Gender role and buffalo rearing decisions in Nepal

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ABSTRACT

Families not only divide works between members, but decisions are also divided between and are made by the members in the family. Men and women have different roles, responsibilities and participation in livestock management and livelihood activities. Such roles could be varied in agricultural activities including livestock rearing. This study examined gender roles and decisions among the buffalo producing farmers with the objective to assess the current scenario of livestock rearing, focusing to the buffalo production and to demonstrate whether such roles and decisions have been changed in the rural context. Data collection was completed into three steps: (i) base line study- carried out during 2012 with 30; 35 and 33 households from Chitwan, Gorkha and Tanahun, respectively. Baseline survey was broadly covered- demographic and socio-economic features; number of livestock raised; gender roles in buffalo production and management (ii) Focus Group Discussion (FGD) was carried out in the same three sites with three mixed group of men and women to strengthen the information. (iii) Additional survey was carried out in Chitwan (n=57) site only during 2014 to triangulate and or scrutinize the whole set of information. Findings clearly revealed that gender roles such as construction of shed, cleaning, grazing and feeding, breeding and veterinary health care are still traditionally done-either male or female alone dominating task that suggest the need to consider role specific planning while promoting scientific buffalo production and or enterprise development. Likewise, gender decision on buffalo rearing, for example-marketing and buffalo production activities (whether to keep buffalo, sale it and determine its number and other alike decisions) are found in favor of joint decision of male and female that firmly suggest the concept to consider such change in buffalo production paradigm while implementing gender based development planning.

Key Words: Household decision, planning, gender-based development, buffalo production

INTRODUCTION

Families not only divide works between members, but decisions are also divided between and are made by the members in the family (Devkota, 1999). This situation generates the concept of roles in the households. As work is divided into 'inside' and 'outside', decision can also be taken as major and other/ minor (Chhetri, 2007). Livestock is an important sector of Nepalese economy. It contributes about 30 Percent of agricultural Gross Domestic Product (GDP) in the country. Livestock has not only been a key source of household cash income for the rural people, but it has also been the main suppliers of

nutrients for growing field crops and users of crops by-products. Mixed farming systems are common in Nepal, where livestock are an integral part of agriculture along with crops, fruit and vegetables. Most households keep some livestock. The average number of livestock is comparable to the average household size (CBS, 2007). Men and women have different roles, responsibilities and participation in livestock management and livelihood activities. Such roles could be varied in agricultural activities including livestock rearing. Research findings reveals that gender roles are especially varied according to domain- reflecting either male or female members' domination in their involvement (Gurung *et al*., 2005; Devkota, 2010). Such domain specific involvement of both men and women are weak in terms of jointly done, but are visible in either men or women dominating task. Examples are found on these trends especially in the agricultural activities including livestock rearing (Bajracharya, 1994; Gurung *et al*., 2005; Devkota, 2010).

Gender roles refer to how men and women should act, think, and feel according to norms and traditions in a society (Groverman and Gurung, 2001). Roles are reflected in the tasks and responsibilities expected of men and women and identities associated with being male or female in a certain society. Gender roles and relations are not fixed. They are dynamic and changing as per the societal change (Devkota, 2010). Traditionally some livestock related roles and responsibilities were specific to women and men, but such specific task have been changed perhaps due to the formation of women groups and social mobilization efforts in the rural community. Thus livestock related decisions are more inclined towards jointly done for several agricultural works including livestock rearing (Gurung *et al*., 2005). Study findings have revealed that there has been change in the paradigm of gender decisions in favor of jointly done rather than male alone or female alone domination which used to be the case in the traditional agricultural practices. Thus it has been reflective scenario that- change in gender roles and decisions is seen in agricultural activities including livestock rearing whereas such change could vary in terms of its magnitude and dimension-male alone to joint, or female alone to joint. This could vary as per location, specific farming system, socio-economic status of the farmers and niche specific differences (Acharya and Bennet, 1981; Bajracharya, 1994; Devkota, 1999). Under this situation gender roles and decisions among the buffalo producing farmers were examined with the objective to assess the current scenario of livestock rearing, focusing to the buffalo production and to demonstrate whether such roles and decisions have been changed in the rural context.

MATERIALS AND METHODS

Improving nutrition and productivity of buffaloes (INPB) to adapt to impacts of climate change in Nepal is a USAID funded project, executed by Michigan State University in collaboration with AFU, NARC and DLS. The collaborative research has been going in relation to improve in overall productivity of buffalo through the technical intervention in the areas of feeds and feeding (forage crop cultivation, feeding); breeding, reproduction management and health management with the aim to conserve buffalo for the future so that they could be able to cope with the changing extreme climatic condition in the future.

This project has executed in three sites namely, Chitwan (Chanauli), Tanahun (Dulegaunda) and Gorkha (Palungtar) of Gandaki river basin.

Present study is mainly focused on gender related issues. In the project activities study of gender role in buffalo production was well envisaged starting from participant farmer selection to related research activities such as- in terms of gender involvement, and decision-making. Thus data collection procedure was completed into three steps: The first set of research work was done in relation to collect basic fact sheet about livestock in general and overall management of buffalo in particular. Accordingly, base line study was carried out during 2012. The study broadly covered- demographic and socio-economic features; number of livestock raised; gender roles in buffalo production and management focusing to the feed and feeding management, health management, marketing and overall household decisions. For this purpose 30 households in Chitwan, 35 households in the Gorkha, and 33 households in Tanahun were interviewed by covering all the participant farmers in the project.

The next set of research work was to verify the critical areas of gender related buffalo rearing activities. Accordingly, Focus Group Discussion (FGD) was conducted in the three research sites. For the focus group discussion- we the team of researchers reached to the participant farmer's hometown during May-June 2014 and requested to gathered at least all the participant farmers those included in our project (n=30 each). It was quite difficult to capture all the participating farmers due to their busy schedule of farm work, nevertheless about 20-25 participant farmers form each district were gathered for the FGD. Accordingly, we had conducted 3 FGD in three project sites of Gorkha, Tanahun and Chitwan, separately. A set of questions were prepared as checklist to be asked to the participants farmers that were systematically asked and the final response was tapped based on consensus through discussion. Firstly, we did a taping of all the information then obtained into a Nepali version. Finally, all the information tapped in Nepali language was systematically retranslated into the English version to draw the valuable and relevant information.

The third set of research work was done as of additional/ supplementary survey in 2014 to triangulate and or scrutinize the whole set of information collected from base line study so that concrete evidence would be possible to collect that would also reflect the time dimension of information which could also address the change scenario of gender roles and decision if any.

In this regard we were only confined to carry out additional study in the Chitwan district. There are some reasons of taking Chitwan as representative site for the supplementary study. One of the reasons of selecting Chitwan is due to the fact that all the residents of Chitwan are migratory population from all over the country that could broadly cover the sample frame of all three study sites as well. The next reason is such that respondents in the Chitwan are fairly educated and are advance in terms of access of information and resources for buffalo production compared with other districts. Thus we captured available households as respondents for this study purpose. Accordingly, 57 respondents were covered whereas both male and female adult members at the rate of two from each

participant household were picked up and interview was done separately to both male and female member of each house. When there are 30 participant households, theoretically there should have been 60 members altogether, but one woman was single whereas male were absent as migrant labour in two households thus total sample size became 57 in the study site. All the data from base line study and in-depth additional work were coded and statistically analyzed using SPSS. Descriptive analysis was done. Data were presented in tables and graph as per relevancies.

RESULTS AND DISCUSSION

Age and Family size

The mean age of the respondents were similar in all three study sites with the overall mean age of 47.8 years. Respondents in Tanahun were relatively younger compared to the other two sites (Table 1). Likewise the mean family size of all sites was also similar with the overall mean size of 6.1 per household. Compared to the other sites, Tanahun had a small family size (Table 1).

Table 1. Mean age and family size of the respondents

Age and family size	Tanahun (n=33)	Gorkha (n=35)	Chitwan (n=30)	Overall (n=98)
Age of the respondent	41.30 (12.39)	53.83 (9.58)	48.13 (12.34)	47.87 (12.49)
Size of the family	5.67 (1.84)	6.66 (2.40)	6.13 (2.25)	6.16 (2.20)

Source: Field Survey, 2012

Note: Figures in parentheses is standard deviation

Status of education

Respondent's level of literacy was visibly good in all three study sites as illiterate % in all three sites was below five percent. Proportion of just literate population was high in Chitwan whereas about one-third of them were having secondary level education in Tanahun and Gorkha. In all three sites, about 11-15% respondents also had college and university level education (Table 2).

Table 2. Level of education of the respondents

Level of education	Tanahun	Gorkha	Chitwan	Overall
Illiterate	1 (3.0)	1 (2.9)	-	2 (2.0)
Just literate	12 (36.4)	11 (31.4)	18 (60.1)	41 (41.8)
Primary level	-	1 (2.9)	-	1 (1.0)
Secondary level	11 (33.3)	12 (34.3)	4(13.3)	27 (27.6)
SLC	4 (12.1)	6 (17.1)	4(13.3)	14 (14.3)
College and university	5 (15.2)	4 (11.4)	4(13.3)	13 (13.3)
Total	33 (100)	35 (100)	30 (100)	98 (100)

Source: Field Survey, 2012

Note: Figures in parentheses indicate percentage of response

Status of livestock rearing

Major livestock species such as cattle and buffaloes were only considered as dominating species in the study sites. Their presence in the site was categorized as improved milch, dry and heifer. Findings revealed that number of improved adult milch cattle per household were high in Chitwan (2.5) whereas number of improved heifer per household was high (6) in Tanahun (Table 3).

Table 3. Status of livestock rearing per household in the study districts

Livestock number per household (mean)	Tanahun (n=33)	Gorkha (n=35)	Chitwan (n=30)	Overall (n=98)
Improved adult milch cattle	1 (0) (n=2)	1 (0) (n=2)	2.56 (3.99) (n=13)	2.18 (3.52) (n= 17)
Improved heifer cattle	6 (0) (n=1)	1 (0) (n=2)	2.73 (3.71) (n=11)	2.85 (3.55) (n= 14)
Improved adult milch buffalo	1.18 (0.39) (n=17)	1.50 (0.63) (n=28)	1.29 (1.04) (n=24)	1.35 (0.76) (n=69)
Improved adult dry buffalo	1 (0) (n=8)	1.24 (0.53) (n=21)	1.22 (0.44) (n=9)	1.18 (0.45) (n= 38)
Improved heifer buffalo	1 (0) (n=3)	1.50 (0.70) (n=2)	1.18 (0.50) (n=22)	1.19 (0.48) (n= 27)
Local adult milch buffalo	1 (0) (n=12)	1 (0) (n=8)	-	1 (0) (n= 20)

Source: Field Survey, 2012

Note: Figures in parentheses is standard deviation

Gender roles in buffalo production and marketing

(a) *Gender roles in shed, feeds and feeding management*

Gender roles on buffalo production are described with respect to the sheds, feeds and feeding management and also health and marketing management. Accordingly, construction related work was heavily dominated by male whereas cleaning of the shed and grazing activities was largely women's domain in all research sites (Table 4). Fodder collection work was dominated by the involvement of male in Tanahun whereas it was equally dominating for female in the case of Gorkha and somehow to the Chitwan. In general, nearly fifty percent of the respondents support the concept of male involvement in fodder collection that was nearly in the similar proportion for female (Table 4).

(b) *Gender roles in animal health management*

Animal health management was dominated by the involvement of male as reported by more than one-third of the respondents in Tanahun and Chitwan and slightly strong domination of male for such activity in the Gorkha. It was, however, a dominating role of female was seen for animal health care in Chitwan. About one-third of the respondents in Tanahun also reported that it is the case of the involvement of both male and female (Table 5).

Table 4 Gender roles in shed, feeds and feeding management in the study district

Roles and activities	Tanahun (n=33)	Gorkha (n=35)	Chitwan (n=30)	Overall (n=98)
Construction of buffalo shed				
Adult male	30 (90.0)	30 (85.7)	25 (83.3)	85 (86.8)
Adult female	1 (3.0)	4 (11.4)	2 (6.7)	7 (7.1)
Both adult	2 (7.0)	1 (2.9)	3 (10.0)	6 (6.1)
Cleaning of buffalo shed				
Adult male	5 (15.2)	7 (20.0)	6 (20.0)	18 (18.4)
Adult female	19 (57.6)	24 (68.6)	21 (70.0)	64 (65.3)
Both adult	9 (27.2)	4 (11.4)	3 (10.0)	16 (16.3)
Grazing and feeding				
Adult male	3 (9.1)	7 (20.0)	5 (16.7)	15 (15.3)
Adult female	22 (66.7)	24 (68.6)	22 (73.3)	68 (69.4)
Both adult	8 (24.2)	4 (11.4)	3 (10.0)	15 (15.3)
Fodder collection from fodder tree				
Adult male	18 (54.5)	15 (42.9)	14 (46.7)	47 (48.0)
Adult female	13 (39.4)	19 (54.2)	14 (46.7)	46 (46.9)
Both adult	2 (6.1)	1 (2.9)	2 (6.6)	5 (5.1)

Source: Field Survey, 2012
Note: Figures in parentheses indicate percentage of response

(c) *Gender roles in buffalo marketing activities*
Gender roles in buffalo marketing related activities, for example, buying of buffalo was thought to be equal responsibilities of either male, female alone and both male and female jointly observed in the Tanahun district.

It was learnt that more than fifty percent of the respondents in Gorkha reported that it was the job of male member alone for purchasing of buffalo. In contrast to the two districts, Chitwan has different scenario of gender involvement in buffalo marketing related activities. Accordingly, about $9/10^{th}$ of the respondents in Chitwan opined that buying of buffalo would be the major responsibility of male member alone in the family (Table 6).

Table 5 Gender roles in animal health management in the study district

Gender roles and activities	Tanahun (n=33)	Gorkha (n=35)	Chitwan (n=30)	Overall (n=98)
Caring of sick milch buffalo				
Adult male	12 (36.4)	15 (42.9)	11 (36.7)	38 (38.8)
Adult female	9 (27.2)	14 (40.0)	16 (53.3)	39 (39.8)
Both adult	12 (36.4)	6 (17.1)	3 (10.0)	21 (21.4)
Feeding medicine to the sick milch buffalo				
Adult male	16 (48.5)	24 (68.6)	24 (80.0)	64 (65.3)
Adult female	7 (21.2)	5 (14.3)	4 (13.3)	16 (16.3)
Both adult	10 (30.3)	6 (17.1)	2 (6.7)	18 (18.4)

Source: Field Survey, 2012

Note: Figures in parentheses indicate percentage of response

Table 6 Gender roles in marketing management of buffalo in the study district

Gender roles and activities	Tanahun (n=33)	Gorkha (n=35)	Chitwan (n=30)	Overall (n=98)
Buying of buffalo				
Adult male	11 (33.3)	20 (57.1)	27 (90.0)	58 (59.2)
Adult female	11 (33.3)	6 (17.1)	1 (3.3)	18 (18.4)
Both adult	11 (33.4)	9 (25.8)	2 (6.7)	22 (22.4)
Selling of buffalo				
Adult male	10 (30.3)	22 (62.9)	27 (90.0)	59 (60.2)
Adult female	13 (39.4)	5 (14.2)	1 (3.3)	19 (19.4)
Both adult	10 (33.3)	8 (22.9)	2 (6.7)	20 (20.4)
Involvement in selling of milk				
Adult male	8 (24.2)	20 (57.2)	27 (90.0)	55 (56.1)
Adult female	16 (48.5)	11 (31.4)	1 (3.3)	28 (28.6)
Both adult	9 (27.3)	4 (11.4)	2 (6.7)	15 (53.3)

Source: Field Survey, 2012

Note: Figures in parentheses indicate percentage of response

Gender division of labour in buffalo production

Table (7) presents the highlights of Focus Group Discussion (FGD) about gender division of labour in buffalo production in the three study sites of three districts. It was revealed that gender division of labour varied as per the study location whereas some of the

activities were observed similar in terms of gender involvement in all study sites. Cleaning of shed was male's domain in Gorkha and Tanahun, but both male and female would do this job in Chitwan. Likewise, fodder collection work would be done by both male and female in all sites, but selling milk would entirely the responsibility of male in all sites (Table 7).

Table 7 Gender division of labor in buffalo production across the study districts

Activities	Gender division of labour							
	Gorkha			Tanahun		Chitwan		
	Male	Female	Both	Male	Both	Male	Female	Both
Cleaning of shed	√			√				√
Feeding animals		√			√			√
Fodder collection			√		√			√
Milking	√				√	√		
Selling milk	√			√		√		
Selling animals	√				√	√		
Obtaining veterinary care	√				√		√	

Source: FGD, 2014

Gender roles in buffalo marketing decisions

Gender decisions on buffalo marketing was studied in relation to determining size of buffalo keeping, decide market place to buy buffalo and decide market place to sell buffalo. Accordingly, about 3/5th of the respondents in Tanahun and Gorkha reported that determining size of buffalo was the role of both male and female whereas it was a dominating work of male in the case of Chitwan. In overall all, it was a dominating case for both male and female members considering all three study sites (Table 8).

In a similar reflection, it was revealed that nearly 70% of the respondents in the Tanahun and about 60% respondents in Gorkha reported that decide market place to buy buffalo was the role of male member whereas about 60% respondents in Chitwan district reported the task as of male dominating. Similar pattern of response was revealed in the case of decide market place to sell buffalo as well (Table 8).

Findings from the Focus Group Discussion

Gendered Daily Work Routine

The present study of Focus Group Discussion (FGD) has tried to get an idea of the activities of male and female do during one day in rural households. There are some similarities in daily work routine between and among the caste and ethnic groups across the districts. Usually, both male and female start their work at 5 to 5.30 is and ends at 6.30 am. However, wake up time varies from one household to another. For example, Mr. Pulananda Adhikari and his wife in Chitwan always wake up at 3 am in the morning that he has more number (60-70) of livestock. Generally, all family members get up between 4.30 to 5 am in the farming community.

Table 8 Gendered decisions on buffalo marketing in the study sites

Activities	Tanahun (n=33)	Gorkha (n=35)	Chitwan (n=30)	Overall (n=98)
Determining size of buffalo				
Adult male	5 (15.2)	8 (22.9)	17 (56.7)	30 (30.6)
Adult female	6 (18.2)	4 (11.4)	1 (3.3)	11 (11.2)
Both adult	22 (66.6)	23 (65.7)	12 (40.0)	57 (58.2)
Decide market place to buy buffalo				
Adult male	3 (9.1)	10 (28.6)	18 (60.0)	31 (31.6)
Adult female	7 (21.2)	5 (14.3)	1 (3.3)	13 (13.3)
Both adult	23 (69.7)	20 (57.1)	11 (36.7)	54 (55.1)
Decide market place to sell buffalo				
Adult male	4 (12.1)	13 (37.2)	19 (63.3)	36 (36.7)
Adult female	8 (24.2)	4 (11.4)	1 (3.3)	13 (13.3)
Both adult	21 (63.4)	18 (51.4)	10 (33.3)	49 (50.0)

Source: Field Survey, 2012
Note: Figures in parentheses indicate percentage of response

In Gorkha, farmers wake up at around 5 am and start to clean the shed, feed the animal and finish milking job within 6.30 am. Then after, they go for selling milk in the nearby cooperative. Woman, however, in all the districts usually keeps busy in kitchen affairs especially for cooking food, caring of elderly and child in the family. During the day time, mostly at around 2-3 pm they go for fodder and forages collection, watering the animal and often they clean the animal as well. Around 4 pm, they go for milking buffalo. Usually, evening meal is ready at around seven to eight pm. They have their food and males go to the bed little bit earlier than females. After cleaning and washing utensils, women go to bed at 9.30 to 10 p.m. Moreover, at present days all the family members enjoys watching Television together during night in all the districts.

In the Tanahun, farmers wake up quite early than in Gorkha. Accordingly, most of farmers at the rural household wake up at 4-5 am in the morning. They also involved in livestock care and management activities like in Gorkha in the early morning hours. The only difference in Tanahun than in the Gorkha is that due to lack of cooperatives in nearby area, they sell the surplus milk in the tea shop and to their fellow neighbors. Usually, neighbors visit their house and purchase milk according to their wish of contact. Some of them are involved in off-farm activities (Service and Business). During the day time, at 3 pm they go for collecting the fodder and forages, and involve in grazing and watering the animal. Mostly, women go for forages collection and men go for the fodder tree collection. After returning to the respective home, women remain engaged into their traditionally assigned duties of preparing meal, cleaning and washing utensils. Similar scenario of gendered daily work routine was found in Chitwan as well. Enjoying with

Television program is a means of relaxation for Tanahun farmer is also common at present days.

Farmers are not only engaged in farming and household affairs, equally they are religious people and regularly participate in different religious functions and activities in group and also make visit to the temple in all the study districts. In all study sites, we found that women usually participate and work together in neighborhood ritualistic function.

Gender division of labour in buffalo production

It was learnt that there were distinct gender division of labor found in buffalo production across the study districts of Palungtar of Gorkha; Dulegaunda of Tanahun and Chanauli of Chitwan districts. Cleaning of shed in Gorkha and Tanahun was done by male whereas such activity was performed by joint involvement of male and female in the case of Chitwan. In the past, the male member of the family in Tanahun did not practice collection of farm yard manure due to the traditional belief that male should not do that activities. Thus, cleaning of shed was the female's job in the past. This indicates that society is changing so as the traditional value is also inclined to change. There was a joint involvement of male and female in fodder collection in all the study districts.

Feeding animals across Tanahun and Chitwan was jointly done by male and female, whereas in Gorkha such activity was done by female alone. Similarly, milking animal, selling of milk and selling whole animal were done by male members in Gorkha and Chitwan while milking and selling milk were the domain of male alone in the Tanahun district. A contradiction in gender role was found in the case of obtaining veterinary care among the study districts. It was learnt that male alone were involved for obtaining veterinary care in Gorkha while female alone took such responsibility in Chitwan. However, both male and female jointly involved for such activity in Tanahun. This information clearly reflects the indication of rigidity in division of labour across the districts. However, flexibility in performing role was also found inclined towards change as per the availability of labour at the household level. These activities are practiced from ancient time. They have learnt to practice those activities from their ancestors and also thought that this is a source of raising household income.

Household Decision-Making Process

Decision-making is not a matter of debate at rural households of Nepal. Generally, decisions are made on the basis of consensus between husband and wife in the family. Minor decisions such as selling and buying small items are made by female in all the districts. Usually, male actively involved in the decisions of buying and selling of animals.

Although selling milk is the job of male members in all the study districts, female member (the mother) of the family often decides on amount of milk to keep for home consumption and for sell. After consuming the required amount of milk, female decides to sell the surplus amount of milk in the local market and to their neighbor. One of the participant farmers of Tanahun has larger amount of milk production thus sold in the dairy nearby location. In Gorkha, the decision making power was found dominated by the

male head (70%) of the family compared to the female (30%) member of the family. The household activities- livestock farming, management and feeding of livestock, are dominated by the female (70%) compared to the male (30%) member of the family. In the case of Tanahun, male members mostly attend social meeting because it is traditionally in practice that favors male.

It was also learned that male and female member jointly participate for making big decisions such as purchasing land, purchasing animal, spending time for social and religious ceremony etc, but for small and minor household decisions either male or female could have individual decision. In Chitwan, both male and female member exercise the power in taking decisions. In the absence of male member, however, female can make her own decision for minor activity, but for major household decisions she decides in consultation with the male members such as Father-in-Law, brother-in-Law or even her own father and brothers.

Challenges for livestock production

There was a similarities found in terms of challenges faced by the participant farmers of study districts. Accordingly, farmers of Gorkha district realized that the biggest challenges for the livestock production was problem of scientific shed due to lack of resource for construction followed by problem of proper management of farm yard manure. Similarly lack of sufficient supply of fodder and forages is another alarming problem for livestock production along with assurance of water availability to feed animals. Moreover, there is lack of strong policy in livestock farming. Similar types of challenges were faced by the farmers of Tanahun and Chitwan as of Gorkha. However, farmers of Chitwan have realized the fact that there is lack of proper grazing field on the top of other constraints and problems related to the livestock. Before launching the LCC INPB Project there was lack of knowledge to feed improved forages to the animals thus they forcefully fed weed to their animals in all the study districts. At present due to impact of project activities they have learnt to feed improved forage and balanced feeds to their animal. This is the lesson learned by the participating farmers in all the study districts.

Motivation towards buffalo production

Positive points

Buffalo milk content more fat percentage, thus buffalo milk is tastier than cow milk. More manure can be produced from buffalo and thus more useful in making soil fertile for agriculture purpose. Buffalo manure/dung is also good for Biogas Plant due to more dung production. Moreover, more than half of the cost of rearing can be incurred even after selling dry buffalo for meat purpose. Therefore, farmers are inclined to raise buffalo compared with the cow farming in all sites of the study districts.

Negative points

In spite of several advantages buffalo posses, buffaloes are considered large animal that requires more feeds and greater attention to rear. Often they are difficult to handle as

well. Thus some farmers are still thoughtful to raise buffalo due to burden of work and less profit.

Findings of supplementary work of Chitwan district

Gender role decisions on land use

About one-third of the respondents reported that men would decide on whether to plant fodder crops into their own farm whereas nearly half of the respondents thought that such decision would be taken by both men and women together. Similar response were also revealed for what fodder crops to plant and how much land to cultivate to grow fodder (Table 9).

Table 9 Gender roles in land use decision among the buffalo rearing farmers of Chitwan

Land use pattern	Gender roles in land use decisions (n-57)			
	Women	Men	Both separately	Both together
Whether to plant feed/ fodder crops into own farm?	6 (10.5)	19 (33.3)	4 (7.0)	28 (49.2)
What feed/fodder crops to plant/sow in own farm?	9 (15.8)	24 (42.1)	-	24 (42.1)
How much land to cultivate as feed/ fodder crops into own farm?	6 (10.5)	19 (33.3)	2 (3.5)	30 (52.7)

Source: Field Survey, 2014

Note: Figures in parentheses indicate percentage of response

Gender role decisions in buffalo production

It was revealed that men would decide on whether to keep buffalo for milk production as reported by about half of the respondents whereas similar proportion of the respondents also thought that such decision would be made by both men and women together. Similar trend of response was also found on the activities such as whether to sell buffaloes, or to select the appropriate breed of buffalo (Table 10).

Table 10 Gender roles in buffalo production decisions among farmers of Chitwan

Buffalo production activities	Gender roles in decisions on buffalo production (n=57)			
	Women	Men	Both separately	Both together
Whether to keep buffalo for milk production and/or farming?	8 (14.0)	26 (45.6)	-	23 (40.4)
Whether to sell buffalo?	9 (15.8)	25 (43.9)	1(1.8)	22 (38.5)
Selection of the breed	3 (5.3)	35 (61.4)	-	19 (33.3)

Source: Field Survey, 2014

Note: Figures in parentheses indicate percentage of response

Gender roles in feed management and animal nutrition

Gender roles in feed management and animal nutrition varied as per activities. For example, about one-third of the respondents reported that women as well as men would involve in planting feed crops whereas about one-fifth of the respondents reported that such involvement would be for both men and women but separately (Table 11).

Table 11 Gender involvement in feed management and animal nutrition related activities among farmers of Chitwan

Feed management and animal nutrition activities	Gender roles in feed management and animal nutrition			
	Women	Men	Both separately	Both together
Planting feed crops (n=57)	20 (35.1)	19 (33.3)	12 (21.1)	6 (10.5)
Tending to feed crops (n=57)	23 (40.4)	10 (17.5)	18 (31.6)	6 (10.5)
Harvesting feed crops (n=56)	25 (44.6)	8 (14.3)	17 (30.4)	6 (10.7)
Selection of purchased feed (n=55)	13 (26.3)	31 (56.4)	10 (18.2)	1 (1.8)
Feed preparation (n=57)	27 (47.4)	10 (17.5)	8 (14.0)	12 (21.1)
Feeding (n=57)	20 (35.1)	22 (38.6)	12 (21.1)	3 (5.3)
Administration of supplements (n=57)	7 (12.3)	45 (78.9)	5 (8.8)	-

Source: Field Survey, 2014

Note: Figures in parentheses indicate percentage of response

Women would be involved in tending feed crops as reported by 2/5th of the respondents whereas about 1/3rd of them reported that tending to feed crops would be done by men only. Feed preparation, on the other hand would be heavily done by women as reported by ½ of the respondents whereas about 1/5th of the respondents thought that it would be done by both men and women together (Table 11).

Gender roles in animal health management

Gender roles in animal health varied according to the activities. For example, about one-third of the respondents reported that diagnosis of diseases would be done singly by women, men, as well as by both but separately whereas more than 80% respondents reported that obtaining veterinary care and buying medicines for buffalo would largely done by men alone (Table 12).

Table 12Gender roles in animal health management among farmers of Chitwan

Animal health related activities	Gender roles in animal health			
	Women	Men	Both separately	Both together
Diagnosis of diseases of buffaloes	18 (31.6)	24 (42.1)	15 (26.3)	-
Obtaining veterinary care for buffaloes	5 (8.8)	47 (82.5)	3 (5.3)	2 (3.5)
Buying medicine for buffaloes	4 (7.0)	51 (89.5)	2 (3.5)	-
Care of sick animal	10 (17.5)	20 (35.1)	8 (14.0)	19 (33.3)

Source: Field Survey, 2014

Note: Figures in parentheses indicate percentage of response

Gender roles in animal reproduction related activities

Information on gender roles for animal reproduction revealed that heat detection in buffalo would be done by women and men alone as reported by about one-third of the respondents whereas obtaining AI services and natural breeding related works would exclusively done by male alone (Table 13).

Table 13 Gender roles in animal reproduction related activities among farmers of Chitwan

Animal reproduction related activities	Gender roles in animal reproduction			
	Women	Men	Both separately	Both together
Heat detection	25 (43.9)	19 (33.3)	8 (14.0)	5 (8.8)
Obtaining AI services	3 (5.4)	52 (92.9)	1 (1.8)	-
Natural breeding	5 (8.8)	44 (77.2)	4 (7.0)	4 (7.0)

Source: Field Survey, 2014

Note: Figures in parentheses indicate percentage of response

Gender roles in milking and marketing activities

Findings revealed that milking would be equally done either by men, women or both separately as reported about by one-third of the respondents. Whereas selling milk, selling buffaloes and determining price of buffalo would be dominated by men as reported by about $3/5^{th}$ of the respondents (Table 14).

Table 14 Gender roles in milking and marketing among farmers of Chitwan

Milking and marketing activities	Gender roles in milking and marketing			
	Women	Men	Both separately	Both together
Who milks the buffalo?	15 (26.3)	22 (38.6)	18 (31.6)	2 (3.5)
Who sells the milk?	9 (15.8)	35 (61.4)	13 (22.8)	-
Who sells the buffalo?	4 (7.0)	33 (57.9)	-	20 (35.1)
Who determines the price of buffalo?	4 (7.0)	34 (59.6)	1 (1.8)	18 (31.6)

Source: Field Survey, 2014

Note: Figures in parentheses indicate percentage of response

Gender concern in the use of assets and income

It was revealed that men would exclusively own the legal title of the land as well as the buffalo as revealed by the response in Chitwan district (Table 15). Regarding decision on spending money by selling milk, about $1/5^{th}$ of the respondents reported that it would be decided by men or women alone whereas ½ of the respondents reported that it would be decided by both men and women together. Similar response was also obtained regarding who decides on how to spend the money from buffalo sales (Table 15)

Table 15 Gender concern in the assets and use of income among farmers of Chitwan

Activities	Gender concern in the use of assets and income (n=57)			
	Women	Men	Both separately	Both together
Assets				
Legal ownership of land	5 (8.8)	51(89.4)	NA	1 (1.8)
Legal ownership of buffalo	9 (15.8)	47 (82.5)	NA	1(1.8)
Use of income				
Who decides how to spend the money from milk sales?	11(19.3)	13 (22.8)	2 (3.5)	31(54.4)
Who decides how to spend the money from buffalo sales?	10 (17.5)	12 (21.1)	2 (3.5)	33 (57.9)

Source: Field Survey, 2014

Note: Figures in parentheses indicate percentage of response

Gender roles in livestock- focusing to the buffalo production

Gender division of tasks and responsibilities is not strict. Gender division of labour varies across regions (Bajracharya, 1994). Both men and women take part in livestock management. However, women generally contribute more labour inputs in areas of feeding concentrate and water, feeding fodder, grazing animals, collecting fodder from grassland or forest, cleaning of barns, milking, churning butter, sale of milk and its products than men in the rural household of Nepal (Devkota, 2010). Findings of this study well revealed that gender roles such as construction of shed, cleaning, grazing, feeding, breeding and veterinary health care are still traditionally done-either male or female alone dominating task. Gender division of labour in livestock farming in South-East Asia is indeed similar to that described in other regions. Men are principally responsible for taking care of large animals and women for small ruminants (Petheram and Basuno, 1986).

In general, women take care of animals and men decide to the major agenda of livestock rearing whereas livestock production overlap and influence each other due to changing paradigm of gender roles as well (Devkota, 2010). When men are absent at the household women carry out these tasks without hesitation and burden perhaps for the temporary adjustment in gender roles. In deed examples of women's involvement are provided from the different agro-ecological zones and context. It is important to make a distinction among the types of responsibility that women have over livestock related activities: ownership, control over decision-making, use rights and provision of labour. In most systems, women provide labour for the various tasks related to livestock, but may or may not control the process of decision-making. Women may be involved in production, but may or may not own the means of production such as livestock, land, water, etc. Nevertheless, it is important to understand about the pattern and practices on how gender role has been assigned in a given context-focusing to the activities that are heavily done, either-men dominating, women dominating, or done by both together at a time as and when it happens to perform based on their convenience. In the case where most of the livestock related works are traditionally done-either men alone, for example, feeding medicine, breeding, shed construction, or women dominating such as feeds and feeding

management, shed cleaning etc. that fairly suggest the need to consider role specific planning while promoting scientific buffalo production and or enterprise development.

Changing decision pattern of men and women in livestock production

The findings of this study clearly revealed changing in the pattern and context of household decision-making in relation to gender decision processes. It is hard to say that both external and internal factors could contribute to have such results as it was beyond the scope of this study, however, social and global environment and their direct as well as indirect impact might contribute even at the household level for such visible changes. Traditionally, most of the livestock related decisions used to be men dominated task such as selling, marketing, use of money after livestock sell whereas women alone would have to hold very minimum participation for such decisions perhaps due to strong social norms and cultural construct (Chhetri, 2007; Devkota, 2010). However, results clearly showed that the common prevalence of joint decisions of both men and women in livestock production and marketing decisions including decisions on selling of buffalo and determining size of buffalo rearing. Many recent changes in the economic and socio-political conditions could affect livestock management decisions - whether it should be done by men or women. "The deleterious impact on women of continuing processes, such as increasing monetization of the rural economy, privatization of land, and commercialization of agriculture could play vital role to have such scenario developed (Joekes and Pointing 1991). In terms of decision-making, the handling and marketing of milk mostly done by women; men make decisions about large animals in the African context as well. In India, men are largely the decision makers for livestock production, and are in charge of general herd management whereas decisions on the sale of animals are generally taken by both men and women (Rangnekar, 1991). Nevertheless, there are visible changes in such scenario across the country. Household level changes towards joint decisions including livestock rearing are also reported by earlier researchers in the Nepalese context (Devkota and Pyakuryal, 2006; Devkota, 2010).

Different logics are found regarding particular decision making process in livestock rearing. For example, it is often argued that gender division of labour and participation in decision-making processes are influenced by the value and uses of animals and their products. Accordingly, if the animals serve purposes that are within the domain of women's responsibilities, such as feeding the family, women will have greater influence on decisions regarding the animals. On the other hand, women participate less in decision-making regarding animals such as draft oxen that are mostly used by men for ploughing (Martins, 1990). Men are responsible for the general welfare of livestock, such as animal care, breeding and herd management. Such scenarios were, however, not strictly revealed in this study where a flat type of joint decisions on major livestock production and marketing were reported. Such cases, although have not been well studied under this research frame, but decision-making for livestock, specially to the buffalo rearing are shifting towards joint decisions of both male and female for major activities such as production and marketing decisions. Indeed a shift from the subsistence economy to commercial production could have affected women adversely, diminishing both their revenue from animal products and their status and decision-making authority. Such

context could have equally been developed due to several factors linked to the personal and social context, but such indication are important to consider for planning and executing development activities that are related to the buffalo rearing and management.

CONCLUSION

Number of mature buffalo per household in the study sites matches to the data of national survey thus buffalo should be considered as one of the prime livestock species whereas gender roles and decisions on buffalo rearing would have greater reflection to the other productive livestock species

It has been clearly revealed that gender roles such as construction of shed, cleaning, grazing and feeding, breeding and veterinary health care are still traditionally done-either male or female alone dominating task that suggest the need to consider role specific planning while promoting scientific buffalo production and or enterprise development.

Gender decision on buffalo rearing, on the other hand, for example-marketing and buffalo production activities (whether to keep buffalo, sale it and determine its number and other alike decisions) are found in favor of joint decision of male and female that firmly suggest the concept to consider such change in buffalo production paradigm while implementing gender based development planning.

ACKNOWLEDGEMENT

This research was financially supported by the project entitled "Improving nutrition and productivity of buffaloes (INPB) to adapt to impacts of climate change in Nepal" funded by USAID, and executed by Michigan State University in collaboration with Agriculture and Forestry University, Nepal Agriculture Research Council and Department of Livestock Services. Farmers of study sites are highly acknowledged for their support in responding the questions. The part of its earlier version was presented in 8th Buffalo Congress held in Istanbul, Turkey during 21-25 April, 2015.

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