



AFGHANISTAN

NATIONAL **LIVESTOCK CENSUS** 2002-2003



FINAL REPORT 2006



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LIVESTOCK CENSUS
2002-2003

OSRO/AFG/212/ITA

FINAL REPORT

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FOREWORD

This report provides the analysis of the four separate surveys conducted under the 2003 Livestock Census.

Livestock plays a fundamental role in Afghan economy and livelihoods. It has been accorded one of the highest priorities in the Master Plan of the Ministry of Agriculture, Irrigation and Livestock (MAIL). Over the past 30 years livestock population has fluctuated due to insecurity and drought in the country. Reliable, updated information and data on livestock numbers, products and production system of the country are scanty. Such data are needed for the appraisal, formulation and implementation of livestock development programmes and projects.

The 2003 Afghanistan National Livestock Census conducted by the Food and Agriculture Organization of the United Nations (FAO) and MAIL aimed to narrow the data and information gap on livestock. The census programme was designed by Professor Wolfgang Pittroff, University of California, Davis, United States of America and Dr Olaf Thieme, FAO. Census enumeration and assessment as well as data processing were done by FAO and MAIL staff. Fieldwork was supervised and managed by Dr Len Reynolds and the FAO national team.

My heartiest thanks are due to all institutions and persons involved in the conduct of the survey and in production of its results. First and foremost, I would like to thank the farmers and the villagers who provided data and information for the survey. The census would not have been successful without their wholehearted support. My special thanks are due to staff of FAO and MAIL for the questionnaire design, survey enumeration and assessment. I should like to acknowledge the financial support provided by the Government of Italy for this important activity through the *Italian voluntary contribution to ITAP 2002/2003 in Afghanistan* project (OSRO/AFG/212/ITA). This work would not have been possible without FAO's technical assistance and operational support.

H.E. Obaidullah Ramin
Minister of Ministry of Agriculture, Irrigation and Livestock (MAIL)
Kabul, Afghanistan
January 2008

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Clarification of district names and locations was undertaken with assistance from the Mol, the CSO and Dr Pinney from the Afghanistan Ministry of Reconstruction and Rural Development. Assistance from UN personnel across diverse projects in Afghanistan and Rome is acknowledged, including particularly Dr Majok, Dr Favre, Dr Crowley, Mr. Mack and Mr. Miagostovich.

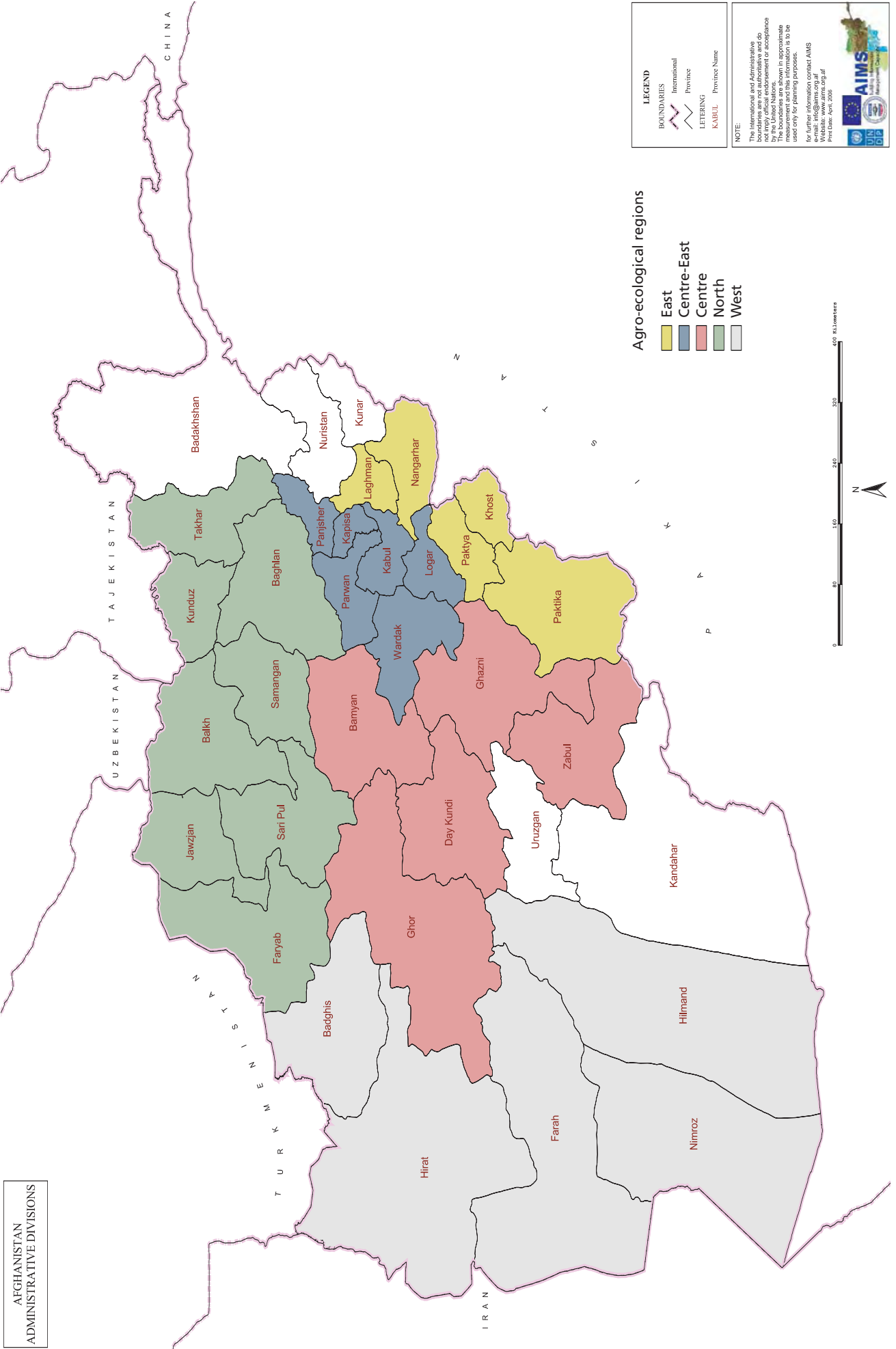
The Afghanistan National Livestock Census was designed by Prof Wolfgang Pittroff, University of California, Davis, and Dr Olaf Thieme, FAO. Field work was managed by Dr Len Reynolds and Dr Habib Nawroz.

Data were analysed by Prof Wolfgang Pittroff (University of California, Davis), Dr Olaf Thieme (FAO) and Prof Fred Dahm (Texas A&M University, College Station, United States of America).

The preliminary report was published in 2003. A long period of in-depth analysis of the massive amounts of data collected in the census followed, especially focusing on Level 2 and Women Livestock Resources Surveys. Data analysis iterated in numerous rounds with post-hoc data clean-up and clarification for all Levels and Surveys. Particularly important was a comparative analysis of Level 1 and Level 2 data using advanced statistical methods. Given the need for a reliable base line data set and the enormous logistical demands faced by nation-wide census operations in Afghanistan, this extraordinary additional effort seemed to be well justified. Some minor modifications of certain summary statistics published in the preliminary report resulted, but all conclusions remained the same.

The final report was written by Prof Wolfgang Pittroff and Dr Olaf Thieme, assisted by Dr Len Reynolds, Dr Nawroz and Mr. Haroon Nessar.

The project team hopes that the hard work of nearly a thousand people summarized in this report will contribute to the reconstruction of Afghanistan.



2. EXECUTIVE SUMMARY

1. After decades of warfare and a devastating drought it was reported that the numbers of livestock in Afghanistan had fallen dramatically. In early 2002, the Ministry of Agriculture and Animal Husbandry of the Transitional Islamic State of Afghanistan requested FAO to organise a national livestock census.
2. The work started in Afghanistan in October 2002 with funding from the Government of Italy and field work was completed by April 2003. Every village in Afghanistan was visited, with the exception of Barmal District in Paktika Province because of insecurity, and parts of Ghor Province because of lack of accessibility over the winter period.
3. A team of 28 supervisors, 24 female surveyors and 821 enumerators were employed for data collection; 14 data entry personnel and 10 data checkers undertook data entry and proofing.
4. Livestock numbers, limited herd structure data and change in ownership during drought were determined by total enumeration in Level 1 of the census. Total enumeration was conducted at the community level in every village in Afghanistan (with the exceptions mentioned above).
5. Level 2 of the Census consisted of a detailed production system analysis designed to survey a representative cross-section of Afghan livestock producers. These data were collected by supervisors from 1 284 selected representative households in randomly chosen villages. The data give detailed information about production practices, production calendars, key production bottlenecks, and suggestions for interventions.
6. In order to ascertain the role of women in livestock production in Afghanistan, a detailed survey focusing on gender role in work responsibility, decision making and producer goals was conducted by female enumerators interviewing 2 899 women in livestock producer households. The data give a detailed picture of gender role in livestock production in Afghanistan, and in addition to Level 2 data, show where successful interventions for livestock development should be directed.
7. Given the historic significance and current potential for value-added livestock production, a survey was conducted to gather information specific to the Karakul sector. Detailed information on Karakul sheep production systems was collected from 132 producers. The data are a snapshot of current production practices and provide, for the first time, background information about this potentially important value-added sector. It should be followed up by a market analysis.
8. The collected data covered 3 044 670 families in 53 214 communities across 36 724 villages. Some communities were unable to state the number of existing families.
9. The total number of cattle in Afghanistan was 3.72 million, and there were 8.77 million sheep, 7.28 million goats, 1.59 million donkeys, 0.18 million camels, 0.14 million horses, 12.16 million chicken, 0.42 million ducks and 0.60 million turkeys.
10. The number of cows kept per family was low, with only Khost, Kunar, Laghman and Nuristan Province reporting more than 1.5 cows per family. The data on number of calves suggests that in many areas, restocking of depleted cattle herds would not be possible at the current reproduction rates.
11. Similarly in many areas reported numbers of young sheep and goats appear low and rebuilding of herds will be slow.
12. The numbers of families without livestock have increased during the years of drought from 11.4 families to 14.4 families per community. However, at the same time numbers of family per community has increased
13. There are no pre-drought livestock census data which could be used for direct comparisons. However, earlier survey results combined with the information from the present census indicate that stock holding per family have decreased sharply.
14. Information from the Level 2 and Women Surveys clearly show that feed and forage production are the major bottleneck for livestock production development in Afghanistan. Future livestock development activities should fully consider these findings and make fodder production an integral part. There is also an urgent need for projects that integrate crop production and livestock development and further animal health programs must be evaluated and planned in conjunction with interventions that are aimed at improving the feed situation.
15. Generally, the farmers' responses after the drought broke in 2003 indicated an optimistic outlook. It was also the time when the new Government took office which might have partly influenced

the positive views about the future. However, Afghanistan is part of the largest drought-prone region in the world and drought will remain a recurring phenomenon. Watershed rehabilitation and drought preparedness must accompany the reconstruction of the Afghan livestock sector to make it more resilient in the future.

16. Three areas in livestock production appear to be most relevant for interventions: Forage production, dairy production, and poultry production. Clearly, cattle are the livestock species which is most important to farmers, and dairy cows are their most important animals. The biggest effect on increased production, improved livelihoods and more food security could be achieved by helping farmers with suitable forage production, ideally well integrated into field crop rotation schemes. Farmers are keenly interested in market integration with dairy products – the potential benefits for small scale commercial dairy development appear to be substantial. Further, a large proportion of women surveyed reported a keen interest in poultry production with a clear focus on egg sales. This seems to be the most effective intervention directly benefiting women in rural Afghanistan, but also in urban centres and should receive appropriate attention by development workers.
17. Wealth distribution data show that Afghan livestock producers are extremely poor by international standards. However, social stratification exists and is regionally differentiated. The regional differentiation is also a result of the 1998-2002 drought, which was of variable severity in different parts of the country. The census shows that the western region has the highest number of farmers with no livestock at all. This was the region most affected by the drought.
18. There appears to be potential for income generation from intensified small ruminant, especially sheep production. Most settled owners of small ruminants have cattle as well and often belong to the wealthier part of the population. The nomadic Kuchi population who keeps a large part of the small ruminants was not included in the present surveys but pre-drought information exists from another FAO (1999) study. Opportunities to develop sheep production are more promising for farmers with access to irrigated land supporting greatly improved forage production. Further analysis of the sheep sector seems indicated, since opportunities for value-added, possibly stratified production appear to exist.
19. Level 2 surveys on feed supply and problems and constraints faced by producers provided much insight into the state of natural resources supporting livestock production in Afghanistan. Livestock owners make substantial efforts to supplement the feeding from natural pastures and crop aftermath with cultivated fodder crops. Feeding of concentrates is very common, but the quantities are usually low and fed mainly during the winter months.
20. The length of the feeding period in the harsh climate of Afghanistan commonly exceeds six months in most locations. Thus, available resources for supplemental feeding and winter forage determine the number of animals that can be kept. This 'Winter Feed Gap', the major constraint of livestock production in most parts of Afghanistan, must be addressed with great care, however. Although no systematic data are available, the aspect of rangeland conditions appears to be poor to catastrophic in many areas of the country. An expansion of livestock numbers, especially small ruminants, facilitated by improved forage resources for the winter feeding period will likely further increase pressure on already stressed rangelands. For small ruminants forages harvested or grazed from pastures and rangelands appear to be quantitatively the most important feed resource. Rangeland conservation, accordingly, is a task of national priority.
21. The average time to reach markets was about two hours, a surprisingly low figure considering the road conditions in Afghanistan. It is possible though that more villages were selected for the Level 2 survey which was nearby the market centres. Farmers did not seem to be overly concerned about access to markets. In light of the other critical issues identified (nutrition, low reproduction, farmer concerns about veterinary health care) markets are not an issue of highest priority.
22. The analysis of distribution of work load and decision making clearly suggests that women are responsible for most livestock-related work at the homestead, while children and to a lesser degree men handle livestock tasks outside the home compound. Since dairy animals are mostly fed at the homestead, cattle forage programs should consider gender in their design. Decision making in livestock production is the domain of men, but for some of the important decisions (purchase or sale of cattle) women share responsibility in the decision making process. Women decide milk and wool sales; therefore, milk collection schemes must explicitly consider the views and involvement of women.

23. Women from rural households provided a wealth of answers on questions related to problems of livestock production and desirable improvements. They overwhelmingly selected cattle as their most important species, and opted for milk production for sale as the most important development activity for cattle production. For women the second most important species was chicken, with the aim of egg production for sale. Future survey work in preparation of livestock interventions should further pursued these questions by asking the questions to both men and women.
24. Karakul sheep production for pelts was in the past an economically very important livestock production in Afghanistan and is still practised. Farmers reported lower sales in pelts and wool compared to the previous year, but expected to sell more the following year. Much, if not most of the Karakul output enters the international markets. More research on the international markets for Astrakhan pelts is therefore needed to judge the potential future of Karakul sheep production in Afghanistan.
25. The census was designed with two levels of sampling intensity. Level 1 as total enumeration census, designed to determine the total number of livestock in the country, and to provide an assessment of livestock losses caused by a catastrophic drought. Level 2 was a survey designed to describe production systems and markets, based on a detailed questionnaire to selected farmers. The data analysis process revealed that sufficient well-trained personnel for checking of data consistency during the census are the key to timely and accurate census execution and analysis. Only stringent quality control exercised during the census allows the use of sophisticated statistical methods for in-depth consistency checking.



photo by: Thieme

3. BACKGROUND

Livestock play a fundamental role in Afghan agriculture, but existing information on the numbers of animals in the country and their distribution predates many years of warfare and a devastating four year long drought. Field reports indicated that animal numbers have fallen sharply since the earlier surveys, but there are no statistics to substantiate the claim. Farmers are aware of the need for vaccination against animal disease but animal numbers are required for planning veterinary campaigns. Reliable statistics as well as comprehensive production system information are needed to guide the design and implementation of livestock development programs carried out in the rebuilding of the Afghan agricultural sector.

During 2002, the Italian Government agreed to contribute funds for the agricultural sub-sectors of the Intermediate and Transitional Assistance for the Afghan people (ITAP), including the provision of funds for a National Livestock Census.

An interim report with the core of the census data was published in 2003. This final report includes the expanded analysis and summary of four separate surveys: Levels 1 and 2 of the livestock census (Level 2 included a detailed production system appraisal), the Women Livestock Owner Survey, and the Karakul Survey.



photo by: Reynolds

4. ACTIVITIES

4.1 ORGANISATION AND PLANNING

Work in Afghanistan started in September 2002. An International Livestock Consultant developed the census and data analysis design and provided operational guidelines and training manuals. The Census Manager planned and supervised the administration of the field work. Census design and methodology are described in full detail in Section 6. Briefly, the census was conducted on two levels of intensity. Level 1 constituted the complete enumeration of all livestock numbers, including limited information on livestock demography and recent changes in livestock wealth. These data were collected at the community level, with a community typically representing a mosque assembly within a village or town. A much more detailed Level 2 census was administered by Supervisors to individual households in randomly selected districts and villages. Level 2 covered detailed information on animal husbandry, feed management and markets. In addition to the census, two separate surveys were administered. One survey specifically addressed livestock production issues from the perspective of women. This survey was administered by female enumerators. The second additional survey specifically addressed Karakul sheep production as a livestock activity of historic significance and current potential for valued-added production.

Work plans were drawn up by early October, with the intention of completing data collection before livestock moved out of their winter quarters with the onset of spring weather. The start of work was divided so that provinces with predominantly mountainous areas would start earlier than lower altitude Provinces where winter would be less of a hindrance to movement of data collectors.

Two levels of management were established. The Census Manager and an Assistant Manager based in Kabul were responsible for nation-wide management of activities. Supervisors, covering 2-3 Provinces provide the second management level, with Data Collectors (Field Staff) based in each district are responsible for visiting all villages in their District, and collecting information on animal numbers.

A national data base kept by the Afghanistan Information Management System (AIMS) under the UN provided a list of Provinces, districts and villages. Afghanistan comprised 32 Provinces, 329 Districts and 30 172 villages. Provinces varied from 4 Districts (Sari Pul) to 22 (Nangarhar). Rural districts varied from 4 villages (Andkhoy in Faryab Province) to 620 (Daykundi in Uruzgan Province). Based on population estimates from AIMS, and assuming seven persons per family, village size varied from six families per village in Wormamay district (Paktika Province) to 3 016 in Andkhoy district (Faryab Province). However, much of the village data was derived from information compiled in the 1970s. This material was taken as the planning base for the census.

A complication arose from variations in the number of districts between the pre-2000 situation recognised by AIMS as the authorised situation and the number of districts recognised officially by the Ministry of the Interior. A further complication arose from the administrative situation on the ground as a result of the creation of new districts by Provincial administrations, which have not been officially recognised by Central Government.

It was decided that the locally accepted name for a district would be used in the Livestock Census - based on the answers from respondents. Names were taken and recorded in Dari or Pashtu. The survey forms and training manuals were prepared in English and translated into two local languages, Dari and Pashtu. Training for Supervisors was held in English, translated into Dari by an interpreter. Field staff training, provided by the Supervisors was held in Dari or Pashtu.

It was estimated that each pre-2000 district would require an average of 4.5 man months (mm) of work to collect the Level 1 census data, giving a national total of 1500 mm. Less time would be required for smaller districts or districts with easier travel conditions; larger or more difficult districts would require more time. It was also recognised that flexibility was required, and a time plan conceived in Kabul could only be taken as guidance. Supervisors were allowed, within limits, to vary

the manpower allowances to suit conditions on the ground. Considerable responsibility therefore rested on Supervisors and their judgement of the situation.

Orders were placed for vehicles and computer equipment during October. Computer equipment arrived during January. Registration of the first vehicle occurred during February, and the second vehicle was registered during March.

4.2 RECRUITMENT AND TRAINING

Twenty five supervisors were selected and trained by the Census Manager and his Assistant. Eleven persons came from the Ministry of Agriculture and Animal Husbandry (MAAH), ten from previous FAO projects, one from the University of Kabul, one from an NGO and two from the private sector. Supervisor training, lasting three days, covered the purpose of the survey, the use of Level 1 and Level 2 forms, and organisation and administration of Supervisor duties. During the course, the Level 1 and Level 2 forms were field-tested by the Supervisors in a nearby village. Lessons learnt during field testing were incorporated into the training. Supervisors also received guidance on organisation and implementation of the training courses to be held in the Provinces for the Field staff.

Pairs of Supervisors were then allocated to cover 2-3 Provinces, given a list of the suggested man-months needed for data collection for each district, and an upper limit of the total man-months available for the group of Provinces under their control. They were given authority to vary the man-months used for any one district, as long as the total man-months remained within the limit for their group of Provinces.

The country was divided into higher and lower altitude Provinces. Supervisors in higher altitude locations started work recruitment and training of Field staff at the end of October. Selection and training in lower altitude areas started in late November.

In the Provinces the Supervisors visited Province Ministries to introduce themselves and inform the authorities of their activities. In some locations it was possible to have broadcast interviews on local radio stations to publicise the livestock census. In these areas, villages then knew of the census before the enumerators arrived.

Data collectors were recruited by the Supervisors at District level, from local people with knowledge of the area and of the livestock sector. These predominantly were Veterinary staff, originally part of the Ministry of Agriculture, but recently in a private sector environment. Other suitable local persons were recruited in Districts where no veterinary field unit existed. Training courses were organised by the Supervisors at suitable locations around their group of Provinces, with around 30 potential field staff attending each course. Attendance at a training course, and a demonstrable understanding of the proposed activities and duties was a requirement before contracts were offered to the field staff.

4.3 DATA COLLECTION

Field data was largely numeric. A record field remained blank where the respondents were unable to answer the question. All names and dates were recorded in local script, Dari or Pashtu. It was decided to record "perceived" names of the District in which the community understands itself to be located.

Information was collected at the village level. However, it was believed that information on total animal numbers would be more reliable from groups of a limited number of respondents, and that it would be difficult to obtain reliable data from a single meeting in a large village. Therefore, during the planning period the collection unit was defined as a community group within a village. Community groups were based on mosque assemblies. A small village might have a single assembly, whereas a large village would have several.

Enumerators made two visits to each mosque assembly. On the first visit the reason for the census was explained to prevent any misconception over its potential tax raising implications, and an explanation was given of the data required. The Shura (council of elders) was requested to organise collection of information from village families by the return date of the enumerator. A second visit was made a few days later and information collected from a representative group from the mosque assembly.

In addition, data was collected from all urban centres. Kabul city was treated as a separate Unit from Kabul Province for data collection. One supervisor and 30 data collectors were involved in the census of Kabul City, taking one month to complete. Enumerators visited Local Area representatives, who in turn contacted street representatives to organise data collection. Kabul City data collectors were recruited from the Departments of Animal Science and Veterinary Science in the University of Kabul. Field staff in the Provinces were derived predominantly from the staff of Veterinary Field Units (VFU). The majority of VFUs are independent entities, although some are still formally in contract with NGOs. FAO received regular information about approximately 230 VFU, but in some regions of Afghanistan these linkages were lacking. Letters of Agreement were prepared with two NGOs, covering areas in the west, west-central and southwest regions of Afghanistan to assist with identification and selection of suitable Field staff in those areas where they have links to VFUs, and where FAO was not represented. Visits were made by census management and supervisors to the field to oversee the work, and ensure data quality.

Data collection was completed in all Provinces by the end of March, with the exception of Ghor Province. During the winter and early spring the road access to Ghor is virtually impossible because of snow and mud. The main access road was only declared open by the Government on 13 April. The survey was undertaken in Ghor using large numbers of data collectors and completed by the end of April. Insecurity prevented data collection in only Barmal District of Paktika Province, adjacent to the Pakistan border.

4.4 DATA ENTRY AND CHECKING

Ten data entry personnel were recruited in early February for training by the Survey Design and Analysis consultant, who visited Kabul again during mid February. Data were entered onto computer by two teams of five staff, on a tailored form to simplify transfer of information from paper to computer. Data were entered in duplicate, once by each team. Each team worked on data from one Province each at a time, with single districts being allocated to a single operator. Data entry was completed by early June.

Duplicate entry by different teams simplified the task of checking the accuracy of entry, by crosschecking the two files relating to a single district. Differences were identified and then corrected by reference to the original data form received from the field. Data checking and correction of the basic data set was completed by the end of July.

In total more than 53 000 records for Level 1 were entered by each team, each record containing 73 fields. Level 2 data comprised 1 285 data records each containing 207 fields. The Women's survey produced 2508 records with 170 data fields each. The Karakul survey material consisted of 133 records with 63 data fields each.

4.5 DATA ANALYSIS

Data were analysed using standard software for descriptive statistics and the statistical analysis package SAS for analytical statistics.

For total livestock numbers, records without information about number of families were included. For all computed variables on family basis, all records with missing information about number of families within the community for which the data were enumerated were omitted. Due to many missing value cells for small stock numbers, it was decided on an individual record basis whether the missing entry

was truly a missing value, or conversely, indicated zero. The criterion used was overall number of animals in the corresponding species. Where this decision was not possible, the record was eliminated.

For all computed variables involving animal ratios, records containing zeroes for the numerator were eliminated. For records with missing values for the numerator variable, it was decided on an individual record basis if the missing entry denoted zero, or was truly a missing value.

The issues of data consistency encountered in this survey are reflective of general problems faced by surveys and are further addressed in the Methods section. In the Results section we report summaries based on Provinces and/or Agro-ecological zones. Detailed tables with all district level data are listed in the Annex sections.



photo by: Thieme

5. RESULTS

5.1 CENSUS DATA SUMMARIES

5.1.1 Districts

Information from field staff employed to collect census data revealed that the FAO baseline information on the number of Districts was at variance with the de facto situation on the ground. Under the many shifting political administrations, new districts were established by dividing those already in existence. While the legal status of the new districts is uncertain and their boundaries unclear, it was decided that location identification data recorded on the survey sheet would reflect the District names in current use by the local population.

The Ministry of the Interior (Mol) had an official list of districts, based on the 1991 situation, but this was different from the list used by the Central Statistical Organisation (CSO). The AIMS list of districts derives from 1979 when the only human population census occurred. The field data collected by the current Livestock Census, shows significant variation from the official government list and from the AIMS list (see Annex). The census was able to identify the relationship between districts on the different lists, allowing partial comparisons to be drawn between the results of the current census and earlier FAO work. However, since the only available computerised maps of Afghanistan have been organised by AIMS, and the maps presented in this report are based on the AIMS maps, the results shown here must be viewed keeping in mind these potential divergences.

At the provincial level, there are a number of differences between the official list and AIMS data. Some districts are allocated to a different district in the AIMS list, and some districts have been completely omitted. Within Provinces there are many districts that do not appear on the AIMS list, and some that have disappeared.

The AIMS data base, from pre-2000 data included 329 Districts in 32 Provinces. Areas in which Provincial capitals are sited are counted by the Mol as "Administrative Units" rather than Districts, e.g. the capital areas of Ghazni, Qalat, and Qalay-I-Naw. The CSO uses the title "Minor Civil Division" for all Provincial Centres and Districts. There are 351 Districts plus 32 Provincial administrative Areas on the Mol list, but 357 plus 32 Provincial Centres in the Minor Civil Divisions of the CSO. Information collected from the field has shown that there are 397 de facto districts (counting Provincial Administrative Units as districts), plus up to 7 more in Ghor Province, and Barmal District in Paktika Province that were not accessed by the Census (Table 1). Some of the Districts on the Mol and CSO lists are not recognised by name by the people of the ground. These were Rashidan and Wali Mohd Shaheed in Ghazni Province, Taraw in Paktika Province and Firoz Nakhchir in Samangan Province. Full details are discussed in the Annex.

The project collected data from 16 urban districts (Nahya) in Kabul City. These areas are not counted as separate districts by the Mol, but are called Districts by the CSO.

5.1.2 Villages, communities and families

The Census data showed that there were more villages than registered in the current AIMS data base. The Census recorded 36 724 villages in the districts surveyed, compared to 30 690 villages recorded in the AIMS data base, and around 36 000 villages known to the Ministry of the Interior. The number of families recorded in the Census was 3 044 670, suggesting 83 families per village. However, the true number of families will be even greater because some communities were unable to state the number present. An attempt was made to determine the number of Kuchi (nomadic livestock producer) families separately from resident families. The overall total of 23 949 Kuchi families recorded in the census understates the true position as normal migration patterns have been disturbed by insecurity along the Pakistan border.

Human population can be estimated, based on the numbers of families and family size. Recent estimates of rural family size (FAO, 2003) at 11.6 persons per household are higher than the figure of 7.6 used in official calculations. The Livestock Census has not formally distinguished between urban and rural families outside the capital. Assuming that 25 percent of families are urban-based and 75 percent rural, and an urban family size of 7.6 people per household, the national human population is at least 32 274 000. The Central Statistical Office (CSO, 2003) estimated the human population at 22.2 million.

Table 1 Summary of districts recognised by the Ministry of the Interior (Mol), the Central Statistical Office (CSO), AIMS and reported to the Livestock Census

Province	Mol # 2003	CSO 2003	AIMS 2001	Livestock Census 2003
Badakhshan	27	27	13	30
Badghis	6	6	7	9
Baghlan	11	14	11	15
Balkh	15	14	14	15
Bamyan	6	6	5	7
Farah	10	10	11	11
Faryab	13	13	12	11
Ghazni	18	18	16	17
Ghor	9	9	7	(3) **
Helmand	11	12	13	15
Hirat	15	16	16	16
Jawzjan	9	9	9	14
Kabul	14	14	14	15
Kandahar	15	15	12	17
Kapisa	5	6	6	8
Khost	12	11	12	13
Kunar	14	14	12	15
Kunduz	6	6	7	7
Laghman	4	4	5	5
Logar	6	6	5	7
Nangahar	21	21	20	25
Nimroz	5	4	5	6
Nuristan	7	7	6	7
Paktika	18	18	15	(17) *
Paktya	9	10	12	14
Parwan	13	13	12	14
Samangan	6	6	5	9
Sari Pul	5	5	6	7
Takhar	16	16	12	17
Uruzgan	8	8	10	9
Wardak	8	8	8	10
Zabul	9	9	9	12
Total	351	355	329	397
#	Mol data base excludes 31 Provincial capital administrative areas			
*	Only 17 districts surveyed out of 18 districts in Paktika			
**	Only 3 districts surveyed in Ghor Province			

Table 2 Number of villages and families on the AIMS database dated 2001 and reported to the 2003 Livestock Census

Province	AIMS	Livestock	Livestock
	2001	Census	Census
	<i>Villages</i>	<i>Villages</i>	<i>Families</i>
Badakhshan	1,820	1,633	111,874
Badghis	639	919	94,815
Baghlan	895	1,259	107,231
Balkh	771	1,349	157,230
Bamyan	1,543	1,712	54,169
Farah	818	1,263	80,829
Faryab	634	970	135,537
Ghazni	2,680	2,336	97,471
Ghor	1,714	815	25,867
Hilmand	1,136	2,297	119,188
Hirat	1,435	2,686	332,893
Jawzjan	254	513	96,796
Kabul	690	987	70,840
Kabul City		420	289,964
Kandahar	1,853	2,662	86,206
Kapisa	399	582	52,059
Khost	519	1,526	39,219
Kunar	475	911	52,661
Kunduz	377	898	63,777
Laghman	464	590	49,839
Logar	394	1,110	51,780
Nangarhar	971	1,688	136,804
Nimroz	427	611	24,969
Nuristan	168	365	23,835
Paktika	981	1,734	38,725
Paktya	707	1,215	33,068
Parwan	980	1,203	88,993
Samangan	471	513	81,989
Sari Pul	556	434	58,177
Takhar	664	1,523	151,157
Uruzgan	2,491	2,239	97,120
Wardak	1,347	2,072	87,067
Zabul	1,427	2,173	52,521
Total	30,700	36,724	3,044,670
*	Only 17 districts surveyed out of 18 districts in Paktika		
**	Only 3 districts surveyed in Ghor Province		

5.1.3 Livestock numbers

Nationally the total number of cattle was 3.7 million. Provincial summary figures are shown below. The most important cattle owning Provinces were Badakhshan and Nangarhar, each holding over 0.3 million cattle, and Takhar and Uruzgan with over 0.2 million each. Nationally, there were 8.8 million sheep and 7.3 million goats. Almost 0.8 million sheep were in Hirat Province, and over 0.5 million in Badghis, Faryab, Hilmand and Kandahar. Out of 7.3 million goats, over 0.5 million occurred in Hirat, Hilmand and Nuristan. Afghanistan has 1.6 million donkeys, with over 0.1 million in Badakhshan, Hirat and Takhar each. With less than 175 000 camels, only Hilmand and Kandahar held more than 20 000. Horses occurred in the smallest numbers (140 000), with more than 20 000 only in Kunduz.



photo by: Reynolds

These numbers constitute a snapshot in time whose most valuable function is that of a national baseline inventory. Combined with data on herd structure and reproductive performance levels, an assessment of the recovery and development potential of the Afghan livestock sector is possible. Basic herd structure data were collected in Level 1. More detailed herd structure information and data on reproductive performance became available through the Level 2 surveys. These data can be used in herd dynamics models to project growth and off take potential of the national inventory.

The contribution of livestock to livelihoods is an important factor in assessing the importance of the livestock sector. Hence, animal numbers per household must also be considered. These numbers are presented below, summarised on the basis of province and agro-ecological region. More information on agro-ecological regions is given in Section 5.2 of this report.

Only families in Badakhshan, Khost, Kunar, Laghman and Nuristan own on average more than three or more cattle. Families own more sheep than goats in most Provinces, but Nuristan families have seven times as many goats as sheep. In general, goats are more numerous than sheep in provinces along the border with Pakistan. Poultry are kept in greatest numbers by families in the east and south-east.

For most Afghan farmers, animals are the only source for power for cultivation and transport. The preferred animal for draft power is the oxen; however, many farmers are too poor to own oxen. The next most frequently used animal for draft is the donkey. The statistics for draft animals summarised three categories: oxen (taken from the answers for this category in the Level 1 survey), cattle and donkeys available for draft (taken from the corresponding answer categories in the Level 1 survey) and animals potentially available for draft (a computed category that included all cattle, donkeys, camels and horses older than two years). The following table presents these numbers as averages per province and summarised for agro-ecological regions. A very small number of records of the Level 1 census did not list the number of families present in the community. Accordingly, all statistics computed on a per family basis were calculated on a filtered data set that was created after further consistency checking.

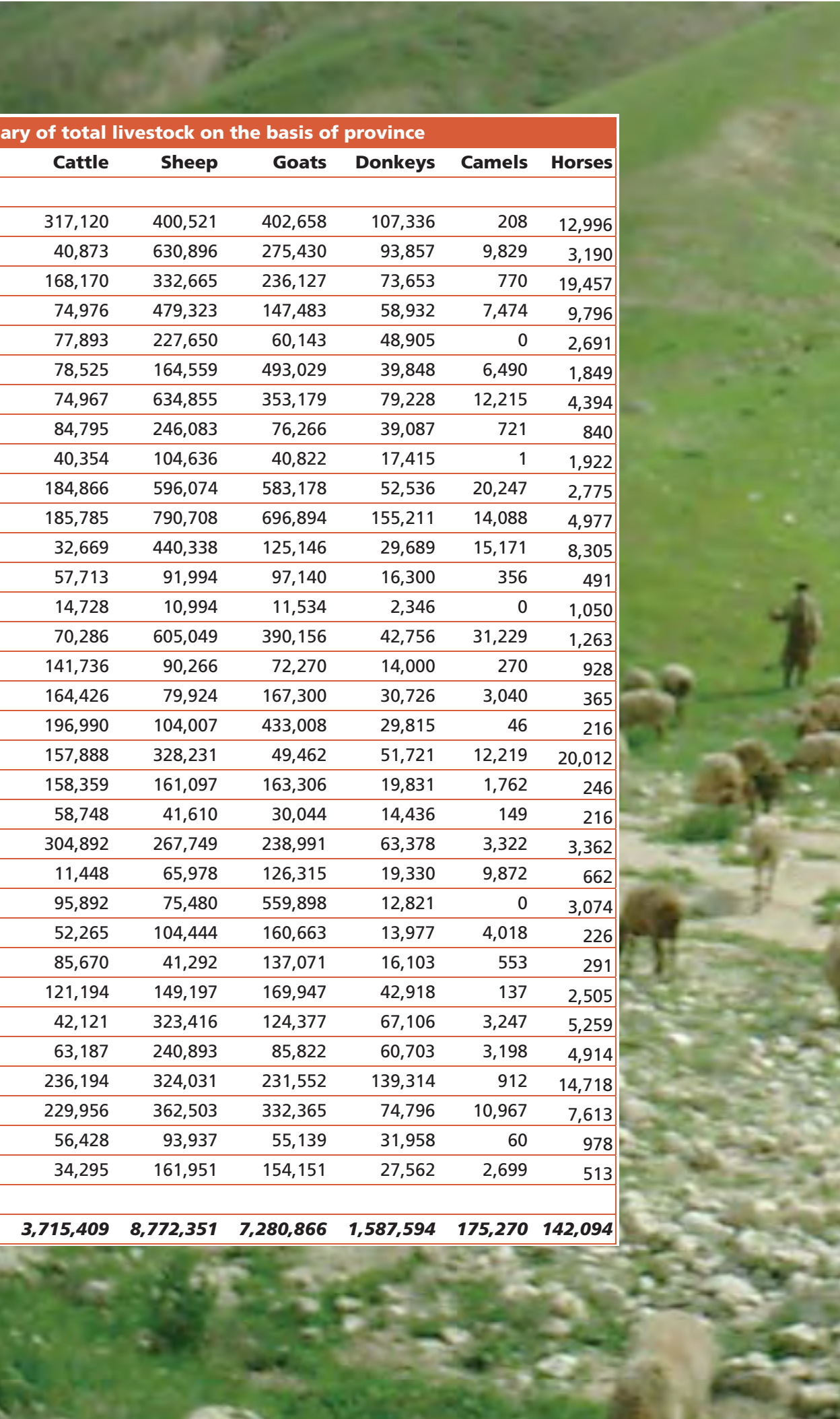


Table 3 Summary of total livestock on the basis of province

Province	Cattle	Sheep	Goats	Donkeys	Camels	Horses
Badakhshan	317,120	400,521	402,658	107,336	208	12,996
Badghis	40,873	630,896	275,430	93,857	9,829	3,190
Baghlan	168,170	332,665	236,127	73,653	770	19,457
Balkh	74,976	479,323	147,483	58,932	7,474	9,796
Bamyan	77,893	227,650	60,143	48,905	0	2,691
Farah	78,525	164,559	493,029	39,848	6,490	1,849
Faryab	74,967	634,855	353,179	79,228	12,215	4,394
Ghazni	84,795	246,083	76,266	39,087	721	840
Ghor	40,354	104,636	40,822	17,415	1	1,922
Hilmand	184,866	596,074	583,178	52,536	20,247	2,775
Hirat	185,785	790,708	696,894	155,211	14,088	4,977
Jawzjan	32,669	440,338	125,146	29,689	15,171	8,305
Kabul	57,713	91,994	97,140	16,300	356	491
Kabul City	14,728	10,994	11,534	2,346	0	1,050
Kandahar	70,286	605,049	390,156	42,756	31,229	1,263
Kapisa	141,736	90,266	72,270	14,000	270	928
Khost	164,426	79,924	167,300	30,726	3,040	365
Kunar	196,990	104,007	433,008	29,815	46	216
Kunduz	157,888	328,231	49,462	51,721	12,219	20,012
Laghman	158,359	161,097	163,306	19,831	1,762	246
Logar	58,748	41,610	30,044	14,436	149	216
Nangarhar	304,892	267,749	238,991	63,378	3,322	3,362
Nimroz	11,448	65,978	126,315	19,330	9,872	662
Nuristan	95,892	75,480	559,898	12,821	0	3,074
Paktika	52,265	104,444	160,663	13,977	4,018	226
Paktya	85,670	41,292	137,071	16,103	553	291
Parwan	121,194	149,197	169,947	42,918	137	2,505
Samangan	42,121	323,416	124,377	67,106	3,247	5,259
Sari Pul	63,187	240,893	85,822	60,703	3,198	4,914
Takhar	236,194	324,031	231,552	139,314	912	14,718
Uruzgan	229,956	362,503	332,365	74,796	10,967	7,613
Wardak	56,428	93,937	55,139	31,958	60	978
Zabul	34,295	161,951	154,151	27,562	2,699	513
Total	3,715,409	8,772,351	7,280,866	1,587,594	175,270	142,094

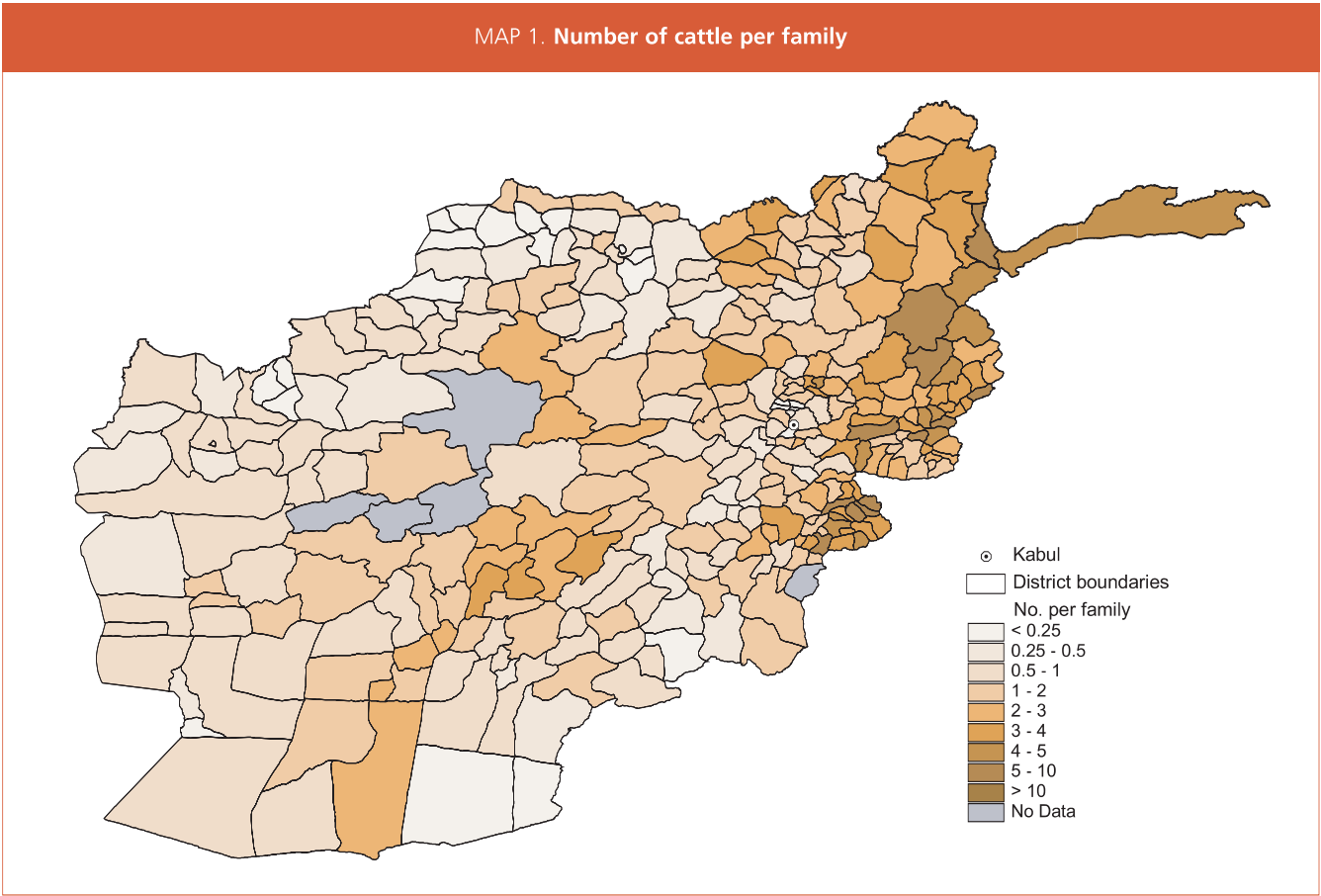
Table 4 Summary of total poultry on the basis of province

Province	Chickens	Ducks	Turkeys
Badakhshan	314,992	2,897	1,793
Badghis	243,141	113	2,650
Baghlan	280,234	13,889	69,876
Balkh	287,895	2,036	3,677
Bamyan	123,432	1,324	6,227
Farah	438,934	10,763	40,431
Faryab	187,457	314	2,905
Ghazni	321,420	1,625	5,696
Ghor	71,391	287	622
Hilmand	850,020	82,262	89,815
Hirat	691,101	4,632	22,744
Jawzjan	155,470	72	560
Kabul	345,497	1,505	3,342
Kabul City	584,833	2,557	4,743
Kandahar	579,870	2,943	12,373
Kapisa	336,556	12,724	1,891
Khost	613,025	3,769	41,816
Kunar	567,032	17,278	53,298
Kunduz	236,551	11,589	15,019
Laghman	391,365	118,245	28,999
Logar	198,365	3,099	6,316
Nangarhar	1,046,032	45,327	86,156
Nimroz	136,657	5,596	21,809
Nuristan	281,504	216	672
Paktika	287,518	405	2,484
Paktya	472,394	2,478	13,852
Parwan	307,186	8,462	4,336
Samangan	118,862	209	288
Sari Pul	124,831	222	1,575
Takhar	345,947	7,182	6,718
Uruzgan	656,214	56,201	43,210
Wardak	268,652	1,312	2,918
Zabul	290,467	1,000	907
Total	12,155,846	422,533	599,718

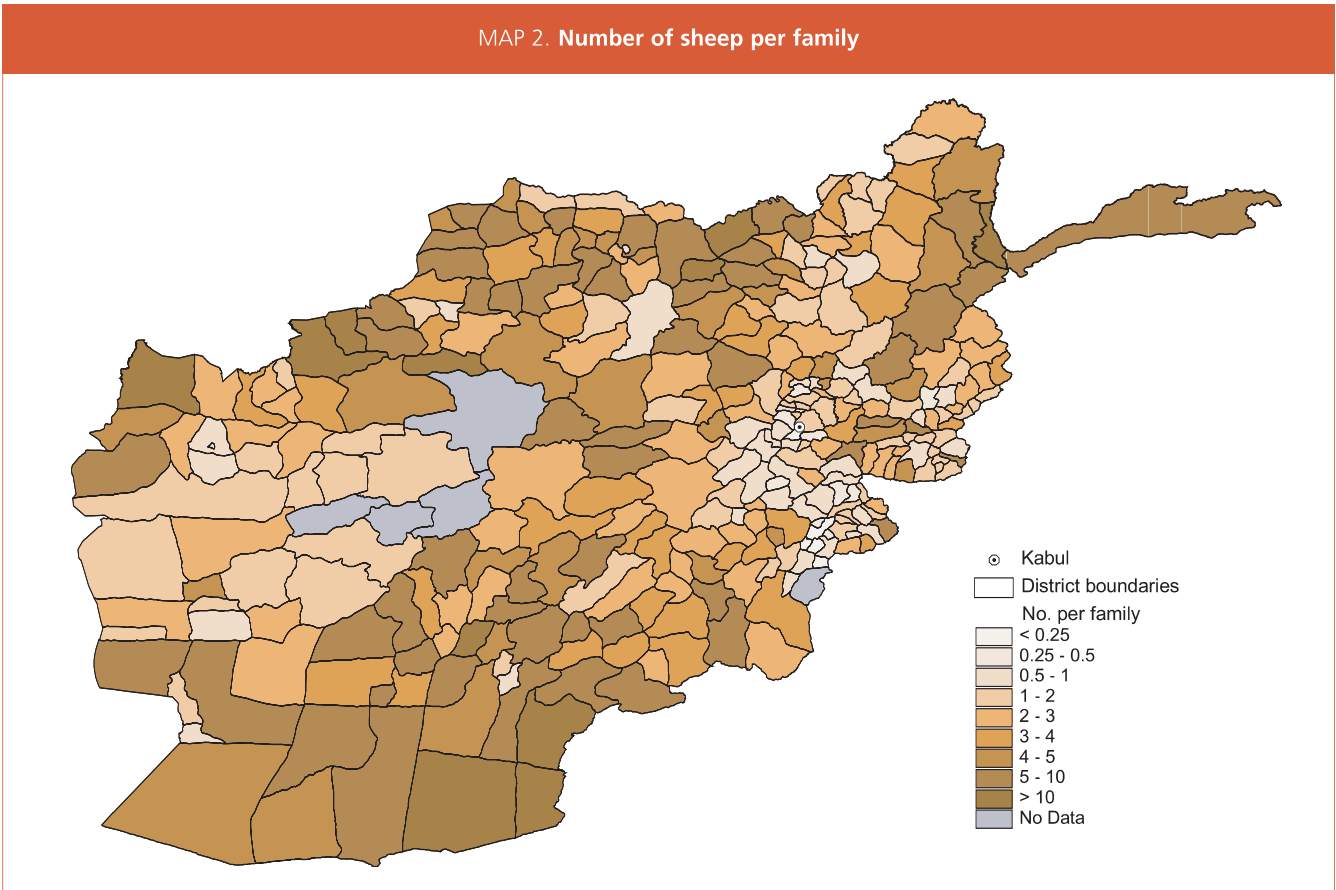
Table 5 Livestock owned per family in 2002-2003											
Agro-Ecological Region	Province	Cattle	Sheep	Goats	Chickens	Donkeys	Horses	Camels	Oxen	Draft Animals (total potential)^a	Draft Animals (reported in survey)
Badakhshan		3.05	4.31	4.23	2.93	0.96	0.15	0.00	0.66	2.98	1.50
East	Khost	4.49	2.71	5.33	16.77	0.90	0.01	0.11	0.07	3.16	0.80
	Kunar	4.32	2.23	10.65	12.75	0.65	0.01	0.00	0.59	3.77	1.29
	Laghman	3.76	7.03	4.10	10.20	0.65	0.01	0.08	0.31	3.13	0.91
	Nangarhar	2.66	3.67	3.31	9.65	0.57	0.02	0.06	0.33	2.43	0.85
	Nuristan	4.20	4.40	31.04	15.24	0.69	0.17	0.00	0.52	3.85	1.28
	Paktika	1.34	4.19	6.63	7.83	0.37	0.01	0.15	0.02	1.10	0.33
	Paktya	2.76	1.95	4.94	15.11	0.49	0.01	0.02	0.03	1.84	0.49
	Average	3.06	3.47	6.78	12.06	0.60	0.02	0.08	0.20	2.45	0.75
Centre-East	Kabul	0.86	2.14	2.24	5.30	0.28	0.01	0.01	0.06	0.62	0.05
	Kabul City	0.08	0.25	0.07	2.44	0.02	0.00	0.00	0.00	0.07	0.02
	Kapisa	2.89	2.21	1.82	6.64	0.32	0.02	0.00	0.12	1.29	0.68
	Logar	1.31	1.30	0.98	4.71	0.31	0.01	0.00	0.09	0.96	0.38
	Parwan	1.52	2.03	2.33	3.75	0.49	0.03	0.00	0.10	0.83	0.44
	Wardak	0.87	1.83	0.84	3.32	0.48	0.01	0.00	0.11	0.73	0.52
	Average	1.16	1.71	1.35	4.11	0.37	0.01	0.00	0.09	0.76	0.38
Centre	Bamyan	1.75	6.13	1.55	2.85	0.90	0.07	0.00	0.39	1.94	1.22
	Ghazni	1.02	3.26	1.00	3.93	0.47	0.01	0.00	0.06	0.68	0.46
	Ghor	1.94	5.63	1.75	3.36	0.72	0.09	0.00	0.66	2.39	1.25
	Uruzgan	2.73	4.72	4.20	9.70	0.92	0.05	0.13	0.54	2.90	1.28
	Zabul	0.69	4.40	4.60	6.75	0.62	0.01	0.07	0.10	0.98	0.62
	Average	1.61	4.57	2.85	5.97	0.72	0.04	0.05	0.30	1.70	0.91
North	Baghlan	1.88	4.26	2.96	3.22	0.75	0.23	0.01	0.39	1.37	1.00
	Balkh	0.58	3.99	1.16	2.08	0.44	0.07	0.06	0.13	0.75	0.50
	Faryab	0.55	4.80	2.62	1.37	0.60	0.03	0.09	0.22	1.02	0.77
	Jawzjan	0.35	4.80	1.34	1.66	0.31	0.09	0.16	0.06	0.67	0.34
	Kunduz	2.56	5.57	0.75	4.15	0.81	0.28	0.17	0.60	2.92	1.15
	Samangan	0.49	3.53	1.47	1.38	0.80	0.06	0.03	0.14	0.78	0.77
	Sari pul	1.12	4.42	1.60	2.30	1.05	0.09	0.07	0.32	1.49	1.07
	Takhar	1.83	2.50	1.90	2.79	1.00	0.11	0.01	0.54	2.34	1.33
	Average	1.22	4.12	1.88	2.42	0.70	0.13	0.06	0.30	1.38	0.87
West	Badghis	0.55	9.94	4.37	3.08	1.10	0.05	0.15	0.21	1.39	1.16
	Farah	1.15	2.70	8.77	6.51	0.62	0.03	0.14	0.06	1.12	0.62
	Hilmand	1.68	6.90	6.55	8.62	0.57	0.04	0.32	0.06	1.56	0.50
	Hirat	0.70	4.55	4.43	2.80	0.67	0.03	0.10	0.18	1.13	0.73
	Kandahar	0.92	8.12	5.75	7.44	0.59	0.02	0.34	0.03	1.31	0.53
	Nimroz	0.60	4.35	8.70	7.76	0.86	0.03	0.54	0.00	1.47	0.26
	Average	1.04	6.15	6.11	6.19	0.66	0.03	0.25	0.09	1.32	0.62
Overall AVG		1.60	4.28	3.91	5.87	0.64	0.05	0.10	0.22	1.56	0.75

* A computed category that include all cattle, donkeys, camels and horses older than two years

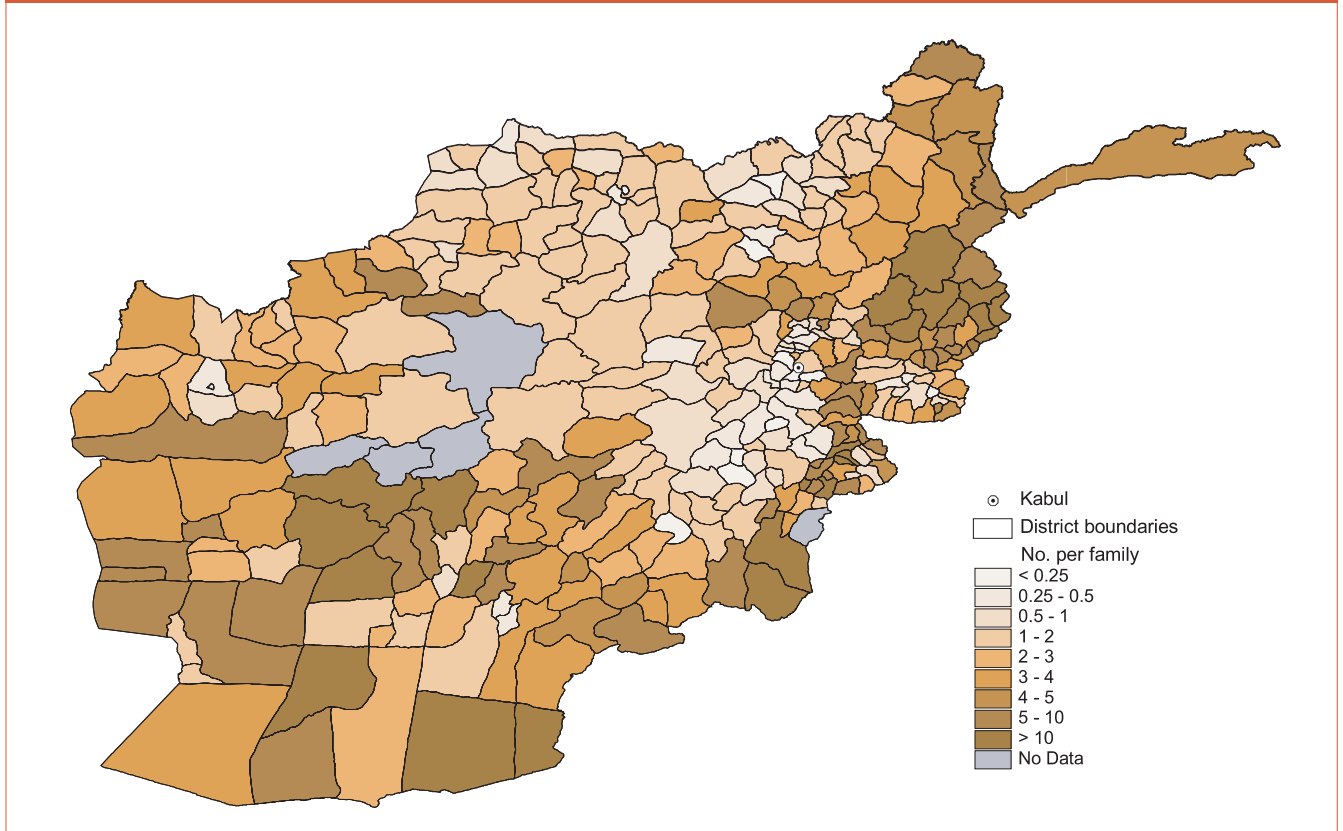
MAP 1. Number of cattle per family



MAP 2. Number of sheep per family



MAP 3. Number of goats per family



5.1.4 Herd Structures

Female cattle older than 2 years

Although most cows do not enter lactation at 2 years in Afghanistan, for the simplification of the Level 1 survey, this age threshold was chosen to provide an upper limit to numbers in meaningful stock classes, in particular cattle available for dairy production and recruitment (see below). Only families in Khost, Kunar, Laghman and Nuristan owned more than 1.5 cows per family. Note that all statistics in this section not referenced on the basis of family were computed from the full data set (which included also records not listing the number of families present in the community surveyed).

Young stock

A simple approach to summarising the state of reproduction is to compute a ratio of young stock to number of reproductive females. If data are of acceptably accuracy (this can be only expected if the simplest of numbers are used, e.g. two age classes), this ratio can provide some insight as to whether populations are stable, declining or have potential to increase. Of course there will be effects such as time of the year, regional markets and so forth that will influence the numbers, since not all data can be collected simultaneously. Therefore, these data, on their own, are not sufficient to suggest high priority areas nor do they give reason for complacency. The data are computed as the sum of categories (younger than 2 years) and current year's young (calves, lambs, kids, foals). These categories were kept clearly separate in the census. In many cases, no-entry cells were interpreted as true zeroes. This may not always be correct. Therefore, the values reported in Table 7 must be viewed as a lower limit.

Cattle

The data indicate that restocking of depleted herds in many areas will not be possible with current reproduction rates. This is further substantiated by Level 2 data and will be discussed below. The available information suggests that cattle reproduction in the east-central area (Ghazni, Wardak, Logar, Parwan, Kapisa Kunar) and in Kunduz and Badghis at 0.7 calves per adult female per year indicates a calving interval of > 15 months after allowing for 10 percent mortality. At the other end of the scale, the calving interval in Jawzan appears to be 3.5 years or greater. Note that these calculations do not consider female sterility. Given the extreme poverty of farmers in Afghanistan, rigorous culling based on deficient reproductive performance is unlikely. Depending on results from Level 2, more in-depth analysis of this critical problem is clearly indicated, for example by way of spot surveys and market surveys. It is also important to compare these data with available information about regional extent and severity of drought.

Smallstock

The basic data in Level 1 do not differentiate between Karakul and other sheep breeds. Provinces with higher levels of Karakul could expect lower proportions of two year old young stock. The data shown below suggests lamb numbers/ewe/year of 1.5 available for restocking and above only in Logar, Nangarhar and Wardak, allowing for a mortality rate over two years of 25 percent subject to the same caveats as the cattle values. Similarly for goats, 1.5 kids/doe/year is only reached in Badghis, Nangarhar and Nuristan.

Table 6 Cows owned per family in 2002-2003

Agro-Ecological Region	Province	Average	Standard Deviation
Badakhshan		1.08	0.88
East	Khost	2.35	1.56
	Kunar	1.86	4.72
	Laghman	1.90	1.70
	Nangarhar	1.32	2.51
	Nuristan	1.87	1.15
	Paktika	0.65	0.55
	Paktya	1.33	0.97
	Average	1.49	2.25
Centre-East	Kabul	0.35	0.38
	Kabul City	0.05	0.10
	Kapisa	0.83	0.44
	Logar	0.65	0.55
	Parwan	0.44	0.40
	Wardak	0.39	0.35
	Average	0.45	0.44
Centre	Bamyan	0.56	0.39
	Ghazni	0.47	0.45
	Ghor	0.60	0.35
	Uruzgan	0.97	0.91
	Zabul	0.32	0.45
	Average	0.60	0.65
North	Baghlan	0.70	0.78
	Balkh	0.26	0.35
	Faryab	0.13	0.13
	Jawzjan	0.18	0.26
	Kunduz	1.11	1.28
	Samangan	0.18	0.27
	Sari pul	0.37	0.48
	Takhar	0.76	0.69
	Average	0.48	0.71
West	Badghis	0.14	0.21
	Farah	0.52	0.68
	Hilmand	0.77	0.62
	Hirat	0.27	0.36
	Kandahar	0.47	0.44
	Nimroz	0.35	0.44
	Average	0.47	0.54
Overall Average		0.68	1.12

Table 7 Ratio of young per adult for cattle, sheep, goats and donkeys									
Agro-Ecological Region	Province	Young per Cow		Young per Ewe		Young per Doe		Young per Jenny	
		AVG	SD	AVG	SD	AVG	SD	AVG	SD
Badakhshan		1.3	0.8	1.3	1.2	1.3	0.9	1.4	1.6
East	Khost	0.9	0.7	0.7	0.8	0.9	2	0.5	0.6
	Kunar	1.4	0.9	1.4	1	1.3	1	1.3	1.4
	Laghman	1.1	1	1.3	3.1	1.2	1.1	0.7	1
	Nangarhar	1.2	1	2.1	3.7	1.5	3.1	0.6	0.9
	Nuristan	1.3	0.8	1.4	0.9	1.9	11.4	1.3	1
	Paktika	1.1	0.6	1.2	1	1	1.2	0.3	0.5
	Paktya	1.1	0.6	1.3	1.6	1.1	1.7	0.3	0.5
Centre-East	Kabul	1.2	1.0	1.5	1.9	1.3	3.2	0.8	1.5
	Kabul City	1	0.8	1.7	2.1	1.2	0.9	0.8	1.5
	Kapisa	1.6	0.8	1.8	1.5	1.3	1.2	0.8	0.8
	Logar	1.3	0.9	2.3	2.8	1.3	1.3	0.2	0.4
	Parwan	1.5	1.0	1.4	2.1	1.2	1.3	0.8	0.9
	Wardak	1.5	0.8	1.9	3	1.4	1.2	0.4	0.6
Centre	Bamyan	1.0	0.6	0.9	0.6	1.0	0.7	0.6	0.6
	Ghazni	1.4	1.1	1.5	1.6	1.3	1.3	0.3	0.9
	Ghor	1.3	1.1	1.2	0.9	1.3	1.0	0.9	0.9
	Uruzgan	1.1	1.0	1.2	2.3	0.9	0.9	0.7	1.1
	Zabul	0.8	0.7	1.3	2.6	0.9	1.0	0.5	0.9
North	Baghlan	0.9	0.8	0.4	0.8	0.5	0.9	0.4	0.6
	Balkh	0.6	0.8	0.5	0.6	0.6	0.9	0.4	0.7
	Faryab	0.7	0.8	0.8	1.7	1	1.7	0.4	0.7
	Jawzjan	0.5	0.4	0.6	0.9	0.7	0.9	0.3	0.3
	Kunduz	1.5	0.8	1.5	1.5	1.4	1.1	1.1	0.9
	Samangan	0.7	0.9	0.5	1	0.5	0.9	0.7	1
	Sari Pul	0.7	0.6	0.4	0.3	0.5	0.5	0.3	0.5
	Takhar	1.2	0.6	1.1	0.7	1	0.6	1.1	0.6
West	Badghis	1.7	1.9	1.6	1.5	1.7	1.4	1	2.7
	Farah	1	1.3	1.5	2.4	1.4	1.7	1.4	1.6
	Hilmand	1.1	1.1	1.5	2	1.1	1	0.9	1.1
	Hirat	1.1	1.1	0.9	1.2	0.9	4.7	0.7	0.9
	Kandahar	0.8	0.6	1	1.5	0.9	0.9	0.4	0.8
	Nimroz	0.7	1.4	0.5	0.7	0.6	0.6	0.3	0.8
Overall Average		1.1	0.9	1.2	1.9	1.1	2.1	0.7	1.1

5.1.5 Changes in Livestock Ownership

Preliminary data and evidence suggested a massive and widespread reduction in livestock numbers due to a 4 year long drought. Lacking dependable survey data prior to the onset of that drought, it is not easily possible to obtain an accurate estimate of the extent of the impact of the drought. It was decided to ask in all communities the numbers of families without livestock now, and the number of families without livestock 4 years before the interviews took place (a time that corresponds to pre-drought conditions). In addition to drought, two additional factors must be considered: (i) The appreciation of the Afghan currency after the ousting of the Taliban regime forced many to sell stock in order to finance loans, and (ii) the substantial number of refugees returning home to Afghanistan. This migration impacted the number of families in the communities, a distortion compounded by the fact that many returnees initially left their livestock behind outside Afghanistan. This is particularly obvious in the case of Kabul City. Data for Kabul City were excluded from the calculation of the average of the Centre-East region.

The following province-level summary shows that overall there was a substantial reduction in number of families owning livestock. However, this was not the case for all provinces. At the time the census was taken, many returned refugees had probably still part or all of their livestock holdings left at their homes in exile. Many refugees needed to settle property claims and were unsure about security, so this attitude is understandable. While we have verbal evidence for this behaviour, we cannot substantiate this speculation with numbers, however.

It goes without question, however, that drought and war substantially reduced the overall livestock population and the average livestock holdings per family.



photo by: Thieme

Table 8 Summary of changes in livestock holdings (families owning no livestock)					
Agro-Ecological Region	Province	Families without livestock 1998	Families without livestock 2002/2003	Percent Change during Drought	Families with only poultry 2002/2003
Badakhshan		11,274	14,522	28.81	9,156
East	Khost	633	1,008	59.24	882
	Kunar	1,781	2,453	37.73	1,447
	Laghman	3,314	4,777	44.15	3,644
	Nangarhar	1,491	26,720	52.76	19,705
	Nuristan	1,422	2,290	61.04	1,735
	Paktika	6,623	7,612	14.93	5,971
	Paktya	2,959	4,093	38.32	3,690
	Total	34,223	48,953	43.04	37,074
Centre-East	Kabul	17,730	14,994	-15.43	10,419
	Kabul City	24,739	265,401	972.80	163,682
	Kapisa	2,818	4,258	51.10	3,666
	Logar	14,908	15,927	6.84	14,293
	Parwan	11,197	16,206	44.74	8,447
	Wardak	26,452	32,466	22.74	25,466
	Total	97,844	349,252	14.7*	225,973
Centre	Bamyan	9,383	12,874	37.21	4,260
	Ghazni	38,724	33,083	-14.57	30,297
	Ghor	5,298	8,006	51.11	3,346
	Uruzgan	16,440	15,366	-6.53	8,523
	Zabul	18,467	21,575	16.83	11,703
	Total	88,312	90,904	2.94	58,129
North	Baghlan	25,644	32,319	26.03	9,611
	Balkh	47,752	66,182	38.60	20,789
	Faryab	42,955	49,366	14.92	16,054
	Jawzjan	34,304	43,412	26.55	9,970
	Kunduz	6,816	8,506	24.79	4,614
	Samangan	22,016	28,277	28.44	7,422
	Sari Pul	9,609	14,859	54.64	2,793
	Takhar	27,852	24,147	-13.30	16,406
	Total	216,948	267,068	23.10	87,659
West	Badghis	26,207	31,354	19.64	11,041
	Farah	19,712	23,144	17.41	11,584
	Hilmand	14,245	15,222	6.86	10,888
	Hirat	75,183	136,168	81.12	57,469
	Kandahar	21,278	28,114	32.13	17,354
	Nimroz	10,599	13,051	23.13	5,230
	Total	167,224	247,053	47.74	113,566
Overall Sum		615,825	1,017,752	65.27	53,1557

*Data for Kabul City were excluded from Centre-East for the calculation of the average change in numbers of families without livestock (see text)

5.2 REGIONAL PRODUCTION SYSTEM CHARACTERISTICS

In order to structure the results of the survey, especially the detailed Level 2 analysis, distinct agro-ecological zones were defined based on regional production characteristics including climatic and topographic aspects. The following table summarises the classification of provinces into these regions and the corresponding number of respondents for each region in the Level 2 survey. Some provinces were not visited with the Level 2 survey. Badakhshan, for its unique properties, constitutes an agro-ecological region of its own.

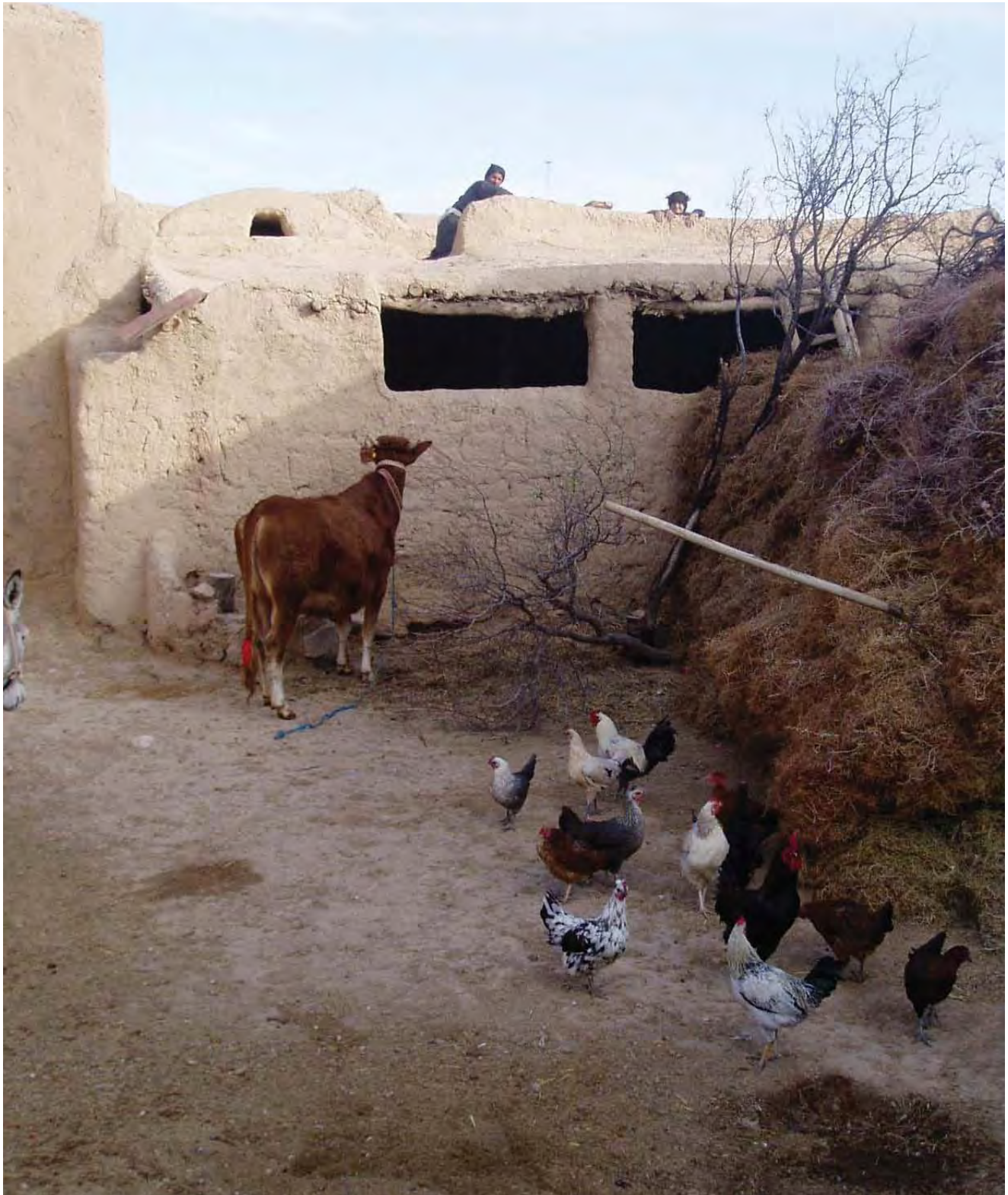


photo by: Thieme

Table 9 Classification of provinces into agro-ecological regions			
Agro-ecological Region	Province	Number of Villages	Interviewed farmers
East	Khost	6	30
	Kunar	NV*	NV
	Laghman	4	29
	Nangarhar	16	130
	Nuristan	NV	NV
	Paktika	6	30
	Paktya	7	32
	All	39	251
Centre-East	Kabul	13	40
	Kabul City		33
	Kapisa	3	10
	Logar	7	50
	Parwan	12	42
	Wardak	6	30
	All	41	205
Centre	Bamyan	18	76
	Ghazni	9	57
	Ghor	5	25
	Uruzgan	NV	NV
	Zabul	10	54
	All	42	212
North	Baghlan	21	97
	Balkh	5	32
	Faryab	4	28
	Jawzjan	4	29
	Kunduz	16	30
	Samangan	8	64
	Sari Pul	5	39
	Takhar	10	20
	All	73	339
	West	Badghis	5
Farah		16	77
Hilmand		4	20
Hirat		15	136
Kandahar		NV	NV
Nimroz		4	19
All		44	277
Badakhshan		NV	NV
All		239	1284

*NV: not visited

Some key statistics from Level 1 are presented as graphical summaries, indicating regional differences apparent in the most basic indicators. Numerical differences between regions and response variables are represented proportionally by the diameter of the circles.

Figure 1 Livestock per family across regions

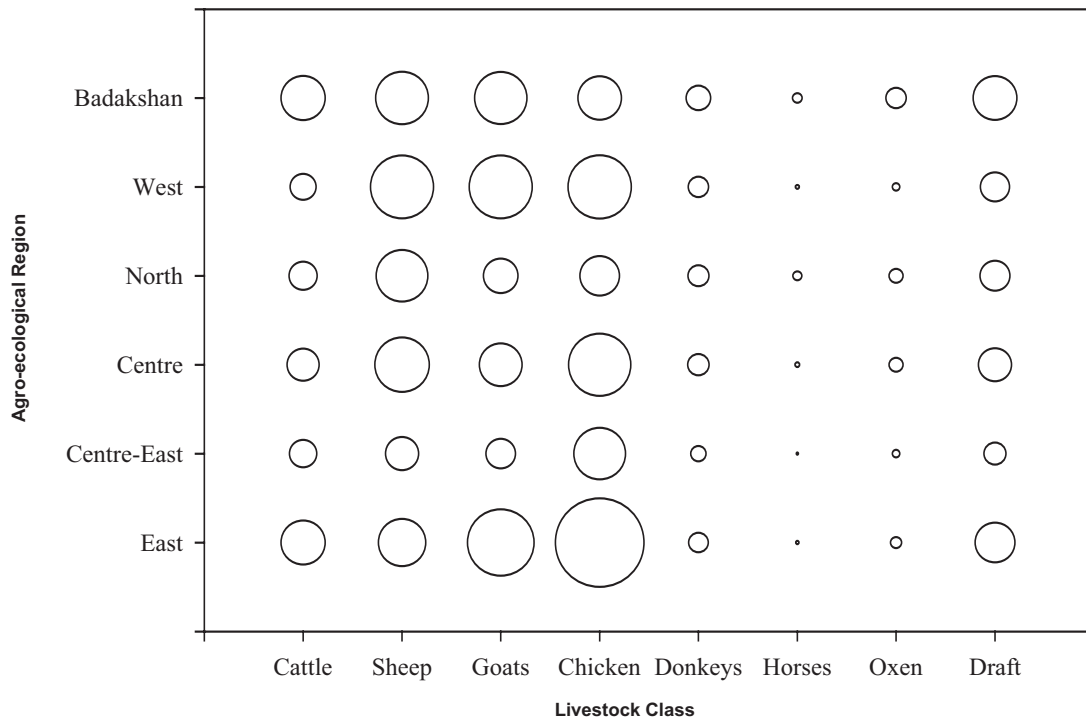
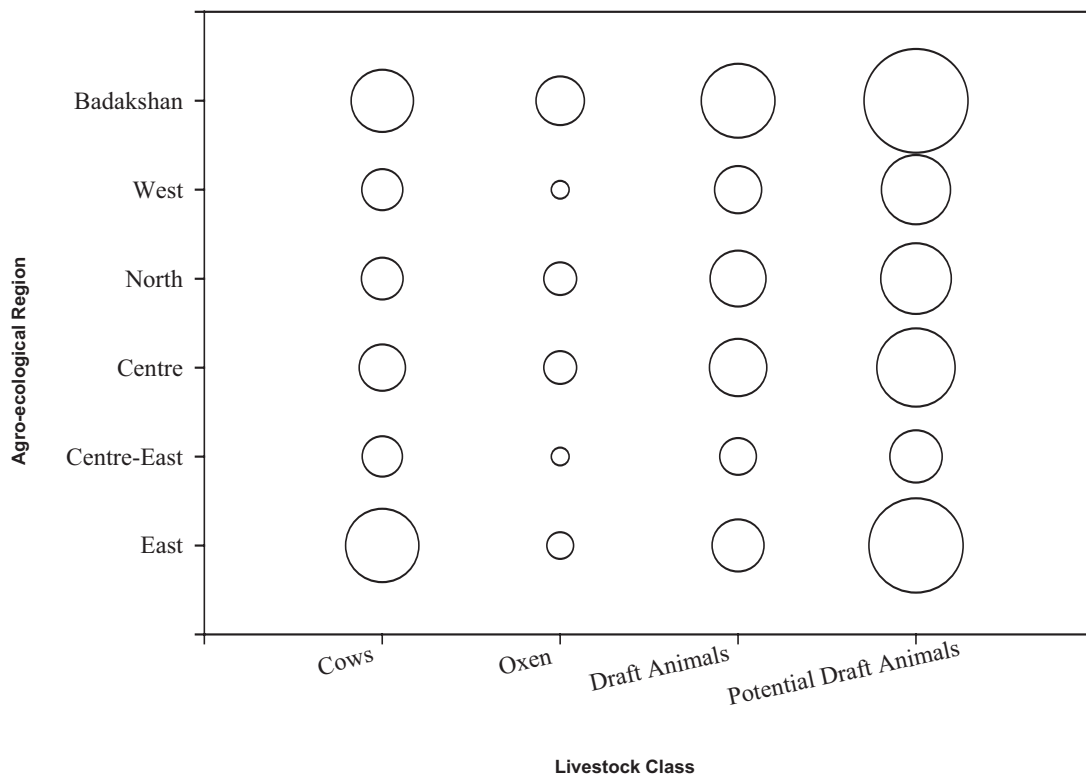


Figure 2 Cows and draft animals across regions



5.2.1 Forage Production and Feeding Situation

The following tables summarise the use of different types of feedstuff, their source (on farm production or purchase), preferences of use and sufficiency of feed supplies. Detailed summaries with individual and total numbers of respondents are listed in Appendix 5.

5.2.1.1 Types of forages used

The following table summarises the percentages of farmers using the feedstuffs listed, specified for each agro-ecological region. Wheat straw was the most commonly used feed from farm production in all regions and Maize Straw is also widely used except in the Centre Region where little Maize is grown. Shaftal and Lucerne are the most popular grown and used fodder crops. Shaftal as annual fodder crop has a relatively higher importance in Eastern Afghanistan while in the other regions Lucerne is the more important fodder crop. Hay from natural grassland has the greatest importance in the Central Highlands. Maize is the most important farm produced concentrate in all regions except in the West where Barley is more important as concentrate feed.

A large proportion of farmers in all regions purchase both concentrates and roughage for feeding their livestock. In addition to their own production approximately 40 percent of the interviewed farmers still have to purchase additional straw to feed their livestock which by quantity is most likely the most important purchased feedstuff. Although not specifically asked in the survey one can assume that the Shaftal and Lucerne were purchased for feeding as fresh fodder crop. Many Afghan farmers also purchase concentrates with Cotton seed cake, Wheat Bran, Maize and Barley in the North and West being the more commonly purchased feed types.



photo by: Thieme

Table 10 Types of forages used in the agro-ecological region (percentage of respondents)

	Agro-ecological Region				
	East	Centre-East	Centre	North	West
Own Production					
Wheat Straw	71.7	88.8	67.5	75.8	74.8
Shaftal*)	64.5	64.4	31.1	8.0	48.2
Lucerne	10.8	66.3	49.1	22.1	54.0
Maize Straw	56.6	48.3	9.0	15.9	21.2
Maize	37.5	52.2	8.5	13.0	18.0
Hay	5.2	3.9	38.2	25.4	27.0
Wheat Bran	7.2	10.2	5.2	27.1	5.8
Barley	0.4	1.5	3.3	2.1	19.1
Sorghum	2.4	2.4	0.9	7.7	0.0
Millet	0.0	6.3	2.8	0.0	0.7
Cotton Seed Cake	0.4	2.9	1.9	3.5	1.1
Purchased Feed					
Cotton Seed Cake	57.0	86.3	52.4	83.2	6.1
Wheat Straw	40.6	35.1	42.9	44.2	38.8
Wheat Bran	21.1	82.0	36.8	38.3	6.5
Lucerne	6.8	45.9	34.4	16.2	24.5
Barley	8.0	7.3	6.1	26.8	77.6
Maize	15.1	33.2	26.9	21.5	7.6
Shaftal	10.0	37.6	23.6	9.7	14.4
Maize Straw	28.3	5.9	2.4	5.9	1.8
Hay	3.2	3.4	10.4	10.9	2.2
Sorghum	0.4	5.4	0.9	3.5	0.7
Millet	1.2	2.9	0.5	0.3	0.7
*Persian Clover, <i>Trifolium resupinatum</i> , but <i>Trifolium clusii</i> (annual Strawberry clover, less productive) is also called 'Shaftal'.					

5.2.1.2 Preferences for feeds and feed supply

In addition to the actual use of feedstuffs the interviewed farmers were also asked for their most preferred feedstuffs, either purchased or produced on their own farm. In addition to the pre-defined types of feedstuffs of the previous chapter a number of other categories were hereby mentioned by the interviewed farmers. The frequency of answers was used to establish a list of the most preferred feedstuffs in the different Agro-ecological Regions.

Table 11 Preferences for purchased feeds (percentage of respondents)

	Agro-ecological region				
	East	Centre-East	Centre	North	West
Forage	4.7	26.6	27.7	8.7	32.0
Lucerne	1.1	10.9	12.5	3.0	7.0
Persian clover	3.4	7.1	8.9	1.4	7.2
Hay	0.3	3.7	2.1	2.7	12.9
Green Plants		4.6	1.4	0.2	4.5
Mountain Grass		0.3	2.8	1.2	0.4
Various Crop Aftermath	27.3	11.2	19.9	10.6	17.6
Wheat Straw	17.3	8.9	12.4	5.1	14.4
Mung Bean Straw	0.8			5.3	0.3
Rice Straw	0.8	0.2	4.9	0.2	
Maize Husks	5.9				
Barley Straw		0.1	1.7		2.9
Maize Stalks		2.0	0.9		
Maize Aftermath	2.4	0.1			
Concentrates	67.7	59.4	49.5	75.9	47.6
Oil Cakes	10.3	21.3	15.0	35.5	5.6
Barley	10.3	2.2	7.3	26.5	30.2
Vetch (<i>Lathyrus sativus</i>)	11.8	9.3	9.1		
Maize	9.4	4.4	7.9	2.8	5.0
Wheat Bran	0.7	7.8	8.5	7.4	0.9
Wheat	14.5	0.3	0.2	0.4	1.4
Grains		5.8	0.6		3.6
Bread		5.6	0.2	2.8	0.3
Soybean	8.2				
Mung Bean (<i>Vigna radiata</i>)		2.8	0.6		0.5
Flour	2.4			0.3	0.2
Others	0.3	2.8	2.9	4.9	2.8

Clearly, farmers prefer concentrates when buying feeds. Oil cakes are the most preferred concentrate feed, but that may be simply a reflection of availability and price. Purchase of Shaftal and Lucerne is especially popular in the Centre and Centre-East regions, presumably as winter fodder.

Table 12 Preferences for on-farm feeds (percentage of respondents)					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Forage	33.0	55.5	66.3	24.9	43.0
Persian clover	27.8	21.9	18.0	2.2	7.7
Lucerne	1.2	21.7	28.5	4.9	10.1
Mountain Grass	0.3	1.1	14.2	8.4	7.3
Green Plants	3.1	3.6	2.5	1.4	12.9
Hay	0.2	4.8	3.0	6.4	4.8
Weeds	0.3	2.3			0.1
Green Barley	0.2	0.2		1.5	
Crop Aftermath	53.7	23.2	29.3	35.8	18.8
Wheat Straw	28.9	21.2	26.8	22.3	17.9
Maize Husks	12.4		0.2		0.9
Maize Aftermath	8.1	0.5	0.2		
Rice Straw	3.9	0.1	2.0	0.9	
Khasha (crop aftermath)				6.1	
Mung Bean Straw	0.1			5.1	0.1
Crop Aftermath		0.7		1.5	
Tree leaves	0.3	0.8			
Concentrates	9.8	19.4	4.5	30.2	37.7
Maize	5.9	10.9	1.7	5.1	6.5
Barley	1.0	0.2	1.5	13.3	11.6
Grains	0.7	3.5			10.2
Wheat	0.3			2.0	8.3
Sorghum	1.4			5.3	0.2
Oil Cakes		2.5	0.7	1.3	0.2
Wheat Bran	0.5	0.6	0.7	1.9	0.6
Cotton Seed		1.7			
Barley flour				1.3	
Others	3.5	1.9	0.0	9.1	0.5

In terms of cultivated forage production, there seems to be considerable interest in Persian clover and Lucerne. Especially Persian clover can be integrated well into crop rotations and should be considered a priority in livestock development programs.

Noteworthy is that the preferences expressed for 'Mountain Grass' (harvested rangeland vegetation) corresponds with higher availability of this type of forage in higher elevation sites. At the same time, this regional differentiation reflects on the state of rangelands. There is simply no surplus to be harvested on rangelands in most of Afghanistan.

Table 13 Feed supplies (percentage of respondents)

	Agro-ecological region				
	East	Centre-East	Centre	North	West
Enough Feed 2002*	44.6	23.9	17.0	3.5	5.0
Enough Feed 2003	45.4	26.8	25.5	47.8	41.7
Pasture Sufficient 2002	16.3	6.3	29.7	11.5	6.8
Pasture Sufficient 2003	17.9	5.4	29.7	36.6	34.2
Purchased Supplements 2002	73.7	93.7	85.8	57.2	61.5
Purchased Supplements 2003	72.9	86.8	80.7	28.9	47.1
Produced Supplements 2002	25.5	15.1	9.4	5.0	2.2
Produced Supplements 2003	27.1	20.0	12.3	14.5	15.8
Feed Prices Increased 2002	80.9	95.1	87.3	96.2	85.3
Feed Prices Increased 2003	74.5	94.1	73.6	17.1	43.5

* For all subjects percentage of respondents

These answers provide a clear indication that in 2003 the drought effects began to subside. These data are valuable as baseline data for future programs in drought preparedness.

Table 14 Length of feeding periods (months)

	Agro-ecological Region				
	East	Centre-East	Centre	North	West
Pasture grazing	8.76	6.86	6.01	5.90	7.44
Stubble period	2.16	2.77	2.05	3.06	2.34
Supplementation period	6.64	8.22	6.29	4.15	4.45

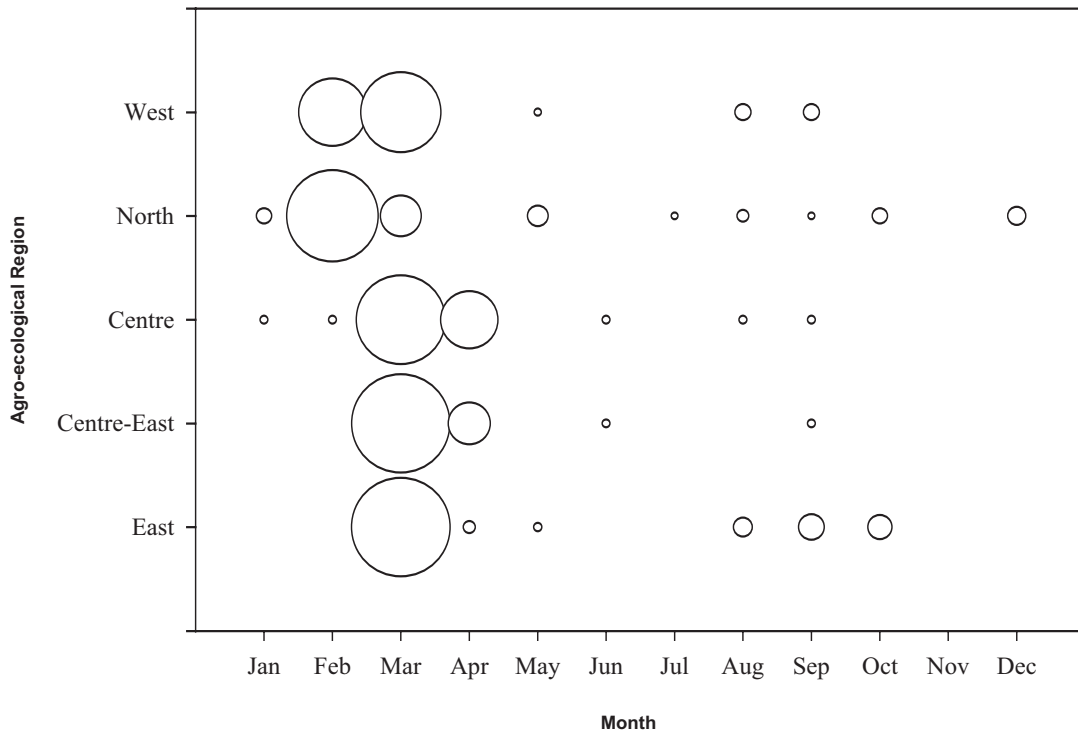
5.2.2 Production Calendar

The production calendar is summarised graphically by region. Lambing and kidding, timing of use of feed resources and sales are considered. The area of the circles in the graphs corresponds to number of respondents. Total number of respondents varied between 828 ('Supplemental Feeding') and 1114 ('Best Time to Sell Cattle'). The detailed figures are provided in the Tables A5-A10 of the Annex.

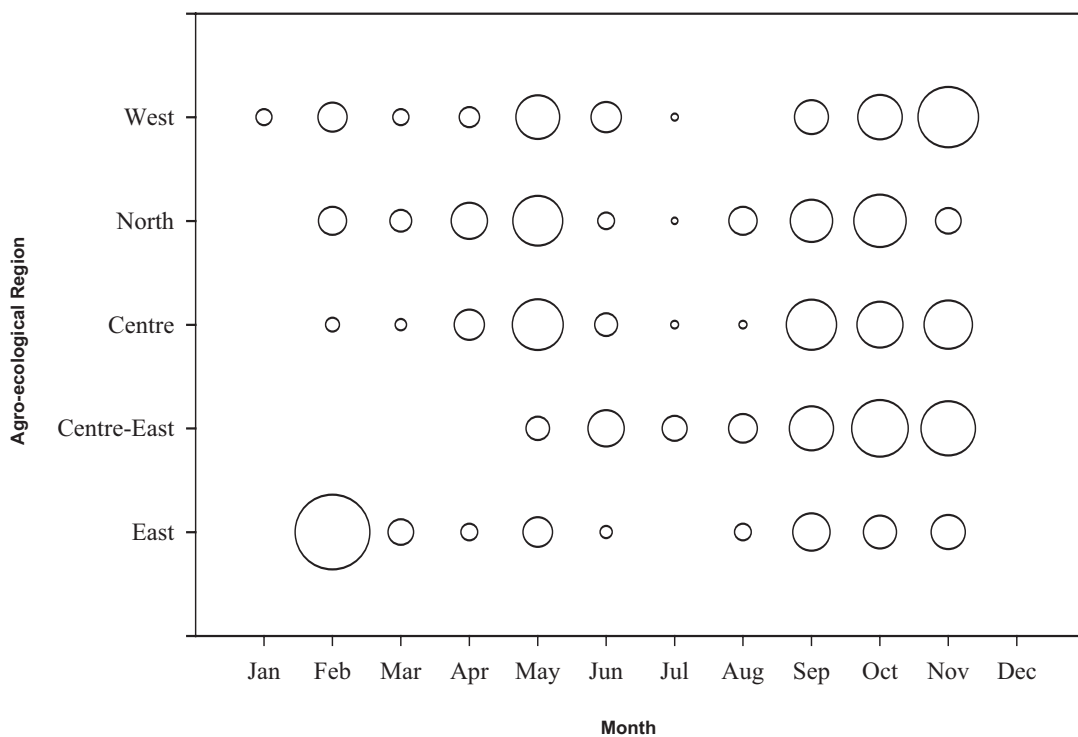


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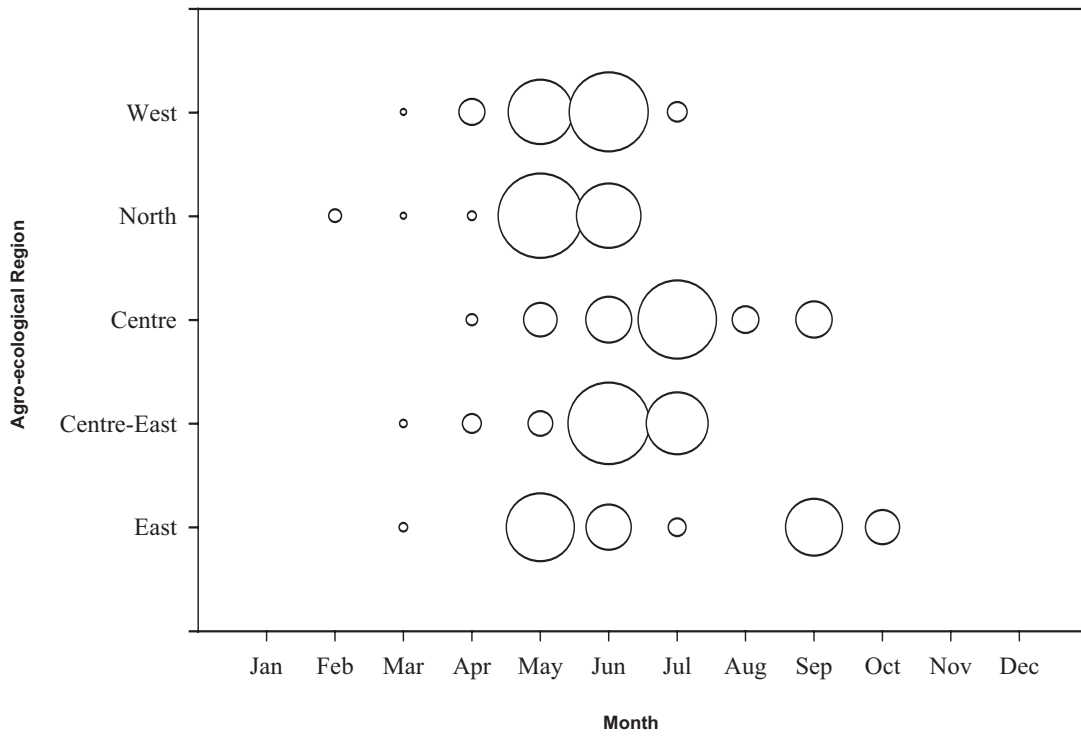
**Figure 5 Begin of grazing season by region
(percent respondents represented in proportion)**



**Figure 6 End of grazing season by region
(percent respondents represented in proportion)**



**Figure 7 Begin of stubble grazing by region
(percent respondents represented in proportion)**



**Figure 8 End of stubble grazing by region
(percent respondents represented in proportion)**

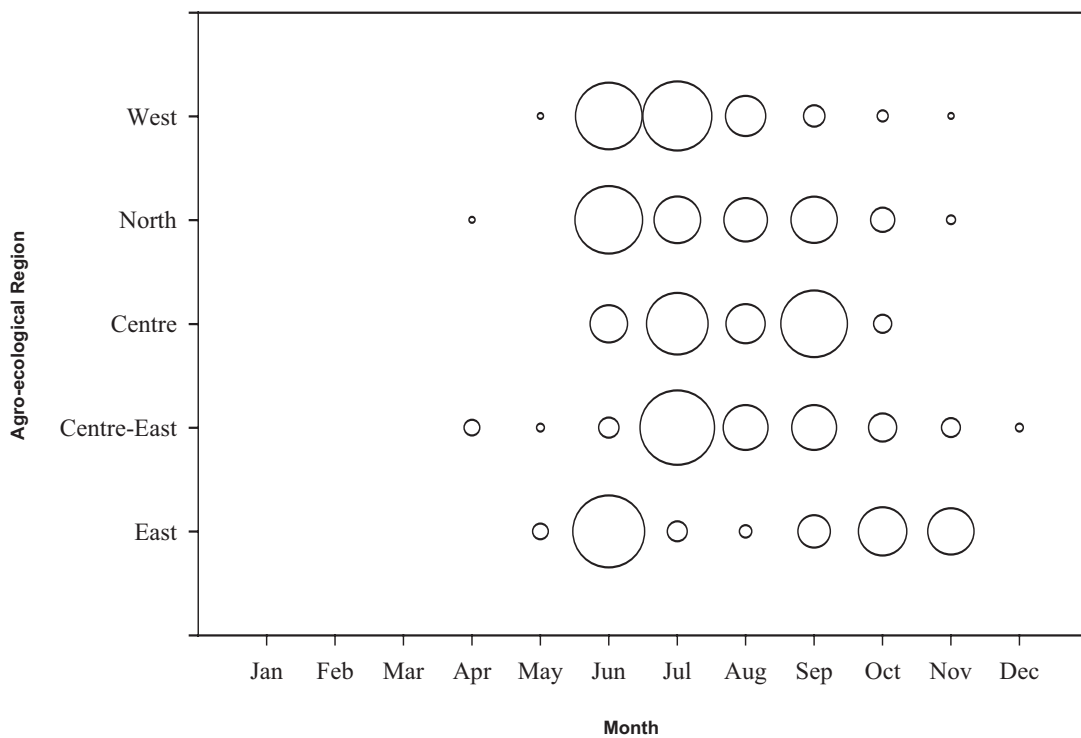


Figure 9 Begin of supplementary feeding by region (percent respondents represented in proportion)

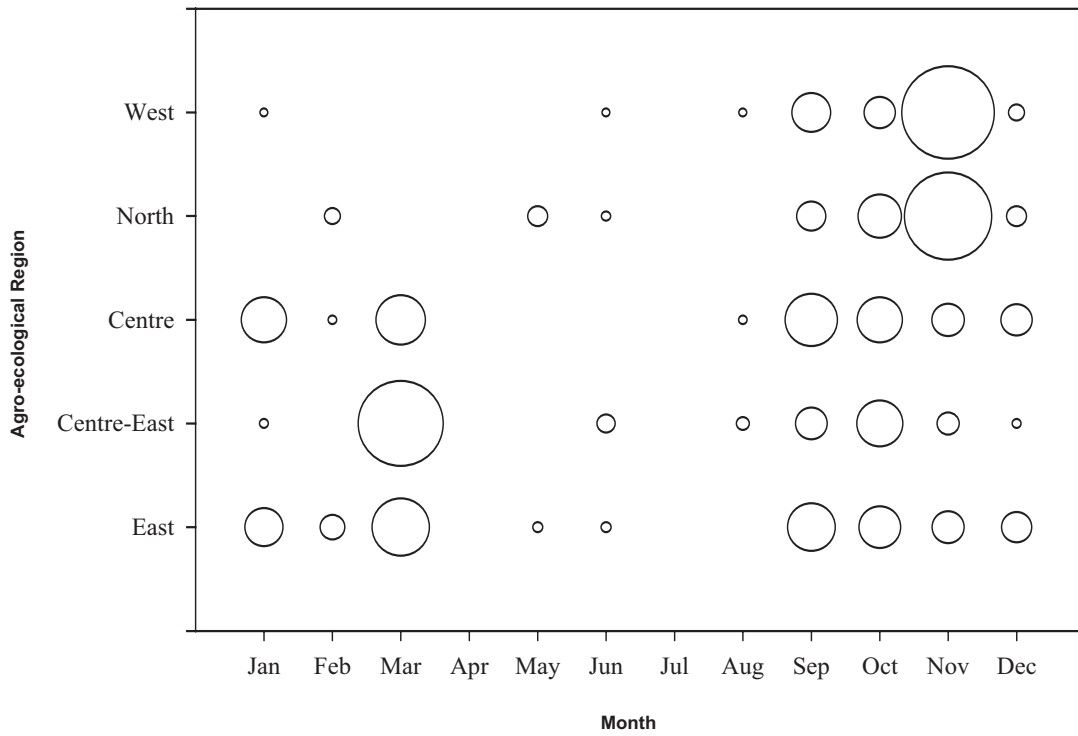


Figure 10 End of supplementary feeding by region (percent respondents represented in proportion)

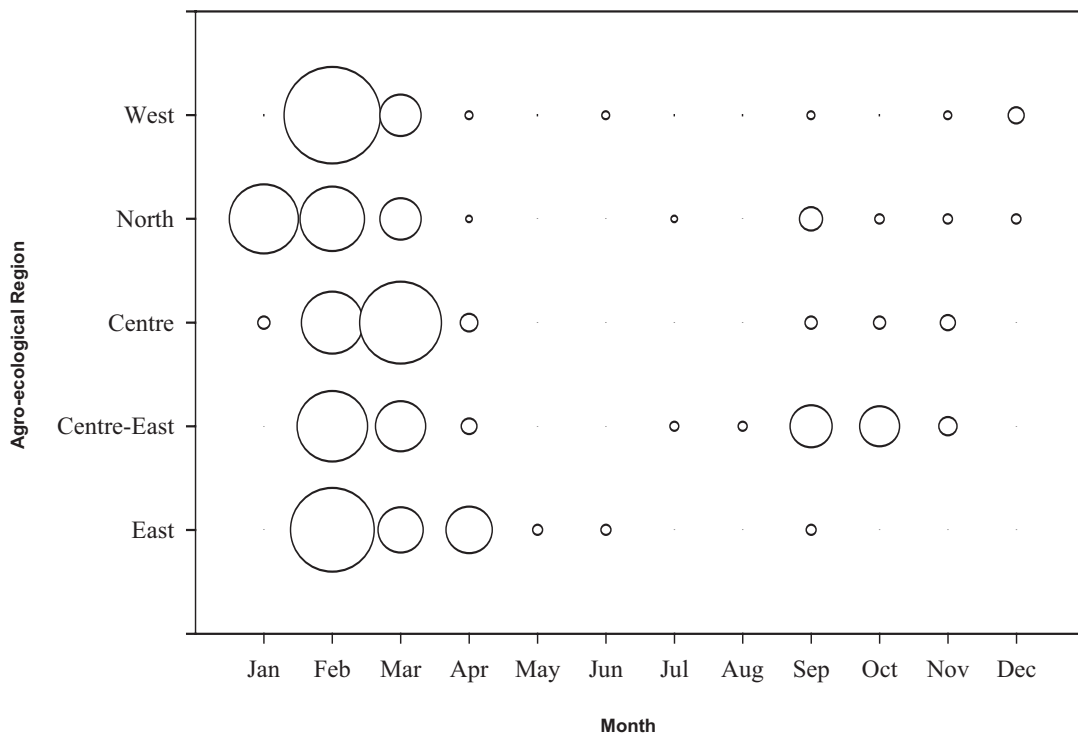


Figure 11 Best time to sell cattle by region (percent respondents represented in proportion)

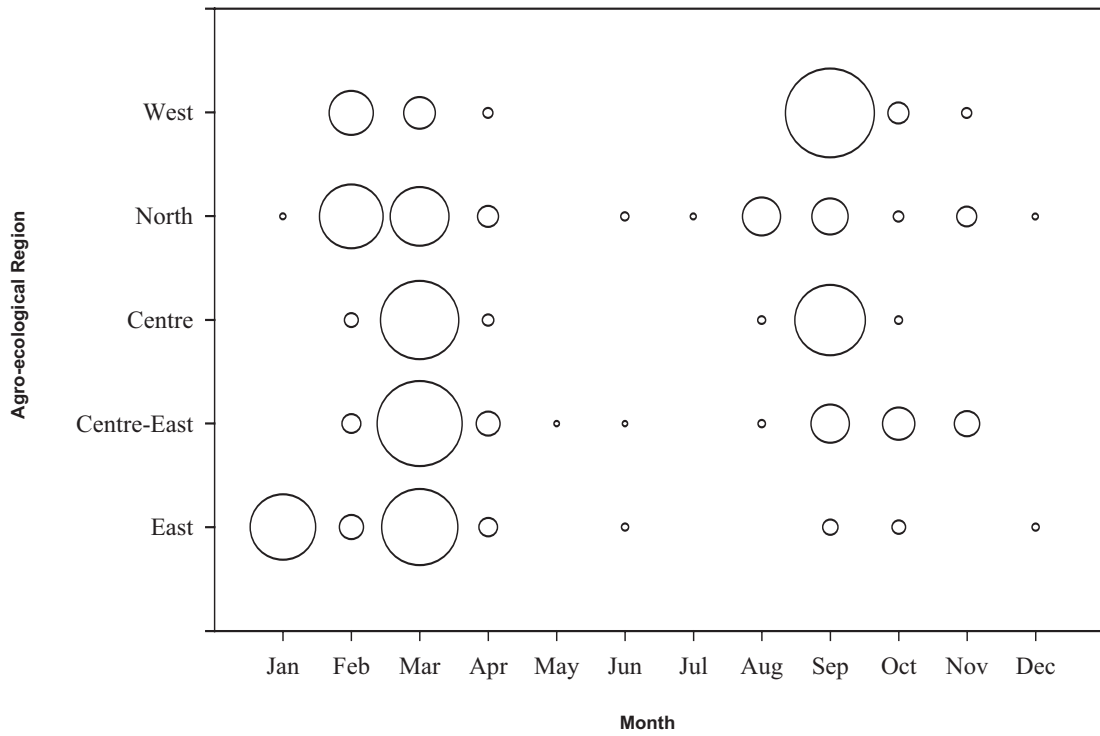


Figure 12 Best time to sell sheep by region (percent respondents represented in proportion)

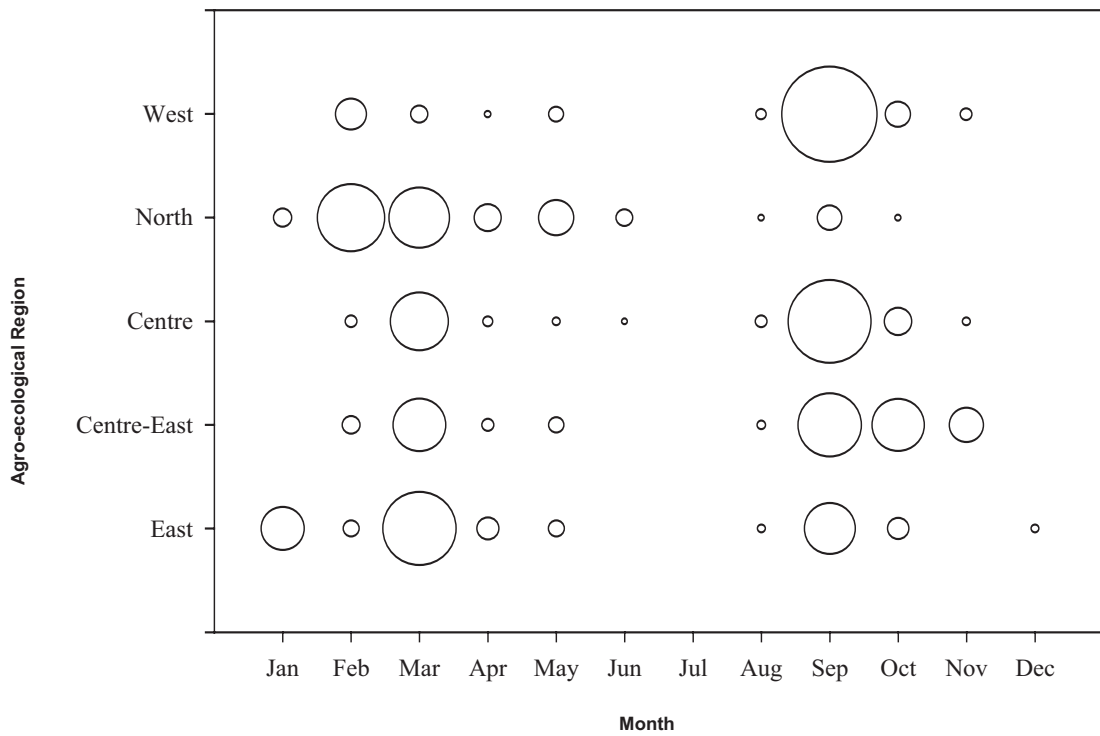


Figure 13 Best time to sell goats by region (percent respondents represented in proportion)

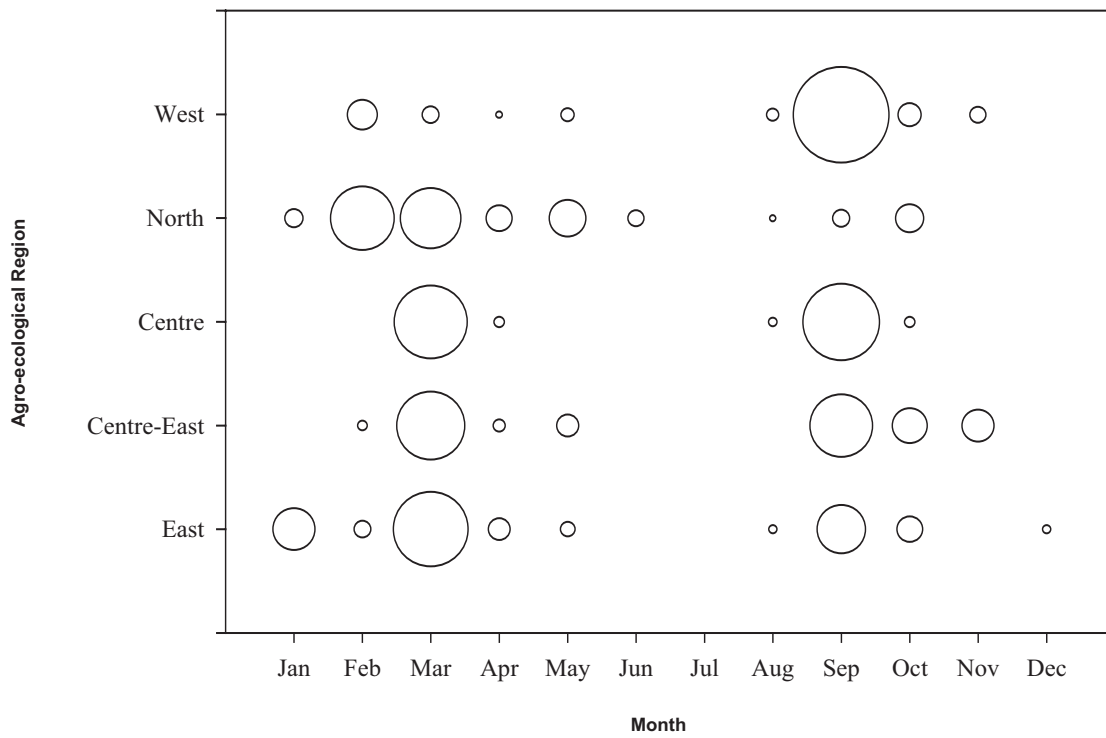
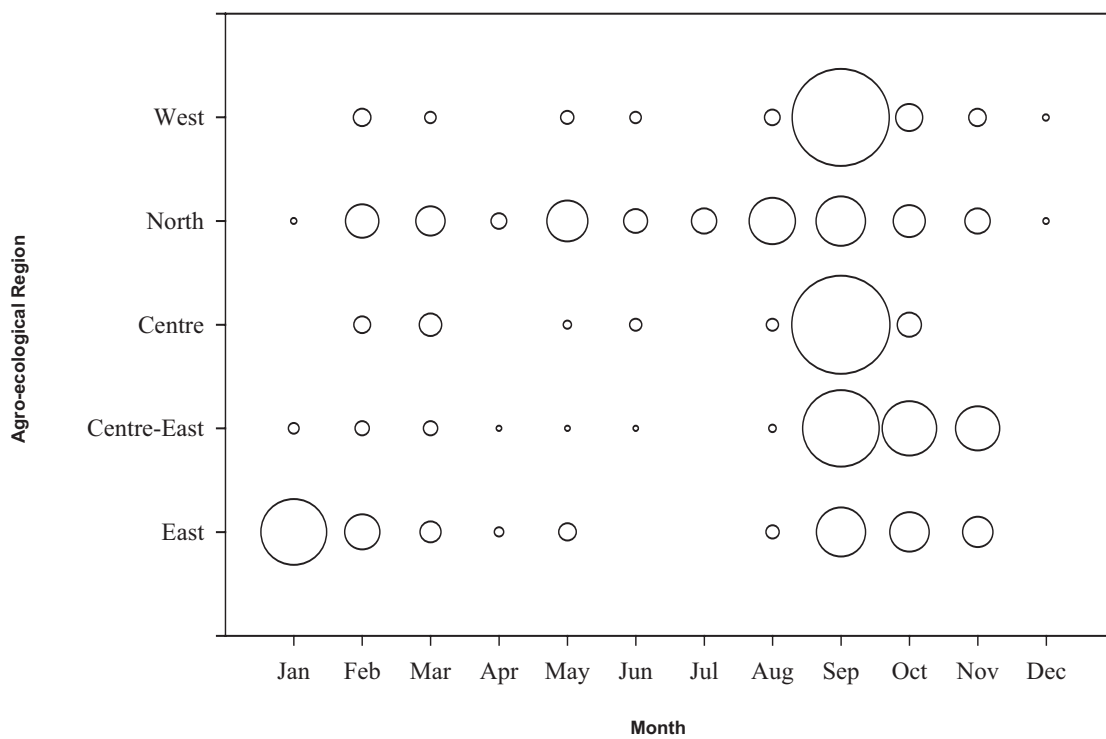


Figure 14 Best time to sell surplus by region (percent respondents represented in proportion)



5.2.3 Livestock Species, Numbers and Demography

The following summary graphs depict the age structure for major livestock species, differentiated by agro-ecological region. Data for camels and horses are summarised for the whole survey because there were not enough respondents to justify breakdown by agro-ecological zone. Note that different age categories were enumerated for different species. Data are also presented in tabular form for further reference in Section 5.3.2 'Livestock Management'.

Figure 15 Composition of cattle herds by sex and age groups in different regions

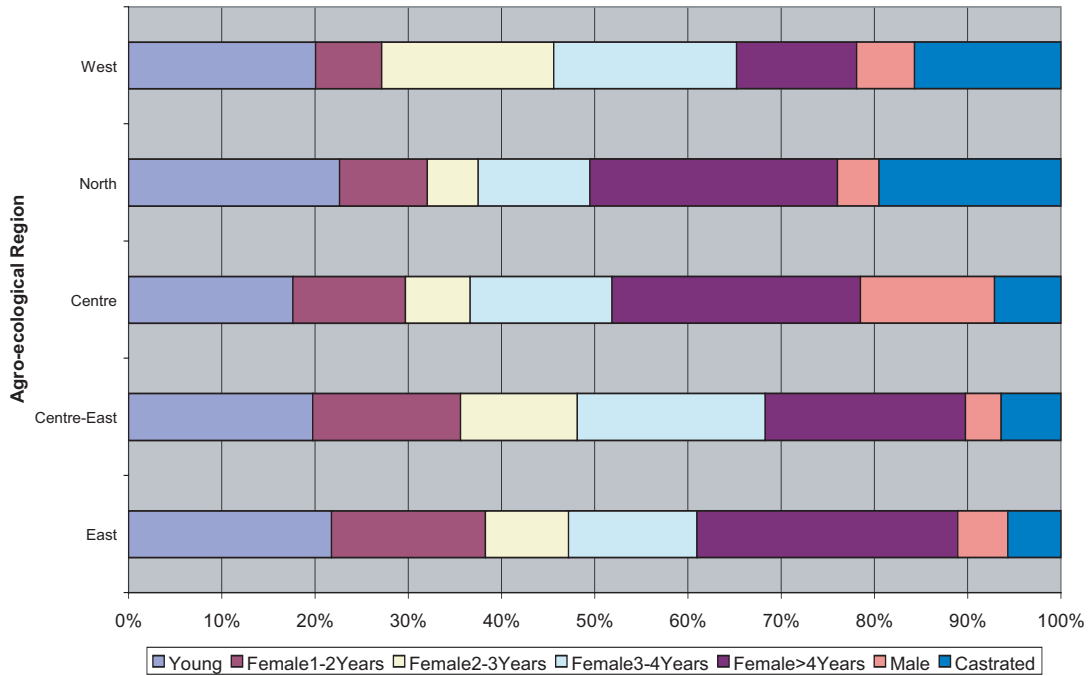


Figure 16 Composition of sheep flocks by sex and age groups in different regions

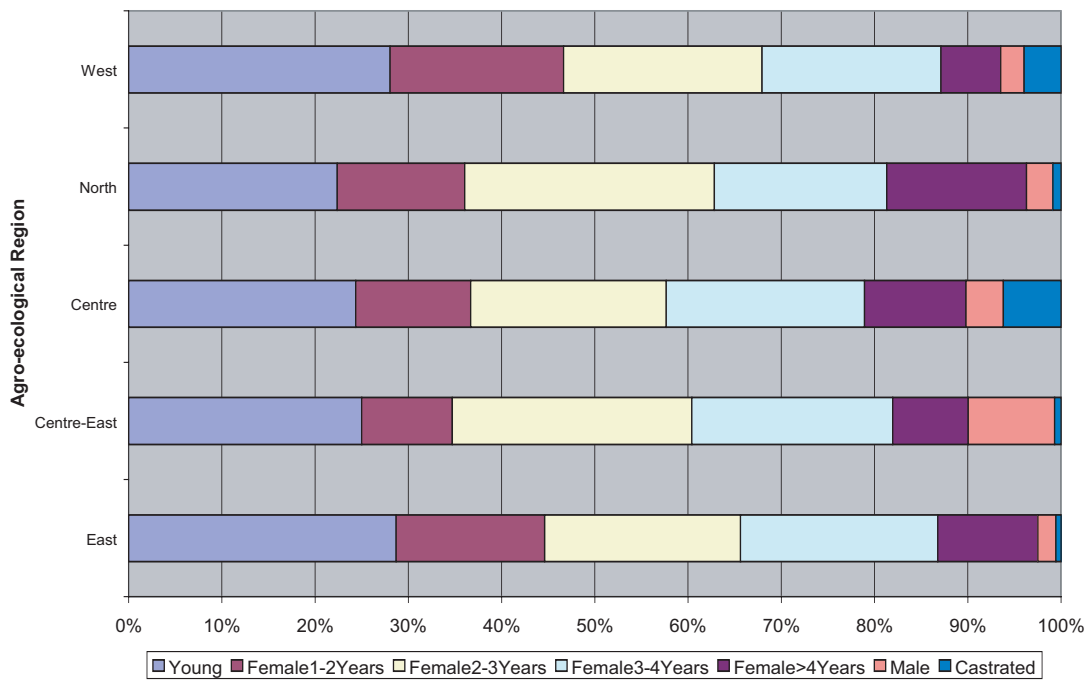


Figure 17 Composition of goat flocks by sex and age groups in different regions

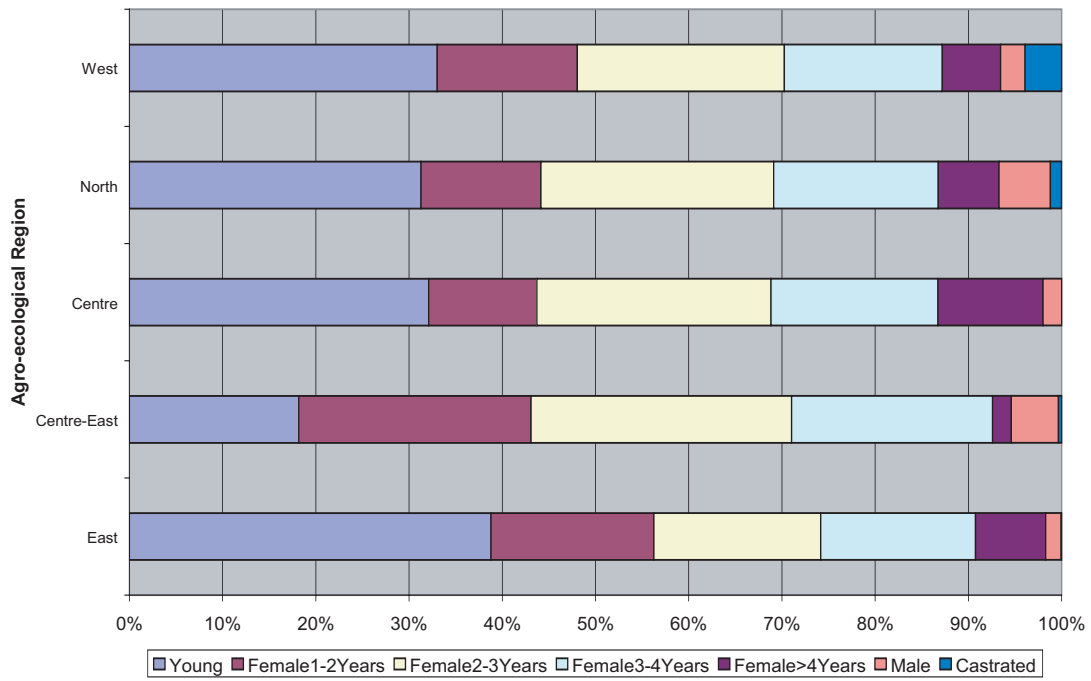


Figure 18 Composition of donkey herds by sex and age groups in different regions

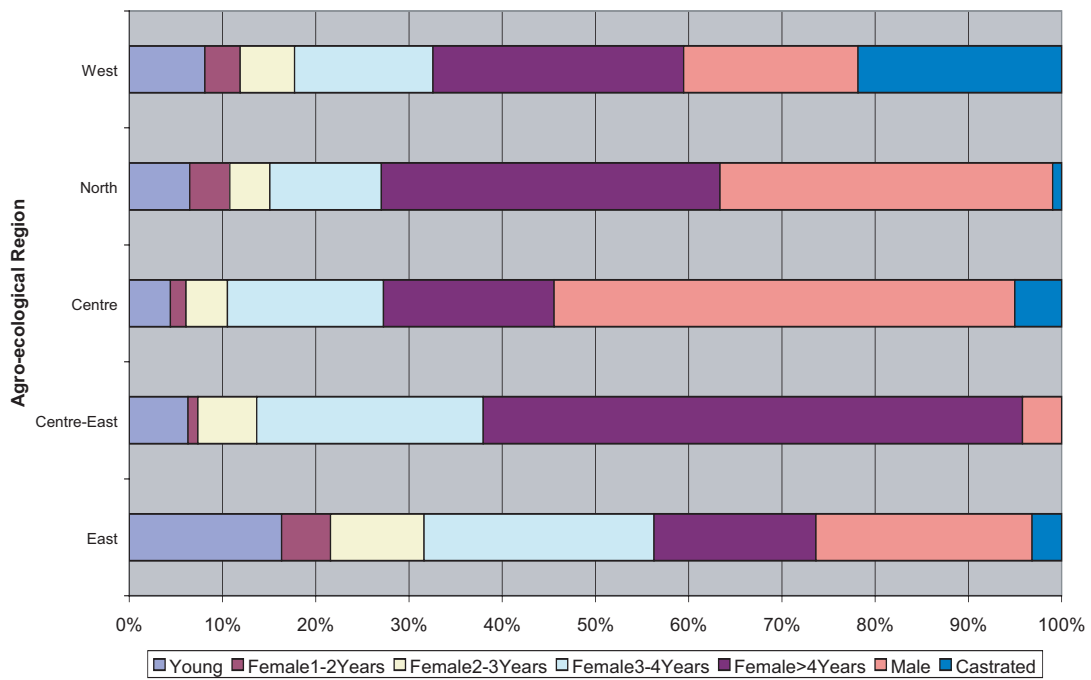


Figure 19 Composition of camel herd by sex and age groups (all regions)

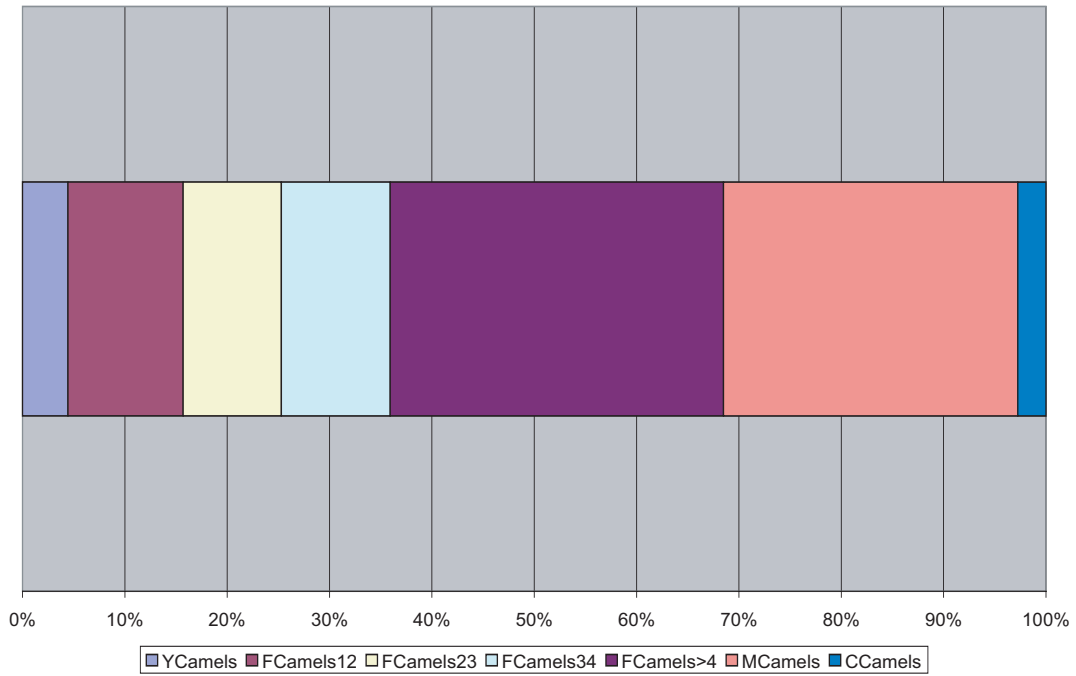
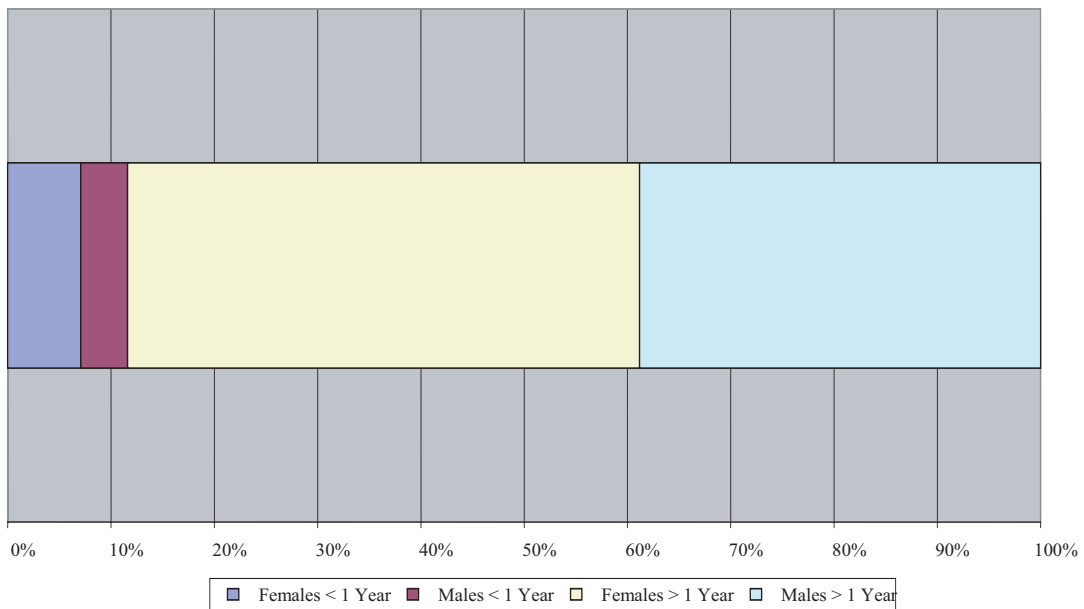


Figure 20 Composition of horse herd by sex and age groups (all regions)



5.3 PRODUCER CHARACTERISTICS

5.3.1 Livestock Wealth Distribution

From the detailed Level 2 data, information about distribution of livestock ownership could be computed. Four livestock species were used to classify wealth distribution: cattle, sheep, goats and chicken. This information is presented on the basis of province and agro-ecological region.

Table 15 Livestock wealth distribution classifications

Class	Cattle	Sheep	Goats	Chicken
1	0	0	0	0
2	1-2	1-49	1-49	1-10
3	3-4	50-99	50-99	11-20
4	5-10	100-499	100-499	21-50
5	> 10	> 499	> 499	> 50



photo by: Park

Table 16 Cattle ownership distribution (percentages)							
Herd size (number of cattle)							
Region	Province	0	1-2	3-4	5-10	> 10	Total Respondents
East	Khost	16.67	10.00	10.00	40.00	23.33	30
	Laghman		17.24	48.28	34.48		29
	Nangarhar	2.31	21.54	35.38	37.69	3.08	130
	Paktika	20.00	20.00	16.67	33.33	10.00	30
	Paktya	3.13	18.75	28.13	21.88	28.13	32
	All		5.98	19.12	30.68	35.06	9.16
Centre-East	Kabul	7.50	30.00	37.50	25.00		40
	Kabul City	24.24	24.24	30.30	18.18	3.03	33
	Kapisa		60.00	30.00	10.00		10
	Logar	10.00	28.00	22.00	34.00	6.00	50
	Parwan		30.95	45.24	21.43	2.38	42
	Wardak	6.67	43.33	40.00	10.00		30
	All		8.78	32.20	34.15	22.44	2.44
Centre	Bamyan	15.87	46.03	19.05	17.46	1.59	63
	Ghazni	35.09	26.32	28.07	10.53		57
	Ghor	24.00	40.00	16.00	16.00	4.00	25
	Zabul	18.52	25.93	31.48	22.22	1.85	54
	All		23.12	34.17	24.62	16.58	1.51
North	Baghlan	10.31	20.62	24.74	37.11	7.22	97
	Balkh	9.38	43.75	46.88			32
	Faryab	29.63	33.33	29.63	7.41		27
	Jawzjan	48.28	34.48	3.45	13.79		29
	Kunduz	3.33	23.33	23.33	30.00	20.00	30
	Samangan	18.75	37.50	23.44	14.06	6.25	64
	Sari Pul	15.38	30.77	25.64	25.64	2.56	39
	Takhar	5.00	20.00	20.00	30.00	25.00	20
	All		16.27	29.59	24.85	22.49	6.80
West	Badghis	36.00	32.00	12.00	20.00		25
	Farah	28.57	45.45	16.88	9.09		77
	Hilmand	15.00	30.00	25.00	20.00	10.00	20
	Hirat	39.85	36.09	15.79	7.52	0.75	133
	Nimroz	15.00	55.00	10.00	15.00	5.00	20
	All		32.73	39.27	16.00	10.55	1.45
Overall AVG/Total		17.67	30.76	25.55	21.45	4.57	1,268

Table 17 Sheep ownership distribution (percentages)							
Flock size (number of sheep)							
Region	Province	0	1-49	50-99	100-499	> 499	Total Respondents
East	Khost	20.00	43.33		36.67		30
	Laghman	48.28	48.28	3.45			29
	Nangarhar	78.46	21.54				130
	Paktika		73.33	10.00	16.67		30
	Paktya	31.25	59.38	3.13	6.25		32
	All		52.59	38.25	1.99	7.17	
Centre-East	Kabul	67.50	32.50				40
	Kabul City	42.42	57.58				33
	Kapisa	30.00	70.00				10
	Logar	56.00	44.00				50
	Parwan	69.05	30.95				42
	Wardak	56.67	43.33				30
	All		57.56	42.44			
Centre	Bamyan	41.27	50.79	7.94			63
	Ghazni	43.86	56.14				57
	Ghor	52.00	48.00				25
	Zabul	33.33	66.67				54
	All	41.21	56.28	2.51			199
North	Baghlan	44.33	39.18	8.25	6.19	2.06	97
	Balkh	3.13	68.75	18.75	9.38		32
	Faryab	14.81	77.78	7.41			27
	Jawzjan	10.34	58.62	13.79	10.34	6.90	29
	Kunduz	3.33	63.33	10.00	13.33	10.00	30
	Samangan	29.69	64.06		4.69	1.56	64
	Sari Pul	10.26	69.23	17.95	2.56		39
	Takhar	25.00	55.00	15.00	5.00		20
	All	23.67	57.99	9.76	6.21	2.37	338
West	Badghis	8.00	64.00	16.00	12.00		25
	Farah	48.05	49.35	1.30	1.30		77
	Hilmand	60.00	40.00				20
	Hirat	48.87	41.35	7.52	2.26		133
	Nimroz	15.00	70.00	10.00	5.00		20
	All	43.27	47.64	6.18	2.91		275
Overall AVG/Total		41.88	49.05	4.73	3.71	0.63	1268

Table 18 Goat ownership distribution (percentages)						
Flock size (number of goats)						
Region	Province	0	1-49	50-99	100-499	Total Respondents
East	Khost	6.67	83.33	6.67	3.33	30
	Laghman	79.31	20.69			29
	Nangarhar	72.31	27.69			130
	Paktika	50.00	46.67		3.33	30
	Paktya	15.63	53.13	9.38	21.88	32
	All		55.38	39.04	1.99	3.59
Centre-East	Kabul	75.00	25.00			40
	Kabul City	66.67	33.33			33
	Kapisa	100				10
	Logar	80.00	20.00			50
	Parwan	97.62	2.38			42
	Wardak	90.00	10.00			30
	All		82.93	17.07		
Centre	Bamyan	52.38	47.62			63
	Ghazni	63.16	36.84			57
	Ghor	20.00	76.00	4.00		25
	Zabul	57.41	40.74	1.85		54
	All		52.76	46.23	1.01	
North	Baghlan	37.11	58.76	3.09	1.03	97
	Balkh	6.25	90.63	3.13		32
	Faryab	25.93	74.07			27
	Jawzjan	13.79	82.76		3.45	29
	Kunduz	33.33	66.67			30
	Samangan	50.00	43.75	4.69	1.56	64
	Sari Pul	10.26	89.74			39
	Takhar	40.00	55.00		5.00	20
	All		30.47	66.27	2.07	1.18
West	Badghis		92.00	4.00	4.00	25
	Farah	20.78	71.43	2.60	5.19	77
	Hilmand	60.00	40.00			20
	Hirat	31.58	63.16	3.76	1.50	133
	Nimroz		95.00		5.00	20
	All		25.45	68.73	2.91	2.91
Overall AVG/Total		46.29	50.32	1.74	1.66	1268

Table 19 Chicken ownership distribution (percentages)							
Ownership class (number of chicken)							
Region	Province	0	1-10	11-20	21-50	> 50	Total Respondents
East	Khost	13.33	43.33	23.33	16.67	3.33	30
	Laghman	6.90	68.97	17.24	6.90		29
	Nangarhar	3.85	40.77	31.54	20.00	3.85	130
	Paktika	3.33	56.67	33.33	6.67		30
	Paktya	3.13	37.50	34.38	12.50	12.50	32
	All		5.18	45.82	29.48	15.54	3.98
Centre-East	Kabul	7.50	47.50	32.50	12.50		40
	Kabul City	21.21	42.42	27.27	9.09		33
	Kapisa	10.00	40.00	40.00	10.00		10
	Logar	36.00	44.00	12.00	8.00		50
	Parwan	14.29	47.62	33.33	2.38	2.38	42
	Wardak	16.67	53.33	30.00			30
	All		19.51	46.34	26.83	6.83	0.49
Centre	Bamyan	47.62	47.62	4.76			63
	Ghazni	22.81	59.65	14.04	3.51		57
	Ghor	24.00	76.00				25
	Zabul	16.67	51.85	27.78	3.70		54
	All		29.15	55.78	13.07	2.01	
North	Baghlan	17.53	60.82	13.40	8.25		97
	Balkh	3.13	50.00	21.88	25.00		32
	Faryab	29.63	66.67	3.70			27
	Jawzjan	58.62	34.48	6.90			29
	Kunduz	13.33	30.00	33.33	20.00	3.33	30
	Samangan	42.19	42.19	15.63			64
	Sari Pul	33.33	64.10	2.56			39
	Takhar		20.00	35.00	35.00	10.00	20
	All		25.74	49.70	15.09	8.58	0.89
West	Badghis	16.00	76.00	8.00			25
	Farah	2.60	32.47	42.86	22.08		77
	Hilmand		45.00	50.00	5.00		20
	Hirat	39.85	52.63	4.51	3.01		133
	Nimroz		25.00	60.00	10.00	5.00	20
	All		21.45	46.55	22.91	8.73	0.36
Overall AVG/Total		20.27	48.66	21.21	8.68	1.18	1268

In order to visualize the regional difference in livestock wealth distribution, summary data are presented graphically by agro-ecological region.

Figure 21 Wealth distribution cattle (percent respondents represented in proportion)

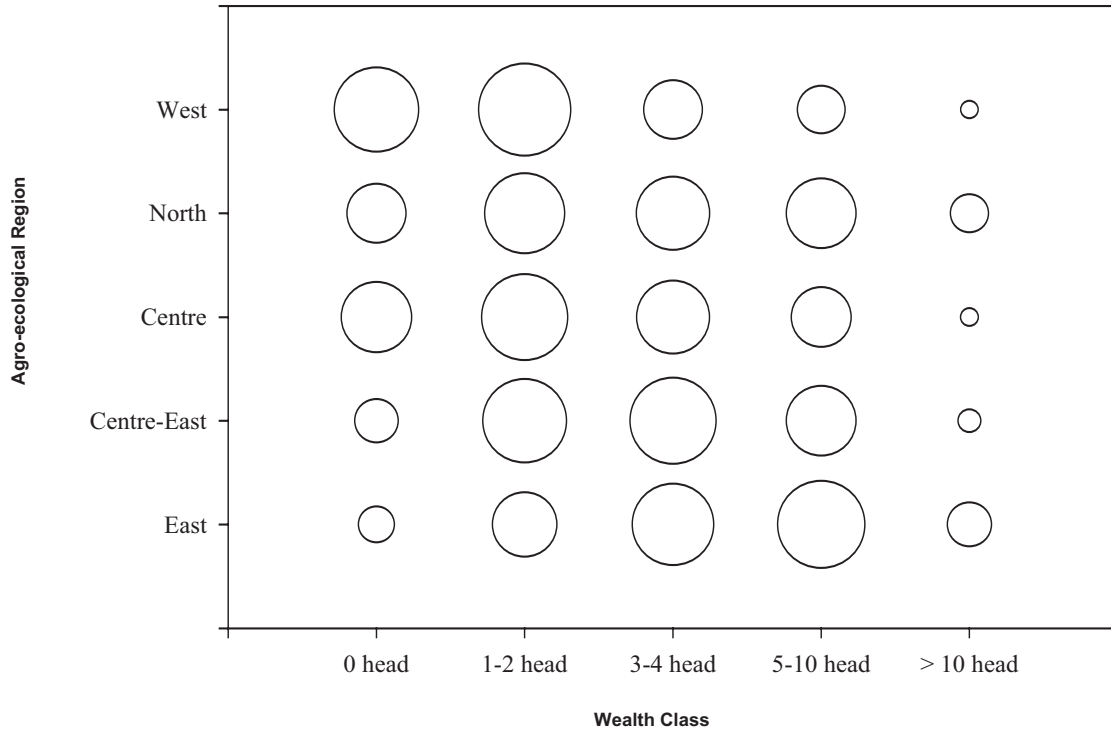
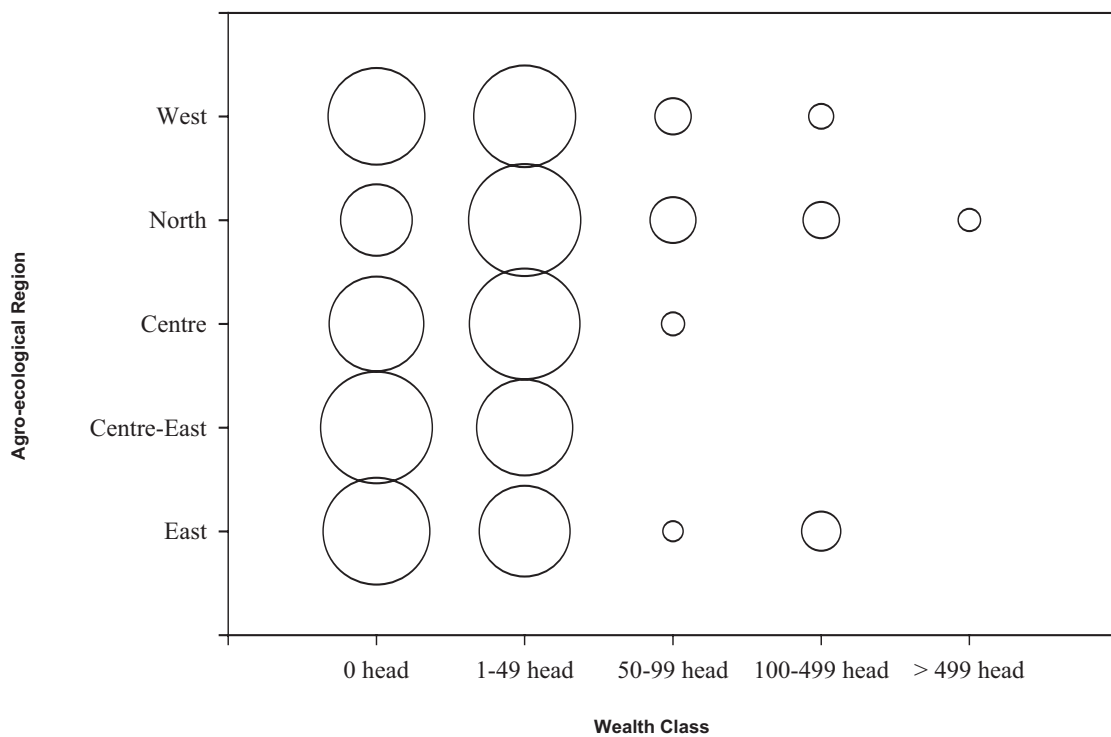


Figure 22 Wealth distribution sheep (percent respondents represented in proportion)



5.3.2 Livestock Management

Livestock management comprised the following responses: age structures, performance characteristic for cattle, sheep and goats, herd and flock composition (from Level 2 data) by agro-ecological region, and the culling and herd management policy in these three species.

5.3.2.1 Age structures



photo by: Guerne Bleich

Table 20 Age structure in herds and flocks surveyed in Level 2 by Agro-ecological region (percentages of the total herd or flock)							
Region	Younger < 1 year	Females 1-2 years	Females 2-3 years	Females 3-4 years	Females > 4 years	Adult male	Castrated male
Cattle							
East	22.6	17.1	9.2	14.3	29.0	5.6	5.9
Centre-East	18.1	14.6	11.5	18.5	19.7	3.5	5.9
Centre	18.4	12.6	7.2	15.9	27.8	15.0	7.4
North	22.4	9.3	5.4	11.8	26.2	4.4	19.3
West	22.5	7.9	20.7	22.0	14.4	6.9	17.6
Sheep							
East	29.4	16.3	21.5	21.7	11.0	2.0	0.6
Centre-East	24.8	9.7	25.5	21.4	8.0	9.2	0.7
Centre	24.8	12.6	21.4	21.7	11.1	4.1	6.3
North	19.4	11.9	23.2	16.0	13.0	2.5	0.8
West	28.3	18.8	21.5	19.4	6.5	2.5	4.0
Goats							
East	39.4	17.8	18.2	16.9	7.6	1.7	
Centre-East	18.4	25.2	28.2	21.8	2.0	5.1	0.3
Centre	33.0	11.9	25.8	18.4	11.6	2.0	
North	29.6	12.2	23.6	16.7	6.2	5.2	1.1
West	33.4	15.2	22.5	17.2	6.3	2.7	4.0
Donkeys							
East	17.6	5.7	10.8	26.5	18.7	24.9	3.4
Centre-East	4.5	0.8	4.5	17.5	41.7	3.0	
Centre	4.1	1.6	4.2	15.7	17.2	46.4	4.7
North	6.3	4.2	4.2	11.7	35.4	34.8	0.9
West	8.2	3.8	5.9	15.0	27.1	18.9	22.0
Camels*							
	4.3	11.0	9.3	10.4	31.7	28.0	2.7
Horses*							
	Males	Females	Males	Females			
	Younger than 1 year		Older than 1 year				
	4.51	7.09	38.81	49.59			

*Averages for all regions

5.3.2.2 Performance characteristics

Table 21 Livestock performance characteristics					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Performance Characteristics for Cattle					
Percentage producers owning bull	13.55	23.41	27.83	32.15	14.03
Percentage cows calving each year	43.03	80.49	35.69	55.76	49.57
Keep cattle (years)	9.75	9.74	9.32	9.44	8.73
Performance Characteristics for Sheep					
Ewes per ram	43.01	13.22	20.92	61.57	47.40
Lambs born (per 10)	8.45	10.10	9.04	8.31	8.24
Lambs weaned (per 10)	6.90	7.57	6.82	6.30	7.14
Age weaning (months)	4.12	4.28	4.40	4.36	3.08
Age lambs sold (months)	6.64	9.21	6.58	5.84	5.56
Keep sheep (years)	5.41	4.91	5.22	5.69	5.64
Performance Characteristics for Goats					
Does per buck	42.30	8.19	18.54	39.17	46.77
Kids born (per 10)	9.70	13.45	10.69	9.56	9.96
Kids weaned (per 10)	7.69	9.79	7.96	7.21	8.82
Age weaning (months)	4.28	4.25	4.15	4.23	3.11
Age kids sold (months)	7.10	8.56	6.41	6.34	5.50

It is very obvious that these reproduction data indicate the most important problem: insufficient nutrition impinging upon reproduction. Strategic supplementation during breeding periods is an important and probable high-impact strategy, especially for small ruminants.

5.3.2.3 Culling Reasons

Table 22 Culling reasons (percentages)					
Reasons fur Culling	Agro-ecological region				
	East	Centre-East	Centre	North	West
Cows					
Old age	15.9	17.9	29.7	58.9	54.4
Unproductive	1.0	12.1	13.9	13.8	3.1
Infertile		1.9	3.6	3.7	1.3
No milk		6.3	6.1		
Sick	0.5	9.2	4.8	1.7	14.6
Feed shortage	40.4	42.0	35.2	18.5	15.9
Drought	1.9				
Cash need	35.1	9.7	6.7	3.4	10.6
Inadequate breed	5.3	1.0			
Ewes					
Old age	34.7	21.8	36.6	61.2	60.8
Unproductive	2.0	7.5	10.4	12.3	3.2
Infertile		2.0	2.2	3.7	1.6
No milk		4.1	4.5	0.4	
Sick	1.0	10.9	6.0	0.7	10.4
Feed shortage	16.3	41.5	32.8	14.6	12.4
Drought	1.0	0.7			
Cash need	44.9	8.2	7.5	7.1	11.6
Inadequate breed		3.4			

Feed shortage is the most frequently cited reason for culling of cattle, and old age dominates the reasons given for sheep.

5.3.2.4 Livestock herd management and sales policy

Table 23 Livestock which are sold first (percentages)					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Species					
Cattle	40.0	62.4	41.4	36.5	30.1
Sheep	7.1	2.5	17.7	30.9	19.9
Goat	2.9	4.5	3.9	24.4	10.5
Other				3.3	1.6
Not specified	50.0	30.7	37.0	4.9	37.9
Sex					
Male	75.8	41.1	20.4	7.5	18.4
Female	3.8	4.5	6.6	17.9	21.1
Not specified	20.4	54.5	72.9	74.6	60.5
Age					
Sub Adult	5.4	18.3	16.6	8.8	3.9
Adult	16.3	27.7	38.7	48.9	71.5
Not specified	78.3	54.0	44.8	42.3	24.6
Performance					
Producing	1.7	5.0	8.3	3.3	8.2
Not producing	7.5	37.1	34.3	1.3	5.9
Not specified	90.8	57.9	57.5	95.4	85.9

Table 24 Livestock which are kept under all circumstances (percentages)					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Species					
Cattle	49.8	80.8	72.7	60.3	27.0
Sheep	5.1	0.5	2.2	32.3	6.6
Goat	2.5	3.5	4.9	1.3	12.7
Other	0.4			4.2	16.6
Not specified	42.2	15.2	20.2	1.9	37.1
Sex					
Male	0.4	1.5	12.6	8.7	2.7
Female	97.5	97.5	82.0	56.5	52.9
Not specified	2.1	1.0	5.5	34.8	44.4
Age					
Sub adult	4.2		6.0	0.3	31.3
Adult	94.1	98.5	89.1	65.2	46.7
Not specified	1.7	1.5	4.9	34.5	22.0
Performance					
Producing	39.7	66.7	66.7	32.6	42.5
Not producing	0.8	0.5			
Not specified	59.5	32.8	33.3	67.4	57.5

These data appear at first sight contradictory. Cattle are listed both as animals sold first and as animals kept under all circumstances. The explanation is that cattle must frequently be sold because of feed shortages. When farmers expect to not have sufficient feed, they will sell cows and not take any chances, because of the substantial value of these animals. At the same time, they are the most valued livestock species and only sold when it is certain that they cannot be kept. On the other hand, farmers will not necessarily sell all sheep, even when feed shortages are imminent, but rather gamble that somehow small ruminants will survive anyway. Farmers are prepared to accept small ruminant losses over the winter feeding period.



photo by Pittroff

5.3.3 Markets

In this segment, data on comparative advantages of species and animal categories in the market, reasons for sale (prices, buyer behaviour), distance to market, and buyer properties are summarised.

5.3.3.1 Livestock sales – priority categories and reasons

Table 25 Sale of livestock (percentages)					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Sell calves*	33.1	75.4	39.9	35.3	60.0
Sell cattle*	27.1	70.1	43.8	31.4	58.9
Sell animals for feed	19.1	32.7	25.5	37.2	48.6
Sell animals for cash	26.3	50.2	50.0	59.0	60.1
Priority of Selling for:					
Feed purchase	45.1	90.6	64.2	72.9	61.6
Cash	54.9	9.4	35.8	27.1	38.4
* Only responses from cattle owners were considered					

5.3.3.2 Trading partners for farmers

Table 26 Livestock trading partners for farmers (percentages)					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Local trader	72.5	60.4	83.8	74.1	82.6
Regional trader	18.4	23.4	7.0	17.0	9.1
Foreign trader	0.4		4.3		
Butcher				3.4	4.9
Bazaar			1.1	0.3	
Different types	8.6	16.2	3.8	5.1	3.4

5.3.3.3 Distance to markets

Table 27 Distance to markets (hours)					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Selling animal	2.11	1.90	2.86	2.28	1.90
Selling wool	1.84	1.96	2.62	1.83	1.77
Selling milk	1.06	1.81	2.46	1.45	1.43
Buying feed	2.18	2.03	2.93	2.09	1.81

5.3.3.4 Sales decisions

Livestock producers were asked about current market experiences compared with the year before. Note that the question on prices was triangulated, asking the same question once in the animal category ('Prices Higher'), and once in the price category ('Price Increased'). There are some numerical differences in the answers, but it is obvious that all responses were optimistic and indicative of strongly improved market prospects.

Table 28 Market changes from 2001/2 to 2002/3 (percentages)					
	Agro-ecological region				
	East	Centre-East	Centre	North	West
Cattle					
Prices higher	67.4	94.7	93.5	88.3	88.1
Earned more money	27.1	42.2	28.8	77.4	55.7
Sold more animals	14.4	34.2	35.9	11.0	11.9
Price Increased	94.9	98.4	98.0	95.1	98.4
More buyers	23.0	21.8	36.5	65.0	15.1
Sheep					
Prices higher	73.1	85.1	88.0	85.3	87.8
Earned more money	49.6	31.0	22.2	76.7	61.5
Sold more animals	27.7	34.5	43.6	14.7	13.5
Price Increased	94.1	89.7	94.9	90.7	98.7
More buyers	55.4	21.5	48.6	58.2	17.9
Goats					
Prices higher	82.1	85.7	91.5	87.7	87.8
Earned more money	47.3	17.1	28.7	77.0	57.1
Sold more animals	25.0	54.3	33.0	11.1	10.2
Price Increased	96.4	85.7	92.6	91.9	98.5
More buyers	37.6	12.9	30.7	55.0	18.4

Table 29 Which category sells best? (percentages)

		Agro-ecological region				
		East	Centre-East	Centre	North	West
Cattle	Calves	39.0	14.4	19.4	37.7	77.2
	Cows	56.0	83.9	74.8	26.2	12.7
	Males	4.0	0.6	3.9	34.6	7.6
	Total (n)	100	174	155	260	197
Sheep	Lambs	23.1	0.7	2.2	3.7	10.0
	Females	33.9	60.7	59.0	21.9	38.1
	Males	18.2	10.7	3.6	26.3	1.3
	Big Size	24.0	26.4	33.1	46.7	48.5
	Total (n)	121	140	139	270	239
Goats	Lambs	19.8	1.0	0.9	1.9	38.0
	Females	48.4	81.0	66.1	60.1	34.1
	Males	26.4	1.0	0.0	10.8	0.5
	Big Size	4.4	15.0	30.4	24.7	25.0
	Total (n)	91	100	112	158	208



photo by Pittroff

5.4 WOMEN LIVESTOCK SURVEY

5.4.1 Introduction

A total of 2,899 interviews were conducted by a female enumerator team assembled and trained by the FAO Mission and the Ministry of Agriculture and Livestock. Interviews were conducted in March and April of 2003. The interviewed females from the rural households identified themselves mostly as 'Housewife' and 'Mother', but also as 'Head of Household', 'Mother in law', or 'Daughter in law'. A group of enumerators operated in each of the provinces visited. Enumerators did not work in more than one province; however, they worked in several districts within their province. Some problems with data quality assurance have to be suspected for a subsection of the survey in Kandahar province. Data from Kandahar province substantially diverging from national averages should be treated with caution.

The survey comprises three sections: livestock statistics, information on division of labour in the family and decision making, and inquiries into problems, possible improvements and perceived constraints to the improvement of the livestock production enterprise of the respondents. The surveyed population includes mostly married women and, in a much smaller proportion, female heads of household. The majority of respondents were the decision making female members of the household and a smaller number those with less authority (daughters in law, daughters). The information about decision making and work responsibilities was considered to be of highest importance. There is currently no reliable information available how work and decision making is divided between men, women and children. The data reported here are unique and of great relevance for developing interventions specifically designed to address gender issues in Afghanistan.

It was important to obtain a picture of the wealth distribution for women's livestock resources. Accordingly, after determination of true zero responses, the complete data set was filtered to eliminate all respondents that did not have any animals of the species for which the following statistics are computed. That is, the following data do not represent global averages, but describe stock distribution for those respondents that did indeed own stock of the species in question. However, global averages including zero stock respondents from this survey are used elsewhere in the analysis of the Afghan Livestock Census data.

The absolute numbers and proportion of interviewed female farmers owning stock was summarised for all livestock species.



photo by Pittroff

Table 30 Family size in the women livestock survey			
Province	District	Average	STD
Nangarhar	Bati Kot	11.92	6.44
	Bihsud	11.06	5.49
	Shewa	9.61	3.95
	All	10.90	5.49
Kabul	Bagrami	10.51	4.69
	Musayi	10.66	4.40
	Paghman	9.83	4.85
	All	10.35	4.66
Logar	Puli Alam	11.86	8.14
Parwan	Chaharikar	8.36	3.17
	Tutum Dara*	8.58	3.53
	All	8.46	3.35
Badakhshan	Argo	8.30	2.94
	Baharak	8.28	2.52
	All	8.29	2.73
Balkh	Chimtal	8.16	3.71
	Dihdadi	9.04	3.45
	Nahri Shahi	9.25	5.13
	All	8.61	3.99
Kandahar	Arghandab	12.68	5.09
	Daman	13.35	4.43
	Dand	12.60	4.58
	Panjwayi	13.91	5.40
	Zhiray**	13.63	4.28
	All	13.33	4.89
Overall Average		10.18	5.00

* Tutum Dara is part of the Chaharikar district

** Zhiray is part of the Panjwayi district

Table 31 Distribution of respondents in the women livestock survey by family status		
Household Position	Number	Percentage
Housewife	1735	59.85
Mother	422	14.56
Mother in Law	172	5.93
Grandmother	12	0.41
Head of family	186	6.42
Widow	1	0.03
Daughter in Law	227	7.83
Daughter	117	4.04
Unknown	27	0.93
Total	2899	

In order to understand the following analyses, it is important to summarize ownership of important livestock species per province. Of the small ruminant owners, only minorities had either goats but no cattle (185, or 27 percent) or sheep but no cattle (163, or 18.9 percent). Although the difference between sheep and goat ownership for those who did not own cattle was small, goats are more frequent among those who do not own cattle. The results confirm Level 1 and Level 2 data: the most important livestock species in Afghanistan is cattle.

Table 32 Ownership of livestock species in the women livestock survey (numbers of respondents owning the species listed)							
Province	Livestock species						
	Cattle	Sheep	Goats	Poultry	Donkeys	Camel	Buffalos
Nangarhar	608	47	126	584	276		55
Kabul	403	101	62	367	244		
Logar	130	60	13	113	57	1	
Parwan	361	51	20	225	261		
Badakhshan	262	178	201	199	262	1	
Balkh	442	180	156	431	385	46	1
Kandahar	302	244	111	378	145	26	1
Total	2508	861	689	2297	1630	74	57

Information about work responsibility and decision making authority was asked separately for the three main livestock species, cattle, sheep and goats. Similar information about chicken had been earlier collected with larger number of village women and was therefore not included in the questions. Answers were only analysed for those respondents who actually owned the concerned livestock species.

5.4.2 Work Responsibilities

5.4.2.1 Cattle

Table 33 Work responsibility – feeding cattle (percentages of respondents)							
Province	No Response	Women	Men	Children	Women and Men	Women/Children	Total Respondents
Nangarhar	0.33	73.85	18.09	7.40	0.16	0.16	608
Kabul		65.51	14.89	19.60			403
Logar	1.54	49.23	16.15	33.08			130
Parwan	1.39	63.16	14.96	20.50			361
Badakhshan		53.44	41.60	4.96			262
Balkh	0.90	65.61	29.86	2.94	0.45	0.23	442
Kandahar	0.33	99.01	0.66	0.33			302
Overall Average/Total	0.56	69.14	19.46	10.65	0.12	0.08	2508

Table 34 Work responsibility – grazing cattle (percentages of respondents)							
Province	No Response	Women	Men	Children	Women and Men	Women/Children	Total Respondents
Nangarhar	58.22	4.28	10.03	27.30	0.16		608
Kabul	7.44	11.91	13.90	66.75			403
Logar	10.00	20.77	3.85	65.38			130
Parwan	1.66	16.07	13.57	68.70			361
Badakhshan		5.73	41.98	52.29			262
Balkh	1.58	24.43	45.70	27.83	0.23	0.23	442
Kandahar	0.33	1.66	21.85	76.16			302
Overall Average/Total	16.39	11.44	21.89	50.16	0.08	0.04	2508

Table 35 Work responsibility – watering cattle (percentages of respondents)							
Province	No Response	Women	Men	Children	Women and Men	Women/Children	Total Respondents
Nangarhar	0.66	75.33	14.64	9.05	0.16	0.16	608
Kabul	0.25	56.82	13.40	29.53			403
Logar	0.77	41.54	6.92	50.77			130
Parwan	1.39	60.11	12.47	26.04			361
Badakhshan		27.10	40.08	32.82			262
Balkh	0.90	65.84	29.64	3.17	0.45		442
Kandahar	0.99	88.74	5.30	4.97			302
Overall Average/Total	0.72	63.32	17.90	17.90	0.12	0.04	2508

Table 36 Work responsibility – tending young cattle (percentages of respondents)							
Province	No Response	Women	Men	Children	Women and Men	Women/Children	Total Respondents
Nangarhar	4.77	90.30	3.45	1.32	0.16		608
Kabul	2.98	95.29	0.74	0.74		0.25	403
Logar	20.00	61.54	3.08	15.38			130
Parwan	41.55	52.63	1.39	4.43			361
Badakhshan	3.82	93.13	2.67	0.38			262
Balkh	10.18	70.81	18.33	0.68			442
Kandahar	2.65	97.02	0.33				302
Overall Average/Total	11.16	81.86	4.86	2.03	0.04	0.04	2508

Table 37 Work responsibility – milking cattle (percentages of respondents)							
Province	No Response	Women	Men	Children	Women and Men	Women/Children	Total Respondents
Nangarhar	6.58	91.28	1.97		0.16		608
Kabul	5.46	94.29	0.25				403
Logar	11.54	86.92	0.77	0.77			130
Parwan	46.26	53.74					361
Badakhshan	3.44	95.42	1.15				262
Balkh	12.44	80.54	6.79		0.23		442
Kandahar	13.25	86.75					302
Overall Average/Total	13.88	84.13	1.87	0.04	0.08		2508

Table 38 Work responsibility – treating cattle (percentages of respondents)							
Province	No Response	Women	Men	Children	Women and Men	Women/Children	Total Respondents
Nangarhar	1.32	4.61	92.76	1.15	0.16		608
Kabul	0.50	11.17	86.35	1.99			403
Logar	3.08	36.92	60.00				130
Parwan	1.39	20.50	72.30	5.26	0.28	0.28	361
Badakhshan		22.90	75.95	1.15			262
Balkh	1.13	10.86	86.88	0.68	0.45		442
Kandahar	0.66	88.41	10.93				302
Overall Average/Total	1.04	22.73	74.44	1.59	0.16	0.04	2508

5.4.2.2 Sheep

Table 39 Work responsibility – feeding sheep (percentages of respondents)

Province	No Response	Women	Men	Children	Women and Men	Women/Children	Men and Children	Total Respondents
Nangarhar	6.38	57.45	19.15	14.89	2.13			47
Kabul	0.99	58.42	13.86	25.74			0.99	101
Logar		41.67	11.67	46.67				60
Parwan	9.80	64.71	13.73	11.76				51
Badakhshan		38.76	56.74	4.49				178
Balkh	8.33	38.89	48.89	3.89				180
Kandahar	0.41	94.67	1.23	2.87	0.41	0.41		244
Overall Average/Total	2.90	59.70	26.60	10.34	0.23	0.12	0.12	861

Table 40 Work responsibility – grazing sheep (percentages of respondents)

Province	No Response	Women	Men	Children	Men and Children	Total Respondents
Nangarhar	57.45		6.38	36.17		47
Kabul	6.93	15.84	17.82	59.41		101
Logar	3.33	13.33	5.00	78.33		60
Parwan	9.80	7.84	19.61	62.75		51
Badakhshan		2.81	57.30	39.89		178
Balkh	9.44	17.22	56.67	16.11	0.56	180
Kandahar	1.64	0.82	15.98	81.56		244
Overall Average/Total	7.20	7.67	32.17	52.85	0.12	861

Table 41 Work responsibility – watering sheep (percentages of respondents)

Province	No Response	Women	Men	Children	Total Respondents	
Nangarhar	6.38	59.57	14.89	19.15	47	
Kabul	0.99	49.50	13.86	35.64	101	
Logar		30.00	6.67	63.33	60	
Parwan	9.80	62.75	13.73	13.73	51	
Badakhshan		16.29	57.30	26.40	178	
Balkh	9.44	37.78	48.33	4.44	180	
Kandahar	0.41	88.52	2.46	8.61	244	
Overall AVG/Total		3.14	51.22	26.36	19.28	861

Table 42 Work responsibility – tending young sheep (percentages of respondents)

Province	No Response	Women	Men	Children	Women/Children	Total Respondents
Nangarhar	34.04	63.83	2.13			47
Kabul	21.78	75.25	0.99	0.99	0.99	101
Logar	28.33	48.33	1.67	21.67		60
Parwan	70.59	27.45	1.96			51
Badakhshan	0.56	53.37	33.71	12.36		178
Balkh	10.00	46.67	41.67	1.67		180
Kandahar	26.64	72.13	1.23			244
Overall Average/Total	20.33	58.54	16.49	4.53	0.12	861

Table 43 Work responsibility – milking sheep (percentages of respondents)

Province	No Response	Women	Men	Children	Women and Men	Total Respondents
Nangarhar	57.45	42.55				47
Kabul	20.79	78.22	0.99			101
Logar	28.33	71.67				60
Parwan	70.59	29.41				51
Badakhshan	0.56	97.19	2.25			178
Balkh	22.22	56.11	20.00	0.56	1.11	180
Kandahar	73.36	26.23	0.41			244
Overall Average/Total	37.28	57.49	4.88	0.12	0.23	861

Table 44 Work responsibility – treating sheep (percentages of respondents)

Province	No Response	Women	Men	Children	Total Respondents
Nangarhar	8.51	4.26	82.98	4.26	47
Kabul	0.99	15.84	79.21	3.96	101
Logar	3.33	33.33	63.33		60
Parwan	9.80	37.25	50.98	1.96	51
Badakhshan	0.56	21.35	77.53	0.56	178
Balkh	10.00	10.56	78.89	0.56	180
Kandahar	0.82	88.11	11.07		244
Overall Average/Total	3.83	38.21	56.91	1.05	861

5.4.2.3 Goats

Table 45 Work responsibility – feeding goats (percentages of respondents)

Province	No Response	Women	Men	Children	Women/ Children	Men and Children	Total Respondents
Nangarhar	7.94	77.78	7.14	7.14			126
Kabul	11.29	56.45	9.68	20.97		1.61	62
Logar	15.38	46.15	15.38	23.08			13
Parwan	25.00	50.00	10.00	15.00			20
Badakhshan	0.50	59.20	35.32	4.98			201
Balkh	6.41	44.23	44.23	4.49	0.64		156
Kandahar	1.80	92.79	1.80	3.60			111
Overall Average/Total	5.37	63.86	23.37	7.11	0.15	0.15	689

Table 46 Work responsibility – grazing goats (percentages of respondents)

Province	No Response	Women	Men	Children	Men and Children	Total Respondents
Nangarhar	60.32	3.97	4.76	30.16	0.79	126
Kabul	12.90	17.74	9.68	59.68		62
Logar	15.38	30.77	7.69	46.15		13
Parwan	25.00	10.00	25.00	40.00		20
Badakhshan	0.50	5.97	39.30	54.23		201
Balkh	6.41	23.72	55.13	14.74		156
Kandahar	2.70	2.70	7.21	87.39		111
Overall Average/Total	15.24	10.74	27.72	46.15	0.15	689

Table 47 Work responsibility – watering goats (percentages of respondents)

Province	No Response	Women	Men	Children	Men and Children	Total Respondents
Nangarhar	7.94	73.81	4.76	12.70	0.79	126
Kabul	11.29	58.06	9.68	20.97		62
Logar	15.38	38.46	7.69	38.46		13
Parwan	25.00	45.00	10.00	20.00		20
Badakhshan	0.50	24.38	39.30	35.82		201
Balkh	6.41	44.87	43.59	5.13		156
Kandahar	1.80	85.59	1.80	10.81		111
Overall Average/Total	5.37	51.81	23.80	18.87	0.15	689

Table 48 Work responsibility – tending young goats (percentages of respondents)					
Province	No Response	Women	Men	Children	Total Respondents
Nangarhar	20.63	76.98	0.79	1.59	126
Kabul	12.90	83.87	3.23		62
Logar	30.77	53.85	7.69	7.69	13
Parwan	60.00	40.00			20
Badakhshan	0.50	72.64	13.93	12.94	201
Balkh	10.26	50.64	37.82	1.28	156
Kandahar	9.01	88.29	1.80	0.90	111
Overall Average/Total	11.18	70.68	13.50	4.64	689

Table 49 Work responsibility – milking goats (percentages of respondents)					
Province	No Response	Women	Men	Children	Total Respondents
Nangarhar	30.95	67.46	0.79	0.79	126
Kabul	11.29	88.71			62
Logar	46.15	53.85			13
Parwan	60.00	40.00			20
Badakhshan	0.50	98.01	1.49		201
Balkh	25.00	56.41	18.59		156
Kandahar	11.71	87.39	0.90		111
Overall Average/Total	16.98	77.94	4.93	0.15	689

Table 50 Work responsibility – treating goats (percentages of respondents)							
Province	No Response	Women	Men	Children	Women and Men	Women/Children	Total Respondents
Nangarhar	10.32	1.59	85.71	2.38			126
Kabul	11.29	16.13	70.97	1.61			62
Logar	15.38	46.15	38.46				13
Parwan	25.00	15.00	60.00				20
Badakhshan	0.50	42.79	56.72				201
Balkh	7.05	16.67	74.36		1.28	0.64	156
Kandahar	1.80	90.09	8.11				111
Overall Average/Total	5.95	33.82	59.22	0.58	0.29	0.15	689

5.4.3 Decision Making

5.4.3.1 Cattle

Table 51 Decision making cattle – Purchasing animals (percentages of respondents)					
Province	No Response	Women	Men	Women and Men	Total Respondents
Nangarhar	0.16	30.26	69.57		608
Kabul	0.25	51.36	48.39		403
Logar	1.54	48.46	50.00		130
Parwan	0.55	46.81	52.63		361
Badakhshan		48.47	51.53		262
Balkh	2.04	5.88	91.86	0.23	442
Kandahar	0.66	22.52	76.82		302
Overall Average/Total	0.68	33.65	65.63	0.04	2508

Table 52 Decision making cattle – Purchasing feed (percentages of respondents)					
Province	No Response	Women	Men	Women and Men	Total Respondents
Nangarhar	0.16	24.51	75.33		608
Kabul	0.25	46.15	53.60		403
Logar	0.77	49.23	50.00		130
Parwan	0.55	46.54	52.91		361
Badakhshan		32.82	67.18		262
Balkh	2.04	5.88	91.86	0.23	442
Kandahar	0.66	15.56	83.77		302
Overall Average/Total	0.64	28.95	70.37	0.04	2508

Table 53 Decision making cattle – Selling animals (percentages of respondents)					
Province	No Response	Women	Men	Total Respondents	
Nangarhar	0.16	30.26	69.57	608	
Kabul	0.74	41.69	57.57	403	
Logar		50.00	50.00	130	
Parwan	1.11	45.71	53.19	361	
Badakhshan		72.90	27.10	262	
Balkh	2.04	5.43	92.53	442	
Kandahar	0.66	48.34	50.99	302	
Overall Average/Total	0.76	37.60	61.64	2508	

Table 54 Decision making cattle – Selling milk (percentages of respondents)					
Province	No Response	Women	Men	Women and Men	Total Respondents
Nangarhar	41.28	44.08	14.64		608
Kabul	8.68	86.10	5.21		403
Logar	66.92	30.00	3.08		130
Parwan	44.88	49.58	5.54		361
Badakhshan		98.47	1.53		262
Balkh	9.50	21.04	69.23	0.23	442
Kandahar	46.36	42.38	11.26		302
Overall Average/Total	28.59	52.31	19.06	0.04	2508

Table 55 Decision making cattle – Treating animals (percentages of respondents)						
Province	No Response	Women	Men	Children	Women and Men	Total Respondents
Nangarhar	1.64	22.86	75.16		0.33	608
Kabul	0.74	36.72	62.53			403
Logar	0.77	58.46	40.77			130
Parwan	0.55	25.21	73.96	0.28		361
Badakhshan		42.37	57.63			262
Balkh	2.26	5.88	91.86			442
Kandahar	0.99	87.42	11.59			302
Overall Average/Total	1.16	34.09	64.63	0.04	0.08	2508



photo by Reynolds

5.4.3.2 Sheep

Table 56 Decision making sheep – Purchasing animals (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	6.38	25.53	68.09	47
Kabul	0.99	51.49	47.52	101
Logar	1.67	43.33	55.00	60
Parwan	1.96	52.94	45.10	51
Badakhshan		50.56	49.44	178
Balkh	7.78	5.00	87.22	180
Kandahar	0.82	12.70	86.48	244
Overall Average/Total	2.56	28.69	68.76	861

Table 57 Decision making sheep – Purchasing feed (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	6.38	19.15	74.47	47
Kabul	0.99	53.47	45.54	101
Logar	1.67	45.00	53.33	60
Parwan	1.96	52.94	45.10	51
Badakhshan		32.58	67.42	178
Balkh	7.78	4.44	87.78	180
Kandahar	0.82	11.07	88.11	244
Overall Average/Total	2.56	24.39	73.05	861

Table 58 Decision making sheep – Selling animals (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	6.38	29.79	63.83	47
Kabul	1.98	45.54	52.48	101
Logar	3.33	40.00	56.67	60
Parwan	1.96	52.94	45.10	51
Badakhshan		65.73	34.27	178
Balkh	7.78	3.89	88.33	180
Kandahar	2.05	28.28	69.67	244
Overall Average/Total	3.14	35.31	61.56	861

Table 59 Decision making sheep – Selling milk (percentages of respondents)					
Province	No Response	Women	Men	Women and Men	Total Respondents
Nangarhar	80.85	6.38	12.77		47
Kabul	30.69	65.35	2.97	0.99	101
Logar	83.33	16.67			60
Parwan	66.67	25.49	7.84		51
Badakhshan		99.44	0.56		178
Balkh	19.44	8.33	72.22		180
Kandahar	86.48	10.25	3.28		244
Overall Average/Total	46.34	35.89	17.65	0.12	861

Table 60 Decision making sheep – Selling wool (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	74.47	2.13	23.40	47
Kabul	46.53	37.62	15.84	101
Logar	91.67	6.67	1.67	60
Parwan	41.18	25.49	33.33	51
Badakhshan		99.44	0.56	178
Balkh	7.78	7.22	85.00	180
Kandahar	70.90	19.26	9.84	244
Overall Average/Total	40.07	34.03	25.90	861

Table 61 Decision making sheep – Treating animals (percentages of respondents)					
Province	No Response	Women	Men	Women and Men	Total Respondents
Nangarhar	12.77	12.77	72.34	2.13	47
Kabul	0.99	52.48	46.53		101
Logar	3.33	51.67	45.00		60
Parwan	3.92	35.29	60.78		51
Badakhshan	0.56	37.64	61.80		178
Balkh	7.78	4.44	87.78		180
Kandahar	0.82	88.11	11.07		244
Overall Average/Total	3.25	46.23	50.41	0.12	861

5.4.3.3 Goats

Table 62 Decision making goats – Purchasing animals (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	15.87	15.87	68.25	126
Kabul	8.06	59.68	32.26	62
Logar	7.69	61.54	30.77	13
Parwan	10.00	50.00	40.00	20
Badakhshan		54.23	45.77	201
Balkh	5.77	6.41	87.82	156
Kandahar	2.70	36.04	61.26	111
Overall Average/Total	5.81	33.96	60.23	689

Table 63 Decision making goats– Purchasing feed (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	15.87	11.90	72.22	126
Kabul	8.06	56.45	35.48	62
Logar	7.69	53.85	38.46	13
Parwan	10.00	50.00	40.00	20
Badakhshan		38.31	61.69	201
Balkh	5.77	7.05	87.18	156
Kandahar	2.70	29.73	67.57	111
Overall Average/Total	5.81	27.29	66.91	689

Table 64 Decision making goats – Selling animals (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	16.67	18.25	65.08	126
Kabul	8.06	51.61	40.32	62
Logar	7.69	53.85	38.46	13
Parwan	10.00	50.00	40.00	20
Badakhshan		76.62	23.38	201
Balkh	5.77	5.77	88.46	156
Kandahar	2.70	54.95	42.34	111
Overall Average/Total	5.95	42.96	51.09	689

Table 65 Decision making goats – Selling milk (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	81.75	11.90	6.35	126
Kabul	19.35	80.65		62
Logar	92.31	7.69		13
Parwan	65.00	35.00		20
Badakhshan		99.50	0.50	201
Balkh	19.87	8.97	71.15	156
Kandahar	55.86	36.94	7.21	111
Overall Average/Total	33.82	47.61	18.58	689

Table 66 Decision making goats – Selling fibre (percentages of respondents)				
Province	No Response	Women	Men	Total Respondents
Nangarhar	88.89	5.56	5.56	126
Kabul	51.61	33.87	14.52	62
Logar	100			13
Parwan	60.00	20.00	20.00	20
Badakhshan		99.50	0.50	201
Balkh	10.26	8.33	81.41	156
Kandahar	67.57	29.73	2.70	111
Overall Average/Total	37.74	40.35	21.92	689

Table 67 Decision making goats – Treating animals (percentages of respondents)					
Province	No Response	Women	Men	Women and Men	Total Respondents
Nangarhar	17.46	8.73	73.02	0.79	126
Kabul	11.29	48.39	40.32		62
Logar	7.69	46.15	46.15		13
Parwan	15.00	30.00	55.00		20
Badakhshan		52.24	47.76		201
Balkh	5.77	5.77	88.46		156
Kandahar	3.60	89.19	7.21		111
Overall Average/Total	6.68	38.61	54.57	0.15	689

5.4.3.4 Graphical Summaries

In order to facilitate a comparative view of these findings, summary graphics were compiled.

Figure 24 Work responsibilities in cattle management

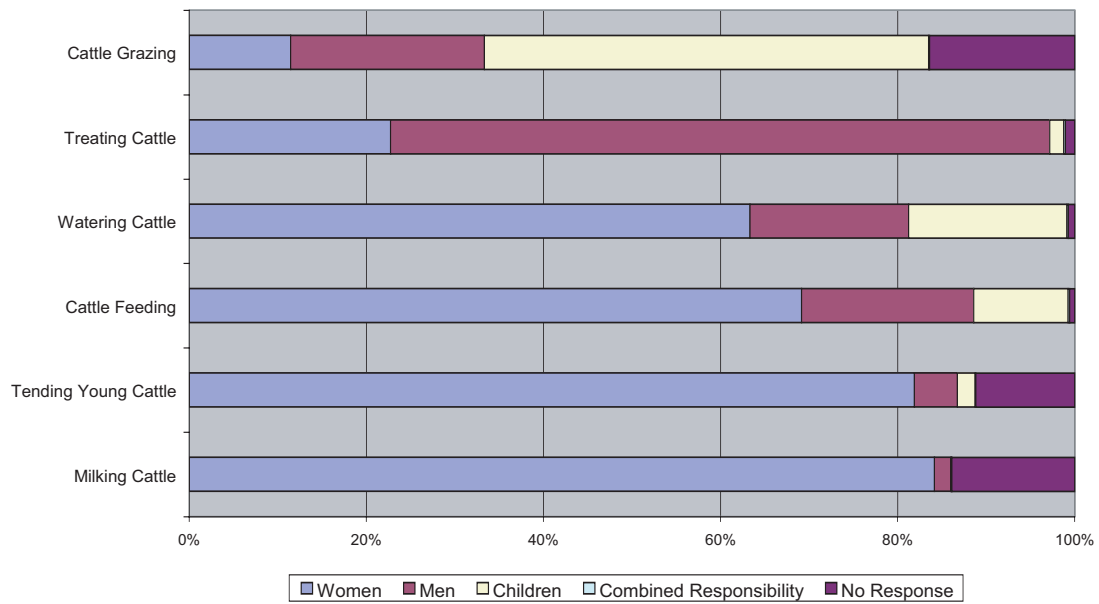


Figure 25 Work responsibilities in sheep management

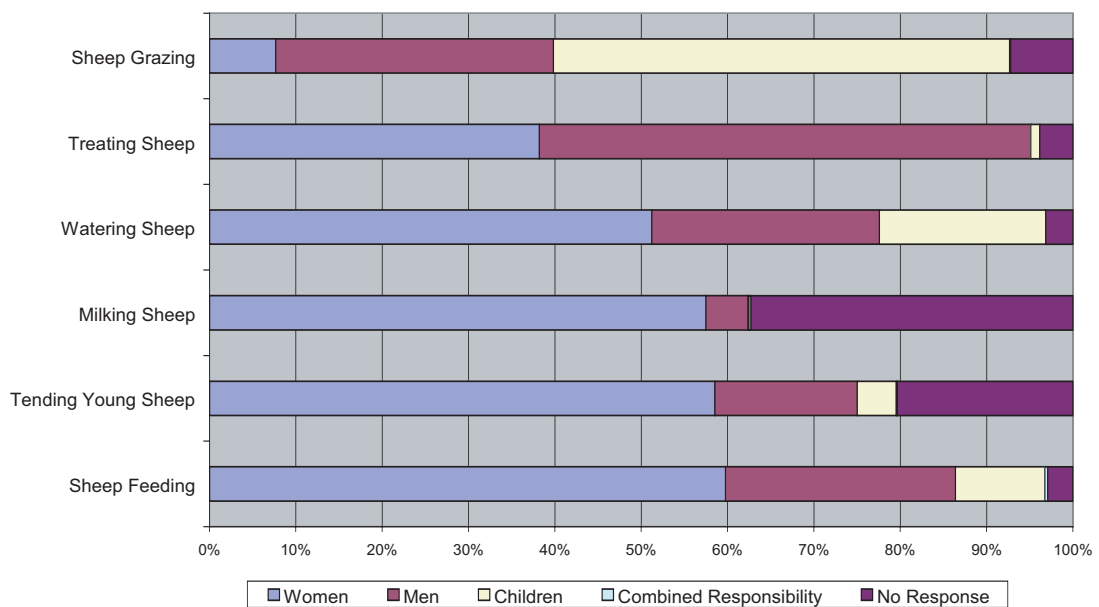


Figure 26 Work responsibilities in goat management

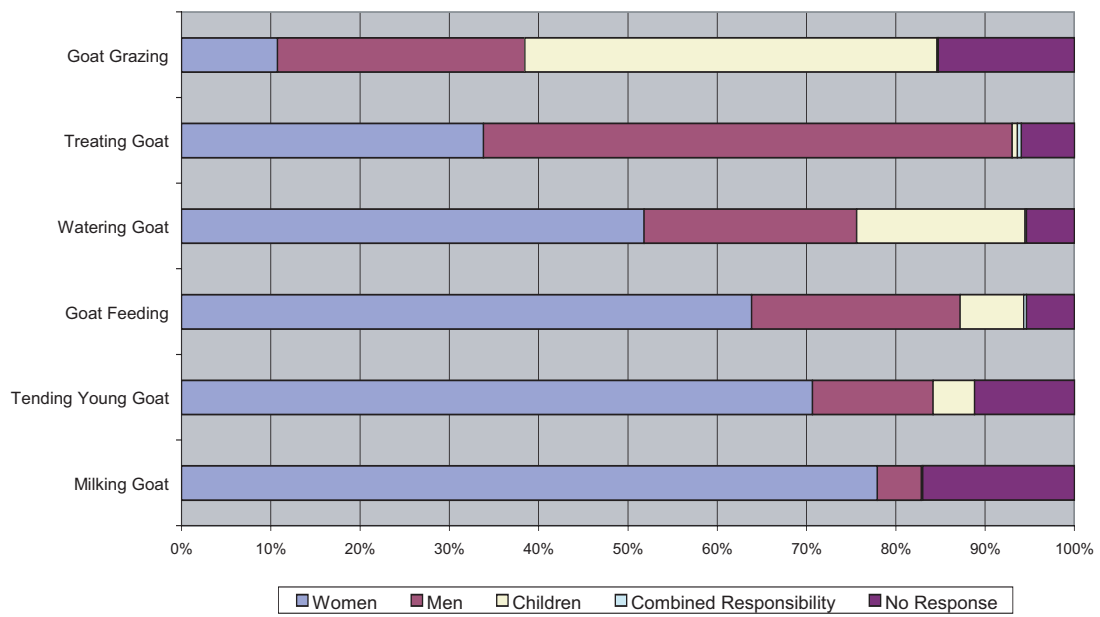


Figure 27 Decision making for cattle management

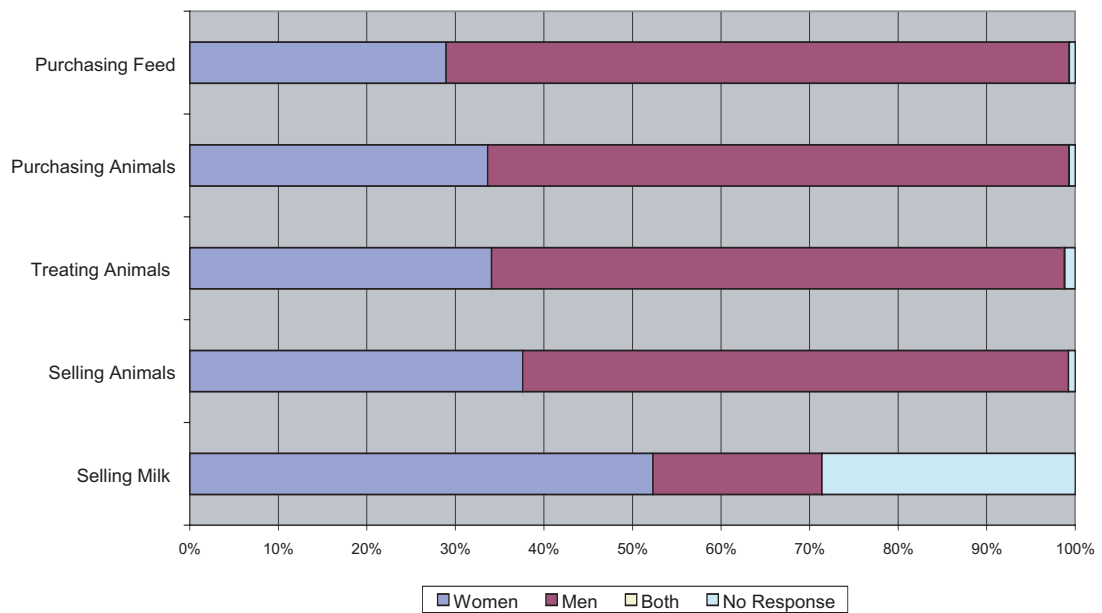


Figure 28 Decision making for sheep management

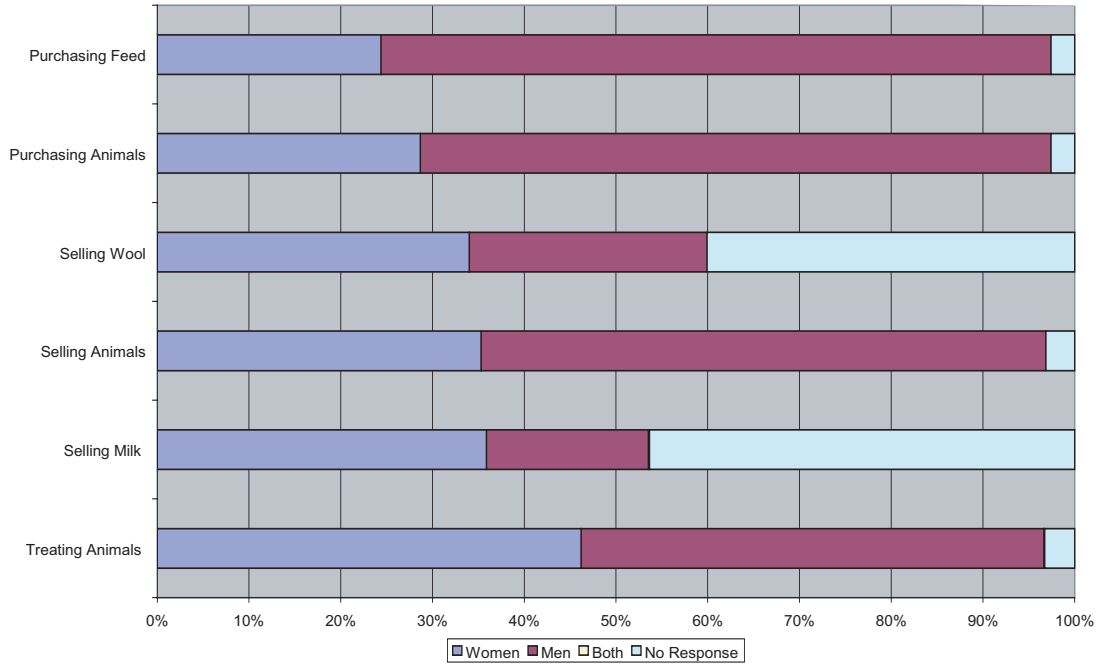
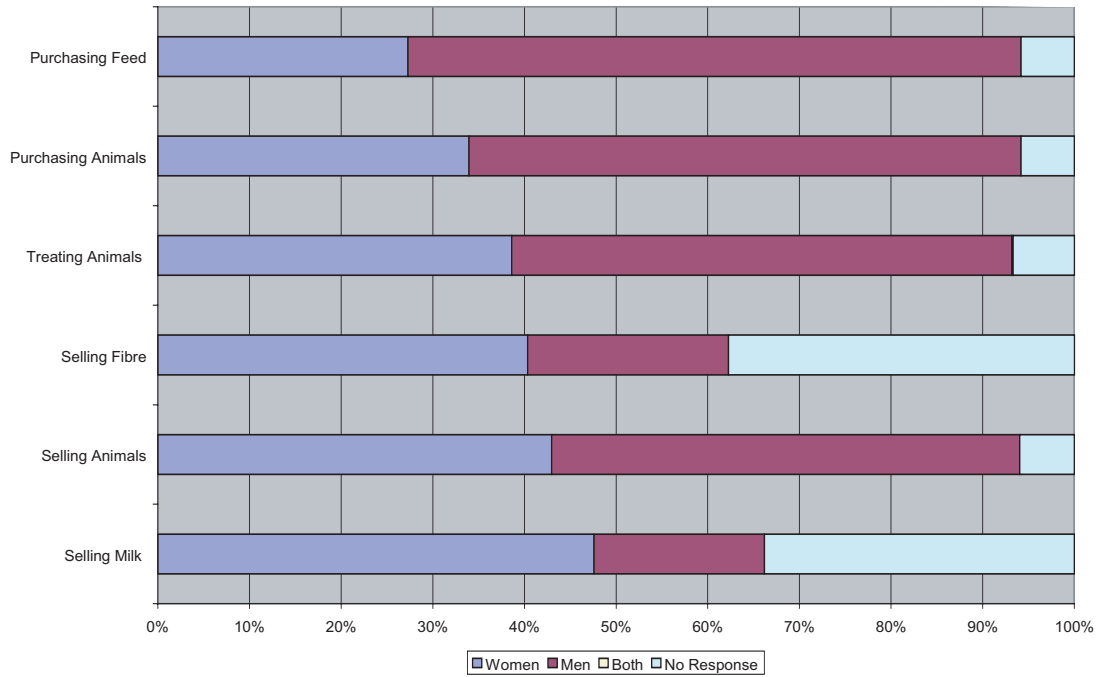


Figure 29 Decision making for goat management



5.4.4 Goals and Preferences

The Women Livestock Survey attempted to evaluate the most important problems perceived and improvements desired by the respondents. All women participating in the survey were given the option to rank specific problems and desired improvements.

In the first question of this Section the respondents were asked from which livestock species they would like to have more animals, and for what purpose of production (milk, meat, wool and work, where applicable, either for household consumption or for sale). Only one preferred species could be listed, but multiple answers for preferred uses were possible. Respondents were required to decide exclusively whether household consumption or production for sale was the most important use. In all but some cases for poultry these restrictions were successfully maintained. The answers from respondents who selected chickens as their most preferred species for herd expansion were also maintained in those cases which were ambiguous for preferred use.

5.4.4.1 Preferred livestock species for herd expansion

5.4.4.1.1 Cattle

The number of respondents who selected cattle as their preferred species for owning more animals was 1,655. Among these respondents 261 did not presently own cattle.

Table 68 Cattle preferred use: milk (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Total Respondents
Nangarhar	1.53	45.09	53.37	326
Kabul	0.75	26.42	72.83	265
Logar	3.66	74.39	21.95	82
Parwan	16.77	20.00	63.23	155
Badakhshan		99.36	0.64	157
Balkh	2.83	3.89	93.29	283
Kandahar	1.29	33.59	65.12	387
Overall Average/Total	2.96	36.62	60.42	1655

Table 69 Cattle preferred use: work/draft (percentages of respondents)

Province	No Response (No Preference)	Home Use	Rent	Total Respondents
Nangarhar	100			326
Kabul	100			265
Logar	97.56	2.44		82
Parwan	83.23	10.97	5.81	155
Badakhshan		55.41	44.59	157
Balkh	17.31	65.72	16.96	283
Kandahar	99.74		0.26	387
Overall Average/Total	74.62	17.64	7.73	1655

Table 70 Cattle preferred use: meat (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Total Respondents
Nangarhar	99.69	0.31		326
Kabul	99.62		0.38	265
Logar	93.90	1.22	4.88	82
Parwan	100			155
Badakhshan		10.83	89.17	157
Balkh	13.07	2.12	84.81	283
Kandahar	99.22		0.78	387
Overall Average/Total	75.05	1.51	23.44	1655

A clear majority of respondents selected cattle as their most preferred species for herd expansion, and of these, most opted for milk. Multiple selections of preferred use were possible; the distribution of the answers shows that milk is what the respondents need most. Further, the majority of the respondents are interested in milk for sale – this clearly illustrates the potential of market-integrated dairy production.

5.4.4.1.2 Poultry

The second most preferred animal species was poultry (chicken). Out of 775 respondents selecting chicken as their most coveted species for herd expansion, 185 actually did not own any chickens.

Table 71 Chicken preferred use: meat (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Household Consumption and Sale	Total Respondents
Nangarhar	84.82	3.63	11.55		303
Kabul	92.68	2.44	4.88		82
Logar	46.15	53.85			13
Parwan	96.45	0.71	2.84		141
Balkh	33.19	9.36	55.32	2.13	235
Kandahar			100		1
Overall AVG/Total	71.35	5.55	22.45	0.65	775

Table 72 Chicken preferred use: eggs (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Household Consumption and Sale	Total Respondents
Nangarhar	16.50	27.39	56.11		303
Kabul	14.63	31.71	53.66		82
Logar	15.38	30.77	53.85		13
Parwan	13.48	5.67	80.85		141
Balkh	11.06	6.81	81.70	0.43	235
Kandahar	100				1
Overall AVG/Total	14.19	17.68	68.00	0.13	775

The vast majority of the women chose market-oriented egg production as the goal for chicken flock expansion.

5.4.4.1.3 Sheep

Approximately 14.4 percent of all respondents (417) selected sheep as their preferred species for expansion of livestock production. Of these, 244 actually did not own sheep at the time of the interviews, but all respondents selecting sheep as the species preferred for herd expansion owned cattle. This observation again demonstrates that sheep ownership in Afghanistan seems to be concentrated among wealthier farmers.

Table 73 Sheep preferred use: milk (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Total Respondents
Nangarhar	100			4
Kabul	77.42	8.60	13.98	93
Logar	84.09	15.91		44
Parwan	69.70	9.09	21.21	66
Balkh	27.27	3.03	69.70	66
Badakhshan		99.13	0.87	115
Kandahar	86.21	6.90	6.90	29
Overall Average/Total	48.44	33.33	18.23	417

Table 74 Sheep preferred use: meat (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Total Respondents
Nangarhar		75.00	25.00	4
Kabul	30.11	53.76	16.13	93
Logar	13.64	77.27	9.09	44
Parwan	46.97	51.52	1.52	66
Badakhshan		13.04	86.96	115
Balkh	7.58	7.58	84.85	66
Kandahar	20.69		79.31	29
Overall Average/Total	18.23	33.81	47.96	417

Table 75 Sheep preferred use: wool (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Total Respondents
Nangarhar	100			4
Kabul	97.85	2.15		93
Logar	100			44
Parwan	96.97	3.03		66
Badakhshan	0.87	79.13	20.00	115
Balkh	28.79	13.64	57.58	66
Kandahar	100			29
Overall Average/Total	60.43	24.94	14.63	417

The majority of respondents are interested in an expansion of sheep husbandry because of market-oriented meat production. Wool and milk production from sheep was much less important to the respondents.

5.4.4.1.4 Goats

Table 76 Goats preferred use: milk (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Total Respondents
Nangarhar	40.00	40.00	20.00	5
Kabul		87.50	12.50	8
Parwan		100		1
Badakhshan		100		13
Balkh			100	3
Kandahar		66.67	33.33	3
Overall Average/Total	6.06	75.76	18.18	33

Table 77 Goats preferred use: meat (percentages of respondents)

Province	No Response (No Preference)	Sale	Total Respondents
Nangarhar	100		5
Kabul	87.50	12.50	8
Parwan	100		1
Badakhshan		100	13
Balkh	33.33	66.67	3
Kandahar	100		3
Overall Average/Total	51.52	48.48	33

Table 78 Goats preferred use: fibre (percentages of respondents)

Province	No Response (No Preference)	Household Consumption	Sale	Total Respondents
Nangarhar	100			5
Kabul	87.50		12.50	8
Parwan	100			1
Badakhshan		92.31	7.69	13
Balkh	33.33	33.33	33.33	3
Kandahar	100			3
Overall Average/Total	51.52	39.39	9.09	33

Goats are clearly not a species considered especially desirable by female Afghan livestock producers. Those that opted for goats were mostly interested in milk production. Given that milk is so important in Afghanistan, it would be interesting to find out more about the fact that the potentially most efficient dairy animal receives so little attention by livestock owners. One possible reason could be that there are no productive dairy goats present in the country. A pilot project for extensive dairy goat production might be a worthwhile consideration.

5.4.4.1.5 Summary of Goals and Preferences:

The key aspects of the preceding section are summarised graphically. Since the clear emphasis in the answers was on cattle and poultry production, results were graphed for only these subsectors.

Figure 30 Preferred Livestock Species

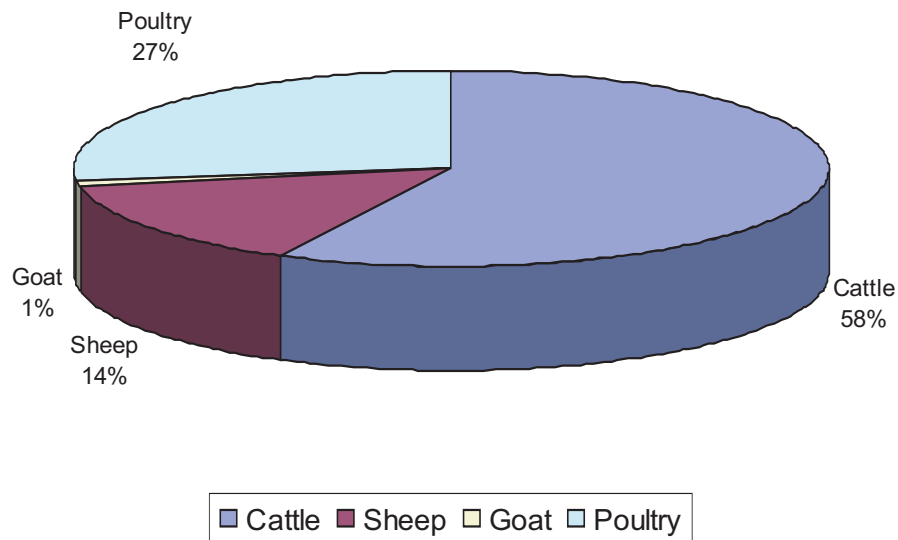


Figure 31 Priorities for cattle production

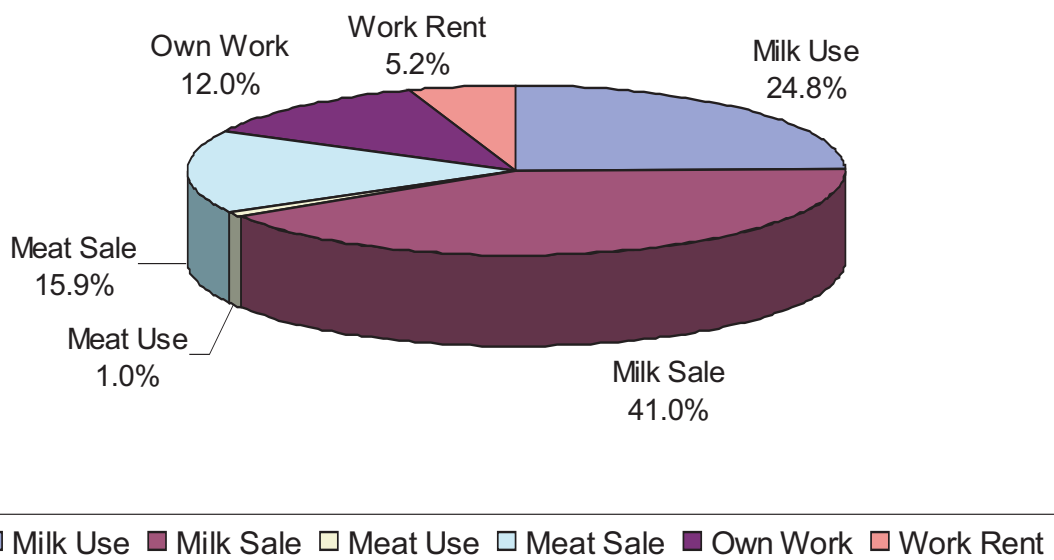
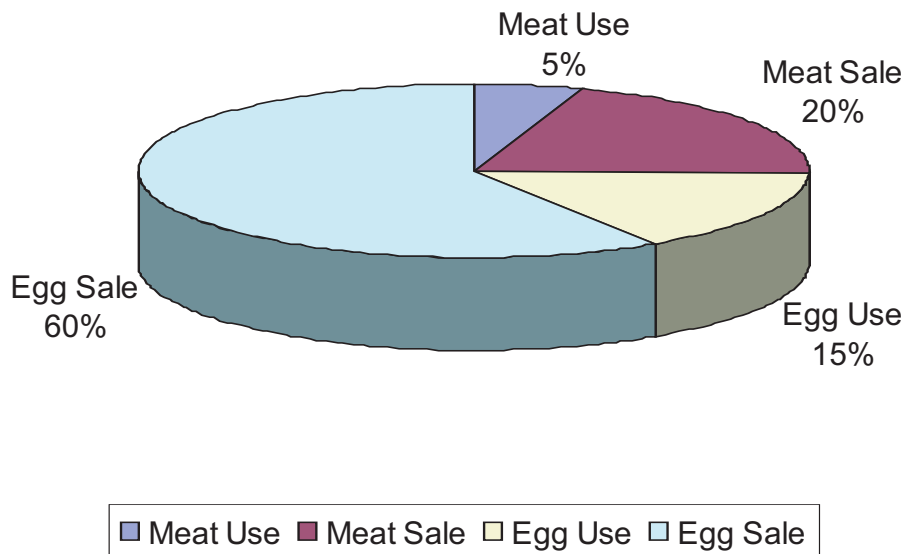


Figure 32 Priorities for poultry production



It is very obvious that cattle are the preferred species, and that milk production for sale is the most important priority for livestock development for Afghan women livestock producers. The second most important priority is poultry development, again with the aim to earn money by selling products on the market.



photo by Thieme

5.4.5 Problems and Improvements

The survey collected considerable amounts of information on problems and opportunities perceived by female livestock owners. All women participating in the survey were given the option to rank specific problems and desired improvements. It was considered to be necessary to summarise these data in both graphical and tabular form. Summary tables in this section do not contain data on district level. These can be found in Annex 8.4.

5.4.5.1 Problems identified for cattle production

Table 79 Problems cattle production - Not enough feed (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	77.12	13.48	3.76	5.64	319
Kabul	49.54	18.58	20.43	11.46	323
Logar	50.94	8.49	8.49	32.08	106
Parwan	28.10	18.57	9.52	43.81	210
Badakhshan	62.96	32.10	1.85	3.09	162
Balkh	68.86	11.40	6.36	13.38	456
Kandahar	98.77	0.62		0.62	324
Overall Average/Total	66.05	13.53	7.32	13.11	1900

Table 80 Problems cattle production - Animal disease (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	12.54	54.55	25.71	7.21	319
Kabul	24.15	54.18	14.86	6.81	323
Logar	11.32	45.28	16.98	26.42	106
Parwan	64.29	28.10	4.29	3.33	210
Badakhshan	32.72	62.35	4.32	0.62	162
Balkh	20.39	38.16	28.51	12.94	456
Kandahar	0.31	63.89	33.33	2.47	324
Overall Average/Total	21.68	49.37	21.16	7.79	1900

Table 81 Problems cattle production - Too far to the market (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan	0.62	1.23	42.59	55.56	162
Balkh	1.54	23.90	29.82	44.74	456
Kabul		1.55	3.10	95.36	323
Kandahar	0.31	0.93	7.10	91.67	324
Logar	5.66	14.15	12.26	67.92	106
Nangarhar	1.88	21.63	25.08	51.41	319
Parwan	0.95	38.57	30.95	29.52	210
Overall Average/Total	1.21	14.95	20.84	63.00	1900

**Table 82 Problems cattle production - Not enough buyers
(percentages of respondents)**

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	1.25	5.96	8.78	84.01	319
Kabul	0.31	2.79	3.41	93.50	323
Logar	1.89	3.77	14.15	80.19	106
Parwan	1.43	5.71	10.48	82.38	210
Badakhshan	0.62	0.62	1.85	96.91	162
Balkh	0.22	14.04	11.40	74.34	456
Kandahar		0.31	0.31	99.38	324
Overall Average/Total	0.63	5.79	6.95	86.63	1900

**Table 83 Problems cattle production - Too much work
(percentages of respondents)**

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	6.90	3.45	18.50	71.16	319
Kabul	8.05	4.64	11.76	75.54	323
Logar	12.26	4.72	6.60	76.42	106
Parwan	2.86	2.38	6.67	88.10	210
Badakhshan	2.47		6.17	91.36	162
Balkh	9.21	1.32	0.88	88.60	456
Kandahar	0.62	0.93	5.25	93.21	324
Overall Average/Total	6.05	2.37	7.84	83.74	1900

**Table 84 Problems cattle production - Cost of labor
(percentages of respondents)**

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar		0.63	1.57	97.81	319
Kabul	3.10	13.00	30.34	53.56	323
Logar	17.92	23.58	33.02	25.47	106
Parwan	0.95	3.33	9.52	86.19	210
Badakhshan	0.62	3.70	43.21	52.47	162
Balkh	0.44	0.22	0.88	98.46	456
Kandahar		0.62	4.01	95.37	324
Overall Average/Total	1.79	4.47	12.89	80.84	1900

5.4.5.2 Desired Improvements in Cattle production

Table 85 Desired improvements cattle production - Better feeding (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	66.47	6.04	13.90	13.60	331
Kabul	63.61	21.41	7.65	7.34	327
Logar	70.00	7.27	3.64	19.09	110
Parwan	27.01	11.37	9.95	51.66	211
Badakhshan	62.73	29.81	2.48	4.97	161
Balkh	77.32	15.33	3.89	3.46	463
Kandahar	99.38	0.62			321
Overall Average/Total	69.65	12.63	6.13	11.59	1924

Table 86 Desired improvements cattle production - Better health care (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	6.34	58.91	8.46	26.28	331
Kabul	16.21	40.67	23.24	19.88	327
Logar	12.73	22.73	17.27	47.27	110
Parwan	11.85	29.38	29.38	29.38	211
Badakhshan	35.40	58.39	4.97	1.24	161
Balkh	10.58	77.32	7.13	4.97	463
Kandahar	0.31	61.68	36.14	1.87	321
Overall Average/Total	11.43	55.35	17.78	15.44	1924

Table 87 Desired improvements cattle production - Better water access (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	0.91	1.21	0.60	97.28	331
Kabul	8.87	22.32	14.07	54.74	327
Logar	2.73	7.27	1.82	88.18	110
Parwan	2.84	4.74	4.27	88.15	211
Badakhshan		0.62	8.07	91.30	161
Balkh	7.99	1.94	29.16	60.91	463
Kandahar	0.31	1.87	4.98	92.83	321
Overall Average/Total	4.11	5.77	11.59	78.53	1924

Table 88 Desired improvements cattle production - Easier market access (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	1.81	3.63	7.25	87.31	331
Kabul		1.22	3.98	94.80	327
Logar	0.91	18.18	13.64	67.27	110
Parwan	2.37	11.85	15.17	70.62	211
Badakhshan		1.86	19.88	78.26	161
Balkh	1.94	2.16	31.10	64.79	463
Kandahar		0.31	1.56	98.13	321
Overall Average/Total	1.09	3.90	13.77	81.24	1924

Table 89 Desired improvements cattle production - Better knowledge about animal husbandry (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	9.67	18.43	27.49	44.41	331
Kabul	2.45	9.17	33.03	55.35	327
Logar	1.82	27.27	19.09	51.82	110
Parwan	20.38	27.01	17.06	35.55	211
Badakhshan		4.97	12.42	82.61	161
Balkh	0.22	1.94	14.25	83.59	463
Kandahar		35.51	54.52	9.97	321
Overall Average/Total	4.47	16.06	26.87	52.60	1924

Table 90 Desired improvements cattle production - Access to credit (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	14.80	11.18	40.48	33.53	331
Kabul	8.56	4.89	14.68	71.87	327
Logar	10.91	15.45	43.64	30.00	110
Parwan	33.18	15.17	23.22	28.44	211
Badakhshan	1.24	3.73	52.17	42.86	161
Balkh	1.51	1.30	11.45	85.75	463
Kandahar			2.49	97.51	321
Overall Average/Total	8.73	5.93	22.04	63.31	1924

5.4.5.3 Problems identified for sheep production

Table 91 Problems sheep production - Not enough feed (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	50.00			50.00	2
Kabul	75.00	13.89	2.78	8.33	36
Logar	60.00	10.00	5.00	25.00	20
Parwan	50.00	8.33	16.67	25.00	12
Badakhshan	73.45	20.35	2.65	3.54	113
Balkh	55.36	14.29	7.14	23.21	112
Kandahar	96.30	3.70			108
Overall Average/Total	73.20	12.66	3.72	10.42	403

Table 92 Problems sheep production - Animal disease (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	50.00	50.00			2
Kabul	8.33	63.89	22.22	5.56	36
Logar	15.00	50.00	5.00	30.00	20
Parwan	25.00	33.33	16.67	25.00	
Badakhshan	23.89	72.57	3.54		113
Balkh	26.79	27.68	29.46	16.07	112
Kandahar	1.85	71.30	21.30	5.56	108
Overall Average/Total	17.12	56.58	17.62	8.68	403

Table 93 Problems sheep production - Too far to market (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar				100	2
Kabul	5.56	2.78	5.56	86.11	36
Logar	5.00	15.00	15.00	65.00	20
Parwan		25.00	41.67	33.33	12
Badakhshan		0.88	14.16	84.96	113
Balkh		25.00	17.86	57.14	112
Kandahar			12.04	87.96	108
Overall Average/Total	0.74	8.93	14.64	75.68	403

**Table 94 Problems sheep production - Not enough buyers
(percentages of respondents)**

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar				50.00	2
Kabul		2.78	11.11	86.11	36
Logar			15.00	85.00	20
Parwan		16.67		83.33	12
Badakhshan		2.65	4.42	92.92	113
Balkh	0.89	8.93	8.93	81.25	112
Kandahar				100	108
Overall Average/Total	0.25	3.97	5.71	90.07	403

**Table 95 Problems sheep production - Too much work
(percentages of respondents)**

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar				100	2
Kabul	5.56	2.78	11.11	80.56	36
Logar	10.00	10.00	10.00	70.00	20
Parwan	8.33	16.67		75.00	12
Badakhshan	2.65	1.77	18.58	76.99	113
Balkh	16.07	2.68	1.79	79.46	112
Kandahar	1.85	2.78	13.89	81.48	108
Overall Average/Total	6.95	3.23	10.92	78.91	403

**Table 96 Problems sheep production - Cost of labor
(percentages of respondents)**

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar				100	2
Kabul		8.33	19.44	72.22	36
Logar	10.00	15.00	45.00	30.00	20
Parwan	8.33		25.00	66.67	12
Badakhshan		1.77	56.64	41.59	113
Balkh	0.89	2.68	3.57	92.86	112
Kandahar			9.26	90.74	108
Overall Average/Total	0.99	2.73	24.07	72.21	403

5.4.5.4 Desired improvements for sheep production

Table 97 Desired improvements sheep production - Better feeding (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	50.00			50.00	2
Kabul	88.24	5.88	2.94	2.94	34
Logar	60.00	10.00		30.00	20
Parwan	60.00	10.00	10.00	20.00	10
Badakhshan	76.11	20.35	1.77	1.77	113
Balkh	77.97	12.71	4.24	5.08	118
Kandahar	98.10	1.90			105
Overall Average/Total	82.09	11.19	2.24	4.48	402

Table 98 Desired improvements sheep production - Better health care (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar	50.00	50.00			2
Kabul	2.94	55.88	11.76	29.41	34
Logar	30.00	30.00	10.00	30.00	20
Parwan	10.00	20.00	20.00	50.00	
Badakhshan	23.89	71.68	3.54	0.88	113
Balkh	11.02	75.42	7.63	5.93	118
Kandahar	1.90	71.43	24.76	1.90	105
Overall Average/Total	12.69	67.91	11.69	7.71	402

Table 99 Desired improvements sheep production - Better water access (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar				100	2
Kabul		14.71	14.71	70.59	34
Logar	5.00	20.00		75.00	20
Parwan				100	10
Badakhshan		2.65	30.09	67.26	113
Balkh	4.24	2.54	33.05	60.17	118
Kandahar		0.95	11.43	87.62	105
Overall Average/Total	1.49	3.98	22.39	72.14	402

Table 100 Desired improvements sheep production - Easier market access (percentages of respondents)

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar		50.00		50.00	2
Kabul	2.94		11.76	85.29	34
Logar		15.00	20.00	65.00	20
Parwan		10.00	30.00	60.00	10
Badakhshan			7.08	92.92	113
Balkh	3.39	3.39	22.03	71.19	118
Kandahar			2.86	97.14	105
Overall Average/Total	1.24	2.24	11.94	84.58	402

Table 101 Desired improvements sheep production - Better knowledge about animal husbandry (percentages of respondents)

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar			100		2
Kabul		11.76	32.35	55.88	34
Logar		20.00	20.00	60.00	20
Parwan		50.00	10.00	40.00	10
Badakhshan		1.77	12.39	85.84	113
Balkh	0.85	4.24	21.19	73.73	118
Kandahar		24.76	56.19	19.05	105
Overall Average/Total	0.25	11.44	28.86	59.45	402

Table 102 Desired improvements sheep production - Access to credit (percentages of respondents)

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Nangarhar				100	2
Kabul	5.88	8.82	23.53	61.76	34
Logar	5.00	10.00	40.00	45.00	20
Parwan	30.00	10.00	30.00	30.00	10
Badakhshan		3.54	45.13	51.33	113
Balkh	2.54	1.69	9.32	86.44	118
Kandahar		0.95	4.76	94.29	105
Overall Average/Total	2.24	3.23	21.39	73.13	402

5.4.5.5 Problem identified for goat production

Table 103 Problems goat production - Not enough feed (percentages of respondents)

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan	54.55	36.36		9.09	11
Balkh	40.28	22.22	4.17	33.33	72
Kabul	16.67	50.00	33.33		6
Kandahar	58.33	33.33		8.33	12
Nangarhar	50.00	50.00			2
Parwan			100		2
Overall Average/Total	41.90	26.67	6.67	24.76	105

Table 104 Problems goat production - Animal disease (percentages of respondents)

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan	45.45	54.55			11
Balkh	34.72	23.61	23.61	18.06	72
Kabul	50.00	33.33	16.67		6
Kandahar		41.67	50.00	8.33	12
Nangarhar	50.00		50.00		2
Parwan	100				2
Overall Average/Total	34.29	28.57	23.81	13.33	105

Table 105 Problems goat production - Too far to the market (percentages of respondents)

Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan		27.27	72.73	11	
Balkh	18.06	18.06	63.89	72	18.06
Kabul			100	6	
Kandahar			100	12	
Nangarhar	50.00		50.00	2	50.00
Parwan	100			2	100
Overall Average/Total	15.24	15.24	69.52	105	15.24

Table 106 Problems goat production - Not enough buyers (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan				100	11
Balkh	1.39	2.78	1.39	94.44	72
Kabul				100	6
Kandahar		8.33	8.33	83.33	12
Nangarhar				100	2
Parwan				100	2
Overall Average/Total	0.95	2.86	1.90	94.29	105

Table 107 Problems goat production - Too much work (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan			9.09	90.9	11
Balkh	22.22	2.78		75.0	72
Kabul			33.33	66.7	6
Kandahar	41.67		25.00	33.3	12
Nangarhar				100	2
Parwan				100	2
Overall Average/Total	20.00	1.90	5.71	72.4	105

Table 108 Problems goat production - Cost of labor (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan		9.09	63.64	27.27	11
Balkh	1.39	4.17	11.11	83.33	72
Kabul			16.67	83.33	6
Kandahar			16.67	83.33	12
Nangarhar				100	2
Parwan				100	2
Overall Average/Total	0.95	3.81	17.14	78.10	105

5.4.5.6 Desired improvements for goat production

Table 109 Desired improvements goat production - Better feeding (percentages of respondents)						
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents	
Badakhshan	63.64	36.36				11
Balkh	76.74	9.30	8.14	5.8		86
Kabul	80.00	20.00				5
Kandahar	100					4
Nangarhar	100					2
Parwan				100		2
Overall Average/Total	75.45	11.82	6.36	6.4		110

Table 110 Desired improvements goat production - Better health care (percentages of respondents)						
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents	
Badakhshan	36.36	63.64				11
Balkh	11.63	72.09	6.98	9.3		86
Kabul		20.00	40.00	40.0		5
Kandahar		50.00	50.00			4
Nangarhar		100				2
Parwan			100			2
Overall Average/Total	12.73	67.27	10.91	9.1		110

Table 111 Desired improvements goat production - Better water access (percentages of respondents)						
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents	
Badakhshan			18.18	81.8		11
Balkh	5.81	2.33	36.05	55.8		86
Kabul		20.00	20.00	60.0		5
Kandahar				100		4
Nangarhar				100		2
Parwan				100		2
Overall Average/Total	4.55	2.73	30.91	61.8		110

Table 112 Desired improvements goat production - Easier market access (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan			27.27	72.7	11
Balkh	2.33	6.98	17.44	73.3	86
Kabul				100	5
Kandahar				100	4
Nangarhar			50.00	50.0	2
Parwan				100	2
Overall Average/Total	1.82	5.45	17.27	75.5	110

Table 113 Desired improvements goat production - Knowledge about animal husbandry (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan			18.18	81.8	11
Balkh	2.33	4.65	22.09	70.9	86
Kabul		20.00	20.00	60.0	5
Kandahar		50.00	25.00	25.0	4
Nangarhar				100	2
Parwan		100			2
Overall Average/Total	1.82	8.18	20.91	69.1	110

Table 114 Desired improvements goat production - Access to credit (percentages of respondents)					
Province	Most important	Second most important	Third most important	Not Mentioned	Total Respondents
Badakhshan			36.36	63.6	11
Balkh	1.16	1.16	3.49	94.2	86
Kabul		20.00	20.00	60.0	5
Kandahar			25.00	75.0	4
Nangarhar			50.00	50.0	2
Parwan	100				2
Overall Average/Total	2.73	1.82	9.09	86.4	110

5.4.5.7 Summary

The following graphs summarise the preceding sections.

Figure 33 Problems of cattle production

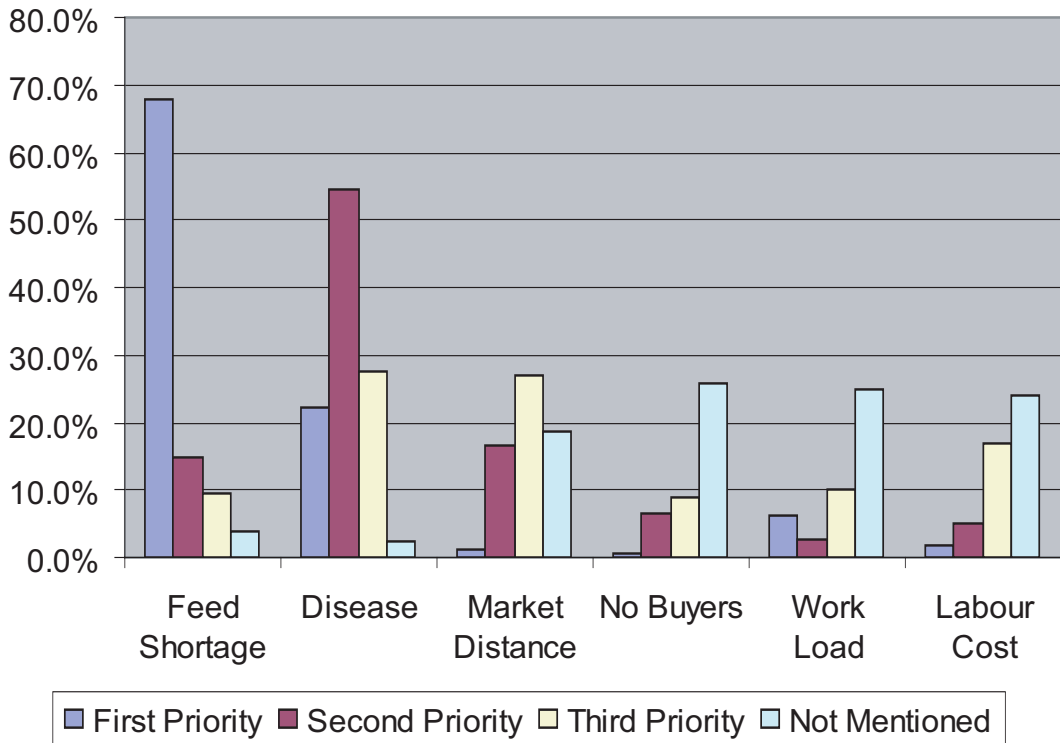


Figure 34 Priorities for improvement of cattle production

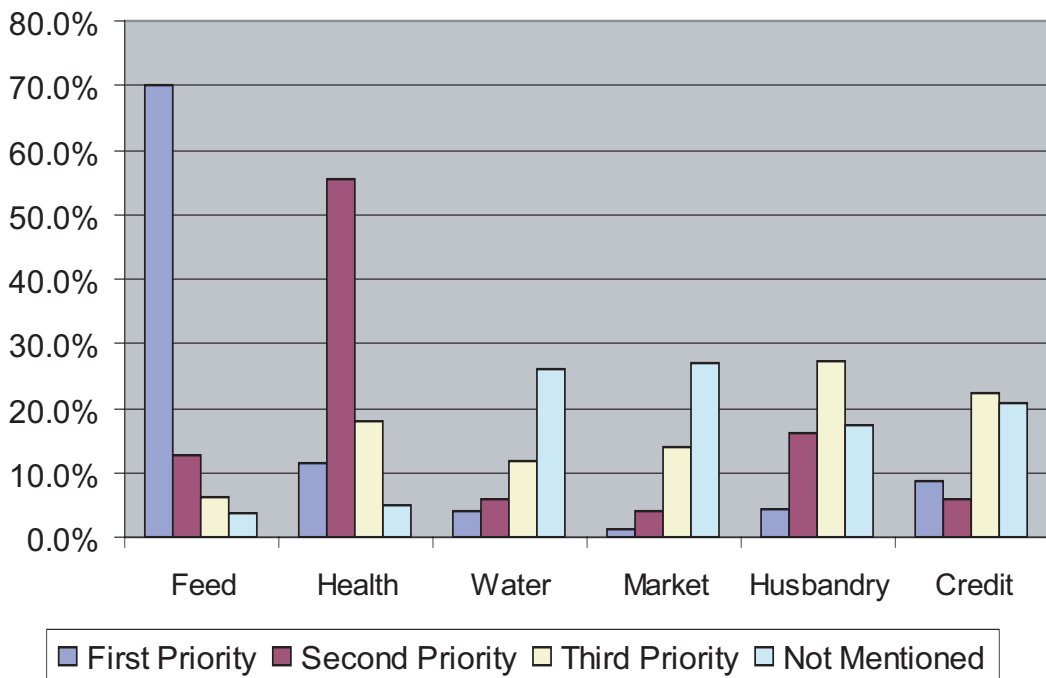


Figure 35 Problems of sheep production

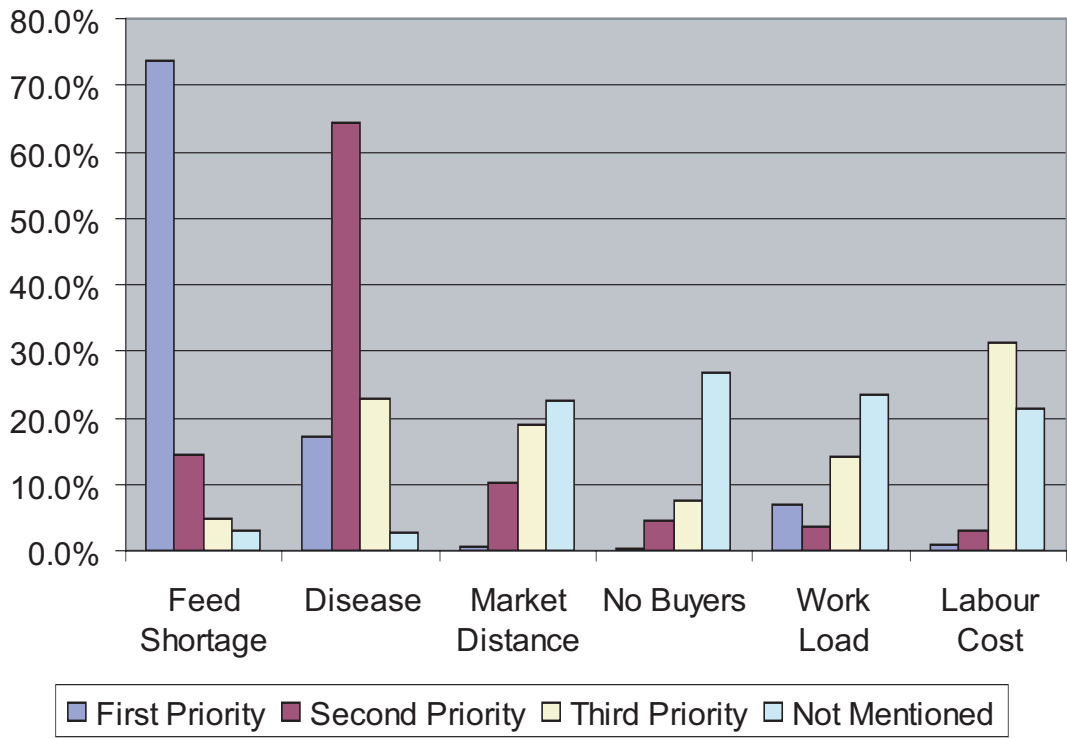


Figure 36 Priorities for improvement of sheep production

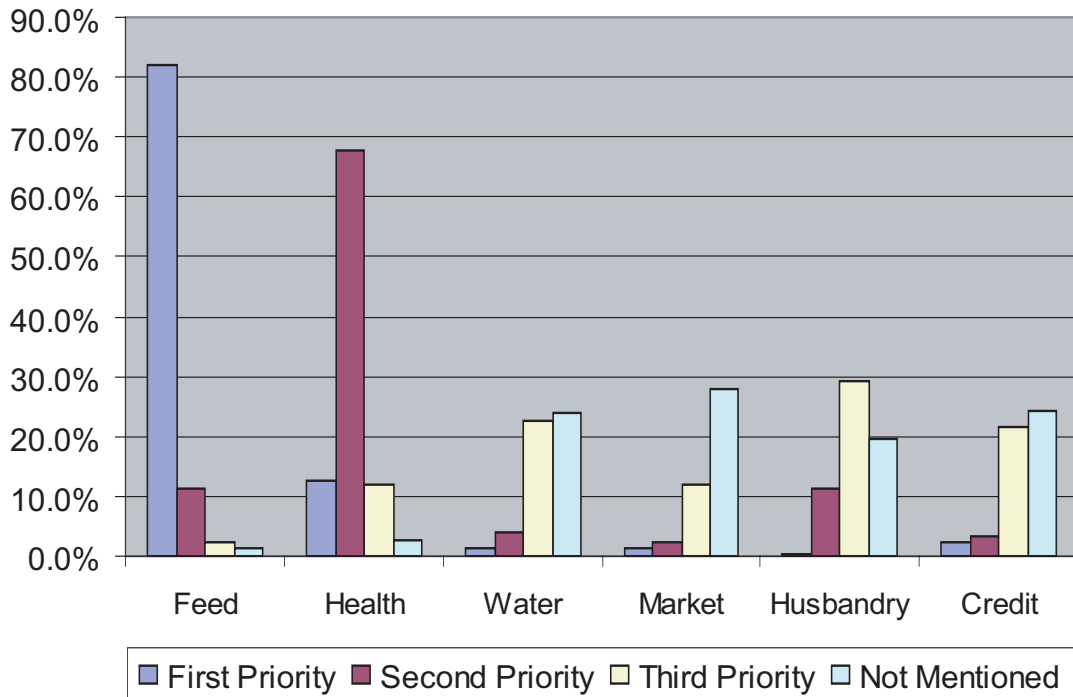


Figure 37 Problems of goat production

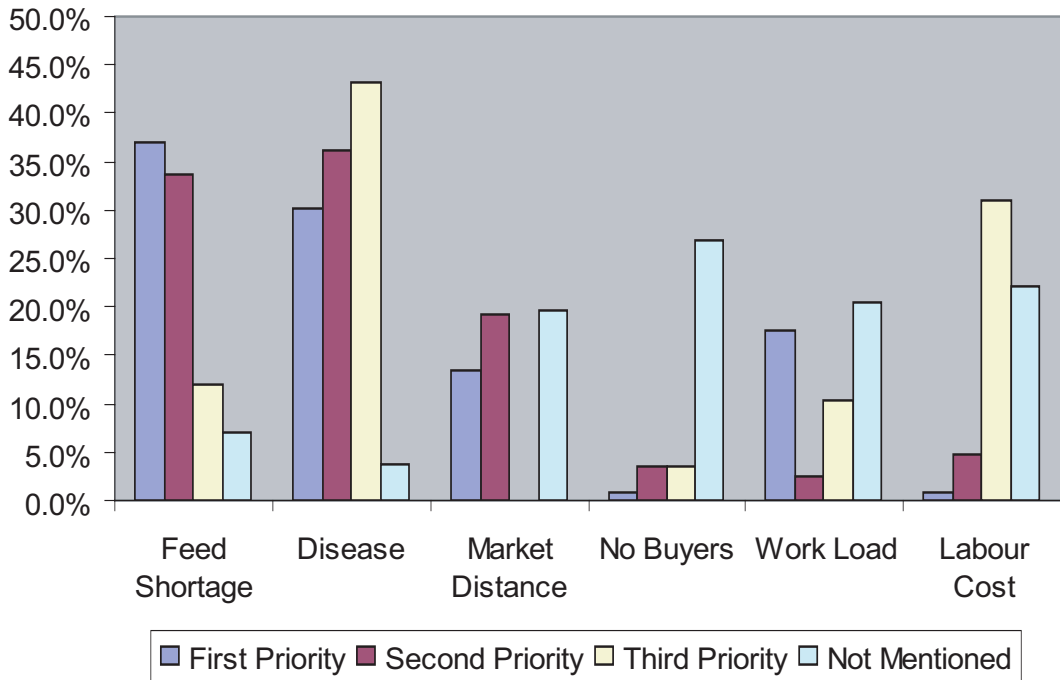


Figure 38 Priorities for improvement of goat production

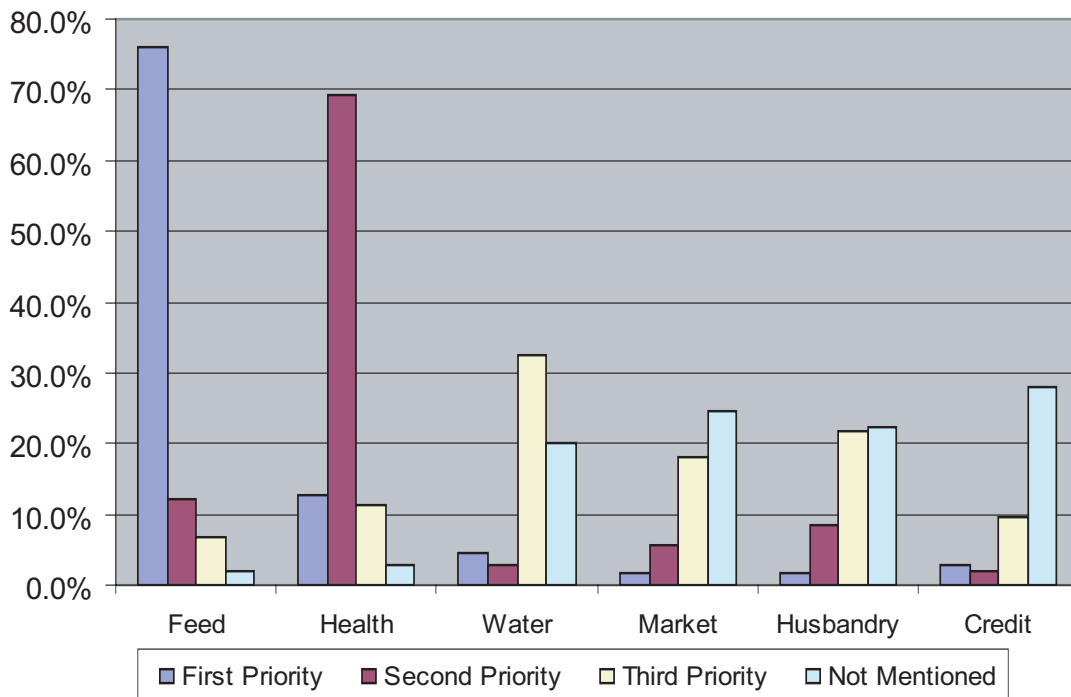


Figure 39 First priorities for improving cattle production

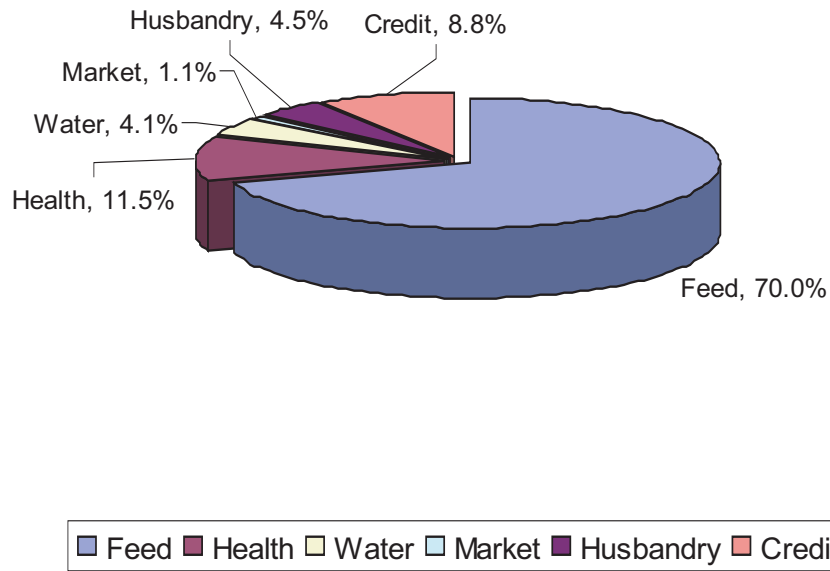
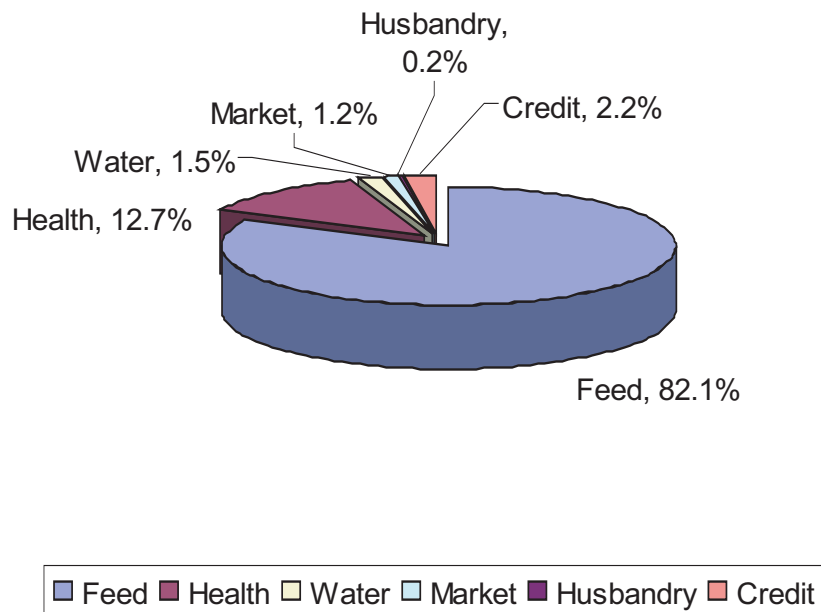


Figure 40 First priorities for improving sheep production



5.5 KARAKUL SURVEY

5.5.1 Introduction

A survey was carried out to collect data and information on Karakul production. This sector has been traditionally of great significance in Northern Afghanistan. Because it is a value added sector, it offers opportunities for income generation as an alternative to the production of illicit drugs. Very little is known about production figures and producers of Karakul in Central and South Asia in general. During the 90's, Karakul went into a deep decline in former Soviet Central Asia. This decline has been driven largely by two factors: (1) the disruption of Soviet-internal and export market channels after the break-up of the Soviet Union, and (2) the general decline in international demand for Karakul pelts, a development that parallels the decline in demand for pelts in the western industrialized world in general. However, anecdotal evidence from Central Asia suggests that in recent years, demand, in particular from countries of the former Soviet Union has been increasing again. Unfortunately, there are no reliable data on the Karakul sector available at all.

As a first step in the development of a Karakul research and development program, basic production information and producer perceptions need to be collected. The Karakul Survey was conducted in the northern provinces of Kunduz, Balkh, Faryab, Samangan, Sari Pul and Jawzjan. A total of 131 Karakul producers were surveyed.

The results also include information about the coefficient of variation because we felt that this additional parameter was useful, given the relatively small sample size and the fact that this is first recent published evaluation of Afghan Karakul production.



photo by Thieme

5.5.2 Flock Size and Distribution of Colour Types

In some areas, notably Balkh, answers to the questions about colour distribution in flocks were not answered. In order to ascertain colour distribution, the data set was filtered for each colour type to include only those records that were true zeros or above. Therefore, the colour type distribution statistics could not be combined into one table.

Table 115 Size of karakul flocks in different provinces

Province	Average Flock Size	STD of Flock Size
Balkh	168	161.69
Faryab	45.32	48.07
Jawzjan	197.27	339.84
Kunduz	181.61	142.22
Samangan	14.22	12.09
Saripul	101.67	113.68
Overall	133.95	189.87

Table 116 Number and proportion of GREY colour pelts in Karakul flocks from different provinces

Province	Average Flock Size	Average No of Grey Colour	Percentages of Grey Colour
Faryab	45.35	23.76	52.40
Jawzjan	96.50	43.14	44.71
Kunduz	181.61	129.10	71.09
Samangan	14.22	6.11	42.97
Saripul	36.25	21.25	58.62

Table 117 Number and proportion of SUR (golden-brown) colour pelts in karakul flocks from different provinces

Province	Average Flock Size	Average No of Sur Colour	Percentages of Sur Colour
Faryab	43.86	0.57	1.30
Jawzjan	96.50	0.29	0.30
Kunduz	182.80	17.13	9.37
Samangan	14.35	0.00	0.00
Saripul	36.25	0.00	0.00

Table 118 Number and proportion of BLACK colour pelts in karakul flocks from different provinces

Province	Average Flock Size	Average No. of Black Colour	Percentages of Black colour
Faryab	45.35	21.41	47.21
Jawzjan	96.50	53.07	55.00
Kunduz	181.61	35.95	19.80
Samangan	14.22	8.11	57.03
Saripul	36.25	15.00	41.38

Since the Sur (Golden-Brown) colour achieves the highest price on the market, higher proportion of Sur type animals would probably increase income for Karakul farmers. The association of high-priced colour types with lethal factors requires careful consideration, however.

Wealth distribution was defined by delineating 5 ownership classes:

Table 119 Ownership classes for karakul flocks

Ownership Class	Flock Size
1	1-15
2	16-49
3	50-99
4	100-499
5	> 499

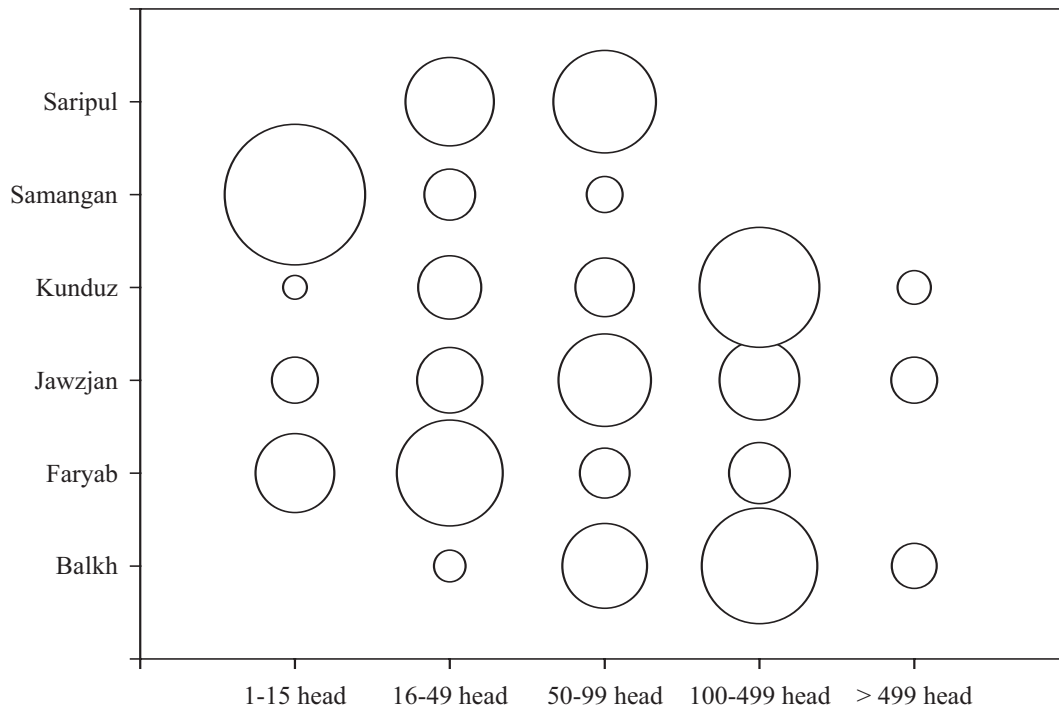
These ownership classes differ from the ones defined above for Level 2 summaries because only producers actually owning sheep were interviewed.

Table 120 Distribution of karakul flock sizes in different provinces

Province	Ownership class					Total Respondents
	1	2	3	4	5	
Balkh		4.35	30.43	56.52	8.70	23
Faryab	26.32	47.37	10.53	15.79		19
Jawzjan	9.09	18.18	36.36	27.27	9.09	22
Kunduz	2.44	17.07	14.63	60.98	4.88	41
Samangan	83.33	11.11	5.56			18
Saripul		33.33	44.44	22.22		9
Overall Average	17.42	19.70	21.21	37.12	4.55	132

These data are graphically summarised as follows:

**Figure 41 Karakul sheep wealth distribution
(percent respondents represented in proportion)**



There are several conclusions from these numbers. First, there is a very large variation in average flock size both between and with provinces (see coefficient of variation). Second, the SUR colour type is rare and sometimes absent. This is the colour that achieves the highest prices in the market. Clearly, there is considerable scope for production improvement. In Karakul sheep, the most expensive colours and curl types are associated with lethal factors. Therefore, the selection to increase Percentages and Numbers of these high-value pelt types is not a trivial undertaking and would benefit considerably from support by research and extension entities. Third, there are quite large flocks in Afghanistan, suggesting the potential to rebuild an industry that formerly was economically very important in the Northern provinces.

5.5.3 Pelt Production

According to Central Asian folklore, Karakul pelt production developed out of the practice to kill one lamb if a ewe had twins, especially in a bad forage year, because the milk production capacity of the Karakul ewe under range conditions suffices only for the successful rearing of one lamb. One should expect therefore a relationship between forage year and decision to pelt lambs rather than rearing them. This decision is based on rainfall. In Northern Afghanistan, most of the precipitation falls in the winter months. At lambing time in early spring, producers therefore have a good sense of expected forage production. Accordingly, the survey asked for typical pelt harvest averages in a bad and in a good forage year.

Table 121 Performance characteristics of karakul flocks in different provinces				
Province	Performance Characteristics	Average	STD	CV
Balkh	Lambing Rate	85.22	9.26	10.87
	Weaning Rate	65.22	8.78	13.47
	Pelting Rate (Good Forage Year)	34.00	28.71	84.43
	Pelting Rate (Bad Forage Year)	56.00	8.79	15.70
	Pelting Rate 2001	39.44	23.68	60.04
	Pelting Rate 2002	39.38	30.10	76.44
Faryab	Lambing Rate	96.84	17.49	18.06
	Weaning Rate	66.84	20.79	31.10
	Pelting Rate (Good Forage Year)	49.47	29.82	60.27
	Pelting Rate (Bad Forage Year)	42.63	28.07	65.84
	Pelting Rate 2001	31.54	26.27	83.28
	Pelting Rate 2002	63.33	100.03	157.94
Jawzjan	Lambing Rate	90.48	19.87	21.97
	Weaning Rate	65.24	15.92	24.41
	Pelting Rate (Good Forage Year)	5.00	10.25	204.94
	Pelting Rate (Bad Forage Year)	47.00	47.76	101.62
	Pelting Rate 2001	40.00	48.99	122.47
	Pelting Rate 2002	44.44	49.69	111.80
Kunduz	Lambing Rate	69.02	20.93	30.32
	Weaning Rate	53.50	27.44	51.28
	Pelting Rate (Good Forage Year)	75.12	20.62	27.44
	Pelting Rate (Bad Forage Year)	44.88	15.95	35.53
	Pelting Rate 2001	40.73	45.82	112.49
	Pelting Rate 2002	45.00	63.36	140.81
Samangan	Lambing Rate	77.78	10.83	13.92
	Weaning Rate	60.56	11.29	18.64
	Pelting Rate (Good Forage Year)	5.00	6.87	137.44
	Pelting Rate (Bad Forage Year)	55.00	15.37	27.94
	Pelting Rate 2001	35.56	20.61	57.96
	Pelting Rate 2002	25.56	18.32	71.71
Sari Pul	Lambing Rate	97.78	11.33	11.59
	Weaning Rate	75.56	16.41	21.71
	Pelting Rate (Good Forage Year)	73.33	41.37	56.41
	Pelting Rate (Bad Forage Year)	23.33	14.91	63.89
	Pelting Rate 2001	13.33	19.44	145.77
	Pelting Rate 2002	NA	NA	NA
Overall Averages	Lambing Rate	82.52	20.05	24.30
	Weaning Rate	61.92	20.68	33.40
	Pelting Rate (Good Forage Year)	47.59	37.16	78.08
	Pelting Rate (Bad Forage Year)	46.07	23.81	51.67
	Pelting Rate 2001	36.24	36.64	101.12
	Pelting Rate 2002	42.19	59.16	140.24

Interestingly, the results are not consistent and may be conditioned by differences between provinces in the general forage situation and feed availability. Usually, Karakul producers pelt most of their lambs in a bad forage year, and rear as many as possible (pelting only male) in a good year. This was the case in the provinces of Balkh, Faryab, Jawzjan, and Samangan, but not in Kunduz and Sari Pul. Lambing Percentages and Numbers was quite low in Kunduz and Samangan. This indicates considerable potential for improvement in nutrition and reproduction. This is even more evident for the weaning rate data. These performance data demonstrate the benefits that a development program could realize by improving nutrition and health services for Karakul production. On the other hand, these reproductive figures are too low for a speedy recovery of sheep flocks after the drought. Interventions in the Karakul sheep sector are necessary.



photo by Pittroff

5.5.4 Markets

5.5.4.1 Returns from pelts and wool

In order to gather information about recent developments, producers were asked if their returns for wool and pelts were better or worse than the previous year.

Table 122 Returns from the sale of pelts in 2002 compared to 2001

Province	Lower Returns	Higher Returns	NA	Number of Respondents	Percentages with lower returns
Balkh	23			23	100
Faryab	19			19	100
Jawzjan	21		1	22	95.45
Kunduz	28	12	1	41	68.29
Samangan	6	2	10	18	33.33
Sari Pul	9			9	100
All	106	14	12	132	80.30

On average, producers reported lower returns, with the notable exception of Samangan. This may suggest regional differences in marketing. Unfortunately, there are no marketing studies available for Karakul pelt production. Most likely, the market is dominated by a few traders that buy directly from producers at lambing time. This may explain why in one province apparently better prices were paid. A better understanding of the Karakul marketing channels in Afghanistan, and indeed Uzbekistan and Turkmenistan (all these countries are likely served by the same traders) is required to develop interventions that help producers directly. The total absence of any quality control and any assistance in training in pelt treatment and conservation must play a role in the economic returns for producers. This could be improved.

Table 123 Returns from the sale of wool in 2002 compared to 2001

Province	Lower Returns	Higher Returns	NA	Number of Respondents	Percentages with lower returns
Balkh	23			23	100
Faryab	19			19	100
Jawzjan	10	11	1	22	45.45
Kunduz	29	11	1	41	70.73
Samangan	7	1	10	18	38.89
Sari Pul	9			9	100
All	97	23	12	132	73.48

The situation for wool sales mirror the results obtained for the pelt market. Again Samangan was the exception. The fact that most of the carpet wool in Afghanistan is imported would suggest good market potential for home-grown wool. However, there is not a single mill in Afghanistan; consequently, wool produced in Afghanistan is hand-spun and can likely not compete with wool purchased at low prices from New Zealand and Europe. Again, an intervention program should look at the market and intermediary processing. Investing in a wool mill in Afghanistan could be a profitable enterprise, if initially some regulation of the wool market was enacted by the Government. Definitely, this could help Afghan sheep producers in rebuilding their flocks and businesses.

5.5.4.2 Market Opportunities

The farmers were asked about current and expected market opportunities. First it was of interested to see if pelts and wool sales differed from the previous year.

Table 124 Market opportunities for karakul pelts					
Sale of pelts in 2002 compared to 2001					
Province	Less	More	NA	Number of Respondents	Percentages of Respondents who sold less
Balkh	14	8	1	23	60.87
Faryab	17	2		19	89.47
Jawzjan	17	4	1	22	77.27
Kunduz	23	18		41	56.10
Samangan	12	1	5	18	66.67
Sari Pul	9			9	100
All	92	33	7	132	69.70

The reasons for lower sales could be manifold, including the desire to rebuild flocks. Therefore, these numbers do not reflect future intentions of producers.

Table 125 Market opportunities for karakul wool					
Sale of karakul wool in 2002 compared to 2001					
Province	Less	More	NA	Number of Respondents	Percentages of Respondents who sold less
Balkh	5	18		23	21.74
Faryab	12	7		19	63.16
Jawzjan	10	10	2	22	45.45
Kunduz	23	14	4	41	56.10
Samangan	13	2	3	18	72.22
Sari Pul	9			9	100
All	72	51	9	132	54.55

The wool market seemed to have been better than the pelt market, but still more farmers reported less wool sales than those reporting higher wool sales. Without more detailed information about regional and international markets, these data are difficult to interpret.

Table 126 Interest of customers for buying more or less pelts					
Province	Less	More	NA	Number of Respondents	Percentages of Respondents who expected to sell less
Balkh	11	12		23	47.83
Faryab	12	7		19	63.16
Jawzjan	19	2	1	22	86.36
Kunduz	1	40		41	2.44
Samangan	2	7	9	18	11.11
Sari Pul	9			9	100
All	54	68	10	132	40.91

Overall, sheep producers had a somewhat optimistic view of the pelt market.

Table 127 Interest of customers for buying more or less wool

Province	Less	More	NA	Number of Respondents	Percentages of Respondents who expected to sell less
Faryab	12	7		19	63.16
Jawzjan	12	9	1	22	54.55
Kunduz	1	34	6	41	2.44
Samangan	8	7	3	18	44.44
Sari Pul	9			9	100
All	51	71	10	132	38.64

The same result was obtained for wool. Again, farmers in Kunduz were the most optimistic.

Finally, farmers were asked if they would be interested in producing more pelts, and which colour obtains the best price for pelts.

Table 128 Interest of customers for producing more or less pelts

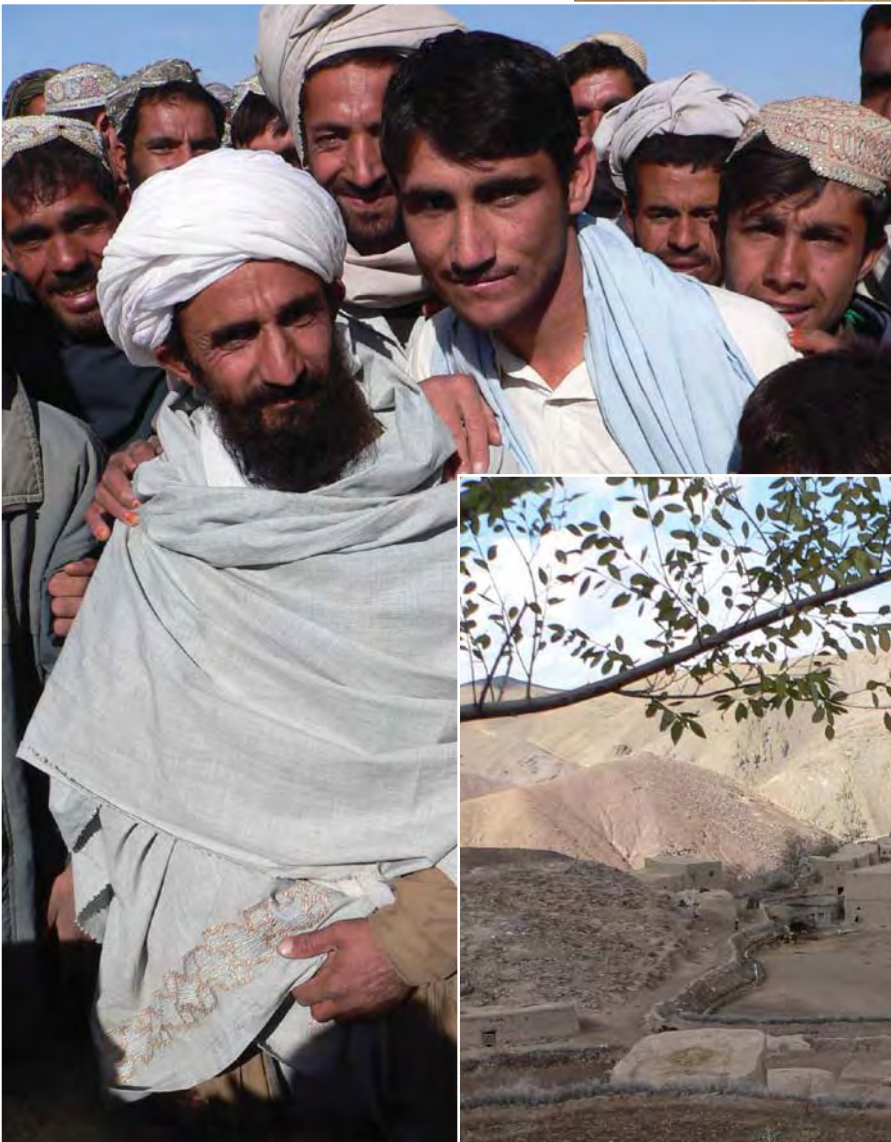
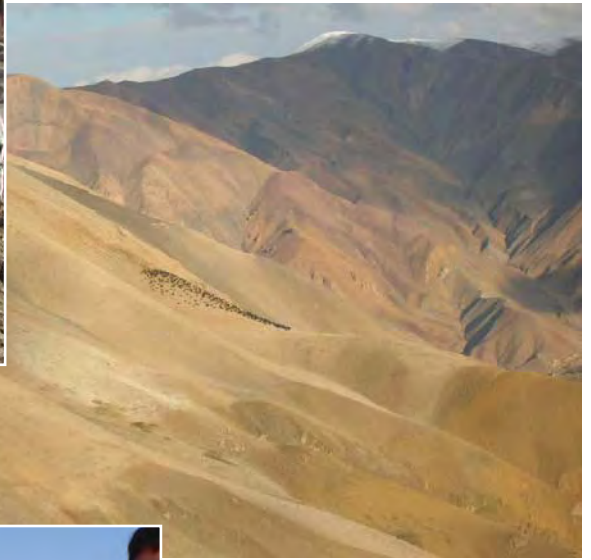
Province	Less	More	NA	Number of Respondents	Percentages of Respondents who are interested in producing more
Balkh	2	21		23	91.30
Faryab	7	12		19	63.16
Jawzjan	10	11	1	22	50.00
Kunduz		39	2	41	95.12
Samangan	9		9	18	0.00
Sari Pul	3	5	1	9	55.56
All	31	88	13	132	66.67

With the exception of Samangan, farmers were clearly interested in Karakul production. It would definitely be of interest to conduct follow up work in Samangan to clarify.

Table 129 Colour of pelts for which best price was obtained

Province	Grey	Sur	NA	Number of Respondents	Percentages of Grey
Balkh	23			23	100
Faryab	19			19	100
Jawzjan	22			22	100
Kunduz	34	7		41	82.93
Samangan	3	12	3	18	16.67
Sari Pul	9			9	100
All	110	19	3	132	83.33

In international markets, the SUR colour usually achieves the highest price. The fact that with the exception of Samangan province most farmers listed GREY as the colour fetching the best price suggests perhaps a preference for that colour that is typical for the market in Afghanistan itself. This further demonstrates the need for market studies to design interventions that help revitalize the Karakul sheep sector in Afghanistan.



photos by Pittroff

6. DISCUSSION

6.1 CENSUS DATA SUMMARIES

Previous data on livestock numbers can be found in FAO surveys undertaken since 1995 (1995, 1997/98 and 2000). Some areas covered in 1995 were omitted from the larger coverage of 1998, because of security and accessibility problems. Previous surveys, due to numerous constraints, could not attempt a systematic estimation of comprehensive livestock numbers. Further, in the absence of reliable human demographics and consistent information about location and administrative settings of human settlements (as explained above, there is no consistent district database), it was impossible to develop a sampling frame that would have allowed for truly randomized sampling on either of the two levels. Consequently, the method of total enumeration was used for Level 1.

No reliable data exist on which to base estimates of the proportion of families or communities included in prior surveys. Accordingly, a comparison of the Afghanistan National Livestock Census data to total numbers reported in previous surveys is not sensible, but nevertheless the numbers per household may give a general indication of livestock numbers pre-drought, together with the changes that have occurred between 1995 and today.

Livestock owned per family, and sheep numbers in particular have clearly fallen sharply. Although the decline between 1998 and 2003 appears steeper than between 1995 and 1998, changes were already underway during the earlier period. There are reports of trans-border movements of livestock by emigrating families, and of returnees leaving stock behind while they investigated the situation in Afghanistan for themselves.

The time of year of the surveys is also important because the Kuchi herds may or may not be present. The Kuchi population in the south and south-east of Afghanistan spend the winter in Pakistan or in districts of Afghanistan close to the border (FAO, 1999). With the current security situation along the border area, it is probable that many would have chosen to remain in Pakistan. During the 1995 survey, the average sheep flock for Kuchis was 100 head, and nationally the total livestock owned by Kuchis was equal to the number owned by the resident population. The present census only captured records from 29,000 Kuchi families, far fewer than were recorded by the limited surveys during 1995 (59,000 families) and 1998 (75,000 families).

Table 130 A comparison of livestock numbers per family from FAO surveys and census results between 1995 and 2003

Species	1995 Survey		1998 Survey		2003 Census
	All	Resident	All	Resident	All
Cattle	3.66	3.75	2.51	2.75	1.22
Sheep	21.93	12.59	14.20	7.93	2.88
Goats	9.40	5.67	5.76	4.38	2.40
Donkey	1.09	0.96	0.71	0.62	0.52
Camels	0.41	0.12	0.23	0.07	0.06
Poultry	11.56	11.86	6.84	7.01	4.00

Given that a far smaller Kuchi population was captured by the 2003 Census, a comparison would be better made with the stock holdings of resident families in previous years. On this basis it is still clear that livestock holdings have declined and that sheep have been particularly hard hit by adverse conditions.

Limited livestock data can be found in the Agricultural surveys undertaken by FAO twice yearly, winter and summer. In the current census, livestock numbers per family have been shown to be considerably reduced from pre-drought values. The survey undertaken in May-June 2002 collected data from 5000 farms in 540 villages across all 32 Provinces and agro-ecological zones. The results indicated that on average a typical farm owned two cattle, four sheep, four goats and six birds. Compared to the previous year, livestock numbers and the proportion of farms keeping livestock had decreased. Survey data over the years 1998-2002 indicated livestock numbers had fallen faster in the later years of the drought.

Preliminary results from the Agricultural survey in winter 2002 indicated that both livestock numbers and proportion of farmers with livestock had started to increase compared to earlier in the year. More information is needed on the marketing patterns for livestock to understand the significance of these observations.

The present Census shows that over the country as a whole, livestock numbers per family are lower than found in the surveys.

6.2 REGIONAL PRODUCTION SYSTEM AND PRODUCER CHARACTERISTICS

The classification of provinces into agro-ecoregions was based on expert opinion. Provinces that are similar in terms of production calendar, natural resource endowment and climatic conditions were grouped together. Badakhshan is different enough from all other provinces to merit definition as a unique agro-ecological region. From Level 1 data, several summary statistics were computed that demonstrated regional differences in livestock wealth, including species-specific differences. These data help understand subsequent summaries on the basis of agro-ecological region.

Forage production

The forage production identified wheat straw, Shaftal (Persian clover), Lucerne, maize straw and maize as the important cultivated and crop-aftermath forages produced on farm. There were considerable differences between agro-ecological regions in some forages, but clearly the most important on-farm feed resource across the whole country is wheat straw. Among the purchased feeds that are currently used, cotton seed cake, wheat straw, wheat bran and Lucerne are the most popular. When asked about preferences for purchased feeds, farmers tended to favour concentrate feed.

When planning interventions for on-farm forage production, the differences between regions should be taken into account. Except for the northern region, farmers seem to favour forages and crop aftermath. Shaftal was particularly popular in the East and Centre-East regions.

Length of feeding period

On average livestock is out on pastures for more than half of the year. Animals need to be fed in the winter between 4 and 8 months, depending on region. The very long period for Centre-East is clearly conditioned by Kabul (see Appendix for province-level data), due to the limited grazing capacity around Kabul City. Information about grazing periods was not asked separately for the different livestock species. However, it is clear that large numbers of the lactating cattle, especially in the East and Centre-East, are also stall-fed during most of the spring and summer months.

The length of the winter feeding period compounds the generally extremely low forage production capacity to create a 'winter feed gap', probably the most critical constraint for livestock production in most parts of Afghanistan. This is definitely the most critical intervention needed. However, it must be recognized that this constraint limits the number of animals grazing rangelands the rest of the year. Given the extremely deteriorated condition of rangelands in Afghanistan (appropriate quantitative data are lacking and should be urgently procured), the 'winter feed gap' may currently be an important safety mechanism preventing further, perhaps irreversible destruction of rangelands. This implies that in locations, where grazing of livestock is important, forage interventions must not take place outside a watershed rehabilitation context, lest incentives be created to even further increase pressure on already overstressed rangeland grazing resources.

Production calendar

The forage year appears to begin in March for most of the country. This coincides with the main calving and lambing periods and the begin of lactation for a large proportion of the livestock. The average early turnout in the northern and western regions is somewhat surprising. Certainly, the begin of the forage year or grazing season in higher elevations occurs much later. The distribution pattern for end of grazing season was much less clear. For most of the country, the grazing season ends in September - November. The western region is relatively late with most respondents indicating November as the end of the grazing period. However, Kuchi nomads begin leaving higher elevation pastures in some areas as soon as late August.

Supplementary feeding can begin as early as September; in the northern and western areas, farmers start supplementation in November, which coincides with the end of the forage year. The end of the supplementary feeding period again mirrors the answers given for the grazing period.

Markets, Trading Partners and Sales Decisions

March and September are the months most livestock are sold. In March, farmers have cash needs for inputs for crop production. In the autumn, farmers typically sell animals either ready for market (lambs/kids) or sell those animals in excess of available feed resources. Autumn markets, therefore, are good indicators of the forage supply situation. Fluctuations in numbers of animals sold on autumn markets and associated price changes are a good indication of the severity of the 'winter feed gap', especially if high numbers of draft animals are sold. These dynamics should be monitored as they are a good indicator of the ability of farmers to successfully plant their spring crops.

Farmers were asked what type of animal they sell first, and which type of livestock they will try to keep under all circumstances. The species most often mentioned in both categories was cattle. What appears to be contradictory at first sight makes perfect sense when considering the dynamics of the forage situation. Farmers with low winter feed supplies will often take chances and try keeping small stock. However, they plan carefully their available forage supply for cattle and when insufficient, they will sell their most valuable animals rather than risking losing them. Although autumn market prices are lower, draft animals are still needed until November for ploughing in most places and will get acceptable prices. These answers are consistent with the general conclusion that cattle are the most important livestock species in Afghanistan.

Priority categories for livestock sales were further broken down. Multiple answers could be given to these questions. Across the entire country, the most frequently given answer for selling cattle was to purchase feed. There were some differences between regions in terms of the age category sold first, but not within region. The average distance to markets was about two hours.

Local traders were the most important business contact for most farmers, followed by regional traders. This suggests that butchers seem to rely on traders when procuring animals for slaughter. Farmers generally reported an increase in livestock prices in 2003, which is reflective of the fact that the drought had broken and demand for animals was higher. Most farmers reported that they had sold more animals than in the year before, and that they earned more money. Cows sold best in most locations.

Wealth distribution

The data on wealth distribution show a rather clearly regionally differentiated picture. Ghazni, Jawzjan, Badghis and Hirat are cattle-poor, the three last provinces especially because they had been hit hard by the drought. In the case of Jawzjan, traditionally a sheep production region, this may have to do more with the agro-ecological conditions than true poverty, as sizeable sheep holdings can be found in this province. However, in Jawzjan there is also a higher than average number of farmers not owning any livestock at all. The data provide clear evidence of a correlation of drought effects with livestock wealth. The western region had the highest number of farmers with no cattle at all, and the lowest number of farmers with more than 10 head of cattle. The central region was also cattle-poor, a consequence of the past drought and years of conflict. The eastern region, on the other hand, is relatively cattle-rich. Numbers for sheep and goats reflect regional characteristics discussed before (most larger sheep holdings in the north, most large goat holdings in the east).

Age structure

The Level 2 age structure data are similar to Level 1 although they indicate a more positive situation. It must be taken into account that no truly randomized sampling frame could be developed for the Level 2 surveys, which is discussed in more detail in the chapter about Methods. Accordingly, comparisons between Levels have inherent shortcomings. The conclusion that the off take potential of Afghan livestock populations is generally low due to inherently low reproductive performance is upheld, however. Livestock dynamics models (for example BAPTIST, 1992) can be parameterized with Level 2 and more detailed off take scenarios can be simulated on the basis of these data.

The reasons given for culling support the interpretation of the market data given above. While obviously the most important reason to sell an animal is old age, feed shortage is the second most frequently cited reason to sell animals.

6.3 WOMEN SURVEY

The women survey focused on three areas: work distribution between men, women and children, decision making authority, and goals, preferences and problems formulated by the women farmers. Questions about work distribution and decision making were by livestock species. The results indicate that the responsibility for specific tasks is distributed among genders and age groups in characteristic ways independent of livestock species. Activities that would require work outside the homestead compound are mostly handled by men and children. Feeding livestock (at the homestead) is typically a task for which women are responsible, whereas herding grazing animals is a task performed by children and to a lesser degree by men. Watering animals, tending young and milking animals is the responsibility of women. Treating sick animals is a task performed mostly by men; however, for small ruminants, the involvement of women in animal treatment is larger. These clear patterns of division of labour suggest the need to consider gender in interventions. For example, tuberculosis prevention should specifically target women since they are most exposed to lactating animals. Likewise, they are responsible for feeding animals on farm. Feeding improvement interventions targeting especially dairy animals should be aware of the need to consider special training needs for women, but also the fact that decisions about input supply are largely made by men. Since the herding of grazing animals is largely a task of children, interventions increasing work load due to herding will likely impact school enrolment and should be carefully monitored.

Decision making in livestock production is mostly a domain of men, but for some important activities, such as purchasing cattle, or selling livestock in general, more than a third of the respondents reported that women make these decisions. Women also decide milk and wool sales. Women play an important role in decision making about treating sick animals and this should be reflected in the design of veterinary programs.

The vast majority of women selected cattle as the species preferred for expansion of their livestock holdings. The most frequently cited intention of using cattle was milk production for sale. The next most important species for women was poultry; the most frequent reason given was egg production for sale. Sheep were selected only by about 15 percent of all respondents as the livestock species which they preferred for future investments. More than half of those respondents preferring sheep did not actually own sheep, but all of the women who wanted to have (more) sheep, also owned cattle. Preferences for sheep were explained by milk and meat, and to a lesser degree by wool production. Goats were not a preferred livestock species for women farmers, and proposals to expand goat production or introduce specific goat systems such as dairy-emphasis goat production should be carefully piloted and evaluated for adoption.

Most women named problems with feeding as the most important for cattle, sheep and goat production, followed by better veterinary health care. Answers for other possible problems were heterogeneous and should be consulted for the planning of specific improvement interventions.

Answers given for desired improvements largely reflected the corresponding answers for the main problems. Improvement of feed supply and veterinary health care were the most frequently requested interventions. In general, the respondents did not seem to perceive labour, market access or lack of knowledge as burning problems. Especially the answers regarding the lack of knowledge suggest potential difficulties in implementing farmer training programs.

6.4 KARAKUL SURVEY

The Karakul survey produced some limited information about production parameters and market opportunities. However, the high variability of the given answers precludes strong conclusions. It is also not clear from the survey how much Karakul sheep production in general is contributing to the livelihoods of the farmers. Large Karakul sheep herds exist and most interviewed farmers expected to sell more, and were interested in producing more. Karakul production was traditionally an important livestock sector in Afghanistan; considerable market research is necessary to determine its future potential.



photos by Pittroff

7. METHODS

7.1 SURVEY DESIGN

From the outset, the census was designed to take place on two levels. Level 1 was planned as a complete enumeration. There were no reliable baseline data, and such an effort is required in order to begin a systematic census program needed for designing sector policies, development interventions, and national vaccination programs.

Typically, in national censuses the approach is to develop an appropriate sampling frame for random sampling that allows the creation of 'gold standard' data against which total enumeration data are then evaluated. This was not possible in Afghanistan. Although the comparison was attempted (see Section 7.2), neither level could, in fact, provide 'gold standard' data quality data. However, the results of this census allow the definition of an appropriate sampling frame for the future. Accordingly, the methodology described in Section 7.2 can be considered a reference for future work.

The design of the census on two levels was motivated primarily by two considerations: first, acquire detailed production system data, and second, create a data set that allows consistency checking of Level 1 data where feasible. While the comparison, as discussed, suffered from inherent sampling design problems impossible to avoid, the analysis of production system characteristics was very successful and further supported by data derived in the survey of female livestock owners.

As this report amply documents, data from both levels are intrinsically consistent and provide an excellent summary picture of the Afghan livestock sector. The key problems and most promising intervention routes were identified. Level 2 results allow the application of livestock herd dynamic models (for example Baptist, 1992) to extrapolate herd growth and potential off take data. The impact of the drought on animal numbers was identified by the survey; however, the reasons for the decline of animal numbers are manifold. For example, many farmers in Afghanistan sell livestock when their wheat crop fails. While often this coincides with forage shortages caused by drought, the sale of the animals does not necessarily coincide with the worst state of the pastures in a drought.



photo by Rlung

7.2 ANALYSIS METHODOLOGY

Most of the analysis effort was invested in data cleaning. The most critical problem encountered was the separation of true zero answers from missing answers. Many statistics required the computation of ratios (for example, number of certain livestock per species, or number of young per dam, etc.). The frequent inconsistency of data entries as a result of unsatisfactory distinction between true zero and missing answer required considerable verification effort. With the exception of the Level comparison statistics, only basic univariate summary statistics were employed. Additional analysis is conceivable, for example discriminate analysis verifying that the definition of agro-ecological zones adequately reflects important production system characteristics. Further, reproduction data could be used for livestock population dynamics modelling.

7.3 DATA CONSISTENCY

Assumptions and Notation

Comparison of Level I and Level II observations were made at the district level. Level I observations are regarded as census data. We denote ratios of number of livestock per family in a district by:

π_{cattle} = the number of cattle per family,

π_{sheep} = the number of sheep per family,

π_{goats} = the number of goats per family,

$\pi_{donkeys}$ = the number of donkeys per family,

π_{camels} = the number of camels per family.

In our analysis, we take as our null hypothesis that these ratios computed from Level I (census) data are the true district values. For example, if:

$X_{cattle,ij}$ = the number of cattle owned by the j^{th} family in the i^{th} village of the district,

and there are N villages in the district and R_i families in the i^{th} village, then:

$$\pi_{cattle} = \frac{\sum_{i=1}^N \sum_{j=1}^{R_i} X_{cattle,ij}}{\sum_{i=1}^N R_i}.$$

The four other ratios are computed in the same manner.

Level II observations are obtained from sub-samples of families that have been randomly selected from each of n villages. Let r_i denote the number of families selected from the i^{th} village. The n villages were randomly selected from the district. Thus a Level II observation, Y_{ij} , is represented as:

$$Y_{ij} = \mu + \upsilon_i + \varepsilon_{ij}, \quad i = 1, 2, \dots, n, \quad j = 1, 2, \dots, r_i,$$

where

μ = the mean of all Y_{ij} is in the district,

υ_i = the deviation of the mean of all Y_{ij} is in the i^{th} village from μ ,

and

ε_{ij} = the deviation of Y_{ij} from the mean of all Y_{ij} is in the i^{th} village.

Because both the number of villages and the number of families in the Level II data are generally quite small relative to the corresponding numbers in the population (Level I data), we ignore the use of finite

population correction factors in our analysis and regard υ_i is and ε_{ij} is as random components in our representation of Y_{ij} . [Aside: Use of finite population correction factors in our analysis likely would have the effect of slightly decreasing our standard error estimates for Level II estimates of district means. This would result in slight strengthening of the conclusions that we present.] Thus, we assume that:

$$\upsilon_i \text{ is } \square \text{ iid } \left(0, \sigma_{\upsilon}^2\right) \text{ and } \varepsilon_{ij} \text{ is } \square \text{ iid } \left(0, \sigma_{\varepsilon}^2\right),$$

Comparisons of Level I and Level II Observations

We outline the basic analysis for cattle data only, and then present results of our analyses for cattle, sheep, goat, donkey and camel data. Under the null hypothesis that

$$\pi_{cattle} = \frac{\sum_{i=1}^N \sum_{j=1}^{R_i} X_{cattle, ij}}{\sum_{i=1}^N R_i}$$

is the true ratio of cattle per family in a given district, we compute:

$$t_{cattle} = \frac{\hat{\pi}_{cattle} - \pi_{cattle}}{s.e.(\hat{\pi}_{cattle})},$$

where

$$\hat{\pi}_{cattle} = \frac{\sum_{i=1}^n \sum_{j=1}^{r_i} Y_{cattle, ij}}{\sum_{i=1}^n r_i},$$

is an unbiased estimator of π_{cattle} computed from the Level II data. Derivation and computation of the standard error of $\hat{\pi}_{cattle}$, $s.e.(\hat{\pi}_{cattle})$, follows.

Derivation of Standard Error

Letting $m = \sum_{i=1}^n r_i$ (and dropping the subscript 'cattle' for notational convenience), we have that:

$$\hat{\pi}_{cattle} = \frac{\sum_{i=1}^n \sum_{j=1}^{r_i} Y_{ij}}{\sum_{i=1}^n r_i} = (1/m) \left(\sum_{i=1}^n Y_{i.} \right),$$

where replacement of a subscript by a dot indicates summation over that subscript. Because observations from different villages are independent due to the random sampling of villages:

$$Var(\hat{\pi}_{cattle}) = Var(\bar{Y}_{..}) = (1/m^2) Var\left(\sum_{i=1}^n Y_{i.}\right) = (1/m^2) \sum_{i=1}^n Var(Y_{i.}).$$

Using our mixed model representation of Y_{ij} :

$$\begin{aligned} Var(Y_{i.}) &= Var\left(\sum_{j=1}^{r_i} Y_{ij}\right) + \sum_{j=1}^{r_i} \sum_{j'=1}^{r_i} \underset{j \neq j'}{Cov}(Y_{ij}, Y_{ij'}) \\ &= r_i \left(\sigma_{\upsilon}^2 + \sigma_{\varepsilon}^2 \right) + r_i (r_i - 1) \left(\sigma_{\upsilon}^2 \right) \\ &= r_i^2 \sigma_{\upsilon}^2 + r_i \sigma_{\varepsilon}^2. \end{aligned}$$

Therefore:

$$\begin{aligned} Var(\bar{Y}_{..}) &= \left(\frac{1}{m^2}\right) \sum_{i=1}^n Var(Y_{i.}) \\ &= \left(\frac{1}{m^2}\right) \sum_{i=1}^n [r_i^2 \sigma_v^2 + r_i \sigma_\varepsilon^2] \\ &= \left(\frac{\sum_{i=1}^n r_i^2}{m^2}\right) \sigma_v^2 + \left(\frac{1}{m}\right) \sigma_\varepsilon^2 \end{aligned}$$

We note that for the special case in which equal numbers of families are sub-sampled in each (say)

village, i.e., $r_1 = r_2 = \dots = r_n = r$, so that $m = nr$, then:

$$Var(\bar{Y}_{..}) = \left(\frac{1}{n}\right) \sigma_v^2 + \left(\frac{1}{nr}\right) \sigma_\varepsilon^2 .$$

Restricted maximum likelihood (REML) estimates of σ_v^2 and σ_ε^2 , which we denote by $\hat{\sigma}_v^2$ and $\hat{\sigma}_\varepsilon^2$ respectively, were obtained using the VARCOMP Procedure of SAS Version 9.0. The estimated variance of $\bar{Y}_{..}$ (or $\hat{\pi}_{cattle}$) was computed as:

$$\hat{Var}(\bar{Y}_{..}) \equiv \hat{Var}(\hat{\pi}_{cattle}) = \left(\frac{\sum_{i=1}^n r_i^2}{m^2}\right) \hat{\sigma}_v^2 + \left(\frac{1}{m}\right) \hat{\sigma}_\varepsilon^2 ,$$

and the standard error of $\bar{Y}_{..}$ (or $\hat{\pi}_{cattle}$) then was computed as:

$$s.e.(\bar{Y}_{..}) = s.e.(\hat{\pi}_{cattle}) = \sqrt{\left(\frac{\sum_{i=1}^n r_i^2}{m^2}\right) \hat{\sigma}_v^2 + \left(\frac{1}{m}\right) \hat{\sigma}_\varepsilon^2}$$

Example Calculation of t_{cattle} :

We use observations from the Qadis district of Badghis province to illustrate the calculation of t_{cattle} . The Level I (census) value for π_{cattle} in the Qadis district is:

$$\pi_{cattle} = 0.5105 .$$

Families from six ($n=6$) villages in the Qadis district were randomly sub-sampled for Level II observation. The numbers of families selected were (in no particular order):

$$r_1 = 5, r_2 = 4, r_3 = 1, r_4 = 5, r_5 = 5 \text{ and } r_6 = 5 .$$

The Level II estimated ratio of cattle per family was $\hat{\pi}_{cattle} = 2.4000$. REML estimates of the variance components were:

$$\hat{\sigma}_v^2 = 1.35743 \text{ and } \hat{\sigma}_\varepsilon^2 = 6.41973 ,$$

so that the standard error of $\hat{\pi}_{cattle}$ was computed as:

$$\begin{aligned}
s.e.(\bar{Y}_{..}) &= s.e.(\hat{\pi}_{cattle}) = \sqrt{\left(\frac{\sum_{i=1}^n r_i^2}{m^2}\right) \hat{\sigma}_v^2 + \left(\frac{1}{m}\right) \hat{\sigma}_\varepsilon^2} \\
&= \sqrt{\left(\frac{5^2 + 4^2 + 1^2 + 5^2 + 5^2 + 5^2}{25^2}\right) (1.35743) + \left(\frac{1}{25}\right) (6.41973)} \\
&= 0.71477 .
\end{aligned}$$

Finally, we compute t_{cattle} as:

$$t_{cattle} = \frac{0.51050 - 2.4000}{0.71477} \approx -2.644 .$$

Summary of Results :

The following table presents values of t_{cattle} (t_{sheep} , t_{goats} and $t_{donkeys}$ are given in the Tables A - A). If the ratios π_{cattle} , π_{sheep} , π_{goats} and $\pi_{donkeys}$ computed using the Level 1 (census) data are the true district values, then corresponding values of t_{cattle} , t_{sheep} , t_{goats} and $t_{donkeys}$ should behave approximately like independent standard normal random variables based on Central Limit Theorem arguments. As a rule of thumb, approximately 95 percent of the values should fall between minus two and plus two, and essentially all values should fall between minus three and plus three. Further, values should be distributed somewhat symmetrically about zero. All four tables exhibit, to varying degrees, the following tendencies:

1. An excess (relative to our rule of thumb) of large $|t|$ values.
2. Most t values are positive, i.e., values tend to be greater than zero.

Conclusions and Discussion

If Level 2 data are randomly selected sub-samples from districts, then the distributions of the t values are inconsistent with the hypothesis that Level 1 (census) values are true values. However, Level 2 observations were sampled mostly from families with livestock, and no sampling frame could be developed based on the distribution of livestock wealth from Level 1 data. In total, only 29 respondents in Level 2 (of 1284) had no livestock at all. Therefore, we should expect the distributions of the t values to exhibit the tendencies noted in the table above. This, of course, is because Level 2 ratios are estimating the ratios of number livestock to number of families, given that the family has livestock, whereas Level 1 data are global averages of number of animals per family, definitely including all families that had no livestock. Thus, there are three potential sources of bias in the Level 2 data: one is the fact that the number of families without livestock in the sample is likely not representative of the number of families without livestock in the population. This bias could be corrected if the number of families without livestock (for each specific species in question) could be reliably estimated from Level 1 data. However, this is not possible since the questions about number of families without livestock in Level 1 were not species-specific. The next source of bias is wealth distribution. Level 1 data are global community averages per family – not allowing to derive a frequency distribution of livestock ownership according to wealth classes as discussed above. If we know the proportion of families in each district who possess no livestock of a given type, then bias-correction adjustments can be made to our Level 2 ratios. The bias-corrected Level 2 ratios can then be reanalyzed using the procedures outlined herein to assess accuracy of the Level 1 (census) observations. The third source of bias is the selection of villages for Level 2 sampling. Although enumerators were asked to not intentionally select villages for sampling, systematic sampling based on convenience criteria is of course likely. However, since no village list was available at the start of Level 2, randomized sampling of villages was not possible.

Table 131 Comparison of cattle numbers in selected districts from Level 1 and Level 2 observations						
Obs	Province	District	π_{cattle}	$\hat{\pi}_{cattle}$	s.e. ($\hat{\pi}_{cattle}$)	t_{cattle}
1	Badghis	Qadis	0.511	2.400	0.715	2.644
2	Baghlan	Baghlan	1.805	3.849	1.045	1.956
3	Baghlan	Dushi	1.718	4.344	0.493	5.325
4	Baghlan	Khinjan	2.477	5.563	0.675	4.571
5	Balkh	Dawlat Abad	0.350	2.250	0.201	9.463
6	Bamyan	Kamhard	2.001	2.571	0.869	0.656
7	Bamyan	Saighan	1.534	2.321	0.437	1.804
8	Bamyan	Shibar	1.050	1.100	0.307	0.164
9	Bamyan	Yakawlang	1.708	3.214	1.120	1.345
10	Farah	Anar Dara	0.446	1.432	0.352	2.802
11	Faryab	Dawlat Abad	0.291	1.821	0.345	4.434
12	Ghazni	Dih Yak	0.997	2.231	0.320	3.855
13	Ghazni	Zana Khan	0.429	1.936	0.690	2.184
14	Ghor	Tulak	0.851	2.640	0.668	2.680
15	Hilmand	Nad Ali	1.961	4.000	0.811	2.514
16	Hirat	Ghoryan	0.380	1.600	0.537	2.270
17	Hirat	Kohsan	0.289	0.611	0.224	1.441
18	Hirat	Obe	0.936	2.449	0.317	4.774
19	Jawzjan	Qurghan	0.105	1.379	0.445	2.864
20	Kabul	Chahar Asyab	1.121	4.067	0.496	5.939
21	Kabul City	Nahya 14	0.060	6.375	1.235	5.113
22	Kapisa	Hisa Awal Kohistan	3.020	4.200	1.321	0.894
23	Kunduz	Dasht Archi	1.628	8.100	3.065	2.112
24	Kunduz	Imam Sahib	3.764	15.900	6.623	1.832
25	Laghman	Alingar	2.211	4.036	0.314	5.812
26	Logar	Baraki Barak	1.256	4.807	1.234	2.877
27	Logar	Charkh	0.725	4.474	0.589	6.362
28	Nangarhar	Kama	5.053	4.515	0.554	-0.970
29	Nangarhar	Khogyani	2.235	3.278	0.531	1.965
30	Nangarhar	Muhmand Dara	2.654	5.359	0.460	5.887
31	Nangarhar	Pachir Wa Agam	2.515	4.191	0.746	2.246
32	Nimroz	Khash Rod	0.667	2.600	0.568	3.403
33	Paktika	Mata Khan	2.345	5.917	1.965	1.818
34	Paktika	Sharan	2.214	3.000	1.025	0.767
35	Paktya	Chamkani	3.409	4.923	0.970	1.560
36	Paktya	Dandi Patan	3.432	8.526	3.359	1.516
37	Parwan	Bagram	1.404	4.037	0.405	6.505
38	Parwan	Jabalusaraj	1.306	5.200	1.126	3.457
39	Samangan	Kaldar	1.078	3.750	0.751	3.555
40	Samangan	Khulm	0.416	3.875	2.048	1.689
41	Sari Pul	Sayed Abad	1.750	2.000	0.730	0.342
42	Takhar	Ishkamish	1.561	7.800	2.681	2.327
43	Takhar	Yangi Qala	2.087	7.100	2.029	2.471
44	Zabul	Shahjoy	0.777	3.148	0.695	3.413
45	Zabul	Shahr-e-Safa	0.965	3.087	0.789	2.688

While the exact comparison between Levels 1 and 2 ultimately proved impossible, we should comment on general tendencies exhibited in the data. The production system data from Level 2 appear to be plausible and coherent. Likewise, summary statistics from Level 1, for example on age structure, are compatible with expert opinion about levels of reproduction typical for the extreme low input conditions of Afghanistan. No systematic bias could be detected. Thus, we arrived at the conclusion that the census data provide a reliable picture of the Afghan livestock sector.

7.4. KEY LESSONS LEARNED

“Statistical inference, properly interpreted, can be misleading. But the nature of statistical evidence is such that we cannot observe strong misleading evidence very often.” (Chambers and Skinner, 2003; p. 60)

Important lessons were learned in the Afghan National Livestock Census. They fall into the categories of Methodology, Organization and Supervision, Logistics, and Analysis.

Methodology

The Census was designed to be conducted on two levels of sampling intensity (in terms of amount of information asked from farmers). Level 1, or total enumeration, had the explicit objective of visiting every community in Afghanistan and enumerate livestock numbers by species, relating it to number of families. Level 2, or sub sampling, had the objective to gather detailed production system information and data that could assist in the interpretation of the general stock inventories gathered in Level 1 and inform the design of interventions in the livestock sector.

A survey requires a sampling frame. A frame is an operational representation of the population units of interest (in the case of the Afghanistan National Livestock Census, all farmers). A frame could be for example a list of all farmers. Typically, there would be various steps involved in developing a sampling frame for general populations. In any case, at some point a list of all objects in the area to be sampled must be available. This was obviously not possible for the Census. Accordingly, the only feasible solution for the estimation of livestock populations in Afghanistan was total enumeration. However, information on a more detailed level was required, given the near-total lack of information about production system characteristics, markets, and producer problems and preferences. Accordingly, a much more detailed questionnaire had to be designed and administered to a sub sample of farmers in Afghanistan. However, since it was not possible to develop a sampling frame because of the total enumeration survey being conducted almost concurrently, certain aspects of the Level 2 survey data may be biased. Sources of bias include omission of provinces (due to security and logistics issues), non-random selection of villages within districts and provinces and non-random selection of farmers (because no frame was available). Accordingly, Level 2 violated one of Dalenius’s required prerequisites of a survey (as cited and discussed in Biemer and Lyberg, 2003, p. 4) – the sampling of units from the frame in accordance with a sampling design specifying a probability mechanism and a sample size. This critical issue affected certain aspects of Level 2 results, in particular composite statistics on number of livestock per family, as discussed above. However, the consistency of data on production system properties and farmer preferences clearly demonstrates that even a survey impacted by (in our case unavoidable) design deficiencies can produce valuable and trustworthy data, if conducted by a responsible field team. In fact, given the enormous logistics problems typically faced by survey teams in developing countries, it is arguable if the rigorous conditions theoretically required are ever met. What is needed, however, is an assessment and discussion of possible sources of error. Unfortunately, this seems to be very rarely accomplished in practice. As the key lesson learned we conclude that a more rigorous description of methods for survey design and analysis of data gathered under conditions not meeting ‘ideal’ requirements would be useful for practitioners.

The methodology problems encountered in the Afghanistan National Livestock Census had two major sources:

- (1) The time restrictions implied by the donor
- (2) The security problems restricting access to parts of the country

The implications of these restrictions, which seem to be frequently encountered in similar survey scenarios, will be discussed next.

Logistics

One of the most critical problems encountered when reviewing previous FAO livestock surveys in Afghanistan was the proper identification of location. As detailed in this report, considerable confusion persists about delineation of districts. As a result, unique identification of sampling units (typically mosque communities within village) for Level 1 (total enumeration) data collection was expected to be difficult. To remedy the problem of non-unique identification of sampling units, it was proposed to equip all surveying teams with GPS units for the recording of geographical coordinates that would ensure unique identification. However, the timeline set by the donor made it impossible to wait until all equipment had arrived. As a result, a major effort had to be invested in unique identification of locations (communities visited for total enumeration). This was a key problem in preparing the data for comparison with Level 2 data. Obviously, the translation from and into Dari and operational difficulties in maintaining translation standards compounded the problem. Nevertheless, the key lesson learned is that census quality is a direct function of available time for preparation and execution. In the preparation of a livestock census operation, all logistical problems must be analysed carefully and their impact on data quality assessed as conservatively as possible. It is critically important to maintain good and direct communications between the donor and the census team to ensure that spending deadlines do not impinge upon survey quality. If a census begins without the necessary preparation, delays in data analysis are unavoidable if minimal standards of data quality, integrity and utility are to be maintained.

Organization and Supervision

The number of people employed in the Afghanistan National Livestock Census indicates the scope and intensity of a task of this magnitude. Given the extraordinary difficulties accessing communities in Afghanistan, the extent to which farmers were reached constitutes a major achievement by itself. The organization scheme employing enumerator teams and supervisors in all provinces worked well for the data collection process. However, a critical problem that could have been prevented to a certain degree by reallocation of personnel resources became apparent during the data analysis process. As described above, one of the most difficult, and in some cases almost intractable problems is the differentiation between true zero responses, and no or missing responses. In particular in the calculation of summary statistics such as livestock per family, or number of young per adult female the confounding of true zeros and missing observations causes enormous problems that require considerable time to resolve. An important lesson learned in the Afghanistan National Livestock Census, therefore, is that consistency checking of data sheets and data entry should begin as soon as the first field data arrive at the census headquarters. As long as enumerators are in the field, corrections are possible with manageable effort. Post hoc data corrections are very difficult, time consuming and costly. Thus, not only is it necessary to employ a data entry team that facilitates consistency checking, there should be an additional team that interfaces between the enumerator – supervisor teams and the data entry teams. The task of this team should be the immediate checking of data sheets and identification of all instances of inconsistent information. It is necessary to develop a special manual for this team that facilitates this task. This manual should be developed during the testing phase of the survey.

Although an effort was made to ensure spelling consistency, the level of preparation of the data entry team was not consistent, especially in terms of knowledge of English. If language problems of the level of complexity encountered in Afghanistan are to be expected, data files should be checked by an additional group of personnel trained specifically to identify spelling consistency problems. Especially if multi-level surveys are conducted, comparisons between survey levels will be extremely time-consuming or even impossible if spelling problems have been resolved post-hoc.

Investment in adequate personnel support during data collection and data entry is the key factor in timely execution and analysis of livestock surveys.

Analysis

Most problems encountered in the analysis of the Afghanistan National Livestock Census data were caused by a few, well defined issues. Chief among them were: differentiation between true zeros and no/missing response, proper identification of location, and spelling inconsistency.

While the methods needed for census data analysis are not very sophisticated, comparison between levels or analysis of triangulated questions can be very involved, as the above section on comparison methodology suggests. More sophisticated methods will be useful only, however, if the quality of data matches their requirements. The most critical issue in survey statistics is the definition of the sampling frame and the appropriate definition of sampling size. As discussed above, this was not possible for Level 2 within the time frame set by the donor.

Livestock surveys are often necessary in post crisis situations, where very little if any tangible information needed for the construction of a sampling frame is available. In such cases, total enumeration should be considered as a first step, focusing on livestock numbers, number of families and, if it all possible, data that allow to derive a distribution of livestock wealth classes so that this important factor can be considered in subsequent survey work. After the analysis of total enumeration data, the next step for the development of a sampling frame for more detailed analyses would be the selection of villages/communities within district and province. For detailed Level 2 type surveys, a sampling frame can be developed based on the randomized selection of villages. In other words, the selection of survey units (farmers) following a national census would be a two step process, first developing a sampling frame for villages, and then for farmers (respondents) within villages.

The analysis of Level 2 data produced evidence of some questions not properly understood by respondents and enumerators. Although training was conducted, a manual was written and the survey was tested, few survey results are free of such problems. Accordingly, the important lesson learned is that extensive testing and in-depth analysis of test survey data pays high dividends in national census programs.

REFERENCES:

- Baptist, R. 1992. Derivation of steady state herd productivity. *Agricultural Systems* 39:253-272
- Biemer, P.P. & L.E. Lyberg. 2003. *Introduction to Survey Quality*. Wiley Interscience, 402 p.
- Chambers, R.L. & C.J. Skinner. 2003. *Analysis of Survey Data*. Wiley, London 376 p.
- CSO. 2003. *Estimated population of Afghanistan 2003-2004, Transitional Islamic State of Afghanistan*, Kabul, Afghanistan
- FAO. 1999. *Activities of the Kuchi Working Team*. Working Paper 1/99. FAO Kabul, Afghanistan
- FAO. 2003. *National Crop Output Assessment*. FAO Kabul, Afghanistan



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