Gender participation in sheep and goat farming in Najran, Southern Saudi Arabia

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Abstract
Sheep and goat farming is a major source of income in the rural areas of Al-Wadiah in Najran region of Southern Saudi Arabia. The study aims to identify the factors and parameters that influence gender participation in sheep and goat farming. Data were collected by interviewing 167 high school students, including 70 male and 97 female students, in Al-Wadiah, by using the simple random sampling technique. Data were statistically analyzed to establish the relationship between gender and participation in sheep and goat farming. The study revealed significant differences between the two genders, for instance, male herders were more experienced, received more benefits, showed greater interest in discussions on topics related to sheep and goat farming, followed information from TV and radio, and received more services offered by veterinary clinics, which proved more beneficial for them. On the other hand, female herders received fewer services, and the veterinary clinics proved less beneficial for them. However, the correlation between the participation of both genders in sheep and goats management was non-significant toward the statement “feeling ashamed of participating in sheep and goat farming.” Generally, sheep and goat rearing proves more beneficial for male participants than female participants, owing to their greater experience and interest in livestock farming. Moreover, they receive more benefits from TV, radio and veterinary clinics to maintain better health of their livestock. Both male and female herders contribute equally to sheep and goat farming by limiting the time spent on their daily routine. This study would enable policymakers and planners to develop more strategies and extension education programs to overcome the identified barriers and improve the livelihood of herders through their enhanced participation in remote areas.

1. Introduction
Livestock contribute to the sustainable livelihoods and security of more than 800 million poor smallholders as Natural Capital (meat, milk, wool, hide, rangeland, and pasture), Financial Capital (cash, savings, credit, insurance, gifts, and remittance), Social Capital (traditions, wealth, prestige, identity, respect, friendship, marriage dowry and festivity), and Human Capital. Furthermore, livestock offer a source of high-quality nutrition for poor households, especially for pregnant women, and improve the cognitive skills and mental growth of children. In marginal rural areas, where poverty is rampant, livestock represent an important asset for local, cultural and socio-economical systems, and allows the effective use of otherwise unutilizable resources (IFAD, 2.016). Along with the source of income and food security in low potential areas, sheep and goat farming has also been the driver for many biological advantages. It is a good source of income owing to its advantages such as a short maturity stage and gestational period. This helps in furnishing cash income for the farmers, as a large number of lambs become ready for sale in local markets (Fitzhugh et al., 1987). Since centuries, small farmers in the arid and semi-arid rural areas of the Arab region have been involved in rearing the small ruminants (sheep and goat) for their survival. Studies have confirmed that goats are important for people living in arid areas. It is well documented that sheep and goat rearing and their production are important tools to improve the living conditions of poor women. It also contributes to meeting their major needs by providing money needed to maintain children’s health and taking care of other responsibilities at home. Small ruminants...
are also a major source of food and non-food products, thus generating more market opportunities (Pollott and Wilson, 2009).

In central and southern Tunisia, women participate in different agricultural activities in irrigated and rain-fed areas, including weeding, hoeing, feeding, and watering the animals. Paid positions not only improve their life standards but also enable them to switch from conventional to modern farming and production activities. Married women are highly involved in innovative activities such as agriculture and livestock management (sheep and goat rearing) to meet their daily needs. The living standards of Tzotzil farmers highly depend on agriculture of maize and beans and sheep rearing, especially for the production of wool and weaving. Among Tzotzil women, earn up to 36% income through sheep husbandry. They produce less expensive clothes, garments, and crafts out of sheep wool. Sometimes, they sell out their sheep or goat to meet their urgent financial needs (Boven, K; Nuffic; Jun Morohashi, UNESCO/MOST). According to Ojango (2014), in East Africa, poultry, goats, and sheep, which are managed by youth and women, are the only assets for leading a better life.

IFAD (1994) revealed that the indigenous knowledge of livestock and its management among rural women most often remains underestimated in developing countries. It is preferred as a special gender task. Women mostly take part in assisting during reproduction, daily care, and doctoring of animals in the society. In Yemen, women share responsibilities in agriculture at their small family-owned farms and help maintain domestic livestock, including sheep, goat, camel, and cows. IFAD (1994) reported that women spend almost five hours in the management/control of sheep production. The organization further noted that Yemeni women involved in domestic animal rearing had extensive indigenous technical knowledge on sheep fattening and the characteristics and requirements of breeding based on respective environments. They could easily differentiate between continuous versus occasional breeding. Indigenous knowledge and management practices on animal production include different technical aspects like time of mating, selection, and lambing interval and season. Women also possess indigenous knowledge on veterinary practices and the effects of nutrition on the growth of the animals. Moreover, they are well aware of the principles of management of the four types of disease symptoms commonly observed in sheep and goat, which include coughing, wheezing, mucous discharge, as well as bloating and digestive ailments. They attribute bloating in sheep to the rapid intake of fresh alfalfa and wet grass, which can be treated effectively using oil or Pepsi Cola if detected early enough. Yemeni women also have indigenous technical knowledge on sheep fattening operations, and it is important to take this into consideration in any related developmental initiatives (M. Niamir-Fuller, nd).

In United Arab Emirates, sheep production is more effective than goat farming, establishing a strong relationship exists between the types of sheep and goat, technical knowledge, and experience of women in sheep and goat management (Fathelrahman et al., 2014). A 2002 study on sheep and goat production in Syria recommended the adoption of innovative technical knowledge rather than conventional practices (Shomo et al., 2010). In Jordanian villages, processing of sheep and goat milk to obtain products such as “Jameed” (traditional “rock” cheese), yogurt, and ghee plays a vital role in generating income at a smaller scale. A partnership with Jordan’s National Center for Agricultural Research and Extension (NCARE) helped improve the profitability of Jameed in the El Karak region. Jameed from El Karak is renowned all over the country and through “rapid rural assessments” of four communities; it was found that it offered the best income potential among dairy products.

In Tanzania, in both districts of Kongwa (Dodoma region) and Mvomero (Morogoro region), 78.7% households had men as major-
ated near the border of Yemen. The objective of this study was to elucidate the differences between male and female participation in sheep and goat management. The study furnished information on obstacles faced by females in rearing sheep and goats in their family. Further, such studies would be helpful for professionals and policymakers to develop the undervalued sector, which possesses a great economic value in both the micro (village) and macro (national) level.

2. Methodology

The study area Al-Wadiah village, with coordinates 16.95°N and 47.01°E is located near the border strip in the region of Najran of Sharurah Province in Southern Saudi Arabia. The questionnaire was designed with the help of members specializing in animal husbandry and social sciences from the departments of Agricultural Extension and Rural Society and Animal Husbandry, College of Food and Agriculture Sciences, King Saud University, Saudi Arabia. Before moving into the study area, the validity and reliability of the questionnaire were tested on 20 potential interviewees who were not part of the study. The required modifications on the questionnaire were made to ensure its validity and reliability. Also data were analyzed to assess the reliability of the instrument (Cronbach’s $\alpha = 0.85$) using the Statistical Package for the Social Sciences (SPSS 17). Data were collected during the face-to-face interviews using the pre-tested and well-structured questionnaires phrased in simple and plain Arabic language. An utmost effort was made to avoid scientific and technical terms. A random sample of 167 respondents, including 70 male and 97 female high-school students of Al-Wadiah region, was drawn using the Random Number Generator Program. Data were collected from both the male and female students actively involved in sheep and goat management. Data were subjected to statistical analysis by using the SPSS.

2.1. Hypotheses of the study are

1. Males and females equally participate in sheep and goat rearing.
2. Males are in a better position to manage bigger herds of sheep and goats due to greater availability of opportunities to enhance their technical knowledge and access to credit facilities.
3. Extension and education programs are catered for males.

3. Results and discussion

No significant (0.110) differences in gender participation were observed among the respondents for the statement “I participate with my family in tending sheep and goat” indicating that both males and females equally participate with their families in looking after sheep and goat on the farm (Table 1). The low income of males might have pushed and prompted the females to participate equally in the sheep and goat farming in Al-Wadiah region (Table 1). Equal participation of males and females might be attributed to the arid conditions prevailing in the area, as they are left with no other professions to adopt, except sheep and goat farming. Similarly, the trends in Northern Nigeria were also observed, where men and women equally share daily activities related to sheep and goat management, resulting in good profits (Bayer and Waters-Bayer, 1989).

As shown in Table 1, the mean value for male and female respondents shows that they do not feel ashamed in tending sheep and goat in the Al-Wadiah village.

The study revealed a non-significant relation (0.343) for the statement “I feel ashamed to take part in the sheep and goat farming.” No significant differences between gender and respondents’ participation in sheep and goat farming were noticed, implying that both males and females are not ashamed of taking part in sheep and goat farming. Therefore, an equal participation was seen. Women equally like rearing sheep and goat despite having less learning and financial opportunities. The women also equally participated in sheep and goat farming without feeling ashamed as it was a major source of income for them to meet the daily needs of their children and other household liabilities. In-fact women are not discriminated when it comes to ownership. Women in the village areas move freely grazing their herds. However, they may not be visiting their sheep and Goat farms that frequently, as the farms could be away from the residential areas. Since women do not drive, therefore they have to rely on men of the family to go to the sheep and goat farms. However, women happily reap few heads of desert bred sheep and goats in their homes to prepare products of their milk. In a study in Thailand, it was noticed that women demonstrated their expertise and skills in livestock production and provided their families with a major share of household income (Natpracha, 1991). A significant difference was also observed between the female and male respondents of the statement “I have experience in sheep and goat farming,” indicating that male respondents have greater experience as compared to females in sheep and goat farming.

According to cultural traditions, males have greater experience in sheep and goat farming as compared to females in Al-Wadiah (Table 1). The reason might be greater access of males to sheep and goat farms. According to the livestock policy, farms are supposed to be at a stipulated distance from the residential areas in the Kingdom of Saudi Arabia. Females have less access to these farms and their mobility is constrained by the non-availability of transport facilities to visit the remote areas for sheep and goat farming. In Saudi Arabia, women cannot drive vehicles on their own in the cities; however, they drive in the villages and remote areas. Sometimes they have to depend on their siblings and sons to drive them to these farms. Similarly, Boserup (1970) observed

| Variables | Mean for male students | Mean for female students | Mean difference | t-value | Sig. |
|-----------|------------------------|-------------------------|-----------------|---------|-----|
| I participate with my family in tending sheep and goat | 1.8143 | 2.0206 | −0.20633 | −1.607 | 0.110 |
| I feel ashamed to participate in sheep and goat farming | 2.8571 | 2.9175 | −0.06038 | −0.952 | 0.343 |
| I have experience in sheep and goat farming | 1.6143 | 1.9588 | −0.34448 | −2.935 | 0.004 ** |
| We obtain benefits from sheep and goat farming | 1.4571 | 1.7938 | −0.33667 | −2.614 | 0.010 ** |
| Tending sheep and goat affects my studies | 2.7000 | 2.6907 | 0.00928 | 0.093 | 0.926 |
| I pay attention to the topics discussed at home on sheep and goat farming | 2.1286 | 2.4845 | −0.35596 | −3.539 | 0.001 ** |
| I follow the information on sheep and goat farming from television and radio | 2.4000 | 2.7113 | −0.31134 | −2.881 | .005 ** |
| I benefit from the services provided by veterinary clinics run by the Ministry of Agriculture | 2.1714 | 2.4742 | −0.30280 | −2.760 | 0.006 ** |

**Significant at p 0.05.
**Significant at 0.01.
that women invariably participated indirectly through men in agriculture, because in many countries men on behalf of female members of the family traditionally hold land resources.

The study also found that males obtained greater benefits from sheep and goat rearing than female based on their mean values. The statement “We obtain benefits from sheep and goat farming” resulted in significant differences in their mean values. Regarding greater participation, males were in a better position to obtain benefits from sheep and goat farming. Usually, men of the house help the females in marketing of their animals. This might be due to their greater experience and easy access to the farm areas as compared to females (Table 1). Possible justification could be attributed to the hobby of male workers to work with sheep and goat, whereas females lack this opportunity, as they had to spend more hours in farming-related activities and other household responsibilities. Therefore, male workers enjoy more opportunities and benefits from sheep and goat farming in terms of money and other facilities. This might result in greater ability to handle big herds of sheep, which meets their needs and makes them successful beneficiaries of loans and credits from banks. Arya and Chander (2003) reported that male herdsmen could obtain more benefits and avail greater opportunities for receiving loans from banks owing to greater chances of selling their animals during the festival of Eid.

The other extraneous variables effecting the rearing of sheep and goats in the rural areas could be: socio-economic status, access to markets for meat, milk, and wool. It is well known that extension education programs, loan and credit facilities and training facilities are primarily meant for male farmers rearing sheep and goats on large scales.

As depicted in Table 1, the study resulted in a non-significant correlation of the statement, “Tending sheep and goat affects my studies.” A very negligible effect on the studies of males and female respondents actively participating in the sheep and goat care was noticed. It might be because males and females spent limited time in taking care of sheep and goat after closing hours of their schools. According to the questionnaire administered in Al-Wadiah village, it was revealed that sheep and goat rearing did not have an effect on studies or education of males and females. In Yemen, women have greater involvement in activities related to agriculture and livestock, including goats, camels, and cows. Rural women in Yemen spend more than five hours in the management/control of sheep (Niamir-Fuller, 1994). In Al-Wadiah, the situation might be different from that in Yemen. In Al-Wadiah region, males and females spend less than five hours for sheep and goat management.

The statement “I care if someone discusses the topic of sheep and goat farming in house” (0.001) has a significant pronounced impact on gender participation. Males most often actively participate in the discussions on sheep and goat care as compared to females, resulting in lower benefits due to the lack of knowledge and awareness (Table 1). Higher and more active participation of males in livestock farming also creates greater interest among them to have more discussions on the topic related to sheep and goat farming. Fetching more profits and having no restrictions on taxes while doing business in the country might have created greater interest among the males in sheep and goat farming. Sheep and goat farming, as an enterprise, provides year-round flow of essential products and income to the rural people. It also provides manure for crop production. Therefore, pastoralists are increasing and realizing that they need to rely on livestock farming more and more.

Television, radio, and veterinary clinics are the known sources of information about sheep and goat farming in Al-Wadiah. According to the results of the survey (Table 1), female respondents do not receive the benefits of information obtained from television and radio unlike their male counterparts. To over-come this disparity and close the gap, vibrant extension programs aiming at enhancing the knowledge levels of females need to be launched that could help and encourage women participating in the discussions made TV and Radio on the ways and means of better rearing sheep and goat heads at the household levels. Short movies and the pictorial extension leaflets if explained by the female extension workers would help narrowing the knowledge deficit.

The statement “I used to follow the information about sheep and goat rearing from television and radio,” indicated that television and radio provide useful information about the caring and health of sheep and goat, resulting in significant differences (on gender) between the mean values of male and female respondents. The possible reason could be the active involvement of females in the household activities such as cooking and caring for the children. Bitende et al. (2001) and Chenyambuga et al. (2012) reported that men own the livestock in agro-pastoral communities. There were only few women involved in livestock practices and those are widowed, divorced, or unmarried. Agriculture remains the main economic activity in the districts of Kongwa and Mvomero that contributes to 97.5% and 82.0% in the Kongwa and Mvomero districts, respectively. Agriculture was a main source of income for households, while livestock ranked as a second source.

Moreover, females do not benefit from veterinary clinics run by the Ministry of Agriculture of Saudi Arabia, as compared to the male respondents (Table 1). Another approach to encourage the participation of females, given the religious culture, would be to teach husbands and wives about sheep and goat production together and show the husbands how important to wives are to production and profitability. The instruction to show husbands specific duties wives could perform and that they could reap the benefits of their labors. This way without ownership the women would see that the enterprise was a true partnership and they are very important to the success of the operation.

The statement “I benefit from veterinary clinics run by Ministry of Agriculture” indicated a significant effect (0.006) on gender participation. Women cannot spare much time to acquire information from these sources. Women do not receive information from the veterinary clinics more frequently as compared to men, due to the cultural values and religious restrictions. Males meanwhile can receive more benefits from the veterinary clinics, which provides services like improved feed, veterinary health practices and services, and improved management practices on rearing small ruminants. They also receive information on feeding management, health care, watering, market information, and trainings related to these management practices.

4. Conclusions and recommendations

Livestock, including sheep and goat, are the major source of income and means of livelihoods for most of the rural people in Al-Wadiah region. Sheep and goat management is extremely important and is of significant value for the farming communities, particularly for those whose livelihood partially or totally depends on livestock production. Small ruminants contribute in economic, employment, food security, socio-cultural, and environmental sustainability by making use of marginal lands, manure, and farm waste. Descriptive results of the study showed a significant relationship between gender and participation in sheep and goat farming and their interest in the health of ruminants. Male respondents realize the importance of veterinary clinics, run by the Ministry of Agriculture, for providing essential services with regard to sheep and goat management.

It is important that extension education and capacity building programs be designed and launched, taking into account the obstacles and barriers faced by the females who rear small ruminants at
the domestic level. By offering incentives to women, their participation can be enhanced. Perhaps without incentives to own and profit from livestock enterprise development women won’t participate at the same rate as if government policies were changed. For example, if women could borrow low interest money to purchase sheep and goats and eventually land. Such initiatives could make women enthusiastic and becoming better sheep and goat producers. Their participation in managing small ruminants can be enhanced by providing them equal benefits of the veterinary clinics and banks, creating stable environments, and providing them equal opportunities, which can make sheep and goat farming a fair business enterprise.

The concrete purpose of was the study was to evaluate the role of extension and help them improving its working. Department of Agricultural Extension has great potential to help reviving an unappreciated enterprise (Sheep and goat farming at the household level). It has got great potential and can overcome malnutrition and support the national cause of achieving food security in the Kingdom. Skilled and able Extension Staff need to work the household while finding a way to upgrade the skills (by combining the local knowledge with the scientific one) of the females at the household level. There are innumerable roles and functions, Department of Agricultural Extension can undertake. However, it would be more reasonable if women extension workers are trained and do perform extension and educational activities.

The study recommended a detailed survey of all the villages having potential for rearing small ruminants to identify the barriers and constraints faced by both the males and the females. The survey also furnished guidelines to the planners and policymakers to formulate plans and policies with the assistance of stakeholders and women farmers to convert the ordinary domestic small-scale activity into a flourishing business. Extension education can result in vibrant capacity building programs, particularly aimed at women ruminant farmers.

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