Six
Livestock Development Interventions and DAP

Animal husbandry is a priority area in terms of increasing incomes and creating employment opportunities in the Central Himalayas. In a region as poor as the mountains, a new economy should be developed based on resource-base management. Livestock form an important resource base in the region and, fortunately, they attract the attention of policy-makers. But, unfortunately, the policies and programmes do not cater to the farmers' needs for agricultural power and they are broadly mismatched with the DAP system. The present chapter critically reviews the various elements of institutional interventions with respect to animal husbandry development, with special reference to the DAP system.

6.1 Conventional Animal Husbandry

Institutional intervention in the animal sector focusses on three aspects: crossbreeding, health care, and fodder production. The cattle improvement programme, or the so-called White Revolution, or Operation Flood, is being carried out extensively in Himalayan areas, with the sole purpose of increasing milk production. The other two, i.e., the health care and fodder production programmes are complementary to it. More than half of all funds allotted to the animal husbandry sector in the Central Himalayan districts are normally spent on crossbreeding cattle.

The National Commission on Agriculture, while endorsing the policy of large-scale crossbreeding, was aware of the fact that *"such a step would hamper the supply of draught animals adapted to farm conditions in the country"* (Nair 1982). But, unfortunately, this was not taken seriously and deliberate crossbreeding today is considered to be the greatest loss to domesticated animal diversity in India (Kothari 1996). As a result, on a country level, it is estimated that 20 per cent of the cattle breeds, 50 per cent of goat breeds, 30 per cent of the sheep breeds, and 100 per cent of the poultry breeds are threatened. According to D.S. Balain, former Chief of the National Bureau of Animal Genetic Resources, India, the Ongole breed of cattle has already been lost in India (Tantia et al. 1993).

In order to combat the great degree of vulnerability inherently associated with crossbreds, which is often expressed in terms of various diseases and physical and physiological

Table 6.1: **Local vs Crossbred Cattle : Normal Husbandry Practices**		
Particulars	**Local**	**Crossbred**
Mating	Local bull, mostly while grazing	Artificial insemination, or exotic bull
Feed/Feeding	Non-farm (CPR) fodders, crop residues, food wastes; grazing and stall-feeding	Cultivated fodders, concentrate (foodgrains and cakes), mineral mixture etc.; stall-feeding
Milking	Female family members	Paid skilled labour if a large number of animals is maintained
Daily Care	Women and children	Paid labour on a dairy farm
Use of Milk	Domestic consumption	Sale in the market
Use of Male Calves	Ploughing and other agricultural work	No use in the mountains, carting in the *Terai* area
Treatment of Sick Animals	Family care and herbal medicines	Vet care and modern drugs

abnormalities, provision of adequate health coverage is an obvious part of the cattle development programme. In the Indian Central Himalayas, a network of veterinary hospitals, animal husbandry centres, dispensaries, A.I. centres, and semen centres has been built up to take care of animal health. Animal health cover is taken care of by 157 veterinary hospitals, 492 animal husbandry centres, and 10 'D' class dispensaries. Money is even drained out of the country by importing exotic bull semen from Western countries. Management of imported semen, often associated with the health package, is given special emphasis. In mountain areas of the Central Himalayas, imported semen is stored in the Deep Frozen Centres located at Srinagar (Garhwal) and Lal Kuan (Kumaon) and caters to the needs of 52 A.I. Centres and 161 A.I. Sub-centres located throughout Garhwal and Kumaon. During 1984-85, as many as 2,468 crossbred animals per A.I. Centre and 1,512 crossbred animals per A.I. sub-centre were produced (Table 6.2).

Health coverage in easily accessible areas, nevertheless, provides castration facilities for draught animals. This facility is not free of cost and, in some places, farmers have to pay for this service. Farmers in one village of Banali reported that they pay as much as

Table 6.2: **Animal Health Cover Network in the Central Himalayas, India**			
Particulars	Kumaon	Garhwal	Total
Veterinary Hospitals	75	82	157
Animal Husbandry Centres	261	231	492
'D' Class Dispensary	7	3	10
A.I. Centres	44	8	52
A.I. Sub-centres	123	38	161
Crossbreds Produced			
Per A.I Centre	404	2064	2468
Per A.I Sub-centre	1077	435	1512

Source: Uttarakhand *Vikas Vibhag*, 1994 -1995. *Progress Report.* Lucknow : Uttarakhand *Vikas Vibhag.*

Rs 50 per castration. Draught animals in many remote villages and those kept by transhumant societies are usually deprived of this facility, and they have to resort to painful traditional measures.

One of the basic problems facing the native females is that of small size, and this is a big constraint to the crossbreeding programme. Inconvenient 'marriage' between large-sized exotics and small-sized locals leads to a high incidence of dystocia. Health coverage supporting crossbreeding is not able to solve this problem.

The health care infrastructure, on the whole, is inefficient and cannot cover the entire livestock population spread over a wide range of inhabited areas. The infrastructure seems strong enough, but is constrained by a high degree of inaccessibility and expensive treatment and/or costly medicines. The staff members available generally dislike taking care of animals in remote areas, and it is also difficult to carry the animals to veterinary centres located, almost always, in areas linked to central facilities. Treatment of some common diseases (milk fever and mastitis, the most common problems among the high-yielder crossbreds, for example) is sometimes more expensive than the cost of the animal itself. Even if the veterinary expert's consultancy is free of cost, specific medicines for the treatment of some diseases are too costly for an average farmer. The entire health coverage does not give due importance to the diagnosis of diseases prevalent in the area, which otherwise could help to introduce preventive measures against these prevalent diseases and, therefore, increase the productivity of animals.

Each veterinary hospital, on an average, covers an area of 325 sq. km., while each animal husbandry/animal service centre has to cover an area of 104 sq. km. Supplies of liquid nitrogen to maintain frozen semen are often disrupted, and this results in a very low conception rate. Health programmes have so far overlooked the problem of endoparasites; a recurrent problem in both native and crossbred cattle. More than 50 per cent of the cattle population at all altitudes is affected by endoparasites, i.e., parasites living within the body of the host. Animals in the valleys suffer mostly from liver fluke, while those at mid- and high altitudes are infested mainly by *Ascaris* parasite. These parasites nourish themselves at the expense of the host and cause severe diseases with fatal results. Periodic deworming of animals on a wide scale could improve or sustain their production potential, but this seems to be the least priority of the conventional health improvement programme.

Deficiency diseases caused by inadequate supplies of certain nutrients leading to infertility or declined productivity are a great hazard to animals. The existing health service network does not address this problem effectively.

Fodder production, the third item in conventional animal husbandry, is mainly focussed on, (i) the cultivation of exotic grasses both on cultivated land and in pastures, (ii) pasture improvement through urea and micro-nutrient applications, and (iii) cultivation of common fodder crops, mainly legumes, on cropland.

The State Animal Husbandry Department is growing exotic grasses and legumes on its farms at Pashulok (Dehradun) and Bhararisain (Chamoli). Fodder seeds are distributed to farmers. Training programmes given by fodder experts are also conducted extensively to boost the programme.

The fodder production programme, however, ignores the mountain resource base completely. CPRs are the most important regional, natural heritage with an enormous potential to provide massive fodder supplies to local livestock. Ironically, the official fodder cultivation programme does not take CPRs into account. Plantation of indigenous fodder-yielding trees and shrubs, which provide more fodder of the desired nutritive value per unit area and also have a crucial ecological role (Singh et al. 1988), are given no priority. In the foreseeable future, there is little possibility of allocating cropland for raising conventional fodder crops, as the conventional institutional programme advocates. Foodgrain crops (rice, wheat, millets, pulses, etc) will remain the staple food for humans. So the nutrition of livestock can be raised by improving the nutritive values of crop by-products. Crop residues, in fact, constitute the principal component of feed for ruminants in almost all small-scale crop-livestock systems (Orskov 1984, 1995). In the Central Himalayas, nearly 35 per cent of the total feed requirements of ruminants come from crop residues alone (Singh and Naik 1987 b). Thus, mountain crops offer a good potential for sustainable animal husbandry. Choosing the right crop varieties with large straw-grain ratios and more nutritive value, coupled with further improvements in the nutritive value through chemical treatment, would provide a promising package for the sustainable productivity of livestock. But, unfortunately, this is not part of the current institutional strategy.

Introducing exotic plants which can provide greater quantities of fodder is a potential risk for Himalayan ecosystems (Singh 1991a, 1991b). There are certain local grass species that provide more fodder per ha than exotic ones. These, planted on the bunds and common lands, could provide greater amounts of fodder. Repeated applications of chemical fertilizers, aimed at improving the productivity of pasture land, is also an ecological hazard to the delicate mountain eco-balance, in addition to posing risks to grazing stock.

6.2 Production for Market

Crop, livestock, and, of course, farming households have linkages, in varying degrees, to the market (Yadav 1990). Growing commercialisation is indicative of the efforts of mountain farmers to use scarce land resources more efficiently for gainful employment and increased incomes (Partap 1995). Production for market, in fact, is the central theme of current development interventions. Despite its subsistence characteristics, mountain agriculture apparently is strengthening its linkages with the market. Transformation, in a sense, represents a situation of feeble intersystemic linkages and a high degree of linkages with the market.

The change in livestock parameters, being promoted particularly through crossbreeding of indigenous cattle with exotic meat/milk type breeds, is not only aimed at creating less diversified herd compositions, incorporating single-purpose and less suitable animals, but also at consolidating the market system in mountain areas. Every element of the so-called cattle improvement programme; or the white revolution (semen, medicines, feed, instrument, technical know-how etc), depends heavily on the market. The only aim is to supply an increased amount of milk to the market. Rising prosperity in the cities and newly-established mountain towns has created a greater demand for animal products. Breed improvement, health care, and fodder cultivation programmes were to meet the demand for milk and other animal products in the cities and towns equipped with modern amenities. To increase this supply, an organized milk collection programme was also launched. The latter, however, could work only in the foothill and *Terai* areas, not in the mountains. In the mountains, livestock owners have evolved their own system of collection and distribution. The great degree of inaccessibility in the region did not allow the institutional system of collection and distribution to operate successfully in the region.

Since the breed improvement programme did not succeed to a great extent, cows (crossbred ones) did not provide any marked increase in the cattle population. The traditional milch animal, the buffaloes, did a laudable jab. Their proportion in the herds increased significantly and that of cattle decreased or remained stagnant (Singh and Sharma 1990). A study in eight villages of two different catchment areas in the Tehri district of Garhwal revealed that, in the total milk pool of the mountain villages, buffalo milk production was as great as 98 per cent (Singh 1992). An estimated two-thirds of the total amount of buffalo milk in the Chamba block of Tehri district were supplied to the local market. Cow's milk is almost always consumed at home. Selling cow's milk is still widely believed to be an inauspicious act. The indigenous cow is, thus, directly linked to the health of a family.

An overwhelming majority of mountain people operates almost entirely in a subsistence economy in which money plays a minor role in daily life. Life's necessities are provided through land-based activities and very little is brought from or sold to the market. The farmers' world (the mountain farming system) is largely self-sufficient (Jackson 1985, Singh and Sharma 1990). But, the present-day mountain village, with so many people living and working away and sending money home, connot be considered to be self-sufficient or self-contained. Nevertheless, this is a latterday development caused by overpopulation and ecological degradation, leading to a state of unsustainability in the system (Jodha et al. 1992, Shrestha 1992, and Singh 1992). This, to some extent, alters the subsistence character of mountain villages and, as a result, the two economies operate side by side and inter-penetrate to a certain degree (Jackson 1985).

White Revolution technology is based on the cash economy, because it requires production inputs (bull semen, feed, medicines, instruments, and technical know-how)

from the market and the sale of produce to the market. This technology is tied to the international economy. Underlying current development interventions is the implicit assumption that it is an indicator of progress if all rural people are dragged into the cash economy. And yet, experience shows that, if subsistence farmers are dragged into the cash economy without a perspective-based approach, chances of their exploitation by the open market system will increase, for, in a pure cash economy, life is dictated by a continual series of transactions mediated by money through the market place.

The monetary economy, strengthened through commercialisation of farming, based on a mountain perspective (Partap 1995) that does not compromise with the ecological sustainability of the system, could be a promising step in mountain development, but the current, market-oriented development in the livestock sector carries potential risks to ecological sustainability (through maintaining genetic uniformity among animals, agricultural productivity (by posing a threat to DAP supply), and human health (by draining animal products, mainly the milk, the most complete source of nutrient, to the market). The long-term sustainability of the agricultural system should be our goal.

6.3 Emphasis on Farm Mechanisation

The conventional agricultural development strategy often stresses the need to introduce small tractors or power tillers into the mountain region. Government-sponsored institutes and agricultural departments, in pursuance of the strategy, have already introduced tractors and power tillers on their respective farms in mountain areas. In the *Terai* region, adjoining the Himalayan foothills, farm mechanization, thanks to institutional efforts, has revolutionised the regional agro-economy, but, despite institutional efforts, the poor mountain farmers opted out of this phenomenon. The Royal Commission on Agriculture of 1927 first set forth the objectives of livestock development in India: increased production per animal and a reduction in animal numbers. This strategy still forms the basis of the current White Revolution technology. It has been assumed that livestock numbers will decrease with the mechanisation of agriculture and that farmers will soon recognise the advantages of keeping one good animal from a quality breed rather than three to four poor ones from indigenous breeds.

As already discussed, farm mechanisation is neither relevant under mountain circumstances nor does it guarantee a decrease in livestock population in mountain areas. The problem of excessive numbers of animals in the region is primarily due to the availability of and free excess to CPRs. An increase in the cattle population is also necessitated by an increase in cultivated area. But the current management trend avoids overpopulation of cattle. Livestock population growth must also be analysed through the existing disease control programme, economics of livestock production from a farmer's and a landless stock owner's point of view, the general ecological state of the uncultivated land, production performance of croplands, and the livestock management system.

Rather than furthering the debate on mechanisation of mountain agriculture, which is not in tune with sustainability in the specific mountain context, institutional efforts should focus on efficient and sustainable use of draught animals in mountain agriculture.

In the *Terai* region, which has been flooded by tractors and other farm machinery, it has been experienced that production is concentrated on a limited number of crops which are most profitable and productive. But, in the hills and mountains, large-scale mechanisation, if it comes into force, would hamper both the diversity of crops as well as of farmers' strategies. The diversity in farmers' strategies is assisted by draught animal use. As Defoer et al. (1995) put it, visualising the diversity of their strategies allows farmers to evaluate their practices and allows researchers and extensionists to guide farmers in improving these practices. Monitoring crucial parameters based on farmers' criteria may help to fine tune extension programmes and policies.

6.4 Neglect of the DAP System

The DAP system, which is an outstanding example of mass application of appropriate technology and which has no alternative in mountain circumstances, is, ironically, not included in the development package for the mountains. This aspect is also missing from the debate on sustainability. The fact is that an approach towards sustainability that does not incorporate DAP considerations would itself be unsustainable. Animal husbandry departments in universities and research institutes hardly consider draught animals as a target of research projects. Official records are devoid of any data on the contribution of draught animals to the mountain agro-economy. Agricultural engineers do not regard agricultural implements, hand-tools, and the harness system as being worthy of improvement. In the Five-year Plans no fraction of the budget earmarked for the livestock sector is allocated to the improvement of draught animals. On the contrary, conventional animal improvement schemes are detrimental to draught animals, both conceptually as well as practically.

It goes without saying that the institutional neglect of the DAP system has been and still is a critical constraint to the improvement of agronomic productivity and amelioration of constraints to sustainability.

The main focus of researchers and agricultural technologists is on improvements in the efficiency of fossil fuel-powered machines. Some amount of work has also been carried out on animal-drawn vehicles and implements, but this is mostly geared towards agriculture in the plains. In the mountain farming system, where the role of DAPs is more pivotal, this field is still unresearched. In essence, any strategy that overlooks the value of DAP in mountain agriculture cannot achieve the goal of sustainable development.