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# Family Status and its Impacts on Livestock Management in Three Districts of Balkh Province

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## ABSTRACT

**Background:** Balkh is one of the strategic and high populated provinces in the north region of Afghanistan that has 14 districts which occupied 2.5% of the total land area of Afghanistan. Livestock is a dominant sector in the province; however, there is luck of knowledge and information in this regards.

**Materials and Methods:** Primary data were collected from 44 households. The survey contained the questionnaires on family structure including the number of male, female and children per household and education status as well as the type and number of animals, animal diseases, quantity of milk production, source of income and water availability.

**Findings:** Average number of the family member was higher in the Aziz Abad (11.2 persons), while Langar Khana had the lower family number (7 persons). Most of the children were educated in Poshti Bagh (85.1%) but only 27.3% of the children were educated in Dihdadi. There was none of the father and mother educated in Dihdadi. The most populated district was Poshti Bagh with 1400 family residence followed by Haji Kot (400) and Aziz Abad (320), respectively. The highest average number of dairy cattle per family and sheep per family belongs to Aziz Abad. Average number of layer chicken per family was 13.2, 7.5 and 2 in Dihdadi, Balkh and Nahri Shahi districts, respectively. Poshti Bagh had the highest milk production rate (9.8 kg/day) as compared to other villages. Foot and mouth diseases in cows, peste des petits ruminants (ovine rinderpest), parasite in sheep, and Newcastle in chicken are the most common diseases of livestock in the province. Source of drinking water in Poshti Bagh was deep well (20%) and river (80%), while people in Aziz Abad and Haji Kot used hand pumps.

**Conclusion:** In Balkh province, livestock provides great opportunities to the upsurge of income and employment. The most of the dairy production comes from small-scale farms. To support the sustainability of small farms and livelihood in the villages, the supporters (NGOs or government) should focus more on families especially women skills related to livestock sector.

**Key words:** Livestock; Family situation; Dairy production; Balkh province

## INTRODUCTION

Balkh province is one of the high populated and strategic provinces in the north region of Afghanistan that has 14 districts including Balkh, Char Bolak, Char Kint, Chimtal, Dawlat Abad, Dihdadi, Kaldar, Khulm, Kishindih,

Marmul, Nahri Shahi, Sholgara, Shortepa, and Zari as shown in (Figure 1) (Grace, 2004). This province covered 16,186.3 $km^2$ areas which is 2.5% of the total land area of Afghanistan (CSOA, 2015). Balkh province has border with three countries including Turkmenistan, Uzbekistan, and Tajikistan (Fouache et al., 2012). The capital of Balkh is Mazar-e-sharif city which is located at $36^0$ 42' N and $67^0$ 12' E (CIA, 2015). Agriculture and livestock are the main employment for the people of the province. Balkh province has temperature greater than 30 $^0$C and seven continuous months with no or negligible precipitation. During these months, livestock faced with heat stress along with other stressed factors.

As the other part of the country, agricultural activities are important sector in this province. Livestock production system is integrated to agricultural activities. Balkh province is one of the important centers for Karakul production (a special breed of sheep) in Afghanistan (West, 2003). Karakul is the symbol of Balkh province (Fortmann, 2009). In addition, dairy productions are important for the local diet either in winter and summer. The most common homemade dairy products are Ghee (clarified butter oil), buttermilk, curd, Qurut (dried curd), cheese and yogurt that generally prepared and supplied to the markets by women (Fouache et al., 2012). Women play a key role in animal husbandry in Afghanistan especially in Balkh province (Zafar, 2005).

After 2001, most of NGOs started their activities to reestablish the agriculture sector and to improve the dairy industry including some projects implemented by United State Agency for International Development (USAID). In addition, The Dairy Industry Revitalization Project for Afghanistan (DIRPA) was a project that focused on milk production, dairy processing and marketing of dairy products during 2004-2007. This project collaborated with Balkh Livestock Development Association (BLDA) in Mazar-e-Sharif to improve milk hygiene, production and balance rations, animal husbandry and veterinary services (MAIL, 2005; Rlung, 2008; Siddiky, 2017). In June 2007, with the efforts of Food and Agriculture Organization (FAO), Ministry of Agriculture, Irrigation and Livestock (MAIL) and dairy farmers of Balkh province, the Balkh Livestock Development Union (BLDU) was established. Later on, USAID builds and equipped the Balkh Dairy Plant in Shir Abad village of Dihdadi district by collaborating of BLDU and FAO. This dairy plant had the capacity to process 5,000 liters of milk per day and covered 450 farmers.

Traditionally, women care about one or two cows, other dairy animals and a number of chickens on a family farm (IDEA-NEW, 2012), but their participation in the farm practices is differed by some factors such as age, wealth and marital status (Grace, 2004). Generally, there is luck of information regarding family status involved in the livestock sector in the province as well as the production capacity and management of livestock in Balkh province. Thus, this study aimed to survey collect primary and secondary data regarding the family status and livestock production capacity in three districts of Balkh province.

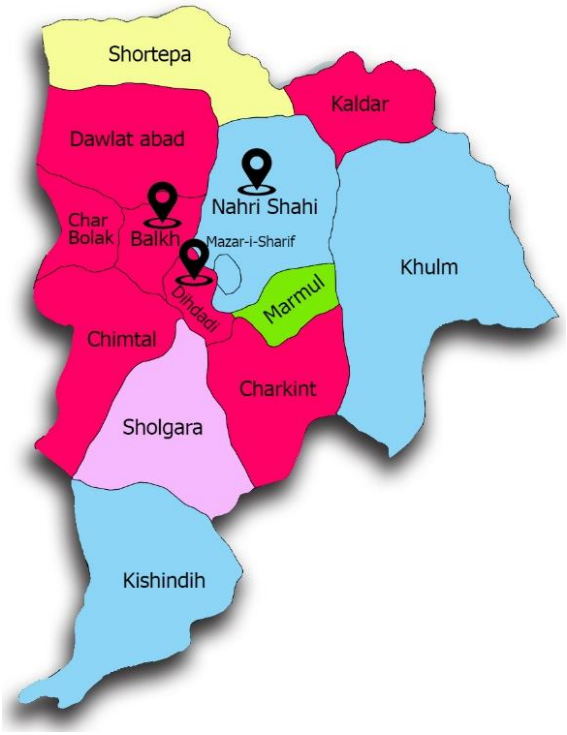


**Figure 1.** Map of Balkh province, Northern Afghanistan (the figure has been created by using Microsoft Office PowerPoint 2013 v.15.0.4.1). Sources: (https://paintmaps.com/blank-maps/85c/samples)

## MATERIALS AND METHODS

In 2015, a questionnaire based survey was conducted in five villages from three districts of Balkh province, including Balkh, Dihdadi, and Nahri Shahi. The survey contains 44 households from Aziz Abad, Haji Kot villages in Balkh district, Poshti Bagh (Oliya and Sofla) and Dihdadi villages in Dihdadi district and Langar Khana village in Nahri Shahi district. The questionnaire of the survey contains the questions regarding the family structure, the number of male, female and children per household, education status, types and number of animals, quantity of milk production, the source of income, and the availability of drinking water. All the interviewed responded in this survey were women. Most of the female were not aware of the economy status of the family. Some secondary data were collected from the Ministry of Agriculture, Irrigation and Livestock (MAIL), Division of Animal Husbandry of Balkh province (DAHB) and Food and Agriculture Organization (FAO) based on their reports from (2005 - 2012).

## RESULTS

### Family Structure, Residency and Source of Income

Family status and educational background of the residence of the three districts in Balkh province are presented in the Table 1. Balkh district had the highest number of family member followed by Dihdadi and Nahri Shahi. Average number of the family member was higher in the Aziz Abad (11.2) and Haji Kot (8.7) villages of Balkh district than other villages, while Langar Khana of Nahri Shahi was the lowest (7). Generally, the females were

higher in all districts than males. Average number of female was high in Aziz Abad (5) while it was low in Langar Khana (3.7). Most of the children were educated in Poshti Bagh (85.1%) village of Dihdadi district followed by Balkh (Aziz Abad, 71.7% and Haji Kot, 78.8%) and Nahri Shahi (42.9%) but only 27.3% of the children were educated in Dihdadi village of Dihdadi district. Higher educated father and mother were recorded in Haji Kot followed by Nahri Shahi. However, none of the fathers were educated in Aziz abad and Dihdadi village, and none of the mothers were educated in Dihdadi district.

**Population and Sources of Income and Drinking Water**

Population rate, source of income and drinking water are illustrated in the Table 2. Based on the available data, the oldest village is Haji Kot followed by Poshti Bagh and Aziz Abad. The most populated district is Poshti Bagh with 1400 family residence with 8400 population followed by Haji Kot and Aziz Abad with 400 and 320 family residence and 2700 and 1920 population, respectively, as shown in the Table 2. Most of the people are labor and they as well have their small business shops which are the income source of them. Majority of the villagers are raising animals doing farm practices and agricultural activities. There are three sources of drinking water in all the surveyed districts which are hand pump, deep wells and rivers. Source of drinking water in Dihdadi was deep well (20%) and river (80%), while people in Balkh district used hand pump for drinking water. However, people in Nahri Shahi use hand pump and river for drinking water (Table 2).

**Livestock Status and their Products**

Table 3 shows the status of livestock management and dairy production in the surveyed districts. The highest number of dairy cattle per family belongs to Aziz Abad (2.7) while the lowest is recorded in Haji Kot which is 0.9. In addition, Aziz Abad had the highest number of sheep per family (13.7) followed by Dihdadi (10.1), Nahri Shahi (8.6), Poshti Bagh (5.1) and Haji Kot (3). Goat management is another asset of livestock with higher number in Aziz Abad (6.4) and the lower number in Haji Kot (1.7). The highest number of layer chicken per family was in Dihdadi followed by Balkh and Nahri Shahi districts, respectively. The highest milk production per day is observed in Poshti Bagh (9.8 kg/day), while the lower milk production is in Langar Khana of Nahri Shahi (4.5 kg/day) as shown in Table 3. One of the important by-products of cow is the dung production which uses for soil fertilization, feul and so on. The highest dung production is recorded in Dihdadi (11 kg/day) followed by Balkh and Nahri Shahi with the lowest rate in Haji Kot (8.3 kg/day).

**Table 1**. Family structure in five villages of Balkh province including average number of male, female, children, son and daughter per family.

| Districts | Villages | FM | Male | Female | Children | Son | Daughter | EC at age of school (%) | NEC at age of school (%) | EF (%) | EM (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Balkh | Aziz Abad | 11.2 | 3.7 | 5 | 6.3 | 2.3 | 3 | 71.7 | 28.3 | 0 | 8.3 |
| | Haji Kot | 8.7 | 4 | 4.7 | 5.9 | 3.1 | 2.8 | 78.8 | 21.1 | 20 | 30 |
| Dihdadi | Poshti Bagh (Oliya & Sofla) | 8.3 | 4 | 4.3 | 6.3 | 3.2 | 3.1 | 85.1 | 14.9 | 11.1 | 0 |
| | Dihdadi | 7.7 | 4 | 3.7 | 3.7 | 2 | 1.7 | 27.3 | 72.7 | 0 | 0 |
| Nahri Shahi | Langar Khana | 7 | 3.4 | 3.6 | 4.8 | 2.5 | 2.3 | 42.9 | 57.1 | 9 | 9 |

FM: family members, EC, educated children, NEC: not educated children, EF: educated father, EM: educated mother

**Table 2.** Establishment year, population, family residence, source of income and drinking water in different districts of Balkh province

| Location | | Established year and population | | Family residence | | Source of income | | | | Source of drinking water |
|---|---|---|---|---|---|---|---|---|---|---|
| Districts | Villages | Established (year) | Population (person) | Beginning of establish | 2015 | Labor | Small family business (shop) | Raising animal | Farming | |
| Balkh | Aziz Abad | 1941 | 1920 | 30 | 320 | Yes | Yes | Yes | Yes | Hand pump |
| | Haji Kot | 1851 | 2700 | 15 | 400 | Yes | Yes | Yes | Yes | Hand pump |
| Dihdadi | Poshti Bagh (Oliya & Sofla) | 1881 | 8400 | 30 | 1400 | Yes | Yes | Yes | Yes | Deep well (20%), River (80%) |
| | Dihdadi | NR | NR | NR | NR | NR | NR | Yes | Yes | Hand pump and river |
| Nahri Shahi | Langar Khana | NR | NR | NR | NR | NR | NR | Yes | Yes | Hand pump and river |

NR: no record

**Table 3**. Average number of dairy cattle, sheep, goat and layer chicken as well as milk and dung production per family in different districts of Balkh province.

| Districts | Villages | Dairy cattle | Sheep | Goat | Layer chicken | Milk production (kg/day) | Dung production (kg/day) |
|---|---|---|---|---|---|---|---|
| Balkh | Aziz Abad | 2.7 | 13.7 | 6.4 | 1.5 | 7.1 | 10 |
| | Haji Kot | 0.9 | 3 | 1.7 | 6 | 9 | 8.3 |
| Dihdadi | Poshti Bagh (Oliya & Sofla) | 1.9 | 5.1 | 3.2 | 6.2 | 9.8 | 9.6 |
| | Dihdadi | 2 | 10.1 | 2 | 7 | 5.5 | 11 |
| Nahri Shahi | Langar Khana | 2.3 | 8.6 | 2.7 | 2 | 4.5 | 8.8 |

**Common Animal Diseases**

There are several species of animals including cattle, sheep, goat and poultry which are managed in small farms in the Balkh province. The diseases such as foot and mouth disease (FMD) in cows, Peste des petits ruminants (PPR) and parasite in sheep, and Newcastle in chicken are the most common diseases as shown in the Table 4. In addition, huge number of sheep and goat are affected and died due to the harsh weather. Based on the report of MAIL in 2012, a huge number (2,500) cattle were affected by FMD, of them 500 cattle were died in Balkh province. Furthermore, 2,000 sheep were infected by PPR, of them 300 sheep were died at the same year. In total approximately 14,500 animals were suffered from the harsh weather in 2012. The harsh weather killed about 1,000 sheep and 500 goats only in Balkh province. Another common disease was Newcastle in chicken that infected a huge number of poultry farms, of them about 3,000 chickens were died due to Newcastle in 2012.

**Table 4.** Animal species, diseases as well as number of infected and died animals in Balkh province.

| Species | Type of disease | Number infected/affected | Number died |
|---|---|---|---|
| Cattle | FMD | 2,500 | 500 |
| Sheep | PPR | 2,000 | 300 |
| Sheep | Harsh weather | 10,000 | 1,000 |
| Goat | Harsh weather | 4,500 | 500 |
| Poultry | Newcastle | NR | 3,000 |

FMD = Foot and Mouth Disease, PPR = Peste des petits ruminants, NR: not record.

## DISCUSSION

The majority of household in Afghanistan, particularly in Balkh province relay upon agriculture and livestock practices (Gang, 2010). Their source of income is also from agricultural and livestock farming productions. The present study demonstrated that majority of family elder ages are uneducated, however, the new and younger generation are educated. Also, the number of female is more than the male in all districts. Thus, females take care of small scale farms in the province. In some societies, women are increasingly involved in managing the small enclosures reserved for milking cows and young calves (Wangui 2014). It shows that traditional livestock practices will be replace with modern farming management in the coming decades.

The research on the status of livestock in three districts of Balkh province was demonstrated that most of the farmers struggle with insecure life due to unstable livestock and agriculture products and the problem doubled by rapid increase of annual population about 2% and urbanization (Zafar, 2005). As livestock and agriculture activity is the only source of income for most of the families, thus the traditional status of this sector have a strong impact in different aspects of farmer's life.

The study reported that several kinds of livestock are managed in Balkh province, of them the common are cattle, sheep, goat and poultry. In addition, milk and dung production are the main output of these livestock

in three districts. These productions are mostly related with the quality of feeding, management practices, environmental stress and diseases (Rojas-Downing et al., 2017). The quality of feeding is one of the greater issues in the case of animal rising in Balkh province which comes from the shortage of feed supply. Erskine et al. (2011) reported protein deficiency of animals in Afghanistan and indicated that in north, people using feeding management and supply the cotton seeds as a dietary supplement to limit the extend of protein deficiency in animals but the availability of that supplement is not sure in all villages. This survey presents that due to harsh weather, inappropriate feeding and breeding management, there is low milk productivity in dairy cattle. The most of the dairy cows are local breed that adapted to the environment but they have low milk production. During last decade, artificial insemination become available for the farmers to improve their cows breed but it was not widely spread in all villages within province because of their distance from the city.

Environment and climate conditions are one of the effective factors in raising animals in Balkh province. The maximum temperature (>30 $^{0}$C) is recorded for seven months of a year in Balkh province with five months without rainfall (Palka, 2001; Pineda et al., 2016) or a negligible precipitation which provide a special condition for animal to face with severe or moderate heat stress. Heat stress has detrimental change on feed intake, production, metabolic and reproduction of dairy cows (West, 2003). A study indicated that the temperature reaches 21 to 36 $^{0}$C, the milk yield starts to decline (Bernabucci et al., 2014) and a negative correlation between raising the temperature and dry mater intake (DMI) was confirmed in dairy cows (West, 2003). Consequently, the milk yield efficiency, protein and fat reduce by the decrease of DMI (Fouache et al., 2012). Therefore it is a significant financial burden and low quality dairy production.

Animal diseases are one of the influencing factors studied in livestock situation in Balkh province, which mainly causes economic defects to the farmers. In recent years, there were several diseases that become the causes of mortality in livestock due to the uncontrolled import of animals from neighboring countries due to the mismanagement of quarantine system and disease control. On the other hand, veterinary clinics are not available in each village as well as the medicines are expensive for farmers to purchase due to their low income. Cattle, sheep and goat mortality were 3.8%, 7.4%, and 5.4%, respectively, in the covered districts. According to (MAIL, 2012) report, most common diseases for cows, sheep and poultry were FMD, PPR, and Newcastle, respectively, in Balkh province. The report showed that animals in the north of Afghanistan face with several stress including environmental stress, mismanagement on housing low quality of feeds, various diseases, water availability and unmodified genetic breed. As the result of these stresses, the farmers face with high mortality of animals and low efficiency on animal's production that is similar to (Silanikove, 2000) findings. The current management for preventing diseases which is implemented by the veterinary program handles by MAIL Mazar and Dutch (non-government organization) to manage disease control is not effective. Using appropriate management system on housing, feed and water supply system, disease control and genetic modification will help to deal with numerous stresses on dairy cattle (Karimi et al.,

2015). Also, an appropriate stress management could be reducing the level of oxidative stress which correlated with improving the antioxidant level by feeding the biological substance to the animals.

## CONCLUSION

In Balkh province, livestock provides great opportunities to the upsurge of income and employment. The most of the dairy production comes from small-scale farms. To support the small farm sustainability in the villages, the supporters (NGOs or government) should have more focus on women skill training on the subjects of animal husbandry, feeding management and hygiene. By considering to a sensitive cultural factor, it is important to train few female of each village extensively and target them to train other villagers. On the other hand, improved livestock practices, genetic improvement and advanced quarantine system can help famers to well manage the current animals and achieved resistance breeds to heat and diseases, consequently increase dairy production and national economy.

## CONFLICT OF INTEREST

The authors declared no conflict of interest.

## REFERENCES

1. Bernabucci, U., Biffani, S., Buggiotti, L., Vitali, A., Lacetera, N., & Nardone, A. (2014). The effects of heat stress in Italian Holstein dairy cattle. *Journal of dairy science*, 97(1), 471-486.
2. Central Intelligence Agency (CIA), United State of America, (2015). PP: 45-56.
3. Central Statistic Organization of Afghanistan. (2015). Demographics report. PP. 154-162
4. Erskine, W., Sarker, A., & Kumar, S. (2011). Crops that feed the world 3. Investing in lentil improvement toward a food secure world. *Food Security*, 3, 127-139.
5. Food and Agriculture Organization (FAO). (2007). First draft country report on the status and perspectives of the animal genetic resources development and conservation in Islamic Republic of Afghanistan, Kabul, Afghanistan. PP: 98-112.
6. Food and Agriculture Organization (FAO). (2008). National livestock census 2002-2003, Rome, Italy. ISBN 978-92-5-105950-0. PP: 37-49.
7. Fortmann, L. (2009). Gender in Afghanistan Sourcebook. The World Bank, Food and Agricultural Organization, and International Fund for Agricultural Development. Washington DC: The World Bank ISBN 978-0-8213-7587-7. *Experimental Agriculture*, 45(4), 515-515.
8. Fouache, E., Besenval, R., Cosandey, C., Coussot, C., Ghilardi, M., Huot, S., & Lamothe, M. (2012). Palaeochannels of the Balkh river (northern Afghanistan) and human occupation since the Bronze Age period. *Journal of Archaeological Science*, 39(11), 3415-3427.
9. Gang, R. (2010). Community-based dispute resolution processes in Balkh Province. Universitäts-und Landesbibliothek Sachsen-Anhalt. Kabul; Afghanistan Research and Evaluation Unit
10. Grace, J. (2004). Gender roles in agriculture: Case studies of five villages in northern Afghanistan (No. 298-2016-4726).
11. Karimi, M. T., Ghorbani, G. R., Kargar, S., & Drackley, J. K. (2015). Late-gestation heat stress abatement on performance and behavior of Holstein dairy cows. *Journal of dairy science*, 98(10), 6865-6875.

12. Ministry of Agriculture, Irrigation and Livestock of Afghanistan (MAIL), Agriculture prospect report (2005). PP: 8-15.
13. Ministry of Agriculture, Irrigation and Livestock of Afghanistan (MAIL), Agriculture prospect report. (2012). PP: 10-12.
14. Palka, E. J. (2001). Afghanistan: A Regional Geography, Military Academy, west point, NY. Department of Geography and Environmental Engineering.
15. Pineda, A., Drackley, J. K., Garrett, J., & Cardoso, F. C. (2016). Effects of rumen-protected niacin on milk production and body temperature of middle and late lactation Holstein cows. *Livestock Science*, 187, 16-23.
16. Rojas-Downing, M. M., Nejadhashemi, A. P., Harrigan, T., & Woznicki, S. A. (2017). Climate change and livestock: Impacts, adaptation, and mitigation. *Climate risk management*, 16, 145-163.
17. Rlung, L. (2008). Dairy Projects in Afghanistan. Poverty Reduction that Works: Experience of Scaling Up Development Success, 109.
18. Siddiky, M. N. A. (2017). Dairying in South Asian region: opportunities, challenges and way forward. *SAARC Journal of Agriculture*, 15(1), 173-187.
19. Silanikove, N. (2000). Effects of heat stress on the welfare of extensively managed domestic ruminants. *Livestock production science*, 67(1-2), 1-18.
20. Wangui, E. E. (2014). Gender, livelihoods and the construction of climate change among Masai pastoralists. In Global Perspectives on Gender and Space (pp. 163-180). Routledge.
21. West, J. W. (2003). Effects of heat-stress on production in dairy cattle. *Journal of dairy science*, 86(6), 2131-2144.
22. Zafar, M. (2005). First draft country report on the status and perspectives of the animal genetic resources development and conservation in Islamic Republic of Afghanistan. Kabul, Afghanistan:FAO