

THE ROLE OF GENDER IN RANGELAND MANAGEMENT AND ITS PRODUCTIVITY

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Summary

The purpose of this study is to explore gender roles, relations, and internal overlap of responsibilities and activities in livestock production and rangeland management. The

female and male respondents were interviewed from Al-Mansoorah village in the northern Badia; from Al- Hazeem village in Al-Azraq city in the middle Badia, and from Al-Manshiyah village in the southern Badia. A sample of 286 respondents from the local community was considered as convenient for representing the local communities for each area (north, middle, and south). Considering the objective of this study, the respondents were targeted to include males and females equally from interviewed households. A structured questionnaire was developed to collect information about the different roles of males and females in rangeland productivity and management and the productivity of livestock. Quantitative techniques were used to generate information on gender roles in rangeland management and productivity based on the respondents' information and perceptions.

The information revealed differences in activities taken by women in the three sites. Activities related to barn management, preparation, cleaning, and water supply, was mainly women's responsibility in all three areas. Women in the southern and middle Badia had reflected a higher participation level than women living in the northern Badia. Nevertheless, women in south Badia had reflected higher participation and involvement in activities related to grazing and fodder supply. Responses from women living in southern Badia bring to light the women's responsibilities in fodder supply for livestock.

The survey results reflect the importance of women's role in all activities related to livestock production. Women and men are working side by side in livestock production, especially women living in the middle and northern Badia, as they have equal responsibilities with men in specific activities as sick animal care, care of pregnant sheep, weaning, and livestock products sellings. Except for women living in the southern Badia had the highest knowledge among the three sites specifically in the care of pregnant sheep, newborn care, shear wool, and weaning. Regarding sheep selling, the women from southern Badia had a high level of participation in this activity. The results showed that women in southern Badia earn financial returns for their participation in livestock production and grazing management, as women in this area had received the actual highest returns in form of livestock heads; on average women get 62.6 head in the year in return for her efforts in livestock production and grazing.

In conclusion, the decision making in rangeland management and its productivity should move beyond gender stereotypes of women herders as helpers and housekeepers and identify women herders as partners in breeding and owners of livestock flocks. Besides, men and women should be seen as complementary and both important in rangeland sustainably. Empowerment should be seen as individuals building constructive relationships through joint efforts and mutual support for better livelihoods and development.

1. Introduction

The total area of Jordan is about 8.9 million hectares (MOA, 2003), where 80% of the land is receiving less than 200 mm average rainfall. This area is recognized as the rangelands (Jordanian Badia), which plays an important role in providing natural feed for livestock with minimal or no costs. Grazing is considered a way of life for 22% of the population living in these areas. The transhumance system was mainly followed in the last century that allowed for natural regeneration of the natural vegetation cover. Nowadays, this situation no longer exists, as traditional grazing rights are neglected due to the increasing livestock population over carrying and the weak natural forage. In the 19th century, the nomadic grazing system was the most commonly used in the production system. In this system, flocks used to move all over the year looking for forage and water, recently, the rangeland had been under stress due to climate change and successive waves of livestock coming from neighboring countries as a result of political situations and wars.

The nomadic grazing system diminished and nomads settle in the marginal areas and started to cultivate some parts of the rangelands, with the low- potential of production, using rain-fed or irrigated methods. Considering the unfavorable environmental factors and using inappropriate farming methods, the rangelands started degradation and declining productivity. This affected the welfare of the settled families and forced the family members to work in other jobs. Consequently, many changes have occurred in the role of family members in herding sheep and taking care of the livestock all over the production process. Different tasks in rangeland and livestock management have been shifted among females and males of the same family, and other tasks were modified.

The current legislation in Jordan has contributed to the disappearance of the traditional common rangelands governance system, which has defined rangeland resting periods and access for entitled user groups in order to preserve resources. Changes in the traditional pastoral system had been reflected in the different roles and decisions made by the pastoral family. This requires exploring the changes in gender roles in pastoral and livestock management. Limited researches have been done on the knowledge and the

roles of gender in rangeland governance and the integration of gender pivot in rangeland governance.

2. Objectives of the study

The purpose of this study is to explore gender roles, relations, and internal overlap of responsibilities and activities in livestock production and rangeland management. The local communities in Jordanian Badia divided into three areas: (1) the northern Badia, (2) the middle Badia, and (3) the southern Badia. Overall, there is very little research conducted on gender issues (such as roles, relations, and responsibilities) in rangelands in Jordan. The results and information provided by this study are considered an important step towards bridging gender issues across roles, decision-making power, participation, productivity, and adaptation to climate change in rangeland management.

3. Methodology

3.1 Study areas

More than 90% of the Jordanian area is classified as arid areas, locally called “Jordanian Badia”, which derived its name from the land where Bedouins live and practice seasonal browsing. This area includes all lands receiving annual rainfall of 50 to 200 mm annually and has general characteristics of seasonal contrasts in temperature with high variations in rainfall within and among years. Badia in Jordan forms major natural rangeland that meets a considerable part of feeding requirements for livestock. The Badia extends from north to south along the eastern portion covering about 90 percent of the country’s total area (Image 1). Badia of Jordan can be subdivided into three main sub-geographical areas:

- The northern Badia, comprising 26,000 km².
- The middle Badia, comprising 10,000 km².
- The southern Badia, comprising 38,000 km².

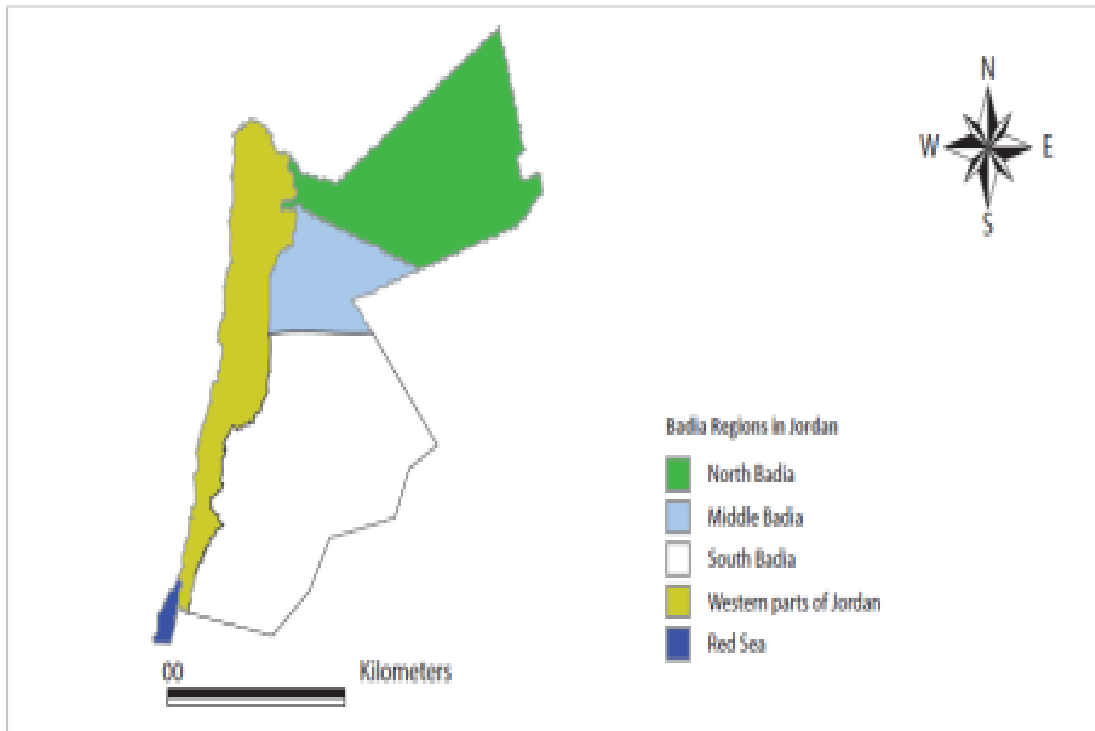


Image 1: Distribution of Jordanian Badia, Source: ICARDA 2012

3.2. Sampling and data collection

The survey aimed at collecting information from the males and females in the local communities within Jordan Badia, therefore respondents were interviewed from Al-Mansoorah village in the northern Badia; from Al-Hazeem village in Al-Azraq city in the middle Badia, and from Al-Manshiyeh village in the southern Badia. A sample of 286 respondents from the local community was considered as convenient for representing the local communities for each area (north, middle, and south). Considering the objective of this study, the respondents were targeted to include males and females equally from interviewed households.

The communities were considered having homogenous and there was no specific profile for selecting individual male and female respondents beyond their willingness to

participate in this study; therefore the respondents were targeted randomly and data collected using a face-to-face method (Table 1). A structured questionnaire was developed and pre-tested. The questionnaire aimed to collect information about the different roles of males and females in rangeland productivity and management and the productivity of livestock.

Table 1: Sample size, distribution between project locations, and gender distribution.

Respondent Gender	North Badia Site 1	Middle Badia Site 2	Southern Badia Site 3	All sample
	(%) number	(%) number	(%) number	(%) number
Male	(51.1) 48	(52.6) 50	(51.0) 49	(51.6) 147
Female	(48.9) 46	(47.4) 45	(49.0) 47	(48.4) 138
Sample size	94	95	96	285

The questionnaire was divided into five parts, which were revolved over the following topics:

1. Detailed information on the **household** type, and socio-economic characteristics for the head of the household and wife, besides household income.
2. Detailed information **livestock size, competent and ownership**, and information about pasture characteristics.
3. Detailed information about **livestock management** and the different tasks are done by males and females, level of women participation, besides respondent's opinion about who is preferred to do these tasks.
4. Detailed information about **livestock production** and the different tasks are done by males and females, level of women participation, besides respondents' opinion about who is preferred to do these tasks related to livestock production.
5. Information about economic returns for women participation in livestock management, women participation in capacity buildings initiatives, and women knowledge about grazing areas and water sources.

3.2. Statistical analysis

Specific data sheets were designed and coded based on the questionnaire parts and questions. Data were entered and analyzed using a program of "Statistical Package for the Social Sciences" (SPSS version 20). Quantitative techniques were used to generate information on gender roles in rangeland management and productivity based on the respondents' information and perceptions. Several tables synthesized the information regarding specific parameters on average values. While other parameters were generated based on the respondents' answers to open questions, these parameters will be presented in frequencies and percentages. These parameters are expected to visualize the gender roles in rangeland in Badia. Nevertheless, the output of using mixed methods of quantitative and qualitative methods strongly recommends that future studies should be supplemented by interviews and focus group discussion in order to provide additional detail in the findings.

4. Results and discussion

In this section, the results reflecting the gender roles in rangeland management and its productivity will be provided based on the three areas of Badia, whereas the last section will provide a comparison between the three areas of Badia

Each section is divided into the following subsections:

- **Socio-economic characteristics for the household's head and housewife**
- **Grazing and herd management**
- **Pasture and livestock management**
- **Livestock production**
- **Economic returns for women participation in livestock management and capacity buildings.**

The information provided in the following subsections demonstrates what we deem to be the most interesting and relevant findings. For further information and additional details, annexes (A-1, A-2, A-3) provide complete sets of tables' that represent the descriptive analysis of the questionnaire.

4.1 Northern Badia

4.1.1 Socio-economic characteristics for the household's head and housewife

This section provides information about the household head and household wife as the following: (1) gender (2) Educational level (3) Health status (4) Age (5) work experience (6) income and income sources.

About 95 respondents were interviewed from the surrounding villages in the northern project site. The sample had provided general information on the socio-economic characteristics of the household head and housewife (Table 2). Most of the respondents' are residents in the Al-Mansoura village. Most of the household heads were males (85%), married (81.9%), and were declared to be in a healthy condition (92.6%), but few were having diabetes as a chronic disease. The average age of the household head was about 51 years old, and on average they had 16.8 years of experience in livestock breeding and production. The average family sizes was about 7.3 people, and only on average 2.6 persons were working in livestock breeding and production.

Table 2: Socio-economic characteristics of the households

Socio-economic characteristics	Mean	Percent
Household Gender - male		85.1
Social Status for Household - married		81.9
Age (year s)	51.14	
experience in livestock breeding (year s)	16.85	
Average Monthly Income (JOD)	428.9	
Wife Age (Years)	44.87	

Both household heads and housewives were asked about their educational levels, the educational levels were ranked in 7 levels, from illiterate level till university degree. As shown in figure 1, where men had ranked the educational level mainly in three classes, about 27.7% of the sample has 7th -10th school grade, and other 20.2% had a high school degree. While women had relatively similar education levels, 31.9% 7th -10th school grade, and 23% had a high school degree. Women were relatively low percentage as illiterate (3%) compared with men (5%).

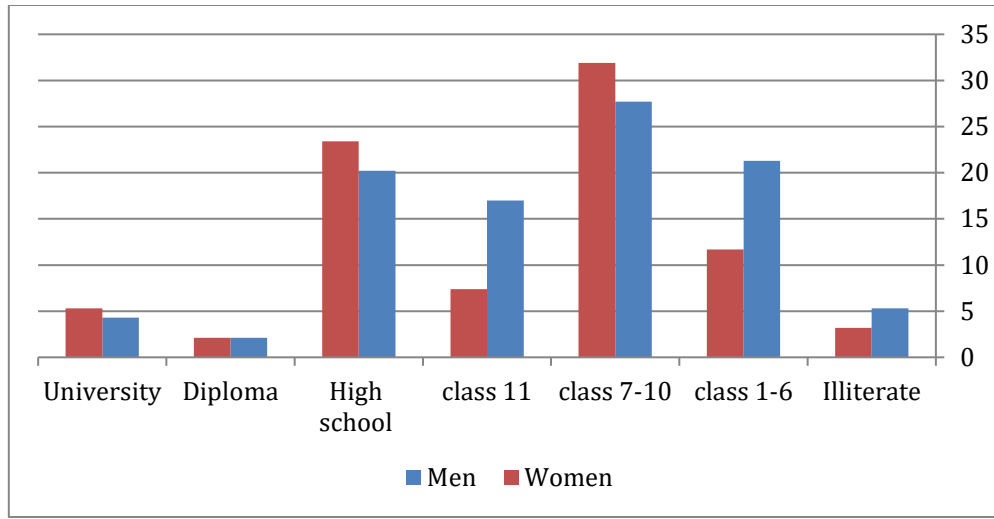


Figure 1: educational level of the household head and housewives

About 45.2 % of the heads of the household were retired and don't have additional jobs, while the other 13.1% were working in livestock breeding. Other 25% of the house heads were farmers, and just a few were working in military forces, private sector, and public sector. Moreover, the majority of the housewives were not working regardless of having an educational degree.

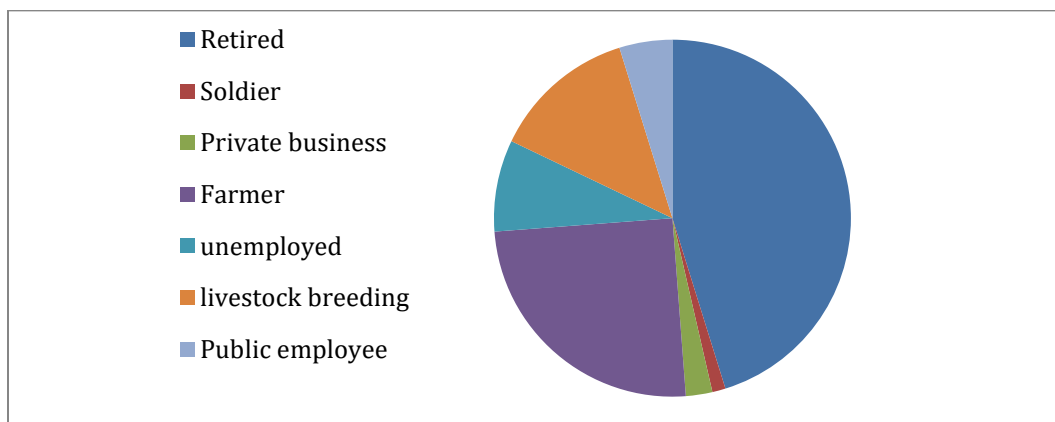


Figure 2: Work fields for the household heads.

4.1.2 Grazing and herd management

This section deals with the purposes of breeding livestock, ownership, and grazing management (Table 3). About 62% of the respondents work in livestock breeding for

trading purposes, while the other 47% raise livestock for domestic consumption. The respondents had on average 71 heads as average livestock flock size, and according to their statements, the average flock size of sheep was about 71 heads, other had on average 15 heads of goats and none of the interviewed respondents raised camels during the period of the data collection for this report. The respondents were asked about the ownership of the livestock, most of the men (91%) said they own the herds, while other 61% of women had stated that they own the herd. Some of the respondents had referred for having share ownership of the livestock.

Table 3: The purpose of breeding livestock and the ownership

	Percentage %	Mean
The livestock is raised for the benefit for :		
Home consumption %	47.3	
Trade%	61.88	
Kind of livestock types:		Mean
Number of sheep (head)	71.69	
Number of goats (head)	15.01	
Number of Camels (head)	0	
Total(head)	70.85	
Herd Ownership		Mean
For Men %		91.81
For Woman %		61.96

The respondents from northern Badia were asked about the locations where the livestock flocks are settled, main fodder sources, and the locations of the areas. The respondents had stated that the livestock flock is settled in three places: Sheds beside the home 73.5 %, Privet farms 3.9%, and Open Region 22.5%. From another point, 64% of the respondents said that the livestock flock depends on feed bought from the market, besides other considered grazing as the second fodder source (27%). Most of the herd breeders depend on the rumored land (61.6%) and private grazing land (30.3%) as the main

grazing locations, a few of the respondents (8.%) use the common land, that is located far away from the livestock barn (figure 3).

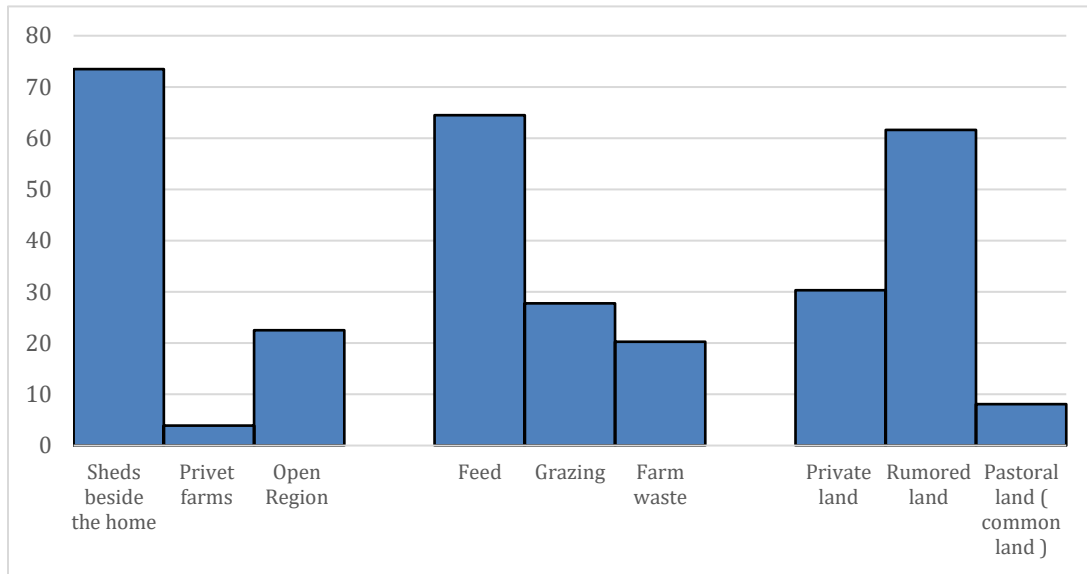


Figure 3: grazing and herd management

4.1.3 Gender role in grazing land and livestock management

This section deals with the pasture and livestock management and the women's participation in activities relevant to grazing and livestock management, which is measured the level of participation on a scale of 1- 10. Besides, how is taking the decision to do these activities, and finally respondents perception about how is preferred to do these activities (Table 4).

The respondents answered that women participate in barns preparations side by side of the men (figure 4), and men are the main decision-makers in this aspect as referred by 74%. While other 78.7% said that men should execute this activity. For cleaning barns, others said that they preferred that women participate in cleaning barns, and women and men (32%) share the process of making decisions about this activity. While 44.7% said that man should execute this activity.

Table 4: the management of the herd

tasks	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks : (1.Woman 2.Man)
	Number (Percent)	Number (Percent)
Preparing barns	Man:70(74.5)	Man:74(78.7)
Cleaning of barns	Man:37(39.4)	Man:42(44.7)
Buying the herd	Man:85(90.4)	Man:88(93.6)
Buying fodder	Man:71(75.5)	Man:85(90.4)
Collecting fodder / crop residue	Man:36(38.3)	Man:52(55.3)
Supervise grazing in nearby places	Woman:40(42.6) Man:52(55.3)	Woman:33(35.5) Man:55(58.5)
Supervise grazing in remote places	Man:79(84.1)	Man:82(87.3)
Supply water the flock	Man:36(38.3) Both:47(50.0)	Man:43(45.7) Both:46(48.9)

Regarding buying fodder or livestock heads, women had very low participation in these activities (2.5 and 2.8, respectively as shown in figure 4). Accordingly, the man was the main person to take the decision in buying fodder and additional head of livestock (85%-71%), and still men and women believe that man is the preferred person to do these activities (88%-85%). Moreover, women were not fully participating in supervising grazing in remote places (2.4 as in figure 4), and the respondent had declared that the man is the one who is making the decisions about this task and is the preferred person for this activity as mentioned by the interviewed participants.

On the other side, women had higher participation in activities of collecting fodder/crop residue, supervise grazing in nearby places, and Supply water to the flock. Both women and men are currently participating in collecting fodder and crop residue from near farms

(35% women, 36% men), but the respondents said that they prefer men to execute this activity (52%). Also, men and women were jointly supervising the grazing in near places; nevertheless, it is preferred to be done by men as stated (55%). Regarding water supply for the clock, both men and women are responsible to do this activity, and the respondents said that both men and women can execute this task effectively.

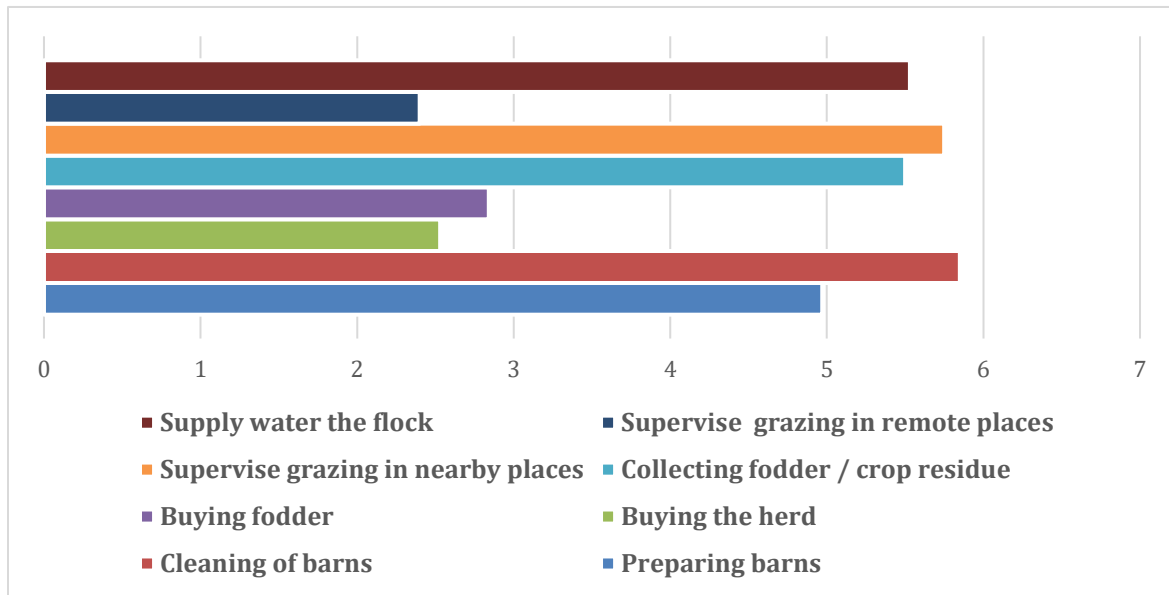


Figure 4: The level of women's participation in livestock-related activities

4.1.4 Gender roles in livestock production and products processing

This section deals with the tasks made for sustaining livestock productivity and the women's participation in activities relevant to livestock caring and production. This participation is measured on a scale of 1- 10. Besides, how is taking the decision to do these activities, and finally respondents perception about how is preferred to do these activities relevant to livestock production and caring (table 5).

The respondents preferred that women participate in caring for sick and pregnant sheep/goats (5.58, 5.98), besides taking care of the newborn animals (6.51) side by side of the men (figure 4), and men are the main decision-maker in this aspect as referred by 64%. While the other 74 % said that men should execute this activity. This probably due to the situations when animals need treatment and veterinarian consultations, in this situation men are prepared to make such contact and services. Others said that both men

and women participate in any decisions related to taking care of the newborn animals, but respondents stated that men (36%) or both men and women (34%) are preferred to execute this activity more than women alone (figure 4). On the other hand, women were participating more in t weaning the young animals (6.3), but men still taking participating in the decision making in this activity side by side with women (men 36%, women 35%), and the respondents emphasized that men (40.4%) and in other cases both men and women (37.2%).

Table 5: Gender roles in livestock production and product processing

tasks	decision maker (1.Woman 2.Man) Number (%)	Who do you prefer to do these tasks (1.Woman 2.Man) Number (%)
Caring for sick sheep	Man:61(64.9)	Man:71(75.5)
Care for pregnant females	Man:47(50.0)	Man:57(60.6)
Newborn care	Man:34(36.2)	Man:34(36.2)
Weaning	Man:34(36.2)	Man:38(40.4)
Wool shear	Man:70(74.5)	Man:81(86.2)
Wool cleaning, making carpets, pillows..etc	Woman:47(50.0)	Woman:45(47.9)
Milking the sheep	Woman:53(56.4)	Woman:43(45.7)
Manufacturing milk products (dairy, cheese)	Woman:74(78.7)	Woman:70(74.5)
Products marketing	Both:45(47.9)	Both:45(47.9)
Selling the sheep	Man:79(84.1)	Man:83(88.3)
Financing / Loans	Man:58(61.7)	Man:57(60.6)

Another activity related to livestock production is wool shear, this activity is one of the least executed or participated in by women (3.04), as many participants stated that men (70%) are responsible for taking most of the decisions related to shear wool, moreover,

they prefer that men to keep responsible in this task (86%), which reflects that this task is inappropriate to be done by women. On the other side, women are mostly involved in wool cleaning and making wool-home products as carpets (7.5), where the interviewed respondents said that women (50%) are more involved in taking the decisions in this activity, and they prefer maintaining women (47.9%) in the decision-making in this activity.

Regarding buying fodder or livestock heads, women had very low participation in these activities (2.5 and 2.8, respectively as shown in figure 4). Accordingly, the man was the main person to take the decision in buying fodder and additional head of livestock (85%-71%), and still men and women believe that man is the preferred person to do these activities (88%-85%). Moreover, women were not fully participating in supervising grazing in remote places (2.4 as in figure 4), and the respondent had declared that the man is the one who is making the decisions about this task and is the preferred person for this activity as mentioned by the interviewed participants.

Regarding manufacturing milk products (milk, cheese...), women had very high participation in this activity (8.46 as shown in figure 4). Accordingly, the woman was the main person to take the decision in manufacturing milk products (78.7%), and still, participants believe that women are the preferred person to do these activities (75%). Moreover, women were not well participating in marketing the milk products (5.55 as in figure 4), and the respondent had said that men and women are favored to be involved in making the decisions about this task.

Regarding selling the animals, women had a very low participation level in this activity (2.9 as shown in figure 4). Accordingly, the man was the main person to take the decision in selling the animal heads (84.1%), and still men and women believe that man is the preferred person to do the selling (88.3%). Moreover, women had well-established access to loans (4.2), and the respondents had declared that the man the one who is making the decisions about this task, and in other cases both men and women are involved in the decision making about taking loans (61%, 30.9% respectively),

nevertheless, man and woman are the preferable people for this activity as mentioned by the interviewed participants (60% and 29% respectively).

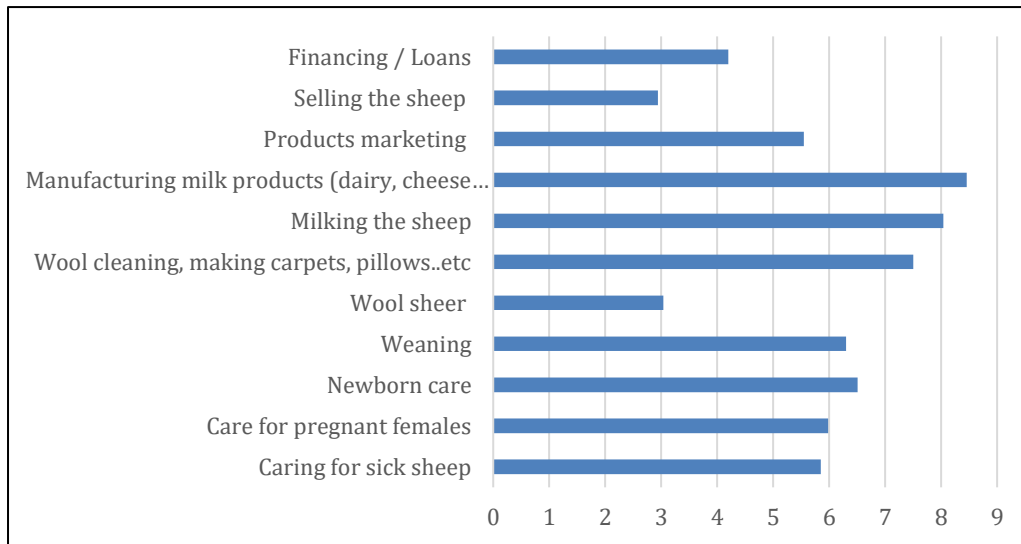


Figure 4: The level of women's participation in livestock production and products processing.

4.1.5 Women participation in financial returns, capacity building, and decision making

The respondents were asked about the financial returns that women can get for their participation in livestock production (Table 6). The interviewed respondents indicated that in 57% of cases women will not get direct financial returns for her participation in herd management and production. While other 42% of respondents pointed that women can get revenues for their given efforts in animal production and caring, and this type of return was said to be in cash as 66.7% of the respondents mentioned. But other women can get revenue as animal heads, and in these cases, the average returns were about 4.5 head/ year.

Moreover, respondents indicated that women in northern Badia don't participate in any activities for capacity building and initiatives for community developments (79%), and if they have such it where mainly through training courses and local committees and

associations related to pasture. On the other side, respondents were asked to assess women's knowledge in grazing areas and the locations of water sources. The respondents pointed that woman was familiar with the grazing areas at the level of (6.67 out of 10) and had given the same assessment for the level of knowledge about the location of water sources used for animal drinking while roaming in open grazing areas.

Table 6: Women participation in financial returns, capacity building, and decision making

	Mean	Percent
Does the woman get any return for her participation in managing and caring for the herd? %		
1. Yes		42.6
2.No		57.4
The nature of revenue		
1. Cash		66.7
2. Sheep heads		33.3
Number of Sheep heads	4.58	
Women participation		
1. Training courses		16.0
2. Local committees		1.1
3. Associations linked to pastures		3.2
4. Don't share		79.8
Determine (the nature of the sessions, committees, or associations in which women participate)		
1. Al-Jawhara Charitable Society		18.8
2. Dairy processing courses		8.3
Evaluate the woman's level of knowledge of the different grazing sites at the district level	6.67	
Evaluate the level of woman's Knowledge of sources for livestock drinking water	6.87	

4.2 Middle Badia

4.2.1 Socio-economic characteristics for the household's head and housewife

This section provides information about the household head and household wife as the following: (1) gender (2) Educational level (3) Health status (4) Age (5) work experience (6) income and income sources.

About 95 respondents were interviewed from the surrounding villages in the middle project site. The sample had provided general information on the socio-economic characteristics of the household head and housewife (Table 7). Most of the respondents' are residents of the Al-Azraq district. Most of the household heads were males (88%), married (87%), and were declared to be in a healthy condition (87.6%), but few had stated they are having diabetes and high blood pressure as a chronic disease. The average age of the household head was about 48 years old, and on average they had 17.3 years of experience in livestock breeding and production. The average family sizes was about 5.4 people, and only on average 2.88 persons were working in livestock breeding and production.

Table 7: Socio-economic characteristics of the households

Socio-economic characteristics	Mean	Percent
Household Gender - male		88.4
Social Status for Household - married		87.4
Health Status for Household - healthy		87.4
Age (years)	48.38	
experience in livestock breeding	17.33	
Average Monthly Income	310	
Wife Age	41.52	
Number of family members	5.4	
Number of family members working in animal production	2.88	

Both household heads and housewives were asked about their educational levels, the educational levels were ranked in 7 levels, from illiterate level till university degree. As shown in figure 5, where men had ranked the educational level mainly in three classes, about 20 % of the sample were illiterate and other 20% were in class 7-10 grade, while other 25% had a high school degree. While women had relatively lower school education

levels, 14% were in 7th -10th school grade, and 15 % had a graduate degree. Women had a relatively higher percentage of illiterate (30%) compared with men (20%), even though with such higher education, 84% of the women were not working.

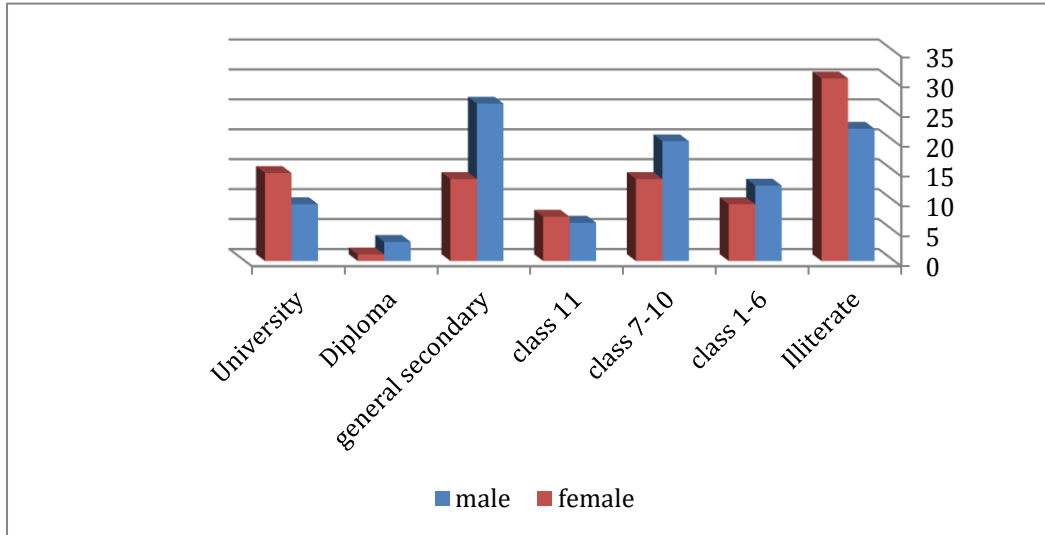


Figure 5: household head and wife education

About 25 % of the heads of the households were retired and don't have additional jobs, while the other 8.4% were working in livestock breeding. Other 10.5 % of the house heads were farmers, and just a few were working in military forces, private sector, and public sector. Moreover, the majority of the household heads were working in the governmental sector, and the other 10.5% were not working.

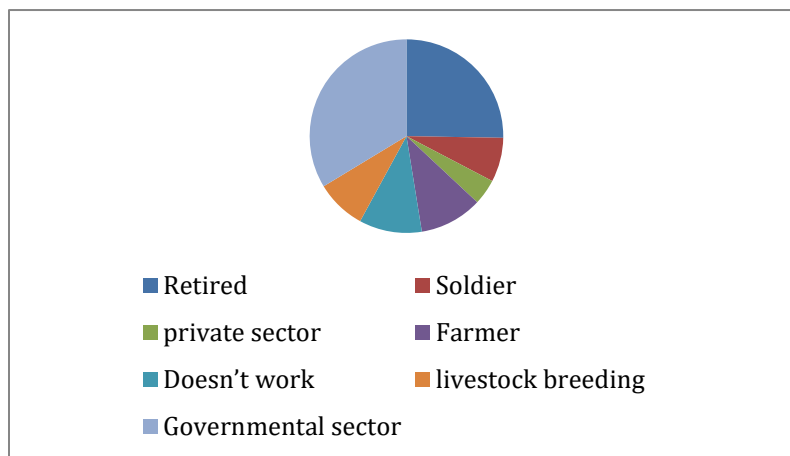


Figure 6: Households heads' jobs in the middle project site.

4.2.2 Grazing and herd management

This section deals with the purposes of breeding livestock, ownership, and grazing management (Table 8). About 54% of the respondents work in livestock breeding for trading purposes, while the other 57% raise livestock for domestic consumption (some of the respondents raise livestock for both purposes). The respondents had on average 19 heads as average livestock flock size, and according to their statements, the average flock size of sheep was about 13 heads, other had on average 11 heads of goats, and about in average 4 heads of camels. The respondents were asked about the ownership of the livestock, most of the men (87%) said they own the herds, while other 63% of women had stated that they own the herd, some of the respondents had referred for having share ownership of the livestock.

Table 8: the purpose of breeding livestock and the ownership

	Percentage %
The livestock is raised for the benefit for :	
Home consumption %	57.60
Trade%	54.35
Kind of livestock types:	
Number of sheep (head)	12.67
Number of goats (head)	10.63
Number of Camels (head)	3.86
Total(head)	19.18
Herd Ownership	Number
For Men %	86.67
For Woman %	63.43

The respondents from middle Badia were asked about the locations where the livestock flocks are settled, main fodder sources, and the locations of the areas (figure 7). The respondents had stated that the livestock flock is settled in three places: Sheds beside the home 71%, Privet farms 13%, and Open Region 16%. From another point, 72% of the respondents said that the livestock flock depends on feed bought from the market, besides other considered grazing as the second fodder source (27%). Most of the herd breeders depend on the rumored land (43%) and private grazing land (51%) as the main grazing

locations, a few of the respondents (6%) use the common land, which is located far away from the livestock barn.

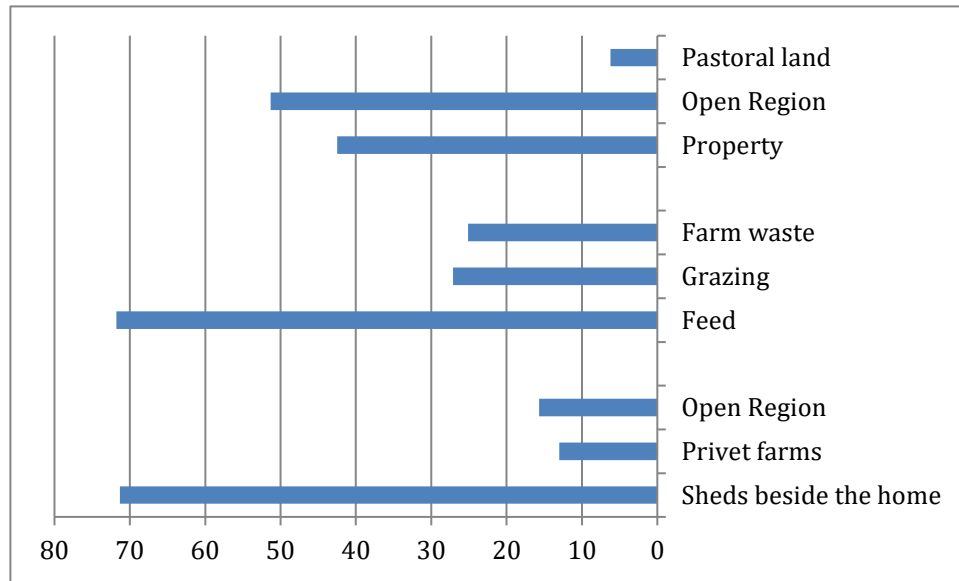


Figure 7: grazing and herd management

4.2.3 Gender role in grazing land and livestock management

This section deals with the pasture and livestock management and the women's participation in activities relevant to grazing and livestock management, which is measured the level of participation on a scale of 1- 10. Besides, how is taking the decision to do these activities, and finally respondents perception about how is preferred to do these activities (Table 9, figure 8).

The respondents preferred that women participate in barns preparations side by side of the men (figure 8), and men are the main decision-maker in this aspect as referred by 34%. While the other 41% said that women should execute this activity. Others said that they preferred that women participate in cleaning barns, and women and men (36%) share the process of making decisions about this activity. While the other 47% said that women should execute this activity.

Table 9: the management of the herd

tasks	decision maker (1.Woman 2.Man) Number(%Percent)	Who do you prefer to do these tasks (1.Woman 2.Man) Number(%Percent)
Preparing barns	Woman:33(34.7)	Woman:39(41.1)
Cleaning of barns	Woman: 34(35.8)	Woman:45(47.4)
Buying the herd	Man:72(75.8)	Man:84(88.4)
Buying fodder	Man:71(74.7)	Man:84(88.4)
Fodder / crop residue collection	Man:59(62.2)	Man:74(77.9)
Grazing in nearby places	Man:45(47.4)	Man:56(58.9)
Grazing in remote places	Man:52(54.7)	Man:69(72.6)
Water the flock	Both:48(50.5)	Both:39(41.1)

Regarding buying fodder or livestock heads, women had very low participation in these activities (2.5 and 2.2, respectively as shown in figure 8). Accordingly, the man was the main person to take the decision in buying fodder and additional head of livestock (76%-75%), and still men and women believe that man is the preferred person to do these activities (88%). Moreover, women were not fully participating in supervising grazing in remote places (2.7 as in figure 8), and the respondent had declared that the man is the one who is making the decisions about this task (55%) and also is the preferred person for this activity as mentioned by the 73% interviewed participants.

Moreover, women had low participation in activities of collecting fodder/crop residue, supervise grazing in nearby places, and but not for supplying water to the flock. Both men are currently participating in collecting fodder and crop residue from near farms (62%), besides, the respondents said that they prefer men to execute this activity (78%). Also, men and women were jointly supervising the grazing in near places (48% men, and

33% women); nevertheless, it is preferred to be done by men as stated (59%). Regarding water supply for the flock, both men and women are responsible to do this activity (50%), and the respondents said that both men and women can execute this task effectively (41%) and also women as well (35%).

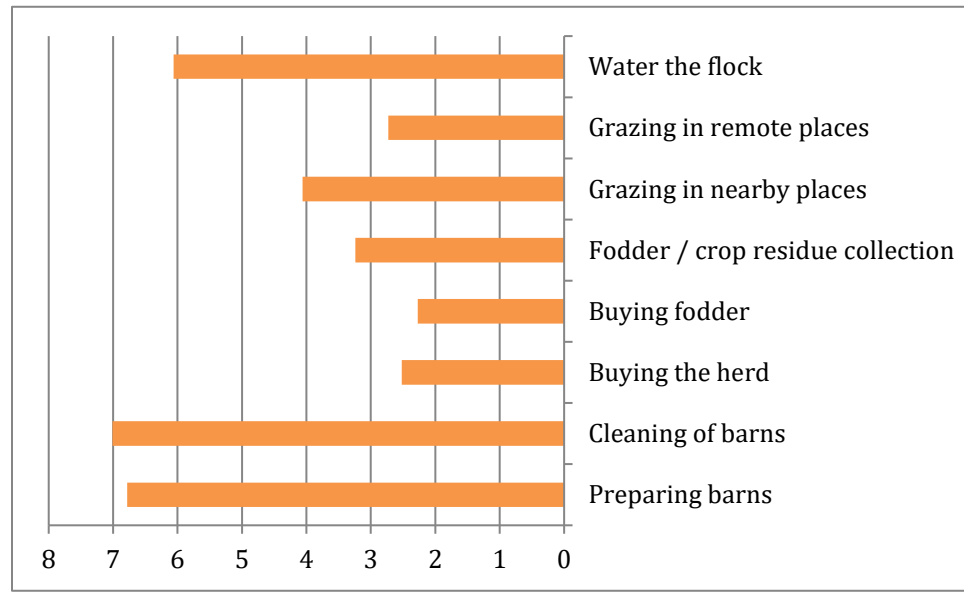


Figure 8: The level of women's participation in livestock-related activities

4.2.4 Gender roles in livestock production and products processing

This section deals with the tasks made for sustaining livestock productivity and the women's participation in activities relevant to livestock caring and production. This participation is measured on a scale of 1- 10. Besides, how is taking the decision to do these activities, and finally respondents perception about how is preferred to do these activities relevant to livestock production and caring (table 10).

The respondents preferred that women participate in caring for sick and pregnant sheep/goats (5.52, 5.93), besides taking care of the newborn animals (6.05) side by side of the men (figure 4), and women and men are the main decision-maker in this aspect as referred by 43%. While the other 38 % said that men should execute this activity, and as well by both men and women (33%). This probably due to the situations when animals need treatment and veterinarian consultations, in this situation men are prepared to make such contact and services. Others said that both men and women (41%) participate in any

decisions related to taking care of the newborn animals, but respondents stated that women (43%) or both men and women (36%) are preferred to execute this activity more than men alone (figure 9). On the other hand, women were participating more in the weaning the young animals (6.2), but men still taking participating in the decision making in this activity side by side with women (41%), and the respondents had emphasized that women (42%) and in other cases both men and women (36%).

Another activity related to livestock production is wool shear, this activity is done by women (4.16), as many participants stated that men (44%) are responsible for taking most of the decisions related to shear wool, moreover, they prefer that men to keep responsible in this task (54%), which reflects that this task is inappropriate to be done by women. On the other side, women are mostly involved in wool cleaning and making wool-home products as carpets (6.44), where the interviewed respondents said that men and women (43%) are more involved in taking the decisions in this activity, and they prefer maintaining women (41%) in the decision-making in this activity.

Regarding milking and manufacturing milk products (milk, cheese...), women had very high participation in this activity (8.59 and 9.04, respectively as shown in figure 7). Accordingly, the woman was the main person to take the decision in milking and manufacturing milk products (52% and 60%), and still, participants believe that women are the preferred person to do these activities (75% -81%). Moreover, women were not well participating in marketing the milk products (4.35 as in figure 9), and the respondent had said that men are favored to be involved in making the decisions about this task (44%).

Regarding selling the animals, women had a very low participation level in this activity (2.55 as shown in figure 9). Accordingly, the man was the main person to take the decision in selling the animal heads (70%), and still men and women believe that man is the preferred person to do the selling (78%). Moreover, women had well-established access to loans (4.0), and the respondents had declared that the man the one who is making the decisions about this task, and in other cases men are involved in the decision making about taking loans (61%), nevertheless, man and woman are the preferable

people for this activity as mentioned by the interviewed participants (61% and 34% respectively).

Table 10: Gender roles in livestock production and products processing

tasks	decision maker (1.Woman 2.Man) Number &Percent	Who do you prefer to do these tasks (1.Woman 2.Man) Number &Percent
Caring for sick sheep	Both:41(43.2)	Man:36(37.9)
Care for pregnant	Both:40(42.1)	Woman:41(43.2)
Newborn care	Both:39(41.1)	Woman:41(43.2)
Weaning	Both:39(41.1)	Woman:40(42.1)
Shear wool	Man:42(44.3)	Man:51(53.7)
Wool cleaning, stretchy pillows	Both:41(43.2)	Woman:41(43.2)
Milk the sheep	Woman:50(52.6)	Woman:72(75.8)
Manufacturing (dairy, cheese)	Woman:57(60.0)	Woman:77(81.1)
Marketing of products	Man:42(44.2)	Man:48(50.6)
Sheep selling	Man:67(70.5)	Man:74(77.9)
Financing / Loans	Man:58(61.1)	Man:58(61.1)

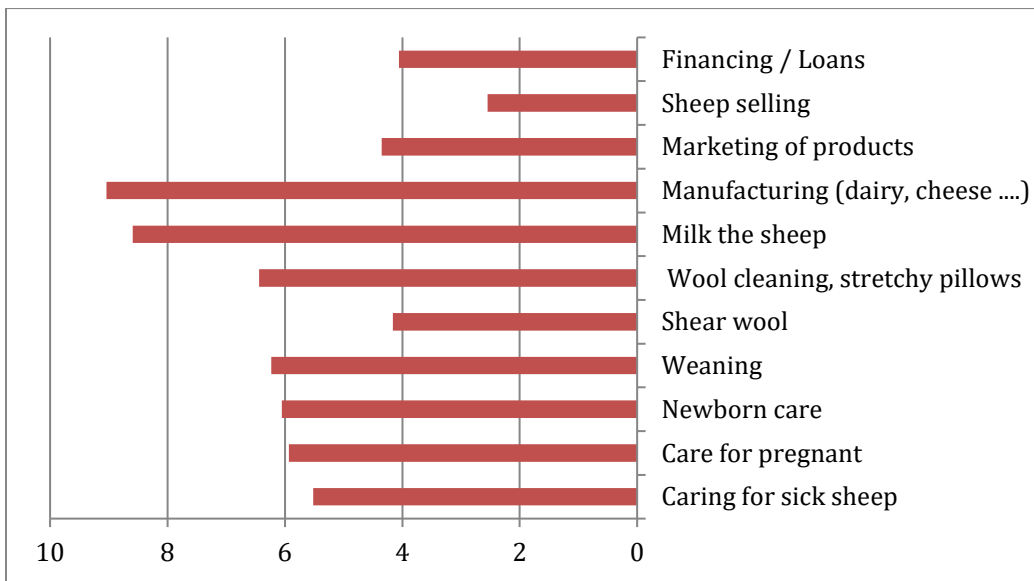


Figure 9: The level of women's participation in livestock-related activities of production and products processing

4.2.5 Women participation in financial returns, capacity building and decision making

The respondents were asked about the financial returns that women can get for their participation in livestock production (Table 11). The interviewed respondent had indicated that in 53.7% of cases women will not get direct financial returns for her participation in herd management and production. While other 46 % of respondents pointed that women can get revenues for their given efforts in animal production and caring, and this type of return was said to be in cash as 69 % of the respondents mentioned. But other women can get revenue as animal heads, and in these cases, the average returns were about 14.5 head/ year.

Table 11: Women participation in financial returns, capacity building and decision making

	Mean	Percent
Does the woman get any return for her participation in managing and caring for the herd?		
1. Yes		46.3
2.No		53.7
The nature of revenue		
Cash		69.6
Sheep heads		30.4
Number of Sheep heads	14.5	
Women participation		
Training courses		22.5
Local committees		4.9
Associations linked to pastures		2.9
Don't share		69.6
Determine (the nature of the sessions, committees, or associations in which women participate)		
Al Irfan Charitable Society		1.1
Dairy processing courses		16.8
The herd care cycle		4.2
Evaluate the woman's level of knowledge of the different grazing sites at the district level	5.59	
Evaluate the level of woman's Knowledge of sources for livestock drinking water	6.33	

Moreover, respondents indicated that women in southern Badia don't participate in any activities for capacity building and initiatives for community developments (69.6%), and if they have such it where mainly through training courses and local committees and associations related to pasture.

On the other side, respondents were asked to assess women's knowledge in grazing areas and the locations of water sources. The respondents pointed that woman was familiar with the grazing areas at the level of (5.59 out of 10) and had given about 6.33 on scale for the level of knowledge about the location of water sources used for animal drinking while traveling in open grazing areas.

4.3 Southern Badia

4.3.1 Socio-economic characteristics for the household's head and housewife

This section provides information about the household head and household wife as the following: (1) gender (2) Educational level (3) Health status (4) Age (5) work experience (6) income and income sources.

About 96 respondents were interviewed from the surrounding villages in the middle project site. The sample had provided general information on the socio-economic characteristics of the household head and housewife (Table 12). Most of the respondents are living surrounding Mansheya protected area Badia / Athrah district. Most of the household heads were males (84%), married (80%), and were declared to be in a healthy condition (87%), but few had stated they are having diabetes as a chronic disease. The average age of the household head was about 51 years old, and on average they had 18.6 years of experience in livestock breeding and production. The average family size was about 7.6 people, and only on average 3 persons were working in livestock breeding and production.

Table 12: Socio-economic characteristics of the households

Socio-economic characteristics	Mean	Percent
Household Gender - male		84.4
Social Status for Household - married		80.2
Health Status for Household - healthy		87.5
Age (years)	50.9	
experience in livestock breeding	18.68	
Average Monthly Income	360	
Wife Age	43.96	
Number of family members	7.63	
Number of family members working in animal production	3.02	

Both household heads and housewives were asked about their educational levels, the educational levels were ranked in 7 levels, from illiterate level till university degree. As shown in figure 10, where men had ranked the educational level mainly in three classes, about 27 % of the sample were illiterate and other 22% were in class 11 grade, while other 14% had a high school degree. While women had relatively lower school education levels, 10% were in 7th -10th school grade, and 7 % had a graduate degree. Women were relatively higher percentage as illiterate (33%) compared with men (27%), though with such lower education, 75% of the women were not working.

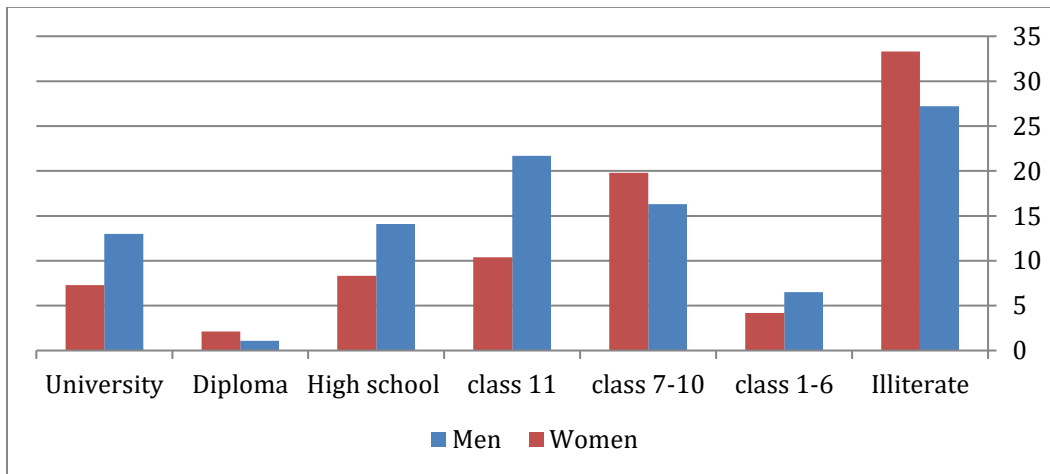


Figure 10: household head and wife education

About 50.6 % % of the house heads were retired and don't have additional jobs, while the other 1.1% were working in livestock breeding. Other 6.7 % of the house heads were farmers, and just a few were working in military forces, private sector, and public sector. Moreover, the 18% of the households' heads were working in governmental sector, and other 11.2% were not working.

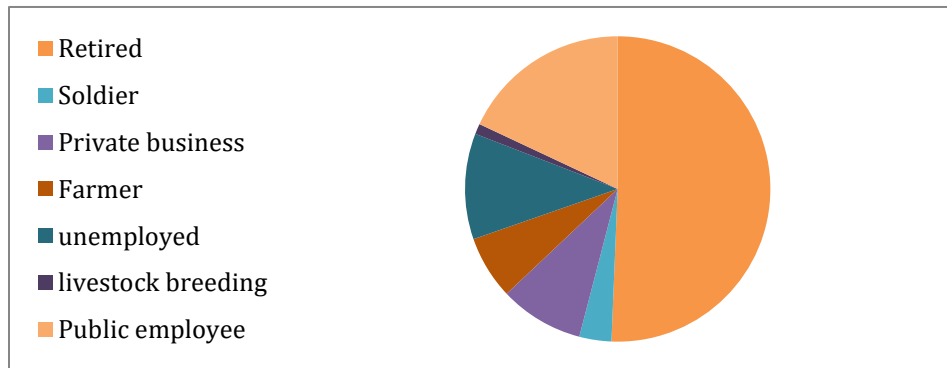


Figure 11: Households heads' jobs in south project site.

4.3.2 Grazing and herd management

This section deals with the purposes of breeding livestock, ownership, and grazing management (Table 13). About 57% of the respondents work in livestock breeding for trading purposes, while the other 53% raise livestock for domestic consumption (some of the respondents raise livestock for both purposes). The respondents had on average 206 heads as average livestock flock size, and according to their statements, the average flock size of sheep was about 97 heads, other had on average 84 heads of goats, and about in average 208 heads of camels. The respondents were asked about the ownership of the livestock, most of the men (82%) said they own the herds, while other 55% of women had stated that they own the herd, some of the respondents had referred for having share ownership of the livestock.

Table 13: purpose of breeding livestock and the ownership

	Percentage %
The livestock is raised for the benefit for _:	
Home consumption %	57.07
Trade%	53.67
Kind of livestock types:	
Number of sheep (head)	97.46
Number of goats (head)	84.23
Number of Camels (head)	208.83
Total(head)	206.41
Herd Ownership	
For Men %	82.41
For Woman %	55.52

The respondents from southern Badia were asked about the locations where the livestock flocks are settled, main fodder sources, and the locations of the areas (figure 12). The respondents had stated that the livestock flock is settled in three places: Sheds beside the home 44%, Privet farms 15%, and Open Region 41%. From another point, 71% of the respondents said that the livestock flock depends on feed bought from the market, besides other considered grazing as the second fodder source (28%). Most of the herd breeders depend on the rumored land (45%) and private grazing land (11%) as the main grazing locations, a few of the respondents (44%) use the common land, that is located far away from the livestock barn.

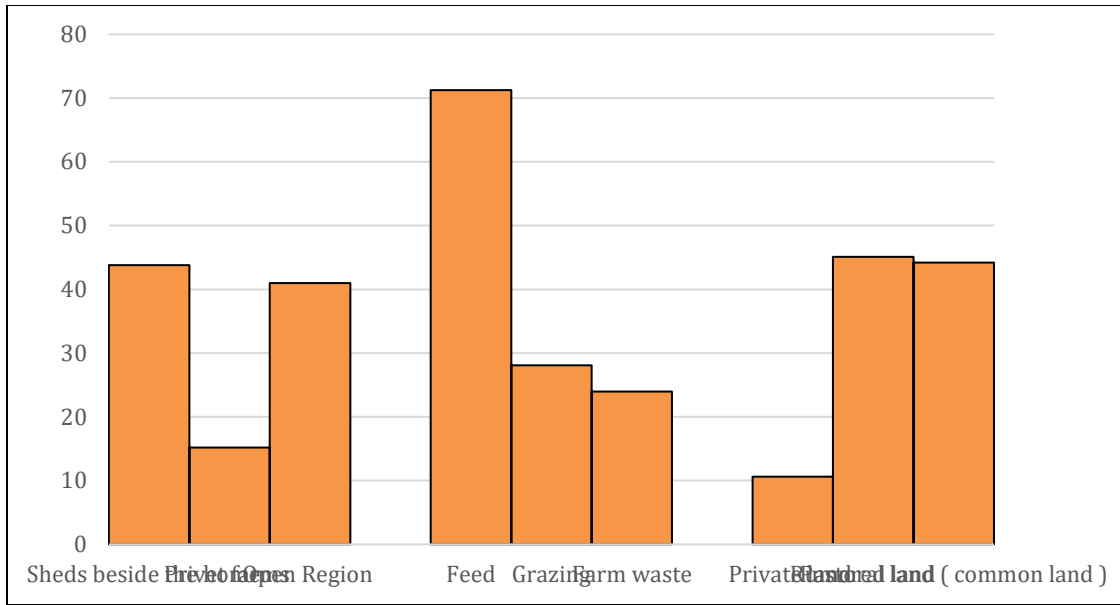


Figure 12: grazing and herd management

4.3.3 Gender role in grazing land and livestock management

This section deals with the pasture and livestock management and the women's participation in activities relevant to grazing and livestock management, which is measured the level of participation on a scale of 1- 10. Besides, how is taking the decision to do these activities, and finally respondents perception about how is preferred to do these activities (Table 14, figure 13).

The respondents preferred that women participate in barns preparations side by side of the men (figure 13), and men are the main decision-maker in this aspect as referred by 61%, and they should also execute this activity as referred by 55%. Others said that they preferred that women participate in cleaning barns, and the men (52%) to make decisions about this activity, beside women (40%).

Regarding buying fodder or livestock heads, women had very low participation in these activities (3.75 and 2.94, respectively as shown in figure 5). Accordingly, the man was the main person to take the decision in buying fodder and additional head of livestock (79%- 82%), and still men and women believe that man is the preferred person to do these activities (70%- 75%). Moreover, women were not fully participating in supervising grazing in remote places (3.9 as in figure 13), and the respondent had

declared that the man is the one who is making the decisions about this task (74%) and also is the preferred person for this activity as mentioned by the 70% interviewed participants.

Table 14: the management of herd

tasks	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Number &Percent	Number &Percent
Preparing barns	Man:59(61.4)	Man:53(55.2)
Cleaning of barns	Woman: 55(57.3)	Man:50(52.1)
Buying the herd	Man:76(79.2)	Man:68(70.8)
Buying fodder	Man:79(82.3)	Man:72(75.0)
Fodder / crop residue collection	Woman:42(43.8)	Man:57(59.4)
Grazing in nearby places	Woman:45(46.9)	Man:61(63.5)
Grazing in remote places	Man:71(74.0)	Man:67(69.8)
Water the flock	Man:52(54.1)	Man:50(52.1)

Moreover, women had high participation in activities of collecting fodder/crop residue, supervise grazing in nearby places, and but not for supplying water to the flock. Only women are currently participating in collecting fodder and crop residue from near farms (43 %), besides, the respondents said that they prefer men to execute this activity (60%). Also, men and women were jointly supervising the grazing in near places (48% men, and 33% women); nevertheless, it is preferred to be done by men and women as stated (43%-47%). Regarding water supply for the flock, both men and men are responsible to do this activity (54%), and the respondents said that men can execute this task effectively (70%) and also women as well (21%).

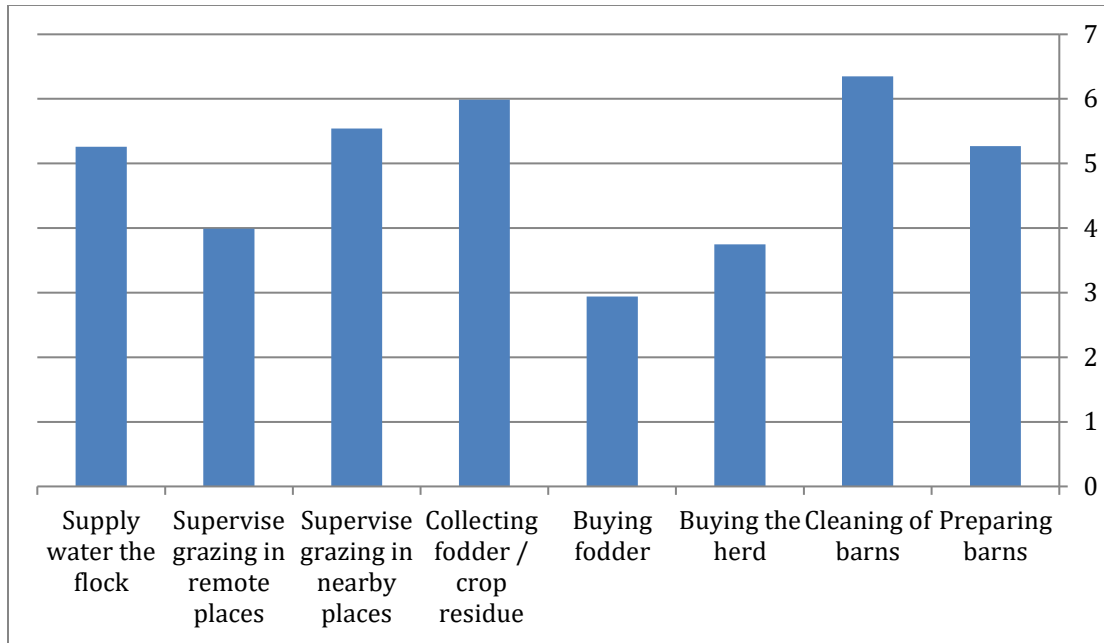


Figure 13: The level of women's participation in livestock-related activities

4.3.4 Gender roles in livestock production and products processing

This section deals with the tasks made for sustaining livestock productivity and the women's participation in activities relevant to livestock caring and production. This participation is measured on a scale of 1- 10. Besides, how is taking the decision to do these activities, and finally respondents perception about how is preferred to do these activities relevant to livestock production and caring (table 15, figure 14).

The respondents preferred that women participate in caring for sick and pregnant sheep/goats (6.26, 6.74), besides taking care of the newborn animals (7.2) side by side of the men (figure 13), and women are the main decision-maker in this aspect as referred by more than 50%. While the other 71 % said that men should execute caring of sick animals. This probably due to the situations when animals need treatment and veterinarian consultations, in this situation men are prepared to make such contact and services. Others said that only women (66%) participate in any decisions related to taking care of the newborn animals, but respondents stated that women (71%) are preferred to execute this activity more than men alone (figure 14). On the other hand, women were

participating more in the weaning the young animals (6.7), but both women and men are taking the decision making in this activity side by side (51%- 45), and the respondents had emphasized that men (62%) are preferred to do this activity.

Another activity related to livestock production is wool sheer, this activity is done in by women (4.9), as many participants stated that men (59%) are responsible for taking most of the decisions related to shear wool, moreover, they prefer that men to keep responsible in this task (64%), which reflects that this task is inappropriate to be done by women. On the other side, women are mostly involved in wool cleaning and making wool-home products as carpets (7.9), where the interviewed respondents said that women (76%) are more involved in taking the decisions in this activity, and they prefer maintaining women (76%) in the decision-making in this activity.

Table 15: Gender roles in livestock production and products processing

tasks	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Number &Percent	Number &Percent
Shear wool	Man:57(59.4)	Man:61(63.5)
Wool cleaning, stretchy pillows	Woman:70(72.9)	Woman: 73(76.0)
Milk the sheep	Woman:77(80.2)	Woman:70(72.9)
Manufacturing (dairy, cheese)	Woman:76(79.2)	Woman:68(70.8)
Marketing of products	Man:59(61.5)	Man:49(51.0)
Sheep selling	Man:82(85.4)	Man:75(78.1)
Financing / Loans	Man:60(62.5)	Man:71(74.0)

Regarding milking and manufacturing milk products (milk, cheese...), women had very high participation in this activity (8.28 and 6.33, respectively as shown in figure 14). Accordingly, the woman was the main person to take the decision in milking and manufacturing milk products (80% and 79%), and still, participants believe that women are the preferred person to do these activities (73% -71%). Moreover, women were participating in marketing the milk products (6.33 as in figure 7), but involved in decision making (61%), and the respondent had said that men are favored to be involved in making the decisions about this task (51%).

Regarding selling the animals, women had a very low participation level in this activity (3.7 as shown in figure 14). Accordingly, the man was the main person to take the decision in selling the animal heads (85%), and still men and women believe that man is the preferred person to do the selling (78%). Moreover, women had well-established access to loans (2.57), and the respondents had declared that the man the one who is making the decisions about this task, and in other cases men are involved in the decision making about taking loans (62%), and also man woman are the preferable people for this activity as mentioned by the interviewed participants (78%).

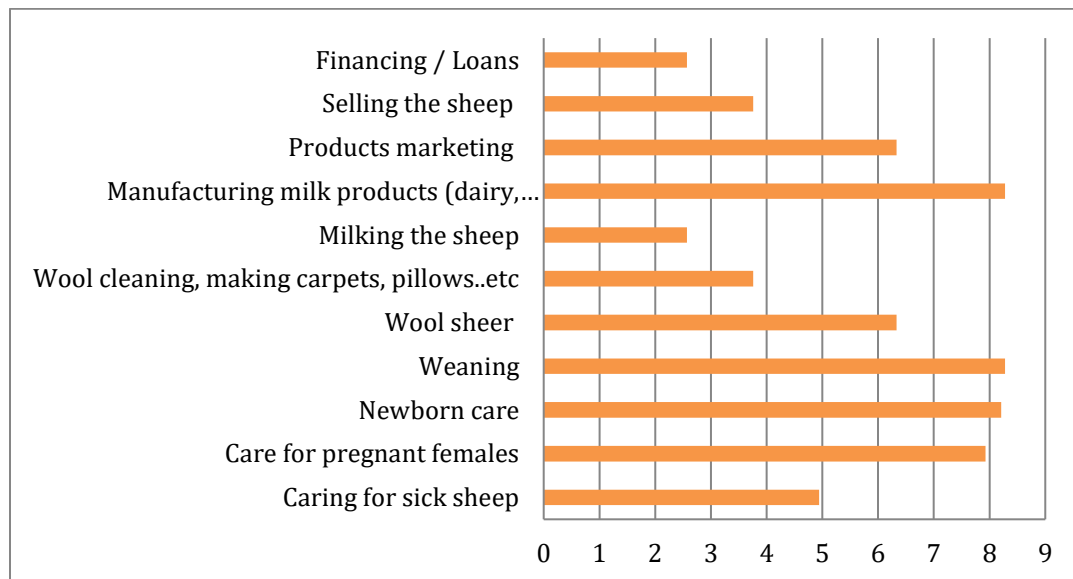


Figure 14: The level of women's participation in livestock production and products processing.

4.3.5 Women participation in financial returns, capacity building and decision making

The respondents were asked about the financial returns that women can get for their participation in livestock production (Table 16). The interviewed respondent had indicated that in 39% of cases women will not get direct financial returns for her participation in herd management and production. While other 61% of respondents pointed that women can get revenues for their given efforts in animal production and caring, and this type of return was said to be in cash as 81% of the respondents mentioned. But other women can get revenue as animal heads, and in these cases, the average returns were about 62 head/ year.

Table 16: Women participation in financial returns, capacity building and decision making

	Number	Percent
Does the woman get any return for her participation in managing and caring for the herd?		
1. Yes	58	61.1
2.No	37	38.9
The nature of revenue		
3. Cash	48	81.4
4. Sheep heads	11	18.6
Number of Sheep heads	mean	62.67
Women participation		
Training courses	9	9.1
Local committees	3	3.0
Associations linked to pastures	16	16.2
Don't share	71	71.7
Determine (the nature of the sessions, committees, or associations in which women participate)		
Al Irfan Charitable Society	18	18.8
Dairy processing courses	8	8.3
Evaluate the woman's level of knowledge of the different grazing sites at the district level	mean	7.69
Evaluate the level of woman's Knowledge of sources for livestock drinking water	mean	7.42

Moreover, respondents indicated that women in southern Badia don't participate in any activities for capacity building and initiatives for community developments (72%), and if they have such it where mainly through training courses and local committees and associations related to pasture.

On the other side, respondents were asked to assess women's knowledge in grazing areas and the locations of water sources. The respondents pointed that woman was familiar with the grazing areas at the level of (7.6 out of 10) and had given about 7.4 on scale for the level of knowledge about the location of water sources used for animal drinking while traveling in open grazing areas.

6. Comparison and Conclusions

This report summarizes collected data about the gender roles in rangeland management and its productivity, which will form a guide for HERD project "Healthy Ecosystems for Rangeland Development" to enhance rangeland development through identifying, and strengthen local communities at the study sites in Jordan. The

Livestock producers in Badia have traditionally adapted to various environmental and climatic changes by building on their in-depth knowledge of the environment in which they live. However, the expanding human population, urbanization, environmental degradation, and increased consumption of animal source foods have changed and/or rendered some of those coping mechanisms ineffective. Thus, this section will provide the most important features that could act as benchmarks of similarities and differences between the project sites of gender roles in rangeland management and livestock production, and act as triggers for interventions for achieving the overall objective of the HERD project.

Gender responsibilities in rangeland management: The following figure (Figure 15) represents a comparison of the level of women's involvement in specific activities related to rangeland use. The information revealed differences in activities taken by women in the three sites. Activities related to barn management, preparation, cleaning, and water supply, was mainly women's responsibility in all three areas. Women in the southern and

middle Badia had reflected a higher participation level than women living in the northern Badia. Nevertheless, women in south Badia had reflected higher participation and involvement in activities related to grazing and fodder supply. Responses from women living in southern Badia bring to light the women's responsibilities in fodder supply for livestock, either in collecting plant residues from agricultural land, supervising the grazing in nearby areas, and also in remote places, and in buying foddors from traders and markets.

Furthermore, the respondents for this study had reflected a strong belief that women have sufficient knowledge of the different grazing sites at the district level, whereas the level of knowledge ranged from 5.59 for those in the middle Badia and the highest level was for women living in the southern Badia (7.69). This also implies the knowledge of livestock drinking water; the women from southern Badia reflected a higher level of knowledge.

Gender responsibilities in livestock production: the results presented in Figure 16 demonstrated an adequate level of harmony among different respondents about women's participation in various activities of livestock production. The survey results reflect the importance of women's role in all activities related to livestock production. Women and men are working side by side in livestock production. especially women living in the middle and northern Badia, as they have equal responsibilities with men in specific activities as sick animal care, care of regnant sheep, weaning, and livestock products selling's. Except for women living in the southern Badia had the highest knowledge among the three sites specifically in the care of pregnant sheep, newborn care, shear wool, and weaning. Besides that, women were more involved in activities related to milking and milk processing products, especially by women from southern Badia. Regarding sheep selling, the women from southern Badia had a high level of participation in this activity. The results showed that women in southern Badia earn financial returns for their participation in livestock production and grazing management, as women in this area had received the actual highest returns in form of livestock heads; on average women get 62.6 head in the year in return for her efforts in livestock production and grazing.

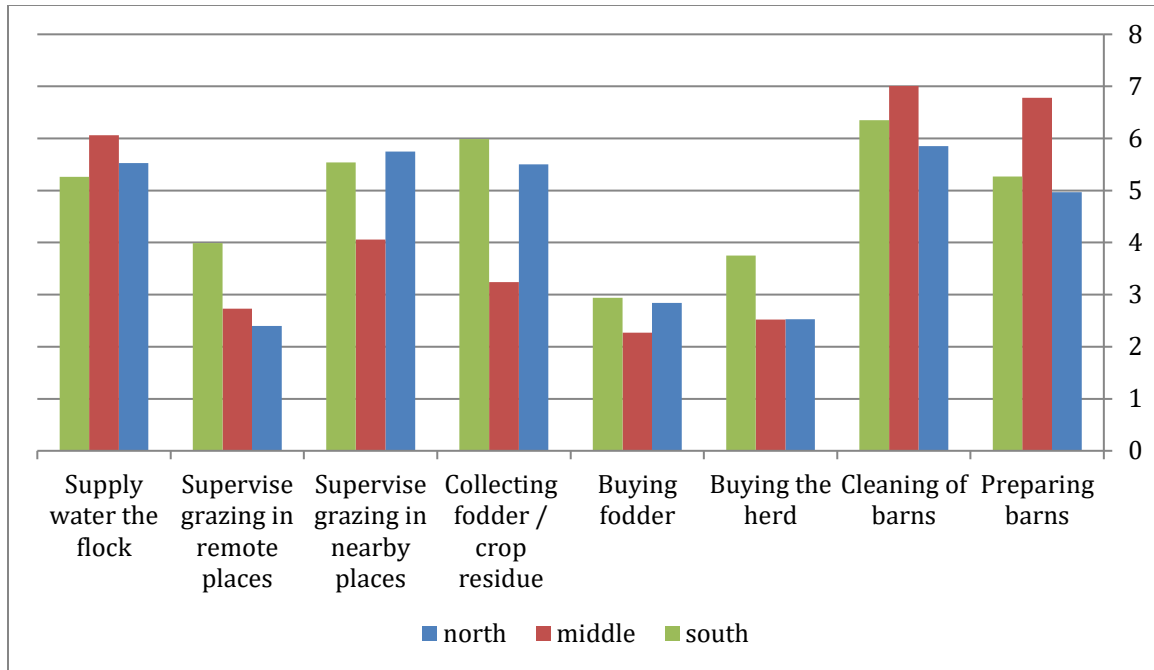


Figure 15: comparison of women role in rangeland- related activities

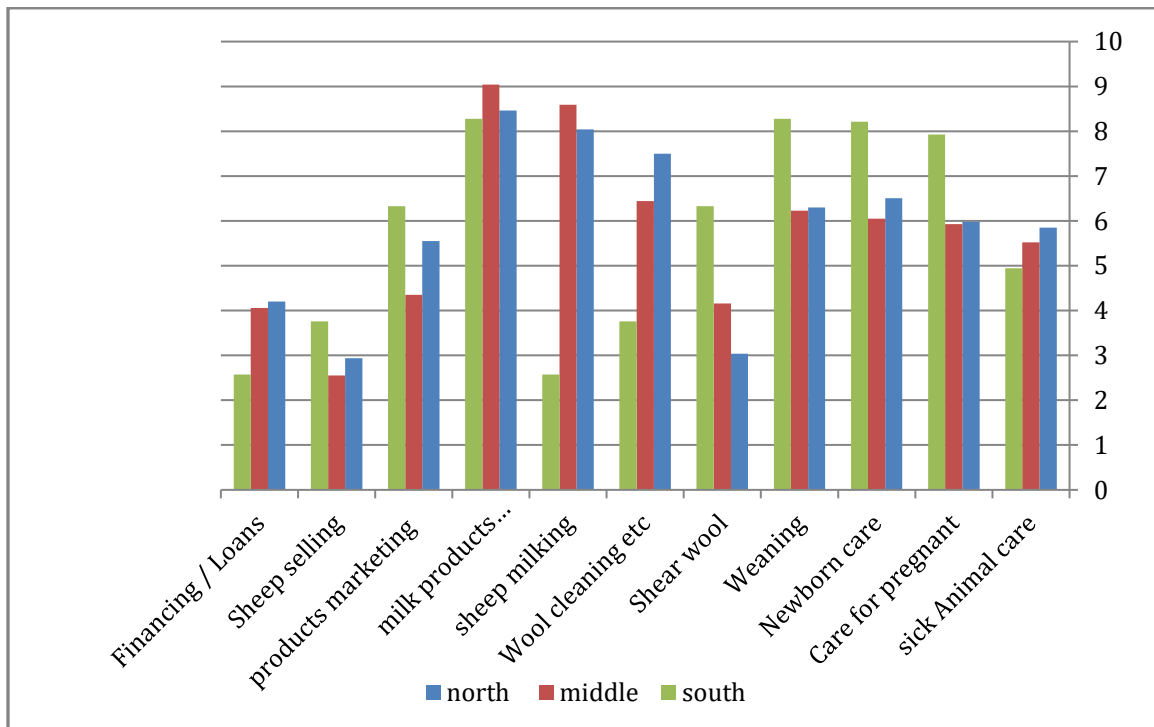


Figure 16: comparison of women role in livestock production- related activities

Finally, **several conclusions** could be gained from the results, which are presented in the following points:

- The decision making in rangeland management and its productivity should move beyond gender stereotypes of women herders as helpers and housekeepers and identify women herders as partners in breeding and owners of livestock flocks.
- Annual extension plans are an urgent need to enhance women's efficiency in livestock production and in the grazing process, which would affect the sustainability of rangeland areas, especially near the urban areas.
- Men and women should be seen as complementary and both important in rangeland sustainably. Empowerment should be seen as individuals building constructive relationships through joint efforts and mutual support for better livelihoods and development;
- For policy formulation, there is a need for gender-disaggregated and socio-economic data in the rangeland and livestock sector, and that to consider the gender-sensitive analysis of livestock production and rangeland system. Different needs and roles of men and women require developing socio-gender sensitive investment strategies for rural areas and designing equitable rural development policies.

Annex A: Results of the Statistical Analysis

A-1: Al-Surra Reserve / Northwestern Badia

Respondent Gender	<u>Region 1</u> (%) number	<u>Region 2</u> (%) number	<u>Region 3</u> (%) number	<u>Total</u> (%) number
Male	(51.1) 48	(52.6) 50	(51.0) 49	(51.6) 147
Female	(48.9) 46	(47.4) 45	(49.0) 47	(48.4) 138

The area of the Al-Surra Reserve / Northwestern Badia (Number of questionnaire 94)

Table 1: Characteristics of the households:

	Number	Percent
Household Gender		
(1) Male	80	85.1
(2) Female	14	14.9
Social Status for Household		
(1)Married	77	81.9
(2) Widower	15	16.0
(3) Divorced	2	2.1
Health Status for Household		
(1)Healthy	87	92.6
(2)Sick	7	7.4
Determined..... diabetes	7	7.4
Age	mean	51.14
Education level of the Household		
1. Illiterate	5	5.3
2. class 1-6	20	21.3
3. class 7-10	26	27.7
4. class 11	16	17.0
5. High school	19	20.2
6. Diploma	2	2.1
7. University	4	4.3
experience in livestock breeding (year s)	mean	16.85

Field or nature of work		
1. Retired	38	45.2
2. Soldier	1	1.2
3. Private business	2	2.4
4. Farmer	21	25.0
5. unemployed	7	8.3
6. livestock breeding	11	13.1
7. Public employee + teacher	4	4.8
Average Monthly Income (JOD)	mean	428.9
Wife Age (Years)	mean	44.87
Wife Education		
1. Illiterate	3	3.2
2. class 1-6	11	11.7
3. class 7-10	30	31.9
4. class 11	7	7.4
5. High school	22	23.4
6. Diploma	2	2.1
7. University	5	5.3
Wife's work		
1. Work	11	12.9
2. Doesn't work	73	85.9
Number of family members (Person)	mean	7.3
Number of family members working in animal production	mean	2.56

Table 2: grazing and herd management

1. The benefit for	Number	Mean
Home consumption %	94	47.3
Trade%	80	61.88
2. Kind of livestock	Number	Mean
Number of lambs (head)	82	71.69
Number of goats (head)	54	15.01
Number of Camels (head)	0	0
Total(head)		70.85
3. Herd Ownership	Number	Mean
For Men %	80	91.81
For Woman %	33	61.96

4. Herd settled in	Number	Percent
1. Sheds beside the home %	75	73.5
2. Privet farms %	4	3.9
3.Open Region %	23	22.5
5. Percentage of herd dependence %	Number	Mean
Feed	94	64.46
Grazing	83	27.77
Farm waste	51	20.29
The locations of grazing	Number	Percent
Private land	30	30.3
Rumored land	61	61.6
Pastoral land (common land)	8	8.1

Table 7.3: the management of herd

tasks	women's participation (10-1)	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Mean	Number (Percent)	Number (Percent)
Preparing barns	4.97	Woman:18(19.1) Man:70(74.5) Both:6(6.4)	Woman:12(12.8) Man:74(78.7) Both: 8(8.5)
Cleaning of barns	5.85	Woman:25(26.6) Man:37(39.4) Both:32(34.0)	Woman:19(20.2) Man:42(44.7) Both:33(35.1)
Buying the herd	2.53	Woman:8(8.5) Man:85(90.4) Both:1(1.1)	Woman:3(3.2) Man:88(93.6) Both: 3(3.2)
Buying fodder	2.84	Woman: 8(8.5) Man:71(75.5) Both:15(16.0)	Woman: 3(3.2) Man:85(90.4) Both:6(6.4)
Collecting fodder /	5.50	Woman:33(35.1)	Woman:22(23.4)

crop residue		Man:36(38.3) Both:25(26.6)	Man:52(55.3) Both:20(21.3)
Supervise grazing in nearby places	5.75	Woman:40(42.6) Man:52(55.3) Both:2(2.2)	Woman:33(35.5) Man:55(58.5) Both:6(6.4)
Supervise grazing in remote places	2.40	Woman:9(9.6) Man:79(84.1) Both:6(6.4)	Woman:4(4.3) Man:82(87.3) Both:8(8.5)
Supply water the flock	5.53	Woman:11(11.7) Man:36(38.3) Both:47(50.0)	Woman:5(5.3) Man:43(45.7) Both:46(48.9)

Table 8: Herd productivity

tasks	women's participation (10-1)	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Mean	Number &Percent	Number &Percent
Caring for sick sheep	5.85	Woman:15(16.0) Man:61(64.9) Both:18(19.1)	Woman:8(8.5) Man:71(75.5) Both:15(16.0)
Care for pregnant females	5.98	Woman:28(29.8) Man:47(50.0) Both:19(20.2)	Woman:18(19.1) Man:57(60.6) Both:19(20.2)
Newborn care	6.51	Woman:27(28.7) Man:34(36.2) Both:33(35.1)	Woman:28(29.8) Man:34(36.2) Both:32(34.0)
Weaning	6.30	Woman:27(28.7)	Woman:21(22.3)

		Man:34(36.2) Both:33(35.1)	Man:38(40.4) Both:35(37.2)
Shear wool	3.04	Woman:6(6.4) Man:70(74.5) Both:18(19.1)	Woman:3(3.2) Man:81(86.2) Both:10(10.6)
Wool cleaning, making carpets, pillows..etc	7.5	Woman:47(50.0) Man:20(21.3) Both:27(28.7)	Woman:45(47.9) Man:23(24.5) Both:26(27.7)
Milking the sheep	8.04	Woman:53(56.4) Man:10(10.6) Both:31(33.0)	Woman:43(45.7) Man:18(19.1) Both:33(35.1)
Manufacturing milk products (dairy, cheese)	8.46	Woman:74(78.7) Man:6(6.4) Both:14(14.9)	Woman:70(74.5) Man:10(10.6) Both:14(14.9)
Products marketing	5.55	Woman:28(29.8) Man:21(22.3) Both:45(47.9)	Woman:19(20.2) Man:30(31.9) Both:45(47.9)
Selling the sheep	2.94	Woman:8(8.5) Man:79(84.1) Both:7(7.4)	Woman:7(7.4) Man:83(88.3) Both:4(4.3)
Financing / Loans	4.20	Woman: 7(7.4) Man:58(61.7) Both:29(30.9)	Woman: 9(9.6) Man:57(60.6) Both:28(29.8)

	Number	Percent
Does the woman get any return for her participation in managing and caring for the herd? %		
1. Yes	40	42.6
2.No	54	57.4
The nature of revenue		
5. Cash	26	66.7
6. Sheep heads	13	33.3
Number of Sheep heads	mean	4.58
Women participation		
5. Training courses	15	16.0
6. Local committees	1	1.1
7. Associations linked to pastures	3	3.2
8. Don't share	75	79.8
Determine (the nature of the sessions, committees, or associations in which women participate)		
1. Al-Jawhara Charitable Society	18	18.8
2. Dairy processing courses	8	8.3
3.		
Evaluate the woman's level of knowledge of the different grazing sites at the district level	mean	6.67
Evaluate the level of woman's Knowledge of sources for livestock drinking water	mean	6.87

A-2: Al-Hazeem site in the middle Badia / Al-Azraq district

Al- Hazeem site in the middle Badia / Al-Azraq district (Number of questionnaire 95)

Table 1: characteristics of family

	Number	Percent
Household Gender		
(2) Male	84	88.4
(2) Female	11	11.6
Social Status for Household		
(1)Married	83	87.4
(2) Widower	8	8.4
(3) Divorced	4	4.2
Health Status for Household		
(1)Healthy	82	87.4
(2)Sick	12	12.6
Determined:		
1. Kidney	2	2.1
2. Diabetes	4	4.2
3. Heart	2	2.1
4. Hemiplegia	1	1.1
5. Nerves	1	1.1
Age	mean	48.38
Education level of Household		
8. uneducated	21	22.1
9. Elementary	12	12.6
10. Junior secondary	19	20.0
11. Senior secondary	6	6.4
12. general secondary	25	26.3
13. Diploma	3	3.2
14. University	9	9.5
experience in livestock breeding	mean	17.33
Field or nature of work		
8. Retired	24	25.3
9. Driver	1	1.1
10. Teacher	5	5.3
11. Soldier	7	7.4

12. Free busineses	3	3.2
13. Farmer	10	10.5
14. Doesn't work	10	10.5
15. livestock breeding	8	8.4
16. Government employee	27	28.4
Average Monthly Income	mean	310
Wife Age	mean	41.52
Wife Education		
15. uneducated	29	30.5
16. Elementary	9	9.5
17. Junior secondary	13	13.7
18. Senior secondary	7	7.4
19. general secondary	13	13.7
20. Diploma	1	1.1
21. University	14	14.7
Wife's work		
3. Work	15	15.8
4. Doesn't work	80	84.2
Number of family members	mean	5.4
Number of family members working in animal production	mean	2.88

Table 2: grazing and herd management

6. The benefit for	Number	Mean
Home consumption	94	57.60
Trade	75	54.35
7. Kind of livestock	Number	Mean
Number of lambs	69	12.67
Number of goats	88	10.63
Number of Camels	7	3.86
Total		19.18
8. Herd Ownership	Number	Mean
For Men	84	86.67
For Woman	35	63.43
9. Herd live in	Number	Percent
1. Sheds beside the home	77	71.3
2. Privet farms	14	13.0

3.Open Region	17	15.7
10. Percentage of herd dependence	Number	Mean
Feed	95	71.79
Grazing	59	27.12
Farm waste	43	25.12
The region of grazing	Number	Percent
Property	48	42.5
Open Region	58	51.3
Pastoral land	7	6.2

Table 7.3: the management of herd

tasks	women's participation (10-1)	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Mean	Number &Percent	Number &Percent
Preparing barns	6.78	Woman:33(34.7) Man:30(31.6) Both:32(33.7)	Woman:39(41.1) Man:34(35.8) Both: 22(23.2)
Cleaning of barns	7.01	Woman: 34(35.8) Man:27(28.4) Both:34(35.8)	Woman:45(47.4) Man:28(29.5) Both:22(23.2)
Buying the herd	2.52	Woman:7(7.4) Man:72(75.8) Both:16(16.8)	Woman:8(8.4) Man:84(88.4) Both: 3(3.2)
Buying fodder	2.27	Woman: 8(8.4) Man:71(74.7) Both:16(16.8)	Woman:8(8.4) Man:84(88.4) Both: 3(3.2)
Fodder / crop residue collection	3.24	Woman:12(12.6) Man:59(62.2) Both:24(25.3)	Woman:11(11.6) Man:74(77.9) Both:10(10.5)

Grazing in nearby places	4.06	Woman:19(20.0) Man:45(47.4) Both:31(32.6)	Woman:20(21.1) Man:56(58.9) Both:19(20.0)
Grazing in remote places	2.73	Woman:10(10.5) Man:52(54.7) Both:33(34.7)	Woman:7(7.4) Man:69(72.6) Both:19(20.0)
Water the flock	6.06	Woman:26(27.4) Man:21(22.1) Both:48(50.5)	Woman:33(34.7) Man:23(24.2) Both:39(41.1)

Table 8: Herd productivity

tasks	women's participation (10-1)	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Mean	Number &Percent	Number &Percent
Caring for sick sheep	5.52	Woman:20(21.1) Man:34(35.8) Both:41(43.2)	Woman:28(29.5) Man:36(37.9) Both:31(32.6)
Care for pregnant	5.93	Woman:27(28.4) Man:28(29.5) Both:40(42.1)	Woman:41(43.2) Man:22(23.2) Both:32(33.7)
Newborn care	6.05	Woman:29(30.5) Man:27(28.4) Both:39(41.1)	Woman:41(43.2) Man:20(21.1) Both:34(35.8)
Weaning	6.23	Woman:30(31.6)	Woman:40(42.1)

		Man:26(27.4) Both:39(41.1)	Man:21(22.1) Both:34(35.8)
Shear wool	4.16	Woman:12(12.6) Man:42(44.3) Both:41(34.2)	Woman:13(13.7) Man:51(53.7) Both:31(32.6)
Wool cleaning, stretchy pillows	6.44	Woman:25(26.3) Man:29(30.5) Both:41(43.2)	Woman:41(43.2) Man:21(22.1) Both:33(34.7)
Milk the sheep	8.59	Woman:50(52.6) Man:12(12.6) Both:33(34.7)	Woman:72(75.8) Man:8(8.4) Both:15(15.8)
Manufacturing (dairy, cheese)	9.04	Woman:57(60.0) Man:12(12.6) Both:26(27.4)	Woman:77(81.1) Man:7(7.4) Both:11(11.6)
Marketing of products	4.35	Woman:19(20.0) Man:42(44.2) Both:34(35.8)	Woman:25(26.3) Man:48(50.6) Both:22(23.2)
Sheep selling	2.55	Woman:10(10.5) Man:67(70.5) Both:18(18.9)	Woman:16(16.8) Man:74(77.9) Both:5(5.3)
Financing / Loans	4.06	Woman:22(23.2) Man:58(61.1) Both:15(15.8)	Woman:32(33.7) Man:58(61.1) Both:5(5.3)

	Number	Percent
Does the woman get any return for her participation in managing and caring for the herd?		
1. Yes	44	46.3
2.No	51	53.7
The nature of revenue		
7. Cash	32	69.6
8. Sheep heads	14	30.4
Number of Sheep heads	mean	14.5
Women participation		
9. Training courses	23	22.5
10. Local committees	5	4.9
11. Associations linked to pastures	3	2.9
12. Don't share	71	69.6
Determine (the nature of the sessions, committees, or associations in which women participate)		
3. Al Irfan Charitable Society	1	1.1
4. Dairy processing courses	16	16.8
5. The herd care cycle	4	4.2
Evaluate the woman's level of knowledge of the different grazing sites at the district level	mean	5.59
Evaluate the level of woman's Knowledge of sources for livestock drinking water	mean	6.33

A-3: Mansheya protected area Badia / Athrah district/ Southern eastern Badia

Mansheya protected area Badia / Athrah district/ Southern eastern Badia (Number of questionnaire 96)

Table 1: characteristics of family

	Number	Percent
Household Gender		
(3) Male	81	84.4
(2) Female	15	15.6
Social Status for Household		
(1)Married	77	80.2
(2) Widower	14	14.6
(3) Divorced	5	5.2
Health Status for Household		
(1)Healthy	84	87.5
(2)Sick	12	12.5
Determined:		
1. Clot	1	1.0
2. Eyes	1	1.0
3. Diabetes	7	7.3
4. Hemiplegia	1	1.0
Age	mean	50.9
Education level of Household		
22. uneducated	25	27.2
23. Elementary	6	6.5
24. Junior secondary	15	16.3
25. Senior secondary	20	21.7
26. general secondary	13	14.1
27. Diploma	1	1.1
28. University	12	13.0
experience in livestock breeding	mean	18.68
Field or nature of work		
17. Retired	45	50.6
18. Driver	5	5.6
19. security	1	1.1

20. Teacher	11	12.4
21. Soldier	3	3.4
22. Free businees	2	2.2
23. Farmer	6	6.7
24. Doesn't work	10	11.2
25. livestock breeding	1	1.1
26. Government employee	5	5.6
Average Monthly Income	mean	360
Wife Age	mean	43.96
Wife Education		
29. uneducated	32	33.3
30. Elementary	4	4.2
31. Junior secondary	19	19.8
32. Senior secondary	10	10.4
33. general secondary	8	8.3
34. Diploma	2	2.1
35. University	7	7.3
Wife's work		
5. Work	22	24.7
6. Doesn't work	67	75.3
Number of family members	mean	7.63
Number of family members working in animal production	mean	3.02

Table 2: grazing and herd management

11. The benefit for	Number	Mean
Home consumption	86	57.07
Trade	85	53.67
12. Kind of livestock	Number	Mean
Number of lambs	74	97.46
Number of goats	93	84.23
Number of Camels	23	208.83
Total		206.41
13. Herd Ownership	Number	Mean
For Men	83	82.41
For Woman	48	55.52
14. Herd live in	Number	Percent
1. Sheds beside the home	46	43.8

2. Privet farms	16	15.2
3.Open Region	43	41.0
15. Percentage of herd dependence	Number	Mean
Feed	88	71.25
Grazing	71	28.10
Farm waste	54	23.98
The region of grazing	Number	Percent
Property	12	10.6
Open Region	51	45.1
Pastoral land	50	44.2

Table 7.3: the management of herd

tasks	women's participation (10-1)	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Mean	Number &Percent	Number &Percent
Preparing barns	5.27	Woman:31(32.3) Man:59(61.4) Both:6(6.2)	Woman: 31(32.3) Man:53(55.2) Both: 12(12.5)
Cleaning of barns	6.35	Woman: 55(57.3) Man:36(37.5) Both:5(5.2)	Woman:39(40.6) Man:50(52.1) Both:7(7.3)
Buying the herd	3.75	Woman:18(18.8) Man:76(79.2) Both:2(2.1)	Woman:20(20.8) Man:68(70.8) Both: 8(8.3)
Buying fodder	2.94	Woman: 13(13.5) Man:79(82.3) Both:4(4.2)	Woman:19(19.8) Man:72(75.0) Both: 5(5.2)
Fodder / crop residue collection	5.99	Woman:42(43.8) Man:37(38.5) Both:17(17.7)	Woman:26(27.1) Man:57(59.4) Both:9(9.4)
Grazing in nearby places	5.54	Woman:45(46.9) Man:42(43.8) Both:9(9.4)	Woman:21(21.9) Man:61(63.5) Both:14(14.6)
Grazing in remote places	3.99	Woman:17(17.7) Man:71(74.0) Both:8(8.3)	Woman:20(20.8) Man:67(69.8) Both:9(9.4)
Water the flock	5.26	Woman:30(31.2) Man:52(54.1) Both:14(14.6)	Woman:30(31.2) Man:50(52.1) Both:16(16.7)

Table 8: Herd productivity

tasks	women's participation (10-1)	decision maker (1.Woman 2.Man)	Who do you prefer to do these tasks (1.Woman 2.Man)
	Mean	Number &Percent	Number &Percent
Caring for sick sheep	6.26	Woman:48(50.0) Man:42(43.8) Both:6(6.2)	Woman:23(24.0) Man:68(70.9) Both:5(5.2)
Care for pregnant	6.74	Woman:59(61.5) Man:32(33.3) Both:5(5.2)	Woman:42(43.8) Man:48(50.0) Both:6(6.2)
Newborn care	7.24	Woman:63(65.6) Man:29(30.2) Both:4(4.2)	Woman:37(38.5) Man:49(51.0) Both:10(10.4)
Weaning	6.71	Woman: 49(51.0) Man:43(44.8) Both:4(4.2)	Woman:30(31.2) Man:59(61.5) Both:7(7.3)
Shear wool	4.94	Woman:35(36.5) Man:57(59.4) Both:4(4.2)	Woman:30(31.2) Man:61(63.5) Both:5(5.2)
Wool cleaning, stretchy pillows	7.93	Woman:70(72.9) Man:24(25.0) Both:2(2.1)	Woman: 73(76.0) Man: 18(18.8) Both:5(5.2)
Milk the sheep	8.21	Woman:77(80.2) Man:14(14.6) Both:5(5.2)	Woman:70(72.9) Man:21(21.9) Both:5(5.2)
Manufacturing (dairy, cheese)	8.28	Woman:76(79.2) Man: 12(12.5) Both:8(8.3)	Woman:68(70.8) Man:22(22.9) Both:6(6.2)
Marketing of products	6.33	Woman:35(36.5) Man:59(61.5) Both:2(2.1)	Woman:41(42.7) Man:49(51.0) Both:6(6.2)
Sheep selling	3.76	Woman:13(13.5) Man:82(85.4) Both:1(1.1)	Woman:16(16.7) Man:75(78.1) Both:5(5.2)
Financing / Loans	2.57	Woman23(24.0) Man:60(62.5) Both:13(13.5)	Woman: 18(18.8) Man:71(74.0) Both:7(7.2)

	Number	Percent
Does the woman get any return for her participation in managing and caring for the herd?		
1. Yes	58	61.1
2.No	37	38.9
The nature of revenue		
9. Cash	48	81.4
10. Sheep heads	11	18.6
Number of Sheep heads	mean	62.67
Women participation		
13. Training courses	9	9.1
14. Local committees	3	3.0
15. Associations linked to pastures	16	16.2
16. Don't share	71	71.7
Determine (the nature of the sessions, committees, or associations in which women participate)		
6. Al Irfan Charitable Society	18	18.8
7. Dairy processing courses	8	8.3
Evaluate the woman's level of knowledge of the different grazing sites at the district level	mean	7.69
Evaluate the level of woman's Knowledge of sources for livestock drinking water	mean	7.42