

## **Promotion of Dairy Husbandry for Sustainable Livelihood: BAIF'S Approach**

*N.G. Hegde*

### **Livestock in Rural Economy**

In an agrobased developing country like India, natural resources provide basic livelihood support to rural people. Our rural families are dependent on land, water, livestock and forests for generating employment and for earning their livelihood. Among the livestock, cattle and buffaloes play a significant role, because of their contribution to human nutrition (milk and butter fat), plant nutrition (farmyard manure) and energy (bullock power). Cattle and buffaloes are maintained by all sections of the community and unlike other natural resources, they are well distributed among small and large land holders. Unfortunately, a majority of them are low productive, nondescript and lack adequate feed resources and health cover to enhance the milk yield.

India possesses a good number of recognised breeds of cattle, which represent less than 15% of the total cattle population. These are classified into milch breeds, draft and dual purpose breeds. Our milch breeds such as Gir, Tharparkar, Red Sindhi and Sahiwal were also popular in other countries, but their major drawback was reproductive inefficiency. Moreover, the bullocks of these breeds were very heavy and slow. Similarly, the cows of draft breed could not produce adequate milk to even feed their calves. Hence, these elite breeds were also neglected by the farmers. There was no scope for selection by culling due to sentimental values attached to cattle.

Over the last few decades, Indian farmers have been letting their animals out in the forests and community pastures for free grazing. Most of these animals maintained by both rich and poor farmers have been receiving vaccinations and veterinary services free of cost from the Government. Thus, the farmers have an incentive to expand their herd size without any financial burden, while seriously threatening the environment and eco-system.

Out of 504.84 million heads of livestock in India, cattle represent over 42% (218 million) of the population. In 1987, the female cattle population in India consisted of 91.301 million indigenous and 7.462 million crossbreds. Except for 10-15% of the milch breeds, the rest of the nondescript cows yield about 200-350 kg milk per lactation and often suffer from many problems, mainly due to neglect and nutritional deficiency. Their calving intervals are long and irregular. The males are smaller in size and weak. Such animals are a liability. To improve this status, it is necessary to adopt a scientific approach to formulate the cattle management policy, covering the conservation of native breeds, improvement of nondescript cattle, health care services, management of community pastures and grazing. This approach has been given due importance.

### **BAIF in Livestock Development**

Realising these problems and the opportunities available to convert this liability into an asset, BAIF initiated a programme to use the low productive cows as seed beds for producing crossbreds. This programme was backed up by the rich experience of its Founder, Late Dr. Manibhai Desai, who had established a herd of high pedigree Gir cows from Saurashtra. This herd was further improved through scientific breeding and management. In spite of such high yielding cows, the dairy farm incurred losses due to low income and high cost of feeding. This

prompted him to explore the scope for crossbreeding and the results were very encouraging. Looking at the success, crossbreeding was extended to non-descript cows and the crossbreds born to these cows yielded 8-10 times more milk over their mothers' production.

To extend this technology at the doorsteps of poor families, the Bharatiya Agro Industries Foundation, which has now been renamed as BAIF Development Research Foundation, was established at Urulikanchan near Pune in 1967. Before launching the field programme, BAIF studied the present problems associated with Artificial Insemination (AI) services offered by Government Institutions. The major bottlenecks are presented below:

### **Problems of Technology Adaptation**

1. **Poor Rate of Conception:** Chilled semen sent from the collection centres in the morning reached the AI Centres late due to poor transport facilities, while a majority of the farmers brought their cows for AI in the morning. Unsatisfactory transportation and storage facilities resulted in deterioration of semen quality thereby causing poor rate of conception. Poor health status of cows and improper time of AI also contributed to the failure.
2. **Poor Quality Germplasm:** The technique of using liquid semen demanded a large number of bulls for semen collection thereby compromising on their genetic merits. In the absence of performance recording of cows, it was impossible to select the bulls of desired merit in large numbers.
3. **Inadequate Feed Resources and Health Care:** Most of the farmers owning livestock do not have adequate fodder and feed resources to nurture their animals. As a result, the animals are not able to exhibit their genetic potentials. Inadequate health care further affected the production capabilities.
4. **Lack of Motivation:** For a long time, most of the rural people were unaware of the merits of AI technology and the advantages of crossbreeding, while others who were aware about this programme had lost trust in the technology due to repeated failures. Even today, there is skepticism about crossbreeding, inspite of its proven benefits.
5. **Poor Marketing Outlet:** In the absence of effective marketing network, farmers had no opportunity to sell the surplus milk. Hence, farmers had no interest in availing the breeding services. In interior areas, where milk collection was not possible, farmers stopped feeding their animals.

### **BAIF's Approach**

Considering these problems, BAIF developed a comprehensive cattle development programme for providing livelihood to the rural people. The objective of this programme is to provide door to door services to breed the local cows, using superior dairy breeds like Jersey and Holstein Friesian.

The salient features of BAIF's Cattle Development Programme are:

- \* Conservation of native breeds and crossbreeding with non-descript animals;
- \* Use of state-of-the-art technology with high quality frozen semen of proven bulls;

- \* Breeding at the doorsteps of farmers for motivation and efficient services;
- \* Close follow-up, technical guidance and monitoring;
- \* Integration of breeding with extension, training, fodder resource development and health care;
- \* Provision of support services like disease investigation, vaccination and nutritional advice;
- \* Training of local youth to take over the operational responsibilities in due course;
- \* Targeting of the underprivileged and sensitivity to social and gender issues.

### **Programme Coverage**

Based on the geographical distribution of breedable cattle and buffaloes, network of roads and communication and milk marketing, the cattle development centre is established, covering a radius of 10-15 km, with over 1000-1500 families and about 1500-2000 breedable cattle and buffaloes. Each centre is managed by a trained Block Programme Officer (BPO) who is expected to initiate socio-economic development activities, apart from providing cattle breeding services. Realising the potential of crossbreeding of cattle, the Planning Commission of India and the Ministry of Rural Development, Government of India have approved the establishment of BAIF's cattle development centres under the Integrated Rural Development Programme and Swarnajayanti Gram Swarozgar Yojana.

Presently, BAIF is operating 1400 cattle development centres in the states of Maharashtra, Gujarat, Rajasthan, Uttar Pradesh, Uttaranchal, Bihar, Madhya Pradesh, Karnataka, Andhra Pradesh, West Bengal, Orissa and Jharkhand. On an average, each centre achieves about 450-500 conceptions resulting in the birth of 200 crossbreds females every year. The crossbreds come into milk production at the age of 28-32 months and yield about 2200-2700 kg milk/lactation. The major focus of the programme is to use the local non-descript breedable cattle for crossbreeding, while conserving the native breeds, in their home tracts.

Apart from AI and pregnancy diagnosis, the BPO undertakes various promotional activities such as calf rallies, veterinary health camps, vaccinations, distribution of mineral mixture, fodder seeds and deworming drugs, capacity building through film shows and village meetings, etc. depending on the need and available resources. Promotion of fodder cultivation, demonstration of feeding non-conventional feeds and improving the quality of crop residues are the other support activities.

BAIF does not provide veterinary clinical treatment activities as this has to be handled only by qualified veterinary doctors whose services are usually available at the veterinary dispensaries operated by the State Government. This understanding has helped in maintaining cordial relations between the State Animal Husbandry Departments and BAIF.

Local youth are also trained in AI, PD, vaccination and management of milch animals with a view to encourage them to serve as AI technicians in their locality. In fact, this effort has paid a rich dividend by promoting self-employed Livestock Breeders in rural areas. Presently, in Western Maharashtra, over 75 youth are operating cattle development centres with franchise from BAIF. These youth, holding a Diploma or Degree in Agriculture or Animal Science are trained and supported by BAIF to manage the cattle breeding centres. They have taken equipment, accessories and motorcycles on lease and operate the centre under the banner of BAIF, which provides the inputs such as liquid nitrogen, frozen semen, extension literature,

mineral mixture, vaccines, antigens, etc. on credit. These technicians collect their fees for various services rendered to the farmers, either directly from the cattle owners or from the affiliated milk or sugar cooperatives. This programme is gradually catching up in other states as well.

To support the cattle development programme in the field with superior quality inputs, BAIF has established a Bull Mother Farm and Bull Station at the Central Research Station, Urulikanchan. This farm houses Jersey and Holstein Friesian cows and bulls of both exotic and native breeds. The Semen Freezing Laboratory is equipped with basic amenities to freeze over two million doses of semen annually. An Embryo Transfer Laboratory has been set up to produce superior quality bulls and to conserve the germplasm of precious native breeds. These bulls are covered under the progeny testing programme for evaluating their genetic potentials to transmit their positive traits. BAIF is also engaged in production of fodder seeds, cattle feeds, mineral mixture, etc. which are essential to boost milk production.

### **Benefits of Crossbreeding**

BAIF initiated cattle development as a programme to ensure sustainable livelihood for the rural poor. Hence, the focus is on the participation of small, needy families to produce crossbreds at their doorsteps without any heavy capital investment. This has ensured the involvement of the entire family. These crossbreds have been acclimatised to the local surrounding. As these animals are highly priced and sensitive to harsh environment, farmers prefer to stallfeed them. With the constraints of space and fodder, many farmers have been disposing off less-productive animals. This has reduced the pressure on forest resources and facilitated regeneration of overgrazed pastures. Thus, upgrading of livestock has a positive impact on the ecosystem and environment.

Stallfeeding has also promoted organic farming. With better feeding of crossbreds, dung production can be doubled. The farmers can enhance the production of farmyard manure and promote eco-friendly agriculture. Earlier when the livestock was let out for grazing, they were under-nourished and dung collection was low. A cow capable of producing about 25 kg dung could hardly provide 6-8 kg per day. For installing a biogas plant, about 50- 60 kg dung was needed every day and this was impossible for most of the families. Now, with 3-4 heads of stallfed animals, even small farmers can install a biogas plant.

With the income from milk, a family maintaining three crossbreds can easily come out of poverty. The cost benefit details of crossbred cows are presented in Table 1.

**Table 1: The Cost Benefit details of Crossbred Cows**

Parameters	Local Cow	Crossbred Cow
------------	-----------	---------------

	Quantity	Amount	Quantity	Amount
<b>Income:</b>				
Average milk production per lactation of 305 days excluding milk suckled by calf (Rs.6.00/litre)	200	1600	2200	17600
Dung, farmyard manure (t/year)	3	1800	5	3000
<b>Total Income (Rs.)</b>		<b>3400</b>		<b>20,600</b>
<b>Expenses:</b>				
Feed : Concentrate (Rs. 5/k)	250	1250	1100	5500
Dry Fodder (Rs.1.5/kg)	2100	3150	2000	3000
Green Fodder (Rs.0.8/Kg)	400	320	1000	800
Vaccinations and Veterinary care		10		300
<b>Total Expenses (Rs.)</b>		<b>4730</b>		<b>9600</b>
<b>Net Income (Rs.)</b>		<b>-1330</b>		<b>11000</b>
<b>(Excluding Labour Costs)</b>				
National Labour Cost				2500
Breeding and other services				300
Cost of growing stock				1500
<b>Net Profit (Rs.)</b>				<b>6700</b>

As the crossbred males can also be used as bullocks, farmers maintaining crossbred cows can meet their bullock power needs locally without additional costs. However, as they are often neglected due to lack of awareness, field extension and demonstration are needed to optimise the use of crossbred bullocks.

Feed management plays a very significant role in enhancing the profitability of dairy husbandry. Generally, the farmers can enhance their profitability by feeding the cattle with home grown green fodder. In the absence of green fodder, the milking animals need concentrate, which will have to be procured at a high price from the local market. Hence, promotion of fodder cultivation and improving the quality of the available feed such as crop residues and by-products can further enhance the profitability of dairy husbandry.

### Conservation of Native Breeds

Although crossbreeding has been well accepted in the country, there are certain areas, where it is not advisable. Firstly, in the tracts of Indian draft breeds, such as Khillar, Hallikar, Dangi, Amritmahal, Krishna Valley, Malvi and Nagor, the farmers continue to produce good quality bullocks. Secondly, in the tracts of Indian dairy breeds like Gir, Sahiwal, Red Sindhi and Tharparkar, which are comparatively hot and dry, these native breeds surpass the crossbreds. Therefore, it is easier and economical for the farmers to maintain the native cows, inspite of lower milk yields. Thirdly, a section of the resource poor farmers particularly the landless, cannot afford to feed their animals well. In this state of neglect, native breeds can withstand the stress better than crossbreds. Similarly in remote areas, where veterinary services are not easily available, native breeds may prove better than the crossbreds.

Native cattle may also find a place where farmers maintain cows to meet their domestic demand for milk and farmyard manure. If the intention of the farmers is not to sell milk, some reduction in milk yield, free from delicate management will not matter. Considering these opportunities, BAIF has been freezing the semen of some of these native breeds and encouraging the farmers to serve their cows with native breeds. The results have been very

encouraging. However, in the absence of adequate data and information on performance of various cattle breeds and their economics, most of these animals are under severe neglect. Systematic studies are needed to evaluate these breeds and conserve them.

### **Strategy for Future Development**

**Wider Replication:** With significant success of cattle development over the last 35 years, BAIF is planning to expand the cattle development programme both in terms of volume and quality. The expansion of cattle development programme can be ensured through promotion of paravets and self-employed youth to provide livestock breeding services, at cost. Establishment of Dairy Farmers' Associations at the block level covering the farmers under a centre is also in progress. Such organisations can assume the responsibility of operating the programme, on their own. Efforts are also made to involve the local NGOs at village or block levels to implement the programme with technical back up from BAIF. Collection of service fees from the farmers can ensure the sustainability of the programme, without any subsidy from outside donors or the Government, after an initial support for 5-7 years. As this pattern is in successful operation in Maharashtra over the last 20 years, wider replication may not pose any obstacle.

**Reducing the cost of Production:** For competing with other countries under the WTO agreement, farmers will have to bring down the cost of milk production. Naturally, this can increase their profit margins as well. Thus, the future challenge needs to be addressed through enhancement of milk yield, production of clean milk and reduction in the cost of milk production. Hence, supplementary extension services have been introduced to improve the feeding, health care and management practice. Regular health monitoring through disease investigation, timely vaccinations and supplementary feeding of minerals and vitamins can reduce the age at calving, calving intervals and enhance the milk yield.

**Clean Milk Production:** With the free international trade agreement, Indian dairy industry will be subjected to severe competition from the developed countries, while providing new opportunities for export. However, to avail of these opportunities, clean milk production has to be ensured. Presently, the milk collected by most of the dairies does not meet the international quality tests due to high bacterial count. This can be avoided by orienting the dairy farmers to adopt simple hygienic practices. Clean washing of udder before milking, disinfections of teats after milking, use of clean containers for storing milk and immediate delivery of milk to the chilling center minimize the bacterial count in milk. Intensive awareness and extension campaigns are needed to promote clean milk production.

**Decentralised Milk Processing:** Presently, the milk is collected at the village level co-operatives and sent to large size dairies located in cities through Taluka and District Level Federations. Most of the dairies, which are engaged in distribution of pasteurized milk, are not able to handle the surplus milk, particularly during the winter season. As a result, milk collection in many regions is suspended once or twice a week during the peak season causing huge losses to dairy farmers. Hence, there is a need to develop an alternate system to process milk on small scale, in small towns as well as to produce a wide range of traditional Indian and Western dairy products. Development of low fat, low calorie dairy products may develop a new market, which can afford to pay a premium for healthy food.

Alternative techniques are also useful for processing milk in remote areas, which are located far away from the consumers. Hygienic and energy efficient methods of producing local dairy

products may prove attractive and economically viable in such areas.

**Research for Sustainability:** For competing with the developing world and to enhance the profit margins of dairy farmers, there is a need to improve the milk yields and cost of production through advanced research studies. Among them, genetic improvement deserves priority. This can provide an opportunity for introducing germplasm of superior quality and higher milk yields, and also conserve precious native Zebu breeds. While the elite farmers are keen to enhance the milk yields through import of elite germplasm, the resource poor farmers may prefer native breeds, if serious efforts are made to select superior sires for breeding. Advanced techniques of embryo sexing and freezing are essential to conserve the native breeds as well.

Marking of genes for disease resistance, heat tolerance and other positive traits such as high protein and fat in milk, udder characters, body confirmation and strength for draft power is another important field of research, proposed to be pursued in due course. Genetic improvement in this direction can further promote economic and eco-friendly dairy husbandry, which millions of small farmers are looking forward to sustainable livelihood.

### **References**

1. Anon. 1992. Dairy Cattle Development Programme: BAIF Way. Unpublished Paper. BAIF, Pune.
2. Gupta, P.R. (Editor) 1997. Dairy India VI En., New Delhi.
3. Hegde, N.G. 1995. Prevention of Cow Slaughter: Economic Gains as primary consideration, Occasional paper, BAIF, Pune.
4. Mangurkar, B.R. 1997. Livestock Breeding Programme in India: A Case Study: BAIF, Pune : 22 pp.