

- [Home](#)
- [Disclaimer](#)
- [Climate Change](#)

[RSS](#) Subscribe: [RSS feed](#)

[GCC News Brief](#)

Global Climate Change News Brief

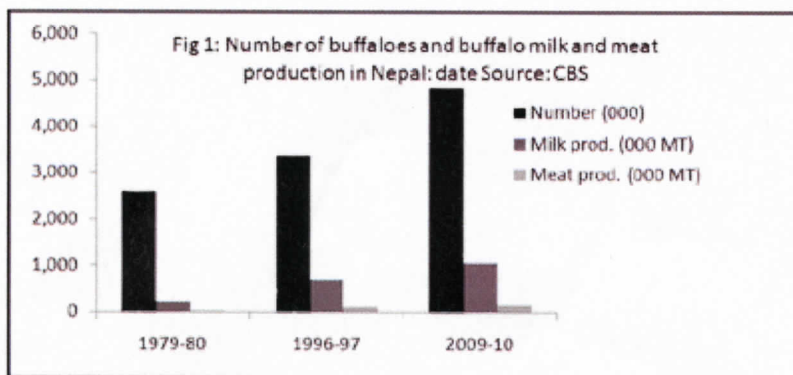
Challenges of #climate change and sustainable livestock production in Nepal

Posted on August 19, 2011 by [Shiva](#)

by **Durga D. Poudel, Ph.D.**

University of Louisiana at Lafayette, Louisiana, USA

Livestock production is one of the major components of Nepalese mixed farming system. In this system, while forest supplies fodder, fuel wood, grazing land, and balances hydrology, livestock convert fodder, grasses, and agricultural by-products to milk, meat, manure, and household income. Soil fertility of agricultural land is maintained by manure application. Agricultural crops provide food to the families, and fodder, straw, and grains to the livestock. Most rural families depend on livestock to support and send their children to schools and colleges. Sustainable development of the livestock resource requires holistic considerations of land, water, forest, agricultural crops, climate, and manpower. According to an Economic Survey by the Ministry of Finance, estimated livestock population for 2009/2010 in Nepal was as follows: goats 8,762,000, cattle 7,199,000, buffalo 4,832,000, pigs 1,062,000, and sheep 797,000. Buffalo contributed 1,066,000 MT (71.3%) of the total milk production, and 162,213 MT (65.3%) of the total meat production in 2009/2010. Coinciding with human population, there is a proportionate increase in the buffalo population in last 30 years in Nepal. There is an 89.91% increase in human population from 1979/80 to 2009/10 and the corresponding increase in buffalo population was 85.49%. Cattle population increased from 5,986,000 to 7,199,000 during the same period.



Available literature indicates that Nepal is highly vulnerable to climate change impacts. While terai region is more vulnerable to floods, temperature rise, droughts, and fire, the mid-hills are vulnerable to landslides and water shortages.

Similarly, the Himalayas are vulnerable to snow melts, glacier retreats, and glacial lake outbursts. Changing weather patterns, extreme rain events and associated floods and landslides, crop failures, habitat shift, acute water shortages, incidence of new diseases and parasites, river-cuttings and land losses, and hydrological changes are some of the impacts of climate change noticed in Nepal. In its Climate Change 2007 publication, the IPCC projects crop yields decline about 2.5 – 10% in 2020s and 5 to 30% in 2050s compared with 1990s levels without CO₂ effects in some parts of Asia. More human diseases, especially water borne diseases, diarrhea, and cholera associated with climate change are expected to increase in the future. While adverse effects of climate change on environmental and natural resources are increasing, food security, agricultural productivity, livestock production, and energy and water security are dwindling. There has been an increase of at least 13 million in the human population in the last 30 years in Nepal, which has obviously exerted tremendous pressures on limited resources such as land, forest, and water. Land use changes have been massive and quick. Current deforestation rate is reported as 1.7%, and soil erosion and land degradation is widespread.

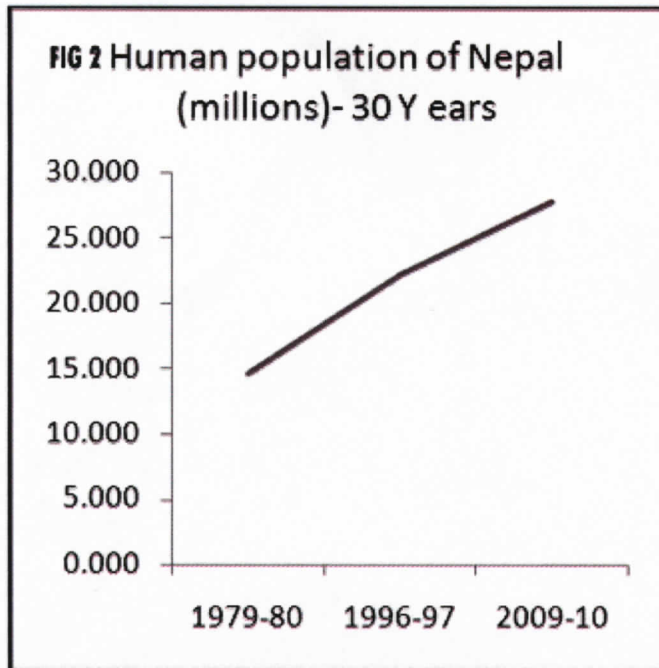
Livestock Productivity

Available data indicates that the average milk yield per cow per year in Nepal is just 451 L, which is extremely low compared to milch breeds in India and western countries. According to information posted on www.indg.in/agriculture/animalhusbandry/, average milk yield in village conditions for Sahiwal, Gir, Tharparker, Red Sindhi, and Hariyana breeds in India respectively is 1,350 L, 900 L, 1,660 L, 1,100 L, and 1,140 L. The average milk yield of Sahiwal, Gir, Tharparker, Red Sindhi and Hariyana in commercial conditions is reported as 2,100 L, 1,600 L, 2,500 L, 1,900 L, and 4,500 L, respectively. Jersey and Holstein Friesian, western milch breeds, respectively have milk yield of 5,000-8,000 L and 7,200 – 9,000 L. Buffalo, which account for two thirds of the total meat produced in Nepal, has an average meat yield of 158.79 kg. With a low off take rate, buffalo is obviously not an appropriate animal for meat production unless improved buffalo meat breeds are developed.

Development of several dozen dairy co-operatives and big dairy firms such as Dairy Development Corporation (DDC), Chitwan Milk (Ltd), and Sujal Dairy in recent years is certainly appreciable. However, despite these developments, due to population increase, daily per capita milk production in Nepal is stagnant for the last 30 years, and is about 148 mL of fresh milk per capita per day, which is equivalent to a half-a-cup of tea. It is a well-known fact that Nepal frequently depends on India to fulfill its deficit on domestic fresh milk supply. For example, to meet domestic demands for fresh milk, last fall the DDC had to import 40,000 liters of raw milk daily at a cost of Rs 29 per liter from Patna Dairy Project India. Various causes associated with poor level of milk production in Nepal include poor milch breed, poor animal health and nutrition program, and insufficient feed and fodder supply.

Livestock Management

The poor condition of animal sheds, lack of veterinary support, inadequate feed supply, and lack of

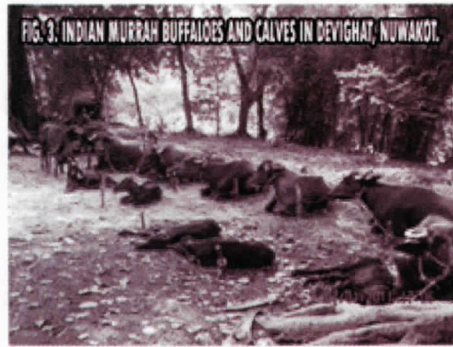


resources with the owners probably characterize livestock management system in Nepal. These conditions are reflected by extremely poor livestock health.

Livestock sheds are often lacking proper roofs, shed walls, drainage, and manure collection systems. With the very seasonal nature of feed supply, livestock often undergo feed deficit especially during the winter season. Developing an effective veterinary support system, ensuring constant and adequate feed supply, and improving livestock sheds are some of the management challenges that need immediate attention. The major feed source for buffalo and cattle include rice straw, wheat straw, maize stalks, maize husk leaves, millet straw, pulses, vegetables, oil seeds, grasses, and fodder trees. It is reported that cultivated lands provide over two thirds of feed supply to livestock in Nepal. Addressing year-round feed and fodder supply effectively is a real challenge for sustainable livestock production in Nepal.

Soil Fertility and Land Capability

Soil types, especially in the mountains and hills, range widely in the short distance depending on parent materials, topography, microclimate, vegetation, and time of soil formation. Dominant parent materials in mid-hill soils include phyllite, schists, gneisses, limestone, quartz, and some carbonaceous materials. Generally speaking, soils are developed from residuum in the upper part of the mountain, colluviums in the middle and the bottom parts, and alluvium materials on the bank of the rivers and streams. Corresponding to these slope positions, younger soils appear in higher positions, and older soils dominate lower hills and valleys. Much older soils occupy alluvial terraces. The younger soils in higher elevations are shallow, contain less organic matter, are low in fertility and are susceptible to soil erosion. Therefore, the higher elevation belts of a mountain are naturally not fit for agricultural production. However, these areas can support pasture, forestry, livestock production,



orchards, and recreational land use types. The incidence of less parasites and diseases on livestock in higher elevations may be another factor for concentrating livestock production especially small ruminants in this belt. The middle and lower elevations of a mountain generally include slightly older soils than the upper elevations. These soils are deeper than soils that are found in higher elevations; they have reasonable levels of soil fertility and are suitable for agricultural production. However, installation or adoption of appropriate soil erosion control measures is necessary. Soils in the bottom of a mountain and on the river banks, which are developed from alluvial parent materials, are much older than the soils in the other parts of the mountain slope. These soils are often dark in color, high in organic matter content, high in soil fertility, and are less susceptible to soil erosion. These soils support intensive rice, wheat, potatoes, vegetables and other agricultural crops.

Due to differences in the nature and properties of soils and the land capability across a mountain slope, it is important to design and develop a livestock production system, especially in the mid-hills and the mountains, considering soil fertility and land capability in order to effectively adapt to climate change impacts and build community resilience. A close observation of one of the mountain watersheds reveals that upper elevations were generally found to have goats, the middle elevation had a mixture of goats, cattle and a few buffalo, and the bottom part had more buffalo, cattle, and goats. While goats and cattle were regularly grazed, buffaloes were mainly stall-fed.

Adaptation and Mitigation

Farmers are aware of changes occurring in their production systems due to global climate change. Increasing incidences of new diseases, skin diseases, drug resistance, new parasites, and poor feed supply are some of the issues farmers have already perceived as problems due to global climate change. There are widespread reports of disappearance of *pokharis* (ponds constructed for collecting surface runoff and rain water for buffalo wallowing), drying of natural springs, and degradation of *bagar* (riparian areas) areas for grazing livestock in Nepal due to climate change. In addition, destruction of crops due to flood and drought affects regular feed supply. Although farmers have tried to adapt to these changes by lowering their herd sizes, switching to smaller-size animals, rain water harvesting, and moving out from the locality, these are only short-term measures. The challenges are finding adaptation and mitigation measures to climate change so that livestock production could be increased and the production system could be strengthened.

link <http://www.telegraphnepal.com/national/2011-08-17/challenges-of-climate-change-and-sustainable-livestock-production-in-nepal>

ADVERTISEMENT