mean value of 4.3.

**Livestock population**

Cattle account for 51.5% (4.5 million) of the total livestock population in the region, poultry for 30.6% (2.8 million), sheep and goats for 14.5% (1.3 million), and equines for 3.4% (0.3 million). It has been estimated that about 14% (4.5 million) of the cattle and 17% of the sheep populations of the country are found in this region. Data on the average number of livestock per farm are not available, but survey results show that in the Bako area there are 10.5 cattle, 2.3 sheep and goats, and 4.2 poultry per farm on average. In the Asendabo area there are 3.4 cattle, 0.9 sheep and goats, and 1.1 poultry (Kassahun Seyoum et al. 1989, Legesse Dadi et al. 1987)

**CATTLE PRODUCTION SYSTEM**

**Breed types, their use, and the purpose of keeping them**

Though the majority of farmers in the region keep nondescript types of cattle, identified breeds like Horo, Sheko, and Abigar are found in the western region. The percentage of the known breeds compared to the nondescript type is not known. Among the respondent farmers 79% indicated the existence of small-scale dairy farms using Horo and Boran Friesian F1 crosses. Some of these farms were reported to have been established as early as 1977, initially by missionaries or individuals, but currently the majority are owned by producer cooperatives. Small-scale dairy farms, with an average of 10 cows, are found in all three administrative regions.

Over 50% of the respondents in this study reported that farmers keep cattle for many reasons: first to meet their power requirements, second for milk production, third for meat, and last for manure production. It is, of course, not easy to delineate the use cattle are put to on a priority basis in a mixed farming system. They are kept for many purposes, which include not only economical uses but also socio-cultural and prestigious purposes. However, since farmers rely almost entirely on ox for their farm power, of all the uses, draft power stands out.

Farmers who have no oxen prepare their lands in different ways. They either do the job manually with the hoe (68% of the respondent farmers), rent oxen (32%) or exchange labor for the use of oxen in various ratios in different areas 1:1 (16%), 2:1 (56%), and 3:1 (10%). But those who own a single ox, besides these options, can also pair with other single-ox owners. In Buno Awraja of Illubabor administrative region, farmers practice pairing a bullock with a cow at times when the cow is empty. On the other hand, in the Masha area of Mocha Awraja and the Sheko area of Gimira Awraja, both in Kefa, ox cultivation is not known, and all farmers cultivate with hoes.

**Production and reproduction status**

*Milk production*. A mean milk yield of 1.7 kg per cow per day and 8 months of lactation were reported for the region. The former ranges from 0.5 kg to 6 kg and the latter from 4 months to 12 months. The highest figure for milk was reported for the Sheko breed of Gimira Awraja in Kefa Administrative Region. Abigar breeds averaged 4 kg of milk per day and Horo 2 kg. Data on milk yield of crosses were not collected.

Milking of newly freshened cows starts on average 15 days after parturition. But it could range from 1 day to 30 days depending on the number of cows already in milk in the household, which in turn governs the degree of need of that family for milk. The higher the number of cows in milk in a household the longer cows are left to suckle their calves. Milking is normally done by women in this region; however, men were also reported to take part in the job (11%). The frequency of milking...
Cattle production system

was twice a day throughout the region.

Nearly 70% of the respondents indicated that feed for cows is supplemented at milking, mainly with home brewery byproducts, salt, grass and tree leaves. Thirty-two percent of the studied areas dried off their cows when the calves died while 67% continued milking them using various means, including the use of pseudo-calf (prepared by covering an object with the skin of the dead calf), a salt lick, some sort of supplementary feed or any one of these methods complemented with udder massage. All are attempts to stimulate milk letdown, triggered by suckling, a trait inherent in zebu.

Breeding. Traits of economic importance for cattle of the western region of Ethiopia are detailed in table 1. Heifers calve on average at the age of 4.4 years; cows calve once every 22 months and stay in production for 7.9 years. Bull calves do not generally reach either breeding or working age prior to 4 years. Farmers do not practice selection of breeding sires.

Sixty percent of the respondents reported absence of seasonality in cow breeding. Among those who indicated its existence, 36% attributed it to the availability of crop residues, 16% to the onset of rains, and 48% to both.

Management

Housing. Calves, small ruminants, and equines were reported to be the only types of livestock kept in a house at night; the rest are kept in a kraal. Animals are often tethered in a house. Tethering is, however, rarely practiced in a kraal.

Feeding. Neither the use of cultivated forage crops nor the conservation of surplus grasses in the wet season for dry-season use is known in the region apart from an insignificant number of places where modern dairying has been established (18% of the studied areas). Animals have to rely, therefore, mainly on natural pasture for their feed requirements the year round. Cattle are allowed to graze on areas that have little or no potential for arable farming. The main grazing areas, including places like hilltops, swamps, forest margins, roadsides, stony or infertile land are usually separated from cultivated land to reduce the possibility of crop damage by livestock (Alemu Tadesse 1982).

Though 77% of the studied areas reported no shortage of pasture in their areas, all invariably indicated the prevalence of dry-season feed shortage. In the dry period, farmers supplement crop residues, tree leaves, salt, or atela (home brewery byproduct) for their animals. These feeds are used either in combination or separately. However, animals are given supplement feed on a strict priority basis: first plowing oxen, second milking cows, and last calves. This finding is consistent with the results obtained for Bako and Jimma areas in previous surveys (Legesse Dadi et al. 1987, Kassaahun Seyoum et al. 1988). Cattle fattening is a forgotten venture in the region.

It was indicated that 75% of farmers in the sampled areas in Kefa, 86% in Welega, and 81% in Ilubabor utilize crop residues individually. This contradicts the earlier finding for the Bako area, which shows that the majority of farmers used crop residues communally (Legesse Dadi et al. 1987). Two areas, Bedele and Sitema, in Buno Awraja of the Ilubabor Administrative Region were the only places where crop residues were used for animal feed. An alternative use, if any, in these areas was not revealed.

The use of grazing land in the western region can be communal, individual or both even though the former is most widely exercised (69% for the

Table 1. Traits of economic importance in the cattle of the western Ethiopia

<table>
<thead>
<tr>
<th>Trait</th>
<th>Mean</th>
<th>S.D. *</th>
<th>Range</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at first calving (year)</td>
<td>4.4</td>
<td>0.88</td>
<td>3–7</td>
<td>4</td>
</tr>
<tr>
<td>Calving interval (month)</td>
<td>22.0</td>
<td>7.19</td>
<td>12–48</td>
<td>24</td>
</tr>
<tr>
<td>Parity (year)</td>
<td>7.9</td>
<td>1.95</td>
<td>4–12</td>
<td>6</td>
</tr>
<tr>
<td>Breeding age for male (year)</td>
<td>4.0</td>
<td>1.32</td>
<td>2–7</td>
<td>3</td>
</tr>
<tr>
<td>Age for work for male (year)</td>
<td>4.1</td>
<td>0.83</td>
<td>2–6</td>
<td>4</td>
</tr>
<tr>
<td>Milk yield per cow per day (kg)</td>
<td>1.7</td>
<td>0.92</td>
<td>0.5–6</td>
<td>1.7</td>
</tr>
<tr>
<td>Lactation length (month)</td>
<td>8.0</td>
<td>1.83</td>
<td>4–12</td>
<td>7</td>
</tr>
</tbody>
</table>

*S.D. = standard deviation
region in general, 53% in Kefa, 75% in Welega and Asosa, and 80% in Ilubabor and Gambela). Fallow and other stubble areas are usually grazed individually in the morning and in the evening as animals go to and come back from the main grazing area.

Herding of animals is often done by children. But at times men are also involved whenever they can release themselves from other responsibilities or are compelled to do so if they do not have children. Herdsmen are hired only rarely. Herding is done either individually or communally. In the latter case owners serve alternately, and the society sets out rules and regulations that govern each member. It was reported that animals are not herded in the Masha area of Mocha Awraja, Kefa Administrative Region.

In Gudiru Chomen, Horo Dengoro, and Gimbi awrajas of Welega Administrative Region, transhumance is exercised. Only one area, Abay Chomen, of the former awraja and four areas of the latter awraja, Boji Dirmaji, Nejo, Mene Sibu and Jarso, practiced this system. Livestock movements, in all cases, are from highlands to lowlands for a period ranging from 3 to 6 months every year. These seasonal movements are aimed at mobilizing animals from densely populated areas to sparsely populated areas in order to alleviate grazing land pressure. Transhumance is seen advantageous in the highlands, particularly from the beginning of land preparation until crop harvest. During this period, bushlands and small plots on the fringes of roads or crop fields which proved unsuitable for cropping alone are available for grazing. This not only puts a great pressure on the available grazing land but also posts a danger to crops because of damage inflicted from animals. Hence both crops and animals benefit from the seasonal movements of animals.

Calf weaning methods: pre- and post-weaning management. In this region newly born calves are allowed to suck all the milk from their dams for the first 15 days, on average, without the interference of the owner. Once milking is started, calves are then used to initiate milk let-down by letting them suck for some minutes immediately prior to each milking.

After milking starts, owners vary in their methods of calf management. Sixty-eight percent of the respondents reported that they provide their calves with special care in one form or another during this period while the rest indicated that they let the calves fend for themselves. Calves were reported to start foraging at the age of 30 days on average. The types of care rendered from this age until weaning include feeding on fresh grass on a cut-and-carry system; supplementing with gruel made of cereal flour; drenching skim milk, cheese or whey; feeding on hay or straw; and allowing calves to graze around the homestead on a ley exclusively reserved for them. In a few places selected tree leaves are crushed, mixed with water, salted, and fed to calves (Kassahun Seyoum et al. 1988).

Weaning is mostly brought about by the dam rather than by the owner. Drying off a cow normally results in calf weaning. Some cows, nevertheless, tend to continue suckling a calf after they have proved reluctant to be milked, and it is only then that the owner starts considering weaning. The methods differ from place to place and even from farmer to farmer within the same locality. Some tie thorny materials around the muzzle of the calf, which prick the cow if the calf attempts to suck; others separate the dam from the calf for a certain period of time; still others paint the teats of the cow with some bitter substance like dung that precludes suckling. There are also instances where the muzzle of the calf is wounded to achieve the same goal.

In 80% of the surveyed areas, calves are let to graze with the rest of the herd after weaning and only 38% stated that they supplement them with grass, salt or atela.

Marketing

The major reasons for the sale of cattle are cash need, disease, old age, and herd replacement. There is no specific age at which cattle are sold, but the result of this study revealed that marketing age ranged from 2 to 11 with an average of 4 years.

As is true in most parts of Ethiopia, the infrastructure for marketing animals is not developed and hence animals are sold to a nearby local or primary market. They are then trekked to bigger cities or terminal markets over a long distance during which they lose much of their body condition. Despite a loss in body condition, there is a considerable price difference between the primary and terminal markets, almost always in favor of the latter. The difference reflects the high demand for meat in urban markets and the high margins earned by middlemen. High middlemen margins may reflect excessive profits or high costs and risks incurred by middlemen.

Primary market prices for different categories of cattle during this survey are indicated in table 2.
Diseases and control measures

The top three cattle health hazards in the region in order of importance are trypanosomiasis, blackleg and parasites (both internal and external). Pasteurellosis and anthrax were also reported to pose a problem occasionally. Internal parasites of great importance are liver fluke, lungworm and various types of intestinal worms while ticks, lice, and mites constitute the major external parasites.

Trypanosomiasis is the single most prominent livestock production constraint in the western region of Ethiopia. Estimate of the total tsetse fly-infested area is 67,500 km², which is about 68% of the total area affected in the country. Trypanosomiasis is found anywhere in the region except in the highlands above 2500 m (Solomon Haile Mariam 1979). From the studied areas alone, 960 ha of land in Kefa, 9480 ha in Welega and Asosa, and 31240 ha in Illubabor and Gambela were reported abandoned as the result of high risk from this disease. All the abandoned areas were at low altitudes with hot climates.

Invariably all the surveyed areas have access to veterinary service rendered by the Ministry of Agriculture, though there have repeatedly been complaints about its inadequacy for various reasons such as shortage of drugs or inadequate staffing. Respondents reported drenching (93%) and cultural medicine (44%) as measures against internal parasites. About 81% of the farmers in the studied area used spraying while 60% relied on hand picking, 58% on local medicine, and 6% on dipping.

<table>
<thead>
<tr>
<th>Cattle category</th>
<th>Price (birr)</th>
<th>No. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D. *</td>
</tr>
<tr>
<td>Fattened ox</td>
<td>291</td>
<td>57</td>
</tr>
<tr>
<td>Fattened cow</td>
<td>233</td>
<td>52</td>
</tr>
<tr>
<td>Ox</td>
<td>229</td>
<td>35</td>
</tr>
<tr>
<td>Pregnant cow</td>
<td>233</td>
<td>55</td>
</tr>
<tr>
<td>Cow</td>
<td>179</td>
<td>44</td>
</tr>
<tr>
<td>Pregnant heifer</td>
<td>172</td>
<td>49</td>
</tr>
<tr>
<td>Bull calf</td>
<td>151</td>
<td>41</td>
</tr>
<tr>
<td>Heifer</td>
<td>113</td>
<td>41</td>
</tr>
<tr>
<td>Calf</td>
<td>50</td>
<td>18</td>
</tr>
</tbody>
</table>

*S.D. = standard deviation

SMALL RUMINANT PRODUCTION SYSTEM

Sheep

Breed types, their use, and the purpose of keeping them. The majority of sheep kept in the region are nondescript in type. Nevertheless, Horo, Bonga, Mocha, Gimira and Sheko were reported. There exists much controversy as to whether the latter four are distinct enough from the Horo to be designated as different breeds. A thorough investigation is required to overcome this dispute.

Sheep are reared invariably for meat. Wool or milk breeds are not known in the region. Some of the breeds have high productivity levels. So far, Horo has been the only sheep breed of the region studied at Bako Research Center. It has a high productive and reproductive potential for meat. It has revealed an average of 141% lambing, 40% twinning and nearly 1% tripleting over the studied period at Bako. The Gimira breed is said capable of producing 3 to 4 lambs per lambing. This level is obviously too high for an indigenous tropical breed kept under traditional husbandry practices with low standards of management. If the indicated productivity level can be achieved with farmers’ management this breed could be on the list among the top in the world. Consequently, due consideration must be given by the research center to further investigate its real potential.
Livestock system of western Ethiopia

Fattening. Sixty-three percent of the respondents indicated that sheep fattening is practiced in their areas. The type of ration used for this purpose is governed by availability; the most frequently used rations are boiled faba bean, cereal flour, household waste and milk byproducts like skim milk or whey, all in conjunction with salt. In the Masha area of Mocha Awraja, false banana root is also used; in the Darimo area (Ilubabor) ash of a tree locally known as lolchisa is fed to fatten sheep. Further investigation has to be made to verify this use.

Marketing. Lambs are marketed at the age of 6 to 18 months, with the most frequent marketing age reported to be 6 months. Current prices for different categories of sheep are shown in table 3.

Diseases and parasites. The important sheep diseases are pneumonia in Kefa, Gambela and Ilubabor and sheep pox and foot and mouth disease in Welega. Liver fluke, intestinal parasites and lung worm constitute the major internal sheep parasites while ticks, lice and fleas comprise the important external parasites. Sick sheep are either brought to the attention of veterinarians or are treated by the owner with cultural medicine.

Goat

No goat breeds have so far been identified in the western region. Thus all are nondescript in type.

Fattening. About 58% of the respondents reported that they fatten goats. The types of feed utilized are similar to those used for sheep.

Marketing. There seems to be no specific age at which goats are marketed though the majority are sold at the age of six months (37%). Prices for different categories of goats are shown in table 4.

Diseases and control measures. Disease is not a serious problem with goats in the region. Nevertheless, trypanosomiasis and contagious caprine pleuropneumonia in Kefa; trypanosomiasis, foot and mouth disease, anthrax, and pox in Welega and Asosa; and trypanosomiasis, foot and mouth disease, pox, and contagious caprine pleuropneumonia in Ilubabor and Gambela pose problems occasionally.

Liver flukes, lungworms and intestinal parasites are the main internal parasites whereas ticks, lice and biting flies constitute the important external parasites. Sixty-nine percent of the areas surveyed sought veterinary assistance to treat sick goats while the rest used local treatment.

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Table 3. Average annual prices of different categories of sheep for 1986

<table>
<thead>
<tr>
<th>Sheep category</th>
<th>Mean</th>
<th>S.D. *</th>
<th>Range</th>
<th>Mode</th>
<th>No. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stag</td>
<td>72</td>
<td>20</td>
<td>30-130</td>
<td>60 &amp; 80</td>
<td>61</td>
</tr>
<tr>
<td>Breeding ram</td>
<td>46</td>
<td>13</td>
<td>20-100</td>
<td>40</td>
<td>57</td>
</tr>
<tr>
<td>Pregnant ewe</td>
<td>40</td>
<td>13</td>
<td>20-110</td>
<td>35</td>
<td>62</td>
</tr>
<tr>
<td>Ewe</td>
<td>33</td>
<td>9</td>
<td>15-60</td>
<td>35</td>
<td>62</td>
</tr>
<tr>
<td>Ram lamb</td>
<td>29</td>
<td>9</td>
<td>15-58</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>Ewe lamb</td>
<td>25</td>
<td>8</td>
<td>14-50</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>Female lamb</td>
<td>17</td>
<td>5</td>
<td>6-30</td>
<td>15</td>
<td>56</td>
</tr>
<tr>
<td>Male lamb</td>
<td>18</td>
<td>6</td>
<td>8-35</td>
<td>15</td>
<td>56</td>
</tr>
</tbody>
</table>

*S.D. = standard deviation
Farmers in this region rear chickens, the only type of poultry kept, for both egg and meat production. Only 23% of the respondents reported the presence of improved breeds in their areas. They were distributed entirely by the Ministry of Agriculture with the exception of the Asosa area, which got its stock from the Ethiopian Nutrition Institute. The Ministry of Agriculture is trying hard to introduce improved breeds to the region, and between 1980 and 1985 it distributed 5813 cockerels and 5471 pullets to farmers (Welega Administrative Region 1986). Despite this effort, the overwhelming majority of the farmers still keep local breeds with poor genetic potential. The greater proportion of these birds does not reach breeding or marketing age before 6 months. Once they start laying, pullets usually produce one egg every other day for a short period of time and then brood. Besides the poor genetic potential, this low level of production is also attributed to poor management. About 92% of the respondents said that they let chickens scavenge while others supplemented their feed with grain once a day. Currently production is known to be constrained by predators (82%), disease (74%), and poor nutrition (37%). Wild animals including some bird species and stray cats are important predators; coccidiosis, Newcastle, and fowl cholera are diseases of major importance in this region.

Eggs that are produced at home have three main destinations: storage for sale, hatchery, or holiday consumption.

EQUINE PRODUCTION

As in most parts of the country, horses and mules play an important role in transporting human beings and goods from place to place. Horses and mules accounted for 74% and 80% respectively of the transportation services of the surveyed areas. Apart from this major task, these animals are also put to other minor and seasonal operations like threshing crops in some regions. Donkeys are, however, mainly kept for pack except in a very few places, e.g. Asosa, where they may also be used for transportation of people. Two network lines of local flights and 2656 km of all-weather road provide other transportation means in this region.

Diseases that impede equine production in order of importance are trypanosomiasis, lymphangitis, and African horse sickness. Fifty-nine percent of the respondents reported that farmers use cultural treatments when their animals are sick. But the treatment of a specific type of disease should be studied in detail in the future.

As with other types of animal production, dry-season feed shortage is another factor that affects equine production. The majority of farmers (70%) utilized crop residues, especially those of small cereals, to alleviate the problem. Fresh grasses and some weeds are also used as a supplement. Cereal grains are used as a feed supplement by only 7% of the respondents, and this is limited to the time of crop harvest when surplus grain exists and for race horses alone.
Livestock system of western Ethiopia

CONCLUSIONS

The western region of Ethiopia is endowed with a high potential for livestock resources. It accounts for 14% of the cattle and 17% of the sheep populations of the country. Despite the threat from diseases like trypanosomiasis, the climate in the region is generally favorable for livestock production.

Cattle breeds that have so far been identified are Horo, Sheko, and Abigar. Sheep breeds reported inhabiting the region are Horo, Donga, Mocha, Gimira, and Sheko. Among the identified cattle and sheep breeds, Horo is the only one studied at Bako Research Center to date. Production and reproduction figures, under farmers' management level, for some of these cattle and sheep breeds were much higher than those obtained for Horo breeds under research conditions at Bako. A study to verify them has yet to be done. In the second phase of this survey, a few animals will be purchased from cattle and sheep breeds of high potential and a preliminary study of productivity will be done at Bako Research Center. Insofar as this survey is concerned, no new breeds of goats, chicken or equines were identified.

As in most parts of the country livestock production system of this region is confronted with the following major problems, listed in order of importance:

- poor management level in terms of feeding, breeding, and health care
- dry-season feed shortage
- disease, especially trypanosomiasis
- internal and external parasites
- low genetic potential of the nondescript local livestock types
- inadequate veterinary services
- poor market infrastructure

REFERENCES

QUESTIONNAIRE ON THE LIVESTOCK BREED AND PRODUCTION SYSTEM OF THE WESTERN REGION OF ETHIOPIA

General

- Climate of the area?
- Annual rainfall, season of rain, duration?
- Crops of the area? Frequency of harvest per year?
- Livestock population in the area?

Cattle

- Breed type in the area?
- Priority of use of cattle?
- Options of plowing for a farmer with no or one ox?
- Age at which most animals are sold? Reasons for sale and current average price for different categories of livestock?
- Presence of crossbred farms in the area? If present, year of establishment? Breed types? Owner? Objective?
- Season of breeding and calving for cattle in the area?
- Day milking starts following parturition? Milk yield per day? lactation length? Supplementation during milking? Frequency of milking in a day? Whether milking is done by men or women?

Calf

- Duration of suckling for calves?
- Supplementation during suckling if any for calves? Care for calves after weaning? Methods of weaning?

Cattle health

- Measures farmers would take when animals are sick?
- Major disease of cattle in the area? Priority in terms of importance? Age and sex for specific diseases if any?
- Major internal and external parasites in the area? Any cultural treatment against parasites?
- Disease out-break experience in the area, and types of diseases if any?
- Area of land abandoned due to diseases in the area? Size of land abandoned in gasha?

Cattle feeding and management

- Whether or not there is a feed shortage problem in the area? Season and duration of shortage if there is any?
- Mode of utilization of grazing land?
- Who herds cattle and mode of herding?
- Whether or not transhumance exists in the area? When? Why? From where to where?
- Whether or not cattle are supplemented during the dry season? Type of supplementation and priority among different categories?

Sheep

- Breeds known in the area and description?
- Purpose of sheep breeding?
- Improved breeds if any? Origin and purpose?
- Number of lambs per lambing for the existing breed?
- Age for sale for lambs? Current prices of different classes of sheep?
- Major sheep disease in the area? Internal and external parasites?
- Measures taken when sheep are sick?
- Sheep fattening practice in the area? Type of feeds used for fattening?

**Goats**

- Similar questions as for sheep

**Poultry**

- Breeds known in the area and description?
- Egg production per hen per day for the breeds?
- Destiny for daily egg production?
- Age at first egg lay?
- Whether or not birds are supplemented?
- Presence of improved poultry breeds in the area? Breed types? Origin? Purpose?
- Major poultry production constraints?

**Equines**

- Use of equines in the area?
- Diseases of equines?
- Whether or not equines are supplemented during the dry season?
- Cultural treatment for sick equines?
- Taboo for different uses of equines?

*Any other form of livestock production apart from cattle, small ruminants, poultry, and equines?*