

Livestock Development for Sustainable Livelihood of Small Farmers

N.G. Hegde

Souvenir of the 39th Annual General Meeting and 48th National Symposium on “Energising Rural India – A Challenge to Livestock Industry. Compound Livestock Feed Manufacturers Association of India (CLFMA), Manesar, Haryana. August 26, 2006: 50-63.

Livestock in India

Animal Husbandry is making a significant contribution to the national economy and socio-economic development in the country. In rural India where over 15-20% families are landless and about 80% of the land holders belong to the category of small and marginal farmers, livestock is the main source of livelihood. In the absence of fertile lands and assured irrigation which are controlled by a small population of rich farmers and lack of employment in the industrial and service sectors, most of the rural families belonging to socio-economically weaker sections of the society maintain different species of livestock to supplement their income. While the land owners prefer cattle and buffaloes, the landless prefer to own sheep, goat and poultry. With the policy of the State Animal Husbandry Department to extend free breeding, vaccination and veterinary services and permit free grazing on community lands, the farmers were encouraged to expand their herd size without any major financial burden. This has probably been the reason for the presence of the world’s largest livestock population in India. India ranks first in cattle and buffalo population, second in goat, third in sheep and seventh in Poultry (Table 1). Although the population of livestock during last 10 years has been stable around 485 million, the buffalo population has increased by 8.91%, while the cattle population has reduced by 6.89%. There has been a significant increase in the population of goats during the last five decades, which is attributed to the decrease in the size of land holdings and persistent drought caused by erratic monsoon, forcing many small farmers to shift from large animals to small ruminants.

The present breedable bovine population under an organised breeding programme is 113.61 million, which includes 12.62 million crossbred, 51.13 million indigenous cattle and 50.28 million buffaloes. India also tops in milk production, with 92 million tons/year. The value of output contributed by livestock in 2003-04 was Rs.164,509 crores, of which Rs.110,085 crores (66.92%) was from milk and the rest from meat. Livestock also provide gainful employment all-round the year to over 16 million people, of which 70% are women. Milk production accounts for 5.86% of the GDP while the total contribution from Animal Husbandry is 9.33%

Table 1: Livestock Population in India

Sr.No.	Species	Livestock Census		Growth Rate (%)
		1997	2003	2003 over 1997
1.	Cattle	198.9	185.2	-6.89
2.	Buffalo	89.9	97.9	8.91
3.	Sheep	57.5	61.5	6.96
4.	Goat	122.7	124.4	1.38
5.	Other Animals	16.34	16.05	-1.77

	Total Livestock	485.4	485.0	-0.08
--	------------------------	--------------	--------------	--------------

Source: Livestock Census, Department of Animal Husbandry & Dairying, Ministry of Agriculture

Performance of Dairy Animals

In spite of achieving the highest milk production in the world, the performance of our cattle has been extremely poor. It can be observed from Table 2 that the average milk yield of cattle in India is far below the yield in other countries. The milk yield no doubt has increased by 100% over 25 years, between 1965 and 1993, but it is still less than 25% of the milk yield in Europe. The performance of our indigenous cows is still poor when the performance of crossbred cows is separated out.

Table 2: Yield of Milking Cows in different Countries

Country	Average Yield (Kg/Lactation)	
	1961-65	1993
Asia	512	1125
India	428	987
Japan	4193	6092
Israel	4625	9291
Europe	2682	4233
France	2552	5289
Denmark	3739	6273
U.K.	3477	5462
North America		
Canada	2852	5938
U.S.A.	3519	7038
Oceania	2364	3508
Australia	2112	4451

It can be observed from Table 3 that the average milk yield of indigenous breeds of cattle has been around 1.98 litres as compared to crossbreds (6.75 lit) and buffaloes (4.50 lit). The above yield of indigenous cattle may not include the yield of draft breeds and non-descript cows which are hardly milked due to low yields. Thus, except 15-20% of crossbreds and elite native breeds, about 80-85% of the livestock, particularly the cattle are not contributing to the milk production. However, they compete for fodder and feed, resulting in huge shortage of feed resources.

Table 3: Expected Growth of Livestock Population and Milk Yield

Year →	2006-07			2021-22		
	Population (mill.)	Production (mill. tons)	Wet Average (kg/day)	Population (mill.)	Production (mill. tons)	Wet Average (kg/day)
Indigenous	28.158	20.263	1.98	31.264	26.248	2.28
Crossbred	2.580	18.682	6.75	12.347	44.703	7.98

Buffalo	32.864	53.986	4.50	40.061	97.789	5.94
Goat	--	4.073	--	--	6.512	--

Vanishing Indian Breeds

Among 30 major Indian breeds of cattle, there are only four milch breeds, namely Sahiwal, Gir, Rathi and Sindhi which are maintained for milk production. Among them, the population of Sindhi and Sahiwal have reduced significantly and the other two breeds are also under severe neglect. There are a few dual-purpose breeds like Deoni, Haryana, Kankrej and Tharparkar while the rest are draft breeds, maintained by farmers for producing bullocks. With the modernisation of agriculture and subdivision of land holdings, bullock power in Indian agriculture is losing its importance. A good pair of bullocks of any good draft breed will require at least Rs.50,000-60,000 for rearing, till they are ready for field operations. This being unaffordable for a majority of the small farmers, these bullocks are often sold in distress by the owners. With less than 1.0 ha land holdings, small farmers cannot make optimum use of bullocks and hence prefer to hire the services of tractors, whenever necessary. Thus, with the diminishing demand for bullock power, the farmers are not adequately motivated to conserve these draft breeds. Thus, many of the draft breeds are under severe neglect. In the absence of a clear cut policy and programme for conservation, these breeds are subject to heavy genetic erosion.

As cattle have sentimental value, farmers hesitate to dispose off their uneconomical animals. This has resulted in increasing population, without proportionate contribution to the production. Even where the farmers are keen to get rid of their unproductive and diseased animals, there are no easy outlets to accept them. With the imposition of ban on cow slaughter, there has been a gradual shift in the ownership of larger animals resulting in marginal reduction of cattle population and increase in buffalo population during the last one decade.

Availability of Feed and Fodder

Availability of feed and fodder is a major constraint in promotion of dairy husbandry in the country. It has been estimated that only 880 million tons of dry fodder was available including greens, which can meet only 35-40% of the demand. This clearly indicates that as most of the livestock are unfed, they are not able to perform optimally. Out of the available dry matter, most of it is available in the form of agricultural by-products and dried grass collected from community wastelands and forests which are of inferior quality. Similarly, the concentrates required for feeding the livestock are also in acute shortage. As a result, even the high yielding animals, which are presumably well-fed are suffering from nutritional imbalance.

With regard to cultivation of forage crops, hardly 3-4% of the area is being utilised in selected pockets where dairy husbandry is prospering as an important source of income. Further expansion of the area is possible only when the quality of livestock owned by farmers improves significantly.

Scope for Development of Livestock Husbandry

It is because of the large number of unproductive animals that there has been severe storage of feed and fodder resources. With regard to the demand for milk, it has been estimated that by 2020, the country will need about 175 million tons of milk per annum. Milk being an important source of protein in India, particularly in rural areas, the demand for milk is likely to increase with the increase in rural prosperity. The demand for meat is likely to increase significantly because of increase in local consumption and severe shortage of meat in the Far East and South East Asian countries, opening an excellent opportunity for export.

With the growing demand for various products, Animal Husbandry can provide good opportunity, particularly for the small and marginal farmers and the landless to improve their economy. Livestock development is a labour intensive activity which demands very close attention throughout the year. This will be a boon for the small farmers and landless who are mostly unemployed or under-employed. Thus, the rural families can certainly take active part in animal husbandry provided it is economically viable and the necessary infrastructure is available to support this programme.

To transform the current status from negative contribution to profitability, particularly to benefit the weaker sections of the society, there is a need for a drastic change in the livestock husbandry policy and greater involvement of the private sector and local communities. The Animal Husbandry sector should be treated at par with the industry for availing finance and tax benefits and the government should encourage Public Private Partnership to attract larger investments, modern technologies and effective networking for forward and backward integration.

Present Status of Animal Husbandry Services

Provision of animal husbandry and veterinary services for farmers were accepted as the responsibility of the State Governments, which were delivered free of cost since independence. The services provided by the Animal Husbandry Department to the farmers are breeding cattle and buffaloes through AI, preventive vaccination, treatment of sick animals and extension services to promote new schemes and technologies. However, in the absence of greater mobility in interior rural areas, most of the services were confined to the periphery of the veterinary clinics established at the block or tehsil level. With the shortage of qualified veterinary graduates, most of these technical services were gradually assigned to semi-skilled livestock supervisors. In the absence of efficient services, farmers in interior areas could not take advantage of the programmes, which were intended to improve the productivity of livestock. There was no scope for sale of surplus commodities due to lack of marketing infrastructure. Thus, the progress of livestock development, particularly the dairy husbandry could benefit a small population in selected pockets, while a large section of small farmers could not take advantage.

Forward and backward linkages are influencing the growth and profitability of this sector even today. In case of dairy husbandry, linkage of the dairy farmers with the processing unit is very critical. In regions where the dairy plants are operating successfully, good quality milch animals can be seen in plenty. In the absence of an efficient milk collection network, farmers start selling their animals. There are many

locations in Rajasthan and Uttar Pradesh where BAIF has been operating the livestock development programme successfully but the milk collection and marketing mechanisms have not been very efficient. In such areas, the farmers preferred to sell heifers or cows in the first lactation at remunerative prices, although maintaining them for milk production could have given sustainable income.

Availability of fodder and feed can play a very important role as about 70% of the cost of dairy husbandry is on feeding. There are several hurdles for the small farmers to procure good quality feed at the right price. In the absence of organised supply, the local traders take undue advantage by supplying inferior quality feed at high cost. In such a situation, dairy farming can be uneconomical in spite of superior technical inputs from Animal Scientists.

The time is ripe for the country to take advantage of the global opportunities to meet the growing demand for milk and meat through reorganisation of the services and business approaches. There is also an opportunity to effectively involve the weaker sections of the society - the landless, women and the small and marginal farmers to take maximum advantage of these opportunities as they do not have many other options to earn their livelihood.

Current Priorities of Government of India

The Government of India had given major thrust on the following activities under the Tenth Five Year Plan.

- Genetic upgradation of cattle and buffaloes and improvement in delivery mechanism of breeding inputs and services to farmers including promotion of clean milk production;
- Extension of dairy development activities in non-operational flood, hilly and backward areas;
- Provision of nutritious feed and fodder through promotion of fodder crops and fodder trees;
- Provision of adequate animal health cover services including creation of disease free zones and control of foot and mouth disease;
- Improvement of small ruminants;
- Provision of credit facilities to farmers.

To achieve the above goal, the Government had adopted the following strategy.

- Expand and strengthen infrastructure for artificial insemination, improve efficiency and effectiveness by using frozen semen technology for cross breeding;

- Create a germplasm bank of superior bulls and bull mothers to serve as nucleus germplasm pool;
- Facilitate genetic improvement of important native breeds through selective breeding and crossbreeding of low productive non-descript stock for both milk and drought purposes;
- Improve productivity of pasture lands, through introduction of improved fodder varieties and development of wastelands for forage production;
- Provide animal health services with special emphasis on control of foot and mouth disease;
- Promote technological inventions for adding value to livestock products;
- Improve the database of livestock performance and products.

Schemes of the Ministry of Agriculture, AHD

The following schemes were launched by Government of India through the 10th Five Year Plan to achieve the above goals.

1. **Central Cattle Breeding Farms:** Support to farmers engaged in production of indigenous and exotic bull calves of Tharparkar, Red Sindhi, Jersey, Holstein Friesian and crossbred cattle and Surti and Murrah buffaloes. However, these farms together produced only about 350 bull calves in 2004-05.
2. **Central Frozen Semen Production Laboratory** in Bangalore produced 12 lakh doses of semen in 2004-05.
3. **Central Herd Registration Scheme (CHRS):** It was launched to register elite cows and buffaloes of important native breeds and to provide incentive for calf rearing. Four units established at Rohtak, Ahmedabad, Ajmer and Ongole are engaged in laying down selection standards and identification of superior germplasm of Gir, Kankrej, Haryana and Ongole breeds of cattle and Murrah, Jaffrabadi, Surti and Mehsana breeds of buffalo. About 11,000 elite cows and buffaloes have been registered during 2004-05.
4. **National Project for Cattle and Buffalo Breeding (NPCBB)** initiated in 2000 aims at genetic upgradation and conservation of important indigenous breeds. The important components of the programme were:
 - a. Introduction of superior bulls for breeding;
 - b. Quality control of semen banks;
 - c. Promotion of private mobile AI service at the doorsteps of farmers
 - d. Streamlining the distribution of liquid nitrogen
 - e. Restructuring of the institutional infrastructure

5. **Feed and Fodder Development:** Assistance is being provided to States for enhancing feed and fodder production. Seven Regional Stations and a Central Station have been established for production of fodder seeds and to set up field demonstrations. Establishment of fodder banks, enrichment of agricultural by-products and supply of fodder mini kit are the major initiatives to enhance the feed supply.
6. **Livestock Health:** Apart from supporting biological products units, disease diagnostic laboratories and livestock disease control programme, special programmes have been launched to control Rinderpest and Foot and Mouth diseases.
7. **Dairy Development:** Major schemes launched to tap the potentials of dairy husbandry were:
 - a. Dairy venture capital fund;
 - b. Integrated dairy development in non-operational flood, hilly and backward areas;
 - c. Assistance to dairy cooperatives;
 - d. Promotion of private dairy processors;
 - e. Strengthening infrastructure for clean milk production.
8. **The programmes of NDDB:** The Perspective Plan 2010 covers strengthening of cooperative business, enhancing productivity, managing quality and building a national information network in the operational flood areas.

Programmes of the State Governments

Based on the priorities set by the Government of India, most of the State Governments had launched the following schemes.

- Treatment of sick animals and preventive vaccination;
- Breeding services;
- Management of cattle farms, calf rearing, fodder demonstration farms, fodder banks, veterinary clinics;
- Support to Goshalas for breed conservation and production of elite animals.

Lack of funds to procure vaccines and delay in supply from the state owned Production Units are often rendering the programme ineffective. Moreover, these programmes could not reach the small farmers in remote areas.

Impact of NPCBB

Among various schemes implemented by the Ministry of Agriculture, NPCBB seems to be the most focused programme to address various problems and to contribute to the economy through participation of weaker sections of the society. This programme which was launched in the year 2000 initially in five states, has been extended to 26 states. The impact of this programme are:

- Support to 51 semen stations to improve the quality.
- 21,605 AI centres were strengthened to convert from stationary centres to mobile centres to provide services at doorsteps.
- Number of AIs has increased from 20 million (1999-2000) to 34 million (2004-05).
- Coverage of bovine population under AI has increased from 16% to 31%.
- Improvement in conception rate from 19.91% to 35.34%.
- Expected to increase the coverage of 113.61 million breedable bovine population to 70% at the end of Phase I to produce 10 million improved females. Phase II of the NPCBB project aims to support over 70 million rural households who own livestock.

Constraints of Livestock Development

In spite of the ambitious programmes launched by the Government of India and State Governments, they were not able to deliver the expected results. There was no significant breakthrough in improving the productivity both in the milch and meat sectors and in reaching the poor for their livelihood.

The reasons for the slow progress were:

1. Non-availability of superior quality breeding bulls;
2. Poor quality of semen produced by many of the laboratories;
3. Inadequate skills of paravets resulting in poor conception and infertility;
4. Inadequate support for paravets for supply of liquid nitrogen, frozen semen, health care and technical guidance;
5. Shortage of fodder resources;
6. Absence of field oriented conservation strategy for indigenous breeds;
7. Lack of coordination among various agencies engaged in livestock husbandry;
8. Poor extension services to motivate small farmers to adopt dairy husbandry for income generation.

Problems of the Poor

If the programme has to reach the poor and make a positive impact for its success, it is necessary to sort out the problems of the poor. The major problems of the rural families living below the poverty line (BPL) in taking advantage of the opportunities in livestock development are presented below:

- Poor quality animals needing genetic upgradation and severe culling;
- Poor breeding services at their doorsteps, both with respect to superiority of the germplasm and timely and efficient delivery resulting in poor conception and production of inferior quality offspring;
- Nutritional deficiency, shortage of feed and fodder;
- Poor health conditions and high rate of mortality due to lack of preventive vaccinations and timely diagnosis of health problems;
- Lack of coordinated efforts to eradicate common diseases;
- High cost of veterinary services leading to neglect of sick animals;
- Spreading of communicable diseases such as Brucellosis, TB, etc. to other animals as well as human beings in the absence of separation facilities;
- Lack of technical guidance to farmers to improve their animal husbandry practices;
- Poor control on technicians engaged in providing various services to farmers resulting in exploitation and lack of treatment for infertile animals;
- Saturation of market in local milk sheds, resulting in lower price realisation and exploitation by the middlemen and private dairies;
- Poor linkage between research institutions and farmers resulting in use of outdated technologies;
- Absence of suitable policies to involve small farmers.

Need for suitable National Livestock Policy

To achieve the revised goal, the first step should be to formulate a national policy. The Indian Livestock Policy therefore will have to take a holistic view and find ways of making best use of the opportunities at the national and international levels. With this background, the National Livestock Development Policy should pursue the following goals (Anon.1996):

- All-round improvement in quality and efficiency to compete in the global market;

- Enable resource-poor households and women to take active part in livestock development for sustainable livelihood;
- Ensure ecological sustainability through conservation of native breeds and control of unplanned population growth to match with available feed and fodder resources.

Strategy for Livestock Development for Benefiting Small Farmers

Keeping in view the performance of various schemes, the following recommendations can be made to boost livestock husbandry, which can boost the production, compete in the global market and attract the landless and small farmers to take advantage of this sector for sustaining their livelihood.

1. Genetic Improvement

1.1. Production of Superior Quality Bulls

- The primary focus of all the State owned and supported farms should be on breed conservation and production of elite bull mothers and bull calves.
- Farmers maintaining elite herds of cattle and buffalo can also be involved in bull calf production through planned breeding and buy-back guarantee.
- Application of MOET (Super ovulation and embryo transfer technology) for production of bull mothers and bull calves should be promoted.
- Progeny testing of sires should be strengthened to aim for the use of proven sire semen on a large scale. A target may be set to cover at least 15-20% of the breeding services by using semen of proven sires, by 2020.

1.2. Production of Superior Quality Semen

- All the semen freezing laboratories should be registered with the Ministry of Agriculture in different regions for periodic evaluation of the quality.
- The bulls to be brought under semen freezing should have certification for their pedigree, performance and disease free status.
- There are many semen freezing laboratories, which have been recommended by the Government of India for closure as they were unable to maintain minimum expected quality. The concerned State Governments may invite interested agencies to operate such laboratories on a benefit-sharing basis.

1.3. Conservation of Genetic Resources

The following activities are proposed for conservation of important native breeds of cattle and buffaloes.

- Study the economics and utility of different breeds;
- Incentive for maintaining the native breeds by compensating the costs and assurance for procurement of elite animals at a premium;
- Procurement of elite females from farmers for bull mother farms managed by research institutions for super ovulation;
- Use of sexed embryos for multiplication of elite progeny;

2. Breeding Services and Management

2.1. Training and Regulation of AI Technicians:

- To avoid inefficient breeding services, skill oriented training should be organised for paravets. The nodal agency can conduct a test for trained paravets to operate breeding services privately.
- To check the quality of the services and to avoid exploitation of the farmers, privately operating paravets can be brought under the supervision of the local Dairy Federation.
- The State Animal Husbandry Department can monitor the work and arrange advanced training periodically. It is necessary to restrict the movement of paravets to their assigned villages to ensure accountability of their services and to prevent unfair competition.

2.2 Support Services

- Timely supply of various inputs such as liquid nitrogen, frozen semen, vaccines, first aid kit, vitamins, concentrates, mineral mixture and forage seeds is essential for the success of the paravets. This can be entrusted to the local Dairy Federation or NGO engaged in livestock husbandry.
- Special programmes should be developed to promote economic management of small ruminants by providing critical inputs and services through their Self Help Groups and assisting in forward and backward linkages.

2.3. Health Care

- There is good scope to privatise health care services, particularly in well-established milk sheds. Thus, the Federations and private entrepreneurs can be encouraged to take up the responsibility of providing effective health care.
- Private veterinarians should be encouraged to practice in close association with paravets engaged in providing breeding services. This

can also enable paravets to take up minor treatments and refer major cases to the veterinary doctor.

- The State Animal Husbandry Department can convert selected veterinary hospitals into specialised units for handling complicated cases referred by the practising veterinarians.
- Establishment of Disease Investigation laboratories by the local Dairy Federation or private agencies can be encouraged to analyse the samples collected by paravets. This will help in providing timely and effective services.
- Research and Development facilities should be strengthened for application of biotechnology for disease diagnosis of production of cost effective vaccines and control of critical diseases.
- AHDs may redefine their role with priority for disease surveillance, establishing disease free zones and eradication of important diseases, forecasting of disease outbreaks and awareness on preventive and curative measures for control, sanitation and clean milk production.

2.4. Strategy for Feed Management

Development of Community Wastelands: Efforts should be made to develop pasture lands involving local communities through soil and water conservation, introduction of improved legumes and grasses, forage tree species and prevention of grazing.

Increase in Forage Yields: Presently, no improved practices are followed for cultivating forage crops. Thus, efforts are needed to breed superior fodder varieties, produce and supply good quality seeds, promote use of soil amendments, biofertilisers and forage harvesting equipment.

Improvement of Nutritional Values: Presently, the major quantity of dry matter is contributed from paddy straws, wheat *bhusa*, sugarcane bagasse and trash, which are of poor nutritional value and with high fibre content. With new techniques, the quality of such fodder should be improved. This will also help in augmenting the fodder shortage.

Complete Feed Rations: To overcome nutritional imbalance in the field and to facilitate small farmers and landless to maintain their livestock under balanced feeding, decentralised complete feed production units can be established.

Fodder Banks: Establishment of fodder banks in fodder scarcity regions through Dairy Federations and People's Organisations can help small farmers to feed their livestock during scarcity. In paddy and wheat growing areas where the straw is wasted, facilities for compacting straw should be installed and arrangement should be made to collect and pack them. Fodder banks can

play a critical role in timely supply of feed to livestock owners during the drought years. However in the absence of any buyers in good seasons, the stock remains unsold, causing heavy burden for the establishment. Hence, the experiences in the past have not been very encouraging. Therefore linking of complete feed production unit with fodder bank can be explored on a pilot scale.

Introduction of by-pass protein feed: Techniques have been developed to avoid wastage of nutrients by feeding by-pass protein. Support should be provided to establish by-pass protein production units particularly in milk sheds where high quality milch animals are maintained.

Reduction of Herd Size: It is also necessary to create awareness among farmers to reduce their herd size and ensure optimum feeding instead of keeping a large number of underfed animals.

Support for Small Farmers: For calf rearing, feed subsidy, insurance coverage, venture capital, etc. may be given to ensure their active role in dairy development and rearing of small ruminants.

2.5. Nodal Agencies

- The responsibility of providing back-up services to paravets and veterinarians can be assigned to milk processing units, dairy federations, voluntary organisations or private entrepreneurs in the region.
- These nodal agencies can also take up the production of critical inputs such as frozen semen, cattle feed, forage seeds, etc. required by the farmers.

2.6. Management of Culled Animals

- Presently, small farmers are not able to get rid of unproductive or sick animals suffering from contagious diseases. Such unwanted animals not only put pressure on feed resources, but also spread diseases. Therefore, suitable arrangements should be made for disposal of the culled animals by way of establishing *panjarpoles* through voluntary organisations or any other means.
- Export of animals to neighbouring countries desiring to procure, can be permitted and coordinated through the nodal agency / AHD.

3. Processing and Marketing of Produce

- Mini dairies should be established in small towns where large dairies are not viable. This will ensure transparency and efficiency.
- Milk processing units should assume a prominent role in promoting breeding services, input supply and health care provision, apart from

collection of milk. The farmers should be trained in clean milk production

- Marketing of small animals is equally difficult and grossly neglected. In the absence of an organised market for sheep and goats, the farmers are cheated by the traders and middlemen. The market for meat, wool and skin is highly scattered. Hence, direct linkage with processors and consumers should be established.

A Call for Immediate Action

Revisit the Policy: There is a need to revisit the present livestock development policy and reset achievable goals, which are realistic and benefit weaker sections of the society.

Many of the programmes are based on certain baseless assumptions, without adequate field data. These include the performance of native breeds, comparative economics of crossbreds vs. native cattle and buffaloes, impact of small ruminants on environment and biodiversity, impact of the breeding and veterinary services provided by the State Animal Husbandry Department. Such studies can help in revising the old schemes to serve the target group better.

Learn from the Past: There are many success stories experienced in the field by farmers and many development agencies in providing efficient breeding services, organizing health care, organizing milk collection and processing, reaching with efficient services in remote areas, organising livestock owners in small groups for self help to rear dairy cattle, small ruminants, poultry and developing community pasture lands, which can be easily replicated by incorporating in various government schemes and by farmers organisations. Such projects should be studied and documented for wider replication. Some of the success stories are presented in Annexure 1.

Focus on Critical Areas: Some of the critical issues hampering the growth of the livestock sector are poor reach to weaker sections of the society particularly in remote and backward areas, non-availability of breeding, feed and fodder, healthcare and market outlets, timely technical guidance and information on disease outbreaks, price and supply of inputs and outputs and finance for investment and working capital.

These problems can be solved through Public-Private Partnership (PPP). Hence the government should facilitate such schemes immediately. Voluntary agencies can play a significant role in the success of PPP, as they can motivate the farmers to take active part and control the vested interests of the private agencies and interact with the government agencies.

References

1. Anon. 1996. National Livestock Policy Perspectives: Report of Steering Group. Planning Commission, Government of India.

2. Anon. 2005. Annual Report 2004-2005. Department of Animal Husbandry and Dairying, Ministry of Agriculture, Government of India. New Delhi.

**Public-Private Partnership for Clean Milk Production
in Tribal Regions of Gujarat**

Valsad District Milk Producers' Union Limited popularly known as Vasudhara Dairy was established in 1973 with its milk shed spread over Navsari, Valsad and Dangs districts. Presently, the Dairy is collecting 3.00 lakh litres of milk per day from 722 village dairy cooperatives. Among them, 80% of the cooperatives are located in tribal areas and 65% societies are managed by women.

This Dairy had installed a capacity of 30,000 litres which was expanded to 1 lakh litres in 1993 and 2 lakh litres in 2001. In 1996, the Vasudhara Dairy entered into an agreement with BAIF Development Research Foundation, an NGO with the objective of enhancing the productivity and to take the programme to those tribal villages which had not taken optimum advantage of this programme earlier. The Dairy also felt the need to improve the profitability of the dairy farmers by reducing the age of calving to less than 30 months and reducing the calving interval while enhancing the yield of the crossbred cows. The Dairy had already established over 180 AI centres by supporting self-employed paravets and appointing Veterinary doctors to support breeding and health care services. However, the programme lacked close monitoring and a holistic development approach to improve the management of dairy husbandry. Thus, a joint programme between Vasudhara Dairy, BAIF and local Dairy Cooperatives was established.

BAIF established a disease investigation laboratory and linked this laboratory with the farmers through AI technicians and veterinary doctors already working in the milk shed. The activities in the new programme included examination of blood, milk, uterine discharge and urine and fecal samples and sending reports to the farmers with an appropriate prescription for health problems and vaccination against FMD, HSBQ and Theileriasis. Special campaigns on mastitis and metritis, awareness on clean milk production, fodder development and special feeding of pregnant cows and heifers were also carried out. The farmers were educated to feed the heifers better and AI technicians were given special incentives based on the coverage of heifers and if their age at first calving was less than 30 months. Similarly, an incentive was given for reducing the interval between two calvings.

As a result of this programme, the milk collection of the dairy which was 1.10 lakh litres in 1996 increased to 1.75 lakh litres in 2000 and to 3.00 lakh litres in 2006. The programme benefited most of the tribal families who did not have any opportunity to sell the surplus milk earlier. The programme increased the milk yield and reduced the cost of milk production. The Dairy did not have to make any huge investment except for setting up the Disease Investigation Laboratory. The cost of providing services to the participating families was recovered from the payment due from supply of milk. The programme supported over 200 self employed paravets who had assured source of income. As their work was monitored, they could upgrade their skills and the farmers got a good deal. This model can be widely replicated by Dairy Federations in the country.

From the Dark Shadow of Poverty

The year was 1973. Famine had struck a number of villages in Maharashtra. One such unfortunate village was Mulgaon Panchpimple in Osmanabad district. Gopinath Khaire who had grown up in this village had no other alternative but to flee from his village to Urulikanchan in Pune district for survival. He landed a job as a daily wage labourer with an earning of Rs. 3 per day which rose to Rs. 9 thereafter. Even with this meagre earning, he managed to purchase a crossbred heifer which was successfully inseminated at the BAIF Centre. The heifer delivered a female calf and started yielding 2 litres a day. With the additional income, he purchased another cow and the daily milk produced increased to 20 litres a day. Encouraged by his success as a dairy farmer, he expanded the herd and also started selling the surplus. Gopinath now owns 5 cows of which 2 are pregnant. The daily milk yield is around 35 litres which is selling Rs.9 per litre. The family is also engaged in cultivation of wheat, maize and sweet sorghum on lease basis on 0.625 ha of land to meet his fodder needs.

His only son Suresh who dropped out of school, worked on BAIF's farm for nearly 18 years as a helper, and is now assisting his father. He earns an additional monthly income of Rs.3000 by milking 15 cows of other farmers. His daughter-in-law Sunita cleans the cowshed and feeds their cows early in the morning, before going for work as a farm labourer and earns a cash income of Rs.50 every day.

With their hands full, there is no time for any vice. With their savings, they constructed a large house in 2004 which has all the modern amenities. A new cattle shed has been built for his prized cattle. Gopinath's wife Prayagbai ensures that her two grandchildren attend school and tuitions regularly.

Goat Development in West Bengal

Goat is an integral part of the farming system and finds multiple uses for meat, skin, milk and manure. The goat population in the country has grown by about 2.4 % over the last census to cross 128 million, inspite of about 15% mortality and 38% annual slaughter. It is essentially a low input-low output livelihood support for most of the poor sections of the society comprising of the landless, women and small and medium farmers. Generally, these families rear 4-5 goats and the flock sizes tend to be larger in areas adjoining the forests.

In terms of domestic and export market, the contribution of goats is high and its share is increasing gradually over the last few decades. Apart from export of hide and meat, the domestic market of meat is growing due to increasing human population. However, goat development has been given low priority and is often neglected in most of the States with very few exceptions which are reflected in the following parameters.

- The breeding policy is vague without emphasis on implementation
- The goat keepers are at the mercy of the middlemen for selling goats; Organised marketing and base pricing policies are absent
- Technology induction and capacity building using appropriate technologies are almost nil
- Lack of credit support is an area of concern
- Health care in terms of preventive health and diagnosis is still a challenging field
- Infrastructure for disease diagnosis and other support services is poor

Against this background, the Government of West Bengal through its Animal Resources Development (ARD) Department has demonstrated that through the involvement of TATA International, NGOs and local communities, a new dimension can be brought to this sector to promote sustainable livelihood, while improving the breed with appropriate technologies. A joint project aimed at demonstrating sound goat husbandry practices for enhancement of income of goat keepers, and upgrading their managerial skills using appropriate technical interventions, was launched by BAIF in 2005 with the financial support of Tata Group involving two reputed local NGOs namely Deepan Yuba Goshti and Socio-Economic Development Programme, Ranibandh. The ARD Department extended full cooperation in providing timely health care.

Promoting scientific breeding through use of superior breeding bucks to be maintained by local goat keepers and organising them to liaise with the ARDD and NGOs for availing various services was the primary step. They were persuaded to pay for the services such as deworming and vaccinations. Demonstrations on forage production, feeding of concentrates and mineral mixture were set up in every village and a weighing balance was provided to understand the impact of various interventions.

The programme is now in place with 2500 participants having a population of 10,000 goats in Burdwan and Bankura districts spread over 100 villages. Field Guides, serve as link persons between the goat keepers and the external agencies. Empowering the local communities and NGOs to handle these services, could help the ARD Department to achieve this success, which could not happen in the past. The programme could reach the needy families in the backward regions within a short span of 8-10 months. The goat keepers are very confident because of the birth of superior quality kids, reduction in the death of kids from 40% to less than 5% mainly due to timely vaccination, higher growth rate due to better feeding, deworming and early castration of male kids and greater awareness about marketing of goats. BAIF and the ARD Department are advising the goat keepers to sell non-descript goats on priority with a view to improve the Black Bengal breed.

Community Pasture Development through People's Participation

Rajasthan has over 1.2 million ha of community pasture lands of which over 60% are unproductive due to excessive grazing and heavy soil erosion. As a result, the pastures are not only lying idle but also posing a threat to agriculture and environment. With a view to develop these community pastures through community involvement, a programme was launched by BAIF, with the support from Swiss Development Cooperation (SDC) at Kavlas in Asind block of Bhilwara district. BAIF motivated the local community to persuade their temple trust to permit the development of the pasture land owned by the Trust. The local communities decided to extend full cooperation including their voluntary labour and BAIF undertook the responsibility of coordinating the project. The programme involved motivation of people, awareness about the need for conserving the pastures, formation of a Pasture Development Committee, survey of the area, fencing of the boundaries, soil and water conservation measures on pasture lands, introduction of forage and shrub species and providing protection. The programme was introduced in a meeting of the Gram Sabha. Initially there was resistance from the landless and small farmers as they felt that their access to common land would be prevented. After identifying the problems, BAIF suggested to the Gram Sabha to nominate their representatives on the Pasture Development Committee. The Committee met regularly to discuss various issues and developed a plan of action, which was shared with the villagers at the Gram Sabha.

The work was initiated as per the plan. Fencing on the boundary and soil and water conservation measures provided employment for the landless and small farmers. Greenery was evident a few weeks after sowing of local forage seeds. Thus, the villagers took more interest and started asking details about the project. They further demanded reconstitution of the Pasture Development Committee, by nominating their own representatives who were close to them. The reconstituted Committee had two members from each of the 10 castes with a Convenor from BAIF. This indicated their interest in the programme. There was complete cooperation from the villagers to provide voluntary labour and protect the pasture from stray animals.

The community also participated in collection of forage seeds and harvesting of forage. They also saved some money from the sale of seeds and fodder and established a corpus, needed to maintain the pasture after the project period.

Looking to the success, BAIF replicated the programme in 15 villages with the support from Sir Dorabji Tata Trust. The project was completed successfully well before the scheduled time, as the participants from these villages could realise the benefits of the project. The Government of Rajasthan provided additional support to replicate this programme in 75 villages under the SGSY Special Programme.

Under this programme, there was an investment of Rs.10,000-14,000 per ha spread over a period of 3 years which resulted in annual production of grass worth Rs.4,000-5,000 per ha, proving the economic viability and technical feasibility of the programme.