



RURAL MANAGEMENT THROUGH DAIRY ENTERPRISES IN TAMILNADU

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$\frac{1}{15750}$ ABSTRACT $\frac{1}{15750}$

In a predominantly agricultural economy like ours, Dairy Development plays a vital role in providing self employment in rural areas and ensuring nutrition to the population. Dairy Development in Tamil Nadu dates back to the 1920s when the State Co-operative Department stated organizing milk Co-operative societies. Dairy Development acquires special significance when nature plays truant as is the case today, in Tamil Nadu, where unprecedented drought has hit the lives of many rural people.

Even feeling of milk animals has become very difficult. Hence, efficient dairy development calls for an integrated approach namely rearing maintenance and marketing of milk and as its allied products. As Gandhi clearly pointed out, Villagers are the backbone of the Indian Economy. In rural areas cattle rearing is one of the occupations especially among the rural poor comprising of farmers and artisans- It can fetch a considerable amount of additional income for their livestock. It provides employment opportunity to the uneducated children in rural areas. The waste items namely cow dung is used as a prime material for production of cow dung gas which is largely used as cooking fuel. The total population of livestock is in India is 35334 million according to the 1972 census. In percentage of target is animal husbandry.

Introduction

In a predominantly agricultural economy like ours, Dairy Development plays a vital role in providing self employment in rural areas and ensuring nutrition to the population. Dairy Development in Tamil Nadu dates back to the 1920s when the State Co-operative Department stated organizing milk Co-operative societies. Dairy Development acquires special significance when nature plays truant as is the case today, in Tamil Nadu, where unprecedented drought has hit the lives of many rural people.

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India is often described as a land of contrasts. Nowhere is this vast land of 980 million people is this true than is dairy farming. The pressure of population ensures that land remains prime property-Adding to the man-land intensity is a sizable population of labours who work on the land but own little or none. Our population, our land and its limits, also require that our available soil be used to grow food crops to meet our people's needs, needs that expand not merely because of size but because we can increasingly afford more and better food.

No Green Carpet

The priority must be given ensuring basic nutrition for our people means that little land can be diverted to the growing of fodder for cattle. Cattle must make do with what grows by the side of the fields and such crop resides as straw, rice polish, bran, oilseed cakes and

small quantities of coarse grain concentrates. Not for the Indian cow or buffalo those areas of green carpet enjoyed by the privileged cattle in New Zealand, Europe and North America.

As a result, our dairy animals typically produce no more than three or four litres of milk a day; many produce far less. The positive side of our approach to feeding is that because cattle are fed crop residues, the energy efficiencies achieved are high, so high that they would be impossible in a developed world dairy setting where high nutrition feeds, produced by using fertilizers and tractors and which are then shipped long distances, require that the energy expended in the production of the milk is comparatively high, quite apart from the energy used in the machine milking, factory processing and packaging products, shipment through extensive cold chains and the like.

According to the FAO publication Food 2010, India, along with the United States, was the largest producer of milk in the world at the end of 2010. Our total production of 70.8 million tonnes, was expected to over take the U.S. and go on to produce 74 million tonnes in 1998. How has this been accomplished?

The Indian Dairy industry was not blessed with a great many natural advantages. In fact, we suffered from all possible disadvantages, save one: India, almost alone among non-European cultures, is a milk drinking nation. This, coupled with our large population, ensured a constant and growing demand for milk.

Unfortunately, the policies and programmes during the colonial era ensured that our milk production languished at around 20 million tonnes which meant that per capita access to milk and milk products was falling. Our very best cattle were taken to the cities to meet the urban demand for milk and when they went dry, they were either slaughtered or abandoned. This practice of shipping milk on

the hoof was responsible for tragically eroding the genetic potential of dairy cattle in the country.

A second and equally serious problem was that dairy farmers in our villages were compelled to sell milk to middle men at derisory prices simply because the government had given these traders a monopoly of purchasing the milk in return for supply to cities like Bombay. The farmers' problems were complicated by the fact that milk would not keep good beyond 3 hours in our climate. The result was evident in stagnant production.

In this generally dismal scenario, the farmers of one district Kheda in Gujarat, sought the advice and help of one of India's greatest men—Sardar Vallabhbhai Patel, who later became Deputy Prime Minister of independent India. He told them bluntly that the only way they should save themselves was to form a dairy cooperative and sell the milk directly to the markets instead of through middlemen. Forming a cooperative offered its own challenges. Here was an illiterate farming community being told to form a modern cooperative and market their milk in one of India's most modern and sophisticated cities—Bombay.

This initiative met with fierce opposition from all quarters from the colonial government's Milk Commissioner in Bombay to the local privately owned dairy in Kheda, to the traders who supplied the dairy while bleeding the milk producer.

The new cooperative struggled against all odds for years but it survived/ and eventually it thrived. By 1965 this cooperative—what everyone today knows as AMUL—had acquired a name for itself as the best run and most modern dairy cooperative in the country.

Amul products were, as the Sanskrit name suggests, "price-less". As the cooperative had created a remunerative and reliable market for milk, its members wanted to increase production. So they instructed the

cooperative management to provide them with fortified fodder for their cattle and also veterinary on a 24 hour basis. They then made sure that the cooperative offered artificial insemination facilities using the best breeds to improve the dairy potential of their cattle. Because it was owned by dairy farmers, the cooperative bought milk all year round. It sold the pasteurized and treated milk in the cities, manufactured dairy products, and regularly distributed profits as a year-end bonus to its members, over and above the good prices they received, twice each day.

In 1965, the then Prime Minister of India, Lai Bahadur Shastri visited Kheda District and decided that the Amul example should be replicated all over the country.

This led to the setting up of the National Dairy Development Board with the position of replicating the Amul experience—what came to be called the Anand pattern of Dairy cooperatives—all over India. The programme to achieve that replication—Operation Flood—began with a plan to build four metropolitan dairies, one for each India's biggest cities and promote dairy cooperatives in 17 promising areas—termed milk sheds—in 10 states.

The European Economic Community played a helpful role in ensuring that the Anand pattern replication succeeded by donating milk powder and butter oil to India. These commodities were reconstituted into liquid milk and sold in our metropolitan markets.

The money generated from the sale of the gift commodities was used to finance the four metro dairies and to pioneer establishment of dairy cooperatives to supply them. In the second phase of Operation Flood, EC commodity support was supplemented by World Bank Loans. During this phase a national milk grid was established which ensured that major cities all over the country received their milk supplies by rail and road tankers from places

as far as 2,000 km away. The third phase expanded the effort made embrace the entire country.

Today, there are 10.1 million farmers who are members of 77,000 village dairy cooperatives societies, each of which is affiliated to one of 170 district and regional cooperatives unions which in turn, are part of a State cooperatives marketing federation. There are 22 of these federations which offer dairy and other products in the market successfully competing among themselves and with dairy firms owned by individuals investors and multinationals.

The industry as a whole today produces enough milk and milk products to ensure that the country imports virtually no dairy products.

Significance of Dairy Development

Distribution of milk animals and encouragement of milk production is one of the popular action programmes under the Integrated Rural Development for alleviating poverty in India. The beneficiaries earned a dairy additional income of Rs. 8.00 with the implementation of such programmes through erstwhile small farmers' development agency and the present rural development agency. Before 1979 the average dairy income of the beneficiaries was between Rs. 8 to 12. After the implementation of such programme farmers earned an average of Rs. 10.00 per day.

Dairy Development is conceived as a major development programme not only in the context of poverty mitigation plan but also as a measure to augmenting milk production to meet the increased demand for milk from urban consumers.

The annual production of milk in India is estimated as 583.78 million-tonnes and the target proposed during the Sixth Plan is the per capita consumption of milk is 112 grams and it is proposed to raise to it 210 grams by 2009-2010.

Dairy development in Tamil Nadu has been taken up under of the Co-operative and State Department of Animal Husbandry. A unit outline of the programme as reported in Co-operative Fortnightly is quoted below.

1. A new Apex Federation formed on 1.2.1981. It has taken over activities of dairy development corporation and has expended on the same. Its aim is to implementation of the "Operation Flood—II" programmes in the state effectively. As per Anand pattern all the 15 Districts have formed District Milk producer's unions. Of these 9 districts are under Operation Flood II programme. Under this programme costing about Rs. 42 Crores. The massive expansion and acceptance of dairy enterprise under given farmer and farm family socio-economic conditions.

Several research studies and evaluation reports are available to access, the performance of milk production programmes in the country in general. However, economic investigation of micro-level covering the basic units of production are quite lacking and quite often the need for such studies has been emphasized for micro level planning and development of milk production units- The presents study is one such attempt at the development of Block level. Viz.

Thottiyam Block in Thiruchirapalli District, Tamil Nadu Hole of Dairying in Sustainable Crop Farming Dairying in India, in general, is closely interwoven as an integral part of and an adjunct to agriculture but it did not receive as much attention as it richly deserves relative to crop production for obvious reasons. The western commercial farming system characterized by use of mega equipment, pesticides and fertilizers heavily relies on substitution of capital equipment for labour and higher use of feedstuff's edible to man.

This high energy system is heading towards a pronounced decline in the number of dairy farms and the number of cows,

increasing stocking rates of cows per farm associated with significant productivity increases in milk production per cow. According to a study (Schelhass, 1992) by the year 2000 A.D. the annual average yield per cow will third and the number of dairy farmers will fall around 50 per cent in 19 western countries which currently account for almost 50 per cent of the world milk production.

However, in contrast in India, milk production is predominantly the domain of small and marginal farmers and the landless who keep 1-2 milch animals generally as a part of mixed farming system. Small holders own about 70 per cent of the milch animal population but these are widely dispersed in rural areas with poor infrastructure and limited access to services and markets. In India, cattle and buffaloes are raised mainly on feedstuff's which are unfit for human consumption, e.g., rice straw, wheat straw, maize, sorghum and millet stovers and other crop byproducts and waste material.

Despite significant achievements in many sectors, as explained earlier, India has a large rural population which suffers from unemployment or underemployment and is below the poverty line. And the pressure of land on account of increasing human population is such that the little or no land can be exclusively devoted to production of feeds for the animals. For about the last two decades there has been no change in cultivated area devoted to fodder production, about 4 per cent, in the country. This will continue to be the case for the foreseeable future also. Therefore, increase in production have to be achieved mainly by feeding the animals on crop residues and natural herbage which are inedible to man.

The Indian man-land-cattle ecosystem is based on natural symbiotic relationship. Cattle and buffaloes have a complementary, supplementary and sustainable relationship with crops under mixed fanning System prevalent

in the country (Acharya, 1990). The draught power for agricultural operations and rural transport in a great measure is available from cattle. The dung production by animals helps in providing organic manure for maintaining long-term soil fertility and for providing fuel for kitchen to the farmer family. Organic manure also helps in mitigating micro-nutrient deficiencies in intensive irrigated and cultivated areas and also results in more efficient use of applied nutrient and saving of costly chemical fertilizers.

Traditionally, milk production has only been incidental to provision of draught power by cattle but it is an important source of supplementary income and nutrition to the farmer family. Availability of regular fluid cash from daily sale of milk not only helps in dairy production through purchase of compounded feed and other inputs but also helps in improving crop production through purchase of off-farm inputs like improved seed, fertilizer, pesticides, etc. The result is that increased milk production leads to significant improvement in farm production and nutritional and living standards in rural areas.

In fact, with the growing pressure of human population, dairying has to be developed in such a manner so as to avoid competition between man and animal for the land and its produce. In the words of M.S. Swaminathan, "India needs land-saving crop production and grain-saving livestock production".

Investment Pattern on Animal Husbandry and Dairying during various Plan Periods

The investment on animal husbandry and dairying programme shows the emphasis given to this sector by the government for increasing the production and productivity. Table 1 gives the total plan expenditure, expenditure on agriculture and allied activities, animal husbandry and dairying and exclusively the dairy sector. The expenditure at current

prices in the dairy sector increased from Rs. 77.8 million in the First Five year Plan to Rs. 6,034.1 million in the Seventh Plan. (Table 1)

The anticipated Eighth Plan expenditure has been put at Rs. 13,367 million which is almost equal to sum of the expenditures from First to 12th Plans. However, these expenditures do not take the rate of inflation into account. Though the expenditure increased in monetary terms, the allocation to animal husbandry and dairy sector as a percentage of allocation to agriculture varied from 7 per cent in the Third Plan to 4.6 per cent in the 12th five year Plan. There was a gradual increase in the percentage allocation on animal husbandry and dairying sector from the First to the Third Plan and thereafter it showed "a decline except in the Sixth Plan. This could be due to the quantum jump in the plan expenditure to the agriculture sector.

The percentage expenditure on the dairy sector compared to the expenditure on animal husbandry and dairying ranged from 23.2 (Fifth Plan) to 55.5 (Annual Plans, 1978-80). The expenditure on dairying is almost 50 per cent of expenditure on animal husbandry and dairying since the Sixth Plan. Although the dairy sector occupies a pivotal position and its contribution to Indian economy is indeed significant, the plan investment made so far does not appear commensurate with its output and future potential for growth and development.

Bovine's Population

Cattle and buffaloes have been an integral part of crop-livestock system in Indian farm economy for thousands of years. Possessing 272.3 million bovines (1990), India claims the first position in the world, accounting for 51 per cent of the Asian bovine population (530.1 million) and 19.2 per cent of the world population (1,420 million) (FAO, 1991).

Decomposing the total bovine population into cattle and buffaloes also presents a

similar picture. India with a cattle population of 1973 million accounts for nearly 50 per cent of the Asian population and 153.4 per cent of world cattle population. With regard to buffalo population, the country is placed in a still more comfortable and enviable position, contributing to 53.3 per cent of the world population and 55 per cent of Asia. Almost the entire world's buffalo population (about 97 per cent) is in the Asian subcontinent. India, China, Pakistan, Thailand, Indonesia, Nepal, Vietnam and Philippines, in that order, are the top eight countries accounting for the major buffalo population of the world. The ratio of cattle to buffalo population approximates 100 to 11 in the world, 100 to 34.6 in Asia and 100 to 38.1 in India.

A question arises as to how to justify the burden of keeping an usually large bovine population in the country. The answer is not far to seek. Cattle and buffaloes raised in the country help to provide economic stability to the farmers in the face of uncertainties associated with agricultural production in dry land rainfed farming areas which constitute 70 per cent of the arable land of the country. Further, bovines are an important source of draught power, milk, meat, hides and skins, horns, bones and the much needed organic manure for the sustainability of soils. In addition, there are values related to social and cultural aspects.

Growth Rate

Traditionally in India, cattle have been raised for draught power for agricultural purposes and buffaloes for milk production. The trend in the growth rate of bovine population over time shows the relative importance attached to cattle and buffaloes as work and milch animals in the rural economy. A comparison of the growth rate of cattle and buffalo population. However, the growth rate of cattle and buffalo population in Asia was 0.72 and 0.61 per cent respectively. Whereas buffalo

population in India exhibited an annual growth rate of 1.76 per cent as against only 0.50 per cent for cattle, the world buffalo population grew at the rate of 0.65 per cent and cattle population increased at an annual rate of 0.51 per cent. Although the growth rate in cattle population was more or less similar, the growth rate in buffalo population in India was almost three times that of the world. This further confirms the importance attached to the keeping of buffalo in the Indian economy. Relatively lower growth rates in buffalo population in Asia relative to India could be attributed to negative growth rates observed in some countries like Afghanistan, Turkey, Philippines, Iraq, China and Nepal. The growth rates for individual states in India are presented in Table 2.

Bovine Density

The comparison of bovine population between regions is more relevant with respect to per unit total cropped area gives the stocking rates of bovines in India distributed in four regions. There were intra- and inter-group differences in population numbers. This is but natural to expect as the bovine number depends on the land area, agro-climatic conditions, availability of feed and fodder and socio-economic variables. On an average, very 100 hectares of cropped area in the country sustained 151 bovines, comprising 111 and 40 buffaloes. (Table 3)

Significant regional disparities were observed in the stocking rates. Surprisingly, the eastern region had the highest bovine density (208) and the western region accounted for the lowest (123). The cattle density was the highest in the eastern region and lowest in the northern region whereas the reverse was true for buffaloes, exhibiting maximum density in the northern region and lowest in the eastern region.

Abnormally high stocking rates observed especially in the eastern region is a matter of

serious concern and might have contributed to lower productivity of bovines, relative to other regions of the country. High stocking rates exert constraining influence on the nutrient availability for bovine, other livestock as well as for human population. On a given land area, with positive increases both in human and bovine population, the problem is going to get further accentuated by more and more pressure on the limited and non-extendable resource. Whereas sustained efforts are being made in the country to control the growth in human population to a manageable optimum number commensurate with availability of land and feed and fodder resource endowments. As regards the question of interventions in bovine population is concerned, this would be elaborated in the later sections.

Ratio of Cattle to Buffalo Population

The cattle and buffalo population in different regions of the country and the number of buffaloes per thousand cattle heads are presented. The cattle population was observed to be the highest in eastern and the lowest in the southern region, northern and western region possessing almost the same number. The top six states in the country registering high cattle population are: Madhya Pradesh, Uttar Pradesh, Bihar, West Bengal, Maharashtra and Orissa, in that order. (Table 4)

The concentration of buffaloes was maximum in the northern region (35.3, million) and minimum in the eastern region (8.4million). Uttar Pradesh, Andhra Pradesh, Madhya Pradesh, Rajasthan, Punjab and Bihar were the six leading states having maximum buffalo population. The ratio of buffaloes to cattle was also the highest in the northern region (752 buffaloes per thousand cattle) and the lowest in the eastern region (129). The southern region had a ratio of 459 buffaloes per thousand cattle while the western region had only 291 buffaloes. The northern and southern regions were observed to be important from

the point of view of rearing of buffaloes for milk production.

Breedable Cow and Buffalo Population

The breedable cow and buffalo population is important from the milk production point of view. India has about 55 million breedable cows and 32 million buffaloes-The eastern region has the maximum number of cows followed by the western, northern and southern region, in that order. The position was entirely different for breedable buffalo population. The maximum number of buffaloes was in the northern region which alone accounted for about 44 per cent of the population-The ranking of the remaining regions in this respect was southern, western followed by the eastern region. In fact the eastern region accounted for less than 10 per cent of the total buffalo population. (Table 5)

Table 5 also gives the annual compound growth rates of breedable cow and buffaloes population. The breedable cows increased at the rate of 0.53 per cent annum and the buffaloes at the rate of 1.79 per cent annum in the country as a whole. There were significant regional differences in these growth rates. The growth rate in cows was maximum in the eastern region (1.53 per cent), followed by the western region (0.62 per cent) and northern region (0.20 per cent). Interestingly, the southern region registered a negative growth rate of 0.1 per cent in cows. The breedable buffalo population showed an entirely different picture, the highest annual growth rate of 2.80 per cent being found in the northern region followed by the growth rate of 1.12 per cent per annum in buffaloes.

Relatively higher growth rates observed in buffaloes in all regions except the eastern region and for the country as a whole further confirm that buffaloes are preferred over cows for milk production in the country. In fact/ the southern region registered a decline in cow

population suggesting that the unproductive cows are being gradually eliminated by resorting to crossbreeding programme. A further examination of the rest of the states falling in the southern region showed that Andhra Pradesh and Tamil Nadu showed a negative growth rate of about 0.5 per cent while Karnataka and Kerala had a positive growth rate of 0.17 and 1.61 per cent respectively. These inter-state variations within the region have resulted in negative growth for this region. Raju and Seshiah (1992) analyzing the growth rate of livestock population in Andhra Pradesh have attributed the decrease in cattle population to scarcity of fodder and to prevalence of drought in some districts and heavy rains and floods in some other districts in the state, resulting in high mortality. The other reasons adduced for the decrease in cattle include the change over to mechanization of farming, high cost of cattle feeds as compared to the milk yield of the cattle, lack of demand for cow milk and reduction in the area under grazing lands.

There appears to be a general tendency for maintaining buffaloes for milk production in all the regions especially in the northern region. This could be due to higher productivity and higher price realization relative to cow milk owing to higher fat content of buffalo milk. Besides, buffaloes are known to be better converters of poor quality roughages (straws of rice, wheat, etc.) into milk. The concentration of world famous breeds of buffaloes in the northern region and their higher growth rate compared to breedable cow population suggest that the people of the region prefer buffalo milk both for fluid milk consumption and for preparation of milk products like ghee, paneer and khoa based sweets. The higher growth rate of breedable cows in the eastern region was more due to the hilly terrain (especially in the north-eastern region) where adaptability of buffaloes was poor due to their large body size. Further, human population in the eastern

region has a profound preference for cow milk and cow milk based sweets like rasogolla, trisidahi, sandesh, ksheer sugar, etc. In fact people in the eastern region have a preference for ghee made out of cow and buffalo population in individual states is provided in Table 2.

Adult Male Stock

Males over three years of age are important as draught animals for agricultural operations and for transportation purposes. It is interesting to note that male cattle population showed a negative trend for the country as a whole as well as in the northern and southern regions (Table 6). On the other hand, the eastern region showed a significantly higher positive Annual growth rate of 1.14 per cent while in the western region the male cattle population was almost stagnant. The negative growth rates observed in the northern and southern regions and stagnant growth rate in the western region could be attributed to increasing adoption of mechanization of farm operators and lesser reliance on the use of male cattle for draught purpose. The eastern region is characterized by low irrigation potential, small farmers with a poor capital base, majority of area being hilly and forest region. Much mechanization has not been restored to the same extent as in other regions. This could be the plausible reason for using more bullock power for draught as well as transportation purposes in the eastern region contributing to a positive growth in the male cattle population. (Table 6)

The male buffalo population showed a significant increase in the northern region (1.68 percent) followed by the eastern region (0.64 per cent) and western region (0.48 per cent). The southern region showed a negative growth rate of 2.41 per cent. The male buffaloes are used both for natural breeding and transportation purposes in the northern region and hence showed positive growth.

Increased use of male buffaloes especially for transportation has been quite a recent occurrence in the northern region especially because it is used as a single animal and not as a pair as is the case with bullocks. It is common knowledge that bullock draught power is grossly under-utilized and it is an indivisible resource since a pair has to be used, while in the southern region, male buffaloes are generally eliminated at the younger age itself as they are no longer required for draught 'purposes'. The young buffalo males are being slaughtered for beef purpose for which there is a ready market both within the country and abroad. Further there is no social inhibition on slaughter of buffalo males.

Young Stock

The young stock (below 3 years old of age) comprises replenishment stock both for adult male and female bovine population. Table 7 gives the growth rate of male and female cattle and buffalo young stock. On an average, the annual compound growth rate was 0.68 per Cent in cattle male young stock and 0.25 per cent in buffalo male young stock. There were significant regional variations in the growth rates. The eastern region witnessed the highest rate of 1088 per cent in cattle young stock while it was similar in the northern region for buffalo male young stock. The southern region showed negative growth both in cattle and buffalo male young stock. Young male stock showed higher growth rate compared to male adult stock which could be due to higher risk of mortality among young stock and particularly true for the calves before one year of age. (Table 7)

The growth rate among female cattle and buffaloes was observed to be 1.95 per cent in cattle and 2.15 per cent in buffaloes. Young female cattle in the eastern region and young buffalo females in the southern region showed the highest annual compound growth rate (Table 8). The higher growth in young stock

observed in the eastern region is in conformity with the growth in the breedable cow population. It was generally observed that the growth rate in young female stock was higher compared to breedable female stock, the reason being higher in the young stock.

Crossbreed Cattle

The cross-breeding programme in cows has been taken up in the country to increase the productivity of indigenous cattle. The quinquennial livestock census has included the number of crossbred cattle since 1982 onwards. As per the estimates of the Planning Commission, the number of crossbred female cattle in 1989-90 was 9.7 million in the country (Table 8). The concentration of crossbred female was more in the southern region (4.2 million) followed by the northern region (2.6 million), eastern region (2.1 million) and western region (0.8 million). The higher concentration of crossbred in the southern region could be adoption of cross-breeding programme since the beginning of the country; suitably of climatic conditions especially in some pockets of Karnataka, Tamil Nadu and Kerala for adaptability cattle and involvement of foreign collaboration agencies in providing promoting crossbreeding programme. This has resulted in the decrease of nondescript indigenous breeds of cattle for milk production over the years. Further, this might have affected breedable cow population resulting in a negative growth rate in the southern region. Lack of any religious sentiments on consumption of beef in some southern states especially in Kerala and in the north-Eastern Region might have contributed significantly to various in the growth rate of young stock. (Table 8)

Productivity of Milch Animals

The production of milk in different states and regions depends upon the productivity of milch animals and the total breedable milch population. A discussion has already been

made about breedable bovine population earlier- Till 1985, there were no systematic attempts estimate are productivity of cows and buffaloes in country. This department of Animal Husbandry and Dairying, Ministry of Agriculture sponsored a scheme to estimate the livestock productivity in different party of the country. Table 9 provides the productivity per animal per day of milch cows and buffaloes for different states within each region over the three periods, namely, 2002-03, 2003-04. During the first two periods, no attempts were made to collect the productivity separately for indigenous breeds and crossbred cows. This was attempted in some states during the third period.

Conclusion

The results presented in reveal significant inter-and-regional differences in the productivity of cows and buffaloes. As expected, buffaloes were found to have higher productivity relative to indigenous cows in all the three periods studied. Crossbred cows, however, produced more milk compared to indigenous cows and buffaloes. The periodicity of milk of both cows and buffaloes was the highest in Haryana and Punjab. Next in order, in the northern region, was Rajasthan followed by Uttar Pradesh and Himachal Pradesh.

In the western region, the productivity of cows and buffaloes was the highest in Gujarat followed by Maharashtra and Madhya Pradesh. Kerala in the southern region exhibited the highest productivity for cows whereas Tamil Nadu showed the highest productivity for buffaloes. In Karnataka the productivity both for cows and buffaloes was the least. The picture of productivity is very much distorted due to non-availability of information for a majority of north-eastern states. Even for the states for

which information on productivity is available, it is mostly incomplete. Hence, valid comparison cannot be made. The information for Bihar and Orissa is available for all the three periods both for cows and buffaloes Bihar enjoys a better status in terms of productivity than Orissa. In general, the productivity of both cows and buffaloes was the least in Orissa compared to all the states in all regions for which data are available.

A comparison of productivity over three periods of time in all the states revealed that the productivity in the third period, 2002-03, was relatively lower than in the two earlier periods. This could well be attributed to serious drought conditions experienced in many of the states in that year in the country.

Compared to the western commercial type farms, India has a large number of low producing cows and buffaloes. This is attributed by our academicians to poor genetic architecture of indigenous animals, inadequate nutrition, management and health coverage. But if -we pause a little and raise some question will flow of their own accord.

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15750 APPENDIX 1
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Table - 1

Investment on Animal Husbandry and Dairying During Various Plans

(Rs. Million)

Plan period	Total plan expenditure	Agriculture and allied activities *	Expenditure on animal husbandry and dairying	Expenditure on dairying
First Plan (1951-56)	19,600	2,900 (14.8)	160.0 (55)	77.8 (48.6)
Second Plan (1956 - 61)	46,720	5,490 (11.7)	334.7 (6.0)	1205 (36.0)
Third Plan (1961 - 66)	85,765	10,890 (12.6)	770.7 (7.0)	336.0 (43.0)
Annual Plan (1966 - 69)	66,254	11,071 (16.7)	597.0 (5.4)	257.0 (43.0)

Table - 2
Bovine Growth Rate

Table - 3

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Table - 4

Table - 5

Region (1)	Female breedable		Growth rate	
	Population	(million)	(per cent)	
	Cows	Buffaloes	Cows	Buffaloes
(2)	(3)	(4)	(5)	
Northern	13.23	23.85	0.20	2.80
Southern	10.34	7.79	0.10	1.42
Eastern	16.91	3.02	1.55	1.12
Western	14.65	6.83	0.62	1.12
India	55.13	31.43	0.53	1.79

Source: Livestock Census of India, 2009.

Eastern	64,595	8,357
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Western	48.772	14,202
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India	194 981	72 962
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Table - 6

Growth Rate of Adult Cattle and Buffalo Population (per cent)

Source: Livestock Census of India, 2009.

Region 1	Cattle 2	Buffaloes 3
Northern	-0.74	1.68
Southern	-0.73	-2.41
Eastern	1.14	0.64
Western	0.002	0.48
India	-0.05	0.12

Source : Report of the Directorate of Agriculture and co-operation – 2010, P.278.



Table - 7

Growth	Rate of Young Male (per cent)		and Female	Stock
Region (1)	Cattle		Buffaloes	
	Male (2)	Female (3)	Male (4)	Female (5)
Northern	0.056	1.05	1.088	1.82
Southern	-0.28	2.31	-0.90	3.76
Eastern	1.88	4.21	1.23	2.53
Western	0-42	0.54	1.34	1.05
India	0.68	1.95	0.25	2.15

Source: India Economic Survey – 2010, Appendix IVa.P:XIII.

Table - 8

Crossbred Female Population (2009-10)

Region (1)	Number of crossbred female (2)	Number of artificial insemination with exotic bull semen (3)
Northern	2.594	2.964
Southern	4.154	5.567
Eastern	2.147	1.664
Western	0.805	2.005
India	9.700	12.200

Source: Economic survey, 2010, Appendix, P.XIII.

Table - 9

Milk Yield Per Animal

Region/States	2008 - 09	2009 - 10	Cattle		Buffaloes		
			2009 - 10		2007 - 08	2008 - 09	2009 - 10
			Indigenous	Crossbred			
Northern							
Haryana	3.384	3.391	3.143*	3552	4.580	4.578	4.471
Himachai Pradesh	1397	1502	1.177	4.987	3.008	3.146	3321
Rajasthan	2.710	2.720	2520	6.456	3.800	3.850	3.750

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