



Safeguarding a national asset: A review on problems faced by Pashmina farmers in Changthang and their amelioration

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Received: 7 April 2014; Accepted: 8 September 2014

ABSTRACT

Pashmina is our national asset. It is one of the finest natural fibers of the world found in our country. This valuable commodity belongs to few far flung and remote areas of Changthang region of Ladakh (Jammu and Kashmir). It is the main source of livelihood of the people of Changthang rearing Pashmina goats. But because of the prevailing circumstances of fodder scarcity and nutrient deficiency, death due to harsh climate (snowfall) and diseases, lack of knowledge and facilities, overcrowding and poor yield, people especially youth are losing interest in this traditional and valuable venture and are joining other fields like Government jobs, business, tourism etc. To preserve this natural fiber and to save our national asset besides making Pashmina rearing a productive industry, the cause of concern should be addressed with special focus on fodder production and conservation on local basis, health and housing management of Pashmina goats and nutrient supplementation. This will also help in improving socio-economic status of Pashmina farmers of Changthang region. This review is based on our field survey in the Changthang region and the review of the researches of other research scholars related to this area.

Key words: Changthang, Fodder, Goats, Pashmina

Pashmina is one of the finest natural fibers of world found in our country (Sheikh *et al.* 2008, Wani *et al.* 2009, Namgial *et al.* 2010). It is produced by one of the rare species of goats i.e. Pashmina goats or Changthangi goats reared by nomadic tribes of Changthang region of Ladakh (Jammu and Kashmir) called as Changpas (Wani *et al.* 2004, 2009, Namgial *et al.* 2010, Singh *et al.* 2013). Pashmina production is the main source of livelihood for Changpas (Bhattacharya *et al.* 2004, Sheikh *et al.* 2008, Bhasin 2012). Based on field observations, these farmers still rear Pashmina goats in traditional ways as per their nomadic lifestyle, grazing pastures on regular basis and on a proper time period so as to avoid over grazing (Sharma 1998, Bhatnagar and Singh 2011). However because of the poor quality of pastures and their deterioration due to overcrowding (Singh 2008), climate change (Miehe and Miehe 2000, Xu *et al.* 2009, Naess 2013), growth of wild shrubs and locust attacks (Wani *et al.* 2008, Morup 2008, Bhasin 2012) etc., fodder scarcity and change of lifestyle is inevitable (Chaudhuri 2000, Singh *et al.* 2013). As the fodder production is on small scale and yield is poor so conservation of fodder is rarely practiced predisposing to shortage of fodder during natural calamities or harsh climates like cold winters (Morup 2008, Bhasin 2012).

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Besides poor housing and health management makes occurrence of disease outbreaks a regular phenomenon causing a huge loss to poor farmers (Bhasin 2012, Singh *et al.* 2013). Keeping in view these problems faced by Changpas and the Pashmina goats, the strategies should be devised to ameliorate the sufferings of poor farmers and to safeguard our national asset - the Pashmina.

Changthang, the eastern region of Ladakh, has 41 villages and hamlets, inhabited by about 8,000 settled and nomadic pastoralist population (Kitchlu 1977). Its 2 main blocks are Nyoma and Durbuk having 23 villages out of which 18 are in Nyoma block and 5 in Durbuk.

Changthang comprises high plateaus and rolling hills (usually >4000 m) interspersed with lake and river basins that have moist patches of relatively dense graminoid vegetation. Most of the remaining arid region is dominated by medium to sparse steppe vegetation. Changthang covers approximately 20,000 km². It is a cold desert having arid climate with severe cold and snow fall during winters (Bhatnagar *et al.* 2006).

Review of the data regarding the year-wise variation of Pashmina goat population, Pashmina production and income from Pashmina goats is given in Table 1. Observations of our field level survey conducted during November-December 2013 in different villages of Changthang using random sampling technique and taking village, household and Pashmina goats as units are given in Table 2. Total population of Pashmina goats is 206,014

Table 1. Year wise variation of Pashmina goat population, Pashmina production and income

Year	Total Pashmina goats	Total Pashmina production (tons)	Income (₹) from Pashmina goats	Reference
2003–2004	150,000	30	11,600–43,800	(Sheikh 2003, Bhattacharya <i>et al.</i> 2004)
2005–2006	184,824–196,383	40	28,908–80,321	(LAHDC 2006, Morup 2008)
2007–2008	170,590–208,878	30–40	76,170.53–83,603.43	(Morup 2008, Sheikh <i>et al.</i> 2008, Bhasin 2012)
2009–2010	167,363	40–50	41,307–112,732	(Wani <i>et al.</i> 2009)
2011–2012	206,014	50	90,000–110,000	(SHD 2012)

Table 2. Field level observation of some parameters regarding Pashmina

Parameter	Average	Range (maximum noted)
Total population of <i>Pashmina</i> goats (number)	190,000	180,000–210,000
Herd size per household (number)	150	50–250 (1200)
Pashmina yield (g) per animal	250	200–300 (550)
Fiber diameter (μ)	12	10–14 (8)
Staple length (cm)	4.5	4–5 (8)
Pashmina production (kg) per household	30	20–40 (300)
Cost per kg (₹)	2,500	2,200–2,800 (3,000)
Income from Pashmina (₹) per household	117,000	110,000–124,000 (660,000)

in Changthang, out of which 131,286 are in Nyoma and 46,564 in Durbuk block (SHD 2012). Total Pashmina production from Changthangi goats is about 50 tonne/ year (Wani *et al.* 2009) which is almost 80% of national production (Sheikh 2003) when the national production is around 60 tonne accounting for less than 1% of world total Pashmina production (Sheikh *et al.* 2008). Yield is about 393.33 g / animal in Changthang region which is higher than other parts of Ladakh but lower than the production potential of animals i.e. about 450–500g / animal / year (Wani *et al.* 2009). Cost is about 2,200₹/ kg (Namgail *et al.* 2007, SHD 2012). The average net income is about ₹ 178.95/animal, average net profit is ₹ 812.28/animal and average employment generation 189.02 days (Wani *et al.* 2009). Keeping in view these benefits and the contribution of Pashmina goats to the livelihood of the Changthang region, there should have been progress in this farming but the situation is alarming as the farmers especially youth are losing interest in it because of fodder scarcity, pasture shrinkage, poor yield, lack of facilities, lack of rearers/ labour, harsh climate, diseases and mortality (Misra *et al.* 1998, Ahmed 2005, Goodall 2004).

Common problems faced by Changpas and possible solutions

Common problems faced by Changpas have been discussed (LAHC 1999, Sharif 2000, Kumar 2000, Sheikh *et al.* 2008, Wani *et al.* 2009, Namgail *et al.* 2007, 2010) but the ground situation is alarming as every year thousands of Pashmina goats are dying because of fodder scarcity, cold stress and diseases. So the need of hour is to formulate the strategies which can ameliorate these problems. Main problems faced by Changpas and the possible solutions are discussed here.

Shrinkage and deterioration of pastures: In the recent past pastures have shrunk in Changthang region (Wenche 2004). There are many reasons for this. Poor growth of pastures is noticed in many areas. Because of the continuous grazing of pastures for many decades the pasture quality has degraded (Jina 1986). It has been noticed that the pastures that used to be lush and green during previous times have either lost charm or are at the brink of extinction. This is particularly visible in Korzok, Samad, Kharnak and Rupshu (Bhasin 2012). Tibetan intrusion due to Sino-India war in 1962 resulted in overcrowding and hence pasture shrinkage especially in Skakjung (Morup 2008). Due to the security restrictions our Pashmina farmers are not allowed to graze their livestock in some parts whereas Chinese nomads are grazing those pastures freely with the result burden on other pastures is increasing on one side and loss of pastures to Chinese is occurring simultaneously (Patil 2008, Morup 2008). Locust swarm has appeared in some pastures which deteriorated the grasses preferred by Pashmina goats. Quality of the Changthang pastures, which have been a mix of grass and legumes, is declining with the proliferation of weeds such as artemisia (Morup 2008, Bhatnagar *et al.* 2006). Development works for construction of roads, buildings, camps, fencings etc., have both shrunk grazing area and damaged the pasture land in the surroundings.

Prospects of fodder development are there (Mir 1986). To combat this pasture shrinkage and deterioration, rotational grazing should be practiced along with mixed population of livestock. This will allow pasture regeneration and provide animals grasses of their preference. Illegal intrusion by refugees should be checked and those already settled should be provided with pasture lands or develop new pasture lands for their livestock. Grazing by Chinese nomads

should be checked or our own herds should also be allowed to graze. Safe and biocompatible remedy for locust infestation should be investigated which will prevent locust swarms without affecting pasture grasses or natural balance. Developmental works should be undertaken only in non pasturelands.

Harsh climate and snow: Despite the fact that the Pashmina yield increases as the environmental temperature decreases, the harsh climate has caused severe mortality in Pashmina goats especially neonates. This may be attributed directly to death due to hypothermia stress (Yatoo *et al.* 2014) or indirectly due to fodder scarcity during snowfall which was the main reason of mortality in Pashmina goats during March 2013 in which almost 30,000 goats died (Morup 2008, Anonymous 2013, Thakur and Pandit 2013). Harsh climate freezes the water and snow causing to shortage of drinking water. Also frozen snow over pastures renders grasses inaccessible to Pashmina goats. Supply from outside is hindered due to closure of roads which are usually not macadamized and become dangerous during winter (Jina 1986, Hussain 2008).

Though the harsh climate and snow fall has there been for decades and is a natural phenomenon but the preventive measures and post disaster measures can be undertaken or kept ready in case of severity so as to minimize loss. Storage of fodders should be done both by Government. and public in the local areas which can be used during scarcity. Development of better roads will enable supplies during natural calamity/snow fall. Better housing for Pashmina goats during cold especially neonates which are more susceptible to hypothermia can prevent mortality.

Change in sheep and goat population: From the data of livestock population of Sheep Husbandry Department, it is clear that the sheep population has decreased whereas goat population has increased except for 2013 data, which may be due to the mortality of almost 30,000 Pashmina goats due to snowfall and fodder scarcity (SHD 2012, Morup 2008). This causes two-fold problems one is change in pasture consumption preference and other is loss of warmth in winter due to reduction in sheep population which contributed to reducing cold intensity in animal house during winters (Animuta *et al.* 2005). Main reason for this change is that the Pashmina is more costly than wool and market demand is more for Pashmina. Hence Pashmina goats are preferred (Namgail *et al.* 2010). This can be solved by balancing the proportion of sheep and goats in flock.

Wildlife: Kyang, argali, antelope and gazelle, also graze on the pastures used by Pashmina goats (Mishra *et al.* 2002). Hence reduction in fodder occurs and Pashmina goats get insufficient grasses for consumption resulting in malnutrition and loss of production. Besides wildlife also damages the cultivated land for crops and fodders (Bhatnagar *et al.* 2006, Bhasin 2012). Though fencing is one of the options but concerns by wildlife department should also be redressed. Fencing restricts movement of wildlife hampering natural migration as is evident in Nyoma and Tsaga area where fencing by forest department and army

camps have hindered wildlife moments. Attacks by wild and feral dogs and foxes have caused great concerns among Changpas and loss to livestock. Hence appropriate measures should be adopted by concerned authorities (like Animal Husbandry Department and Wild Life Department) to prevent such attacks.

Tourists: The pack animals for tourists and car rally teams also destroy the fragile top soil as is evident from the condition of pastures surrounding Tso-kar (lake) in Samad area and Ldad in Kharnak, which are turning into deserts (Bhasin 2012, Singh *et al.* 2013). Tyre marks can be seen all over Loma, Rongo and Anley as well (Morup 2008).

Lack of connectivity: Mountainous terrains, poor status of roads and harsh climate makes many villages of this region inaccessible. During winters and snowfall the condition still worsens as roads get blocked (Jina 1986, Bhasin 2012). Mobile towers are lacking and mobile service is not present. Though V set telephones are present in some areas but they are usually out of function. Internet services are nonexistent in most of the areas. Hence this area totally lacks connectivity. In the event of natural calamity like recent snowfall or cloud burst, relief works take weeks to months to reach this area as happened last year during March snow fall when acute fodder shortage resulted in heavy mortality in Pashmina goats. But fodder supplies from outside could only reach after 2 to 3 weeks that too via army helicopters when the road was not pliable (Morup 2008, Anonymous 2013). The local KVK at Nyoma can help in minimizing these losses by developing and supplying locally produced fodders to poor farmers during natural calamity besides providing other reliefs.

Fodder scarcity: One of the main problems for the Changpas in the current scenario is arranging fodder for the Pashmina goats. As the pastures have shrunk and their production potential has decreased hence need for fodders have increased (Bhasin 2012, Singh *et al.* 2013). Besides increasing demand for Pashmina has led to increase in Pashmina goat preference. As the area under fodder cultivation is meager, soil fertility is poor and yield is low so cultivation is hardly practiced (Wenche 2004, Namgail *et al.* 2007, Yatoo *et al.* 2011). This ultimately resulted in fodder shortage especially in winters or during snowfall when the pastures are covered under snow and external supply is hampered due to closure of roads by snow or frozen waters (Jina 1986, Singh *et al.* 2013). This problem can be solved by developing locally suitable and adaptable fodders having better yields, conservation and enrichment of fodders, providing seeds of fodders, fertilizers to farmers and encouraging them for fodder cultivation (Fox *et al.* 2009, Yatoo *et al.* 2012).

Disease outbreaks: Foot and mouth disease (FMD), Pestes des petitis ruminants (PPR), contagious caprine pleuropneumonia (CCPP), goat pox, liver flukes, ectoparasites and skin affections, diarrhoea and mortality are some of the major health related problems of Pashmina goats in Changthang (Bhattacharya *et al.* 2004, Sheikh *et al.* 2008). Poor management, lack of awareness and

veterinary facilities (medicines/ vaccines) at appropriate time are main reasons for disease outbreaks (Wani *et al.* 2009, Bhasin 2012). This can be solved by proper vaccination, deworming and treating affected animals properly besides providing awareness about proper health management of Pashmina goats.

Neonatal mortality: Death of lambs and kids causes a great loss to farmers. One of the main reasons for this loss is neonatal diarrhoea, hypothermia and malnutrition (Ganai and Sheikh 2004, Nair 2010, Morup 2008). Improper housing, overcrowding, dirtiness and improper feeding result in neonatal diarrhea and death. Neonatal mortality ranges between less than 5% in organized farms and as high as 30% in unorganized farms (Ganai and Sheikh 2004). Providing medicines and awareness regarding scientific rearing and housing will help in preventing neonatal mortality (Jina 1995, Wani *et al.* 2009).

Lack of knowledge/awareness and facility: Our field survey revealed that the Changpas lack knowledge and awareness regarding improved farming techniques, livestock management, disease prevention and control strategies. They are not getting vaccines, medicines, seeds etc., at appropriate time. Providing awareness and training to farmers will help in encouraging farmers for adopting modern techniques. Besides information regarding processing of farm produce and marketing avenues should be made available to Changpas so as to minimize the exploitation by middleman. By providing facilities like seeds, vaccines and medicines at appropriate time will help in ameliorating most of the problems faced by Changpas. In this KVK, Nyoma can play an important role. This will boost production of crops, fodders, livestock and make them self sufficient.

Non adaptability and non suitability of technologies: Experimentation under local environmental conditions will be the ideal way for studying and developing technologies and products for local needs as they will be more suitable and adaptable to this region than the ones developed in other parts of the country which have usually failed under the harsh climatic conditions of Changthang region. By establishing Krishi Vigyan Kendra (KVK), Nyoma at this highest mountainous region Indian Council of Agricultural Research (ICAR) has provided a life saving remedy for the poor Changpas and their livestock. This will help in developing fodders and feeding products locally, provide the much needed timely prophylactic and therapeutic regimes and management practices to livestock farmers in addition to the usual KVK mandate.

Future thrust

The world famous Pashmina of Changthang is facing a danger of extinction as the Changpas are losing interest in Pashmina goat rearing because of the multifactorial problems. So to safeguard our national asset developmental strategies should be designed as per the needs and requirements of this region which can address the concerns of Changpas and boost the production of their fields and

livestock. Experimentation and studies under local environmental conditions like regional stations and KVKs will be a more feasible option for development of area-specific technology or products as the technology or products developed in other parts of the country are usually not suitable for this region. This will not only help in increasing fodder production locally, enhancing Pashmina production but also improve socio-economic status of Changpas.

ACKNOWLEDGEMENT

Authors are thankful to Vice Chancellor, SKUAST-Kashmir for their help and support in this study and acknowledge the hospitality of Changpas.

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