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ECONOMICS AND EMPLOYMENT OF DAIRYING IN PUNJAB

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The farming classes have been rearing milch animals along with cultivation of crops since traditional times. The milch cattle were kept to meet the twin needs of domestic milk consumption and draft animals. There was virtually no milk market. Things, however, have changed during the recent years. The milk market has come up in the State and dairying has thus started receiving increased attention. This enterprise is believed to be employment-intensive and income-bright. The planners and policy makers advocate dairying particularly for ameliorating the economic conditions of the weaker sections of the society, *i.e.*, small and marginal farmers and also the landless classes. Dairying, *inter alia*, is also advocated to promote diversification of agriculture. We, however, feel that there are several wrong notions about the scope of this enterprise and dairying may not turn out to be a sound economic alternative under the prevailing situation of input and output prices for this enterprise relative to other competing crop enterprises. The subject needs objective analysis to bring out a clear picture. In this paper, we have made an attempt to analyse the economic and employment aspects of dairy enterprise particularly on a comparative basis with the crop enterprises for the State of Punjab which has made remarkable progress in the crop sector.

Source of Data

The analysis is based on the data contained in the research reports and a dissertation prepared in the Department of Economics and Sociology, Punjab Agricultural University, Ludhiana. The other relevant information has been taken from the Statistical Abstracts of Punjab, Livestock Census and the sample surveys carried out by the Animal Husbandry Department of Punjab.

Dairying in Punjab: Relevant Background Information[1]

Before discussing the economics and employment position for dairy enterprise, it would be pertinent to give in brief some background information about dairying. This would help in a proper appraisal of the situation. Under this, we would briefly discuss the information relating to the population of milch animals, their breeds, production of milk, productivity of cattle, the ownership pattern of milch animals, etc.

Population of milch animals:—There were 19.64 lakh milch animals in the the State of Punjab in 1961. This population has shown consistent increase thereafter and the number was 22.24, 27.29 and 31.35 lakhs in the years

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1. Sample Survey for the Estimation of Livestock Products in the Punjab State, 1977-78, Department of Animal Husbandry, Punjab, Chandigarh.

1966, 1972 and 1978 respectively. It is important to note that the composition of milch animals has undergone significant change during this period. The number of buffaloes has almost doubled during the period 1961 to 1978. But the number of cows has remained stagnant at about 8 lakhs. Rather there is a slight decline. The percentage of cows to the total population of milch animals was 40.6 in 1961 but it has come down to only 25 in 1978. The important reasons for the decline in the population of cows are increased mechanization of agriculture in which the demand for draft cattle has declined significantly and also replacement of low yielding indigenous cows with buffaloes and cross-bred cows.

Breed:—In the case of buffaloes, 56 per cent of the animals were of Murrah breed, 16 per cent Nili breed and the remaining were non-descript ones. In the case of cows, 46 per cent were of Haryana breed, 1 per cent Sahiwal, 6 per cent cross-bred and the remaining were non-descript breeds. This means that the cross-bred cows numbered 0.47 lakh in 1978 which formed 1.5 per cent of the combined population of milch cows and buffaloes.

Production of milk:—The total milk production in the State was 21.03 lakh tonnes in 1970-71 which increased to 29.26 lakh tonnes in 1978-79. The per capita production of milk increased from 437 gm. per day to 511 gm. per day in the same period. It is important to note that whereas the per capita production of milk improved by only 74 gm. during the period 1970-71 to 1978-79, the corresponding increase in the per capita production of foodgrains was of the order of 400 gm.

Milk yield:—The average yield of buffaloes was 4.31 kg. of milk per animal per day in 1970-71 and the figure for 1977-78 was 4.22 kg. It means that there has been no improvement in the productivity of animals during this period of seven years. The average milk yield of cows was still lower—this being a little over 3 kg. per animal per day in 1977-78.

Since there has been no improvement in the productivity of milch animals during recent years, the increase in milk production has come entirely due to the increase in numbers. As against this, in the crop sector, there has been a notable increase in the productivity of important crops in the Punjab during this period. For example, the average yield of wheat and paddy increased from 2,238 and 1,765 kg. per hectare in 1970-71 to 2,537 and 2,910 kg. per hectare respectively in 1977-78. This fact has to be borne in mind while looking at the comparative economics of crops and dairy animals to be discussed in the subsequent sections.

Ownership pattern:—Dairying has not been taken up on commercial lines in the rural areas of Punjab. As traditionally, the farmers are keeping milch animal along with crop cultivation. A study has shown that of the total milch animals about 75 per cent were with the cultivators and the remaining 25 per cent with the non-cultivators. Again, among the non-cultivators, 75 per cent of the milch animals were with the agricultural labourers. The average number of adult milch animals per cultivator family was a little above 4 and it was about 2 in the case of non-cultivators.

Distinct features of dairy enterprise:—Dairy enterprise has some distinct features, which apart from its economics matter a lot in influencing the choice of dairying vis-a-vis the general crops. Dairying is an enterprise without holidaying, which means, that it requires constant attention and needs more delicate management. In the case of crops, however, one can afford to have some off-time as the operations are not as much time bound as in dairying. The point in favour of dairying is that the operations are not physically as much taxing as in crops; there is greater degree of indoor activity and hence there is great scope for family labour, especially women and children, to participate in the work. However, the mere availability of family labour is not enough, it is the willingness to participate that matters. It is, therefore, naive to think that a particular section of farming population, or persons of a particular category, *e.g.*, small and marginal farmers are better placed to take up this enterprise. The choice would be governed by how one values the above non-economic considerations. It would be interesting to note that there was a positive correlation between farm size and the number of milch animals, although on per unit area basis, the number of milch animals was a little higher on small farms.

Economics of Dairying

We would discuss the economics of dairying separately for cultivators and non-cultivators. It is necessary to analyse the situation separately for these two categories because the scope and need of promoting dairy enterprise is quite different in the two categories. First of all, we would discuss the economics for the cultivators who possessed three-fourths of the total milch animals in the State.

In the study under report, more than 90 per cent of the milch animals were buffaloes. Of the total animals, 60 per cent were wet and the remaining were dry ones. The costs and returns give the average figures for the whole lot. The average milk yield per lactation per animal (inclusive of dry and wet) was about 700 litres and the average sale price was Rs. 1.80 per litre. These were all typical rural dairy farms under the mixed farming situation. The costs and returns have been worked out both on per animal and per hectare basis for the year 1978-79. Per hectare returns have been calculated to see the comparative economics of milch animals and crop enterprises.[2] The gross returns per animal amounted to Rs. 1,716. The paid-out costs worked out to Rs. 1,328 giving the net returns of Rs. 388 per animal per year. The paid-out costs (A_2 cost) formed a little more than 75 per cent of the gross returns. Fodders, concentrates and hired labour accounted for 34.99, 42.61 and 4.93 per cent respectively of the total costs. If we take into account the total labour cost (family and hired) the proportion of the family labour component was about 72 per cent. The corresponding gross returns,

2. The returns can be compared on the basis of returns to capital and labour also but we feel that in our situation it is more meaningful to compare the returns on per unit area basis because most of the farmers base their decision on returns to land which happens to be a most scarce factor.

paid-out costs and net returns on per hectare basis (returns over A_2 cost) worked out to Rs. 10,132, Rs. 7,839 and Rs.2,293.[3]

Comparative Economics of Dairying and Crop Farming

As already stated, the choice before the land owning cultivator, after a certain stage, is to introduce dairying as a competitive enterprise with the crops. The relationship between the two enterprises is no doubt of a complementary nature in initial stages but a stage is reached when these enterprises start competing for all the limited resources at the disposal of the farmer, *i.e.*, land, labour, capital and even management. In areas of progressive agriculture, therefore, it is important to study the comparative economics of these two enterprises.

The gross returns, paid-out costs and net returns per hectare from crop cultivation amounted to Rs. 4,568, Rs. 2,385 and Rs. 2,182 respectively. It is important to note that the net returns from crop cultivation (Rs. 2,183) per hectare are almost of the same magnitude as the returns on per hectare basis from dairying (Rs. 2,293), and the two figures are not significantly different from each other. However, the paid-out costs as a percentage of gross returns are much lower (47.8) in crop farming compared with dairying (77.4 per cent). The hired labour cost accounted for as much as 18.41 per cent of the paid-out costs in the case of crops against only 4.93 per cent for dairying. Of the total labour costs (hired and family) for crop farming, the proportion of family labour was only 40 per cent and the remaining was hired one.[4]

Labour Employment in Dairying

Although the relative share of labour input in dairying in the total cost is less, yet the absolute magnitude of labour employment turns out to be much higher. On an average, the per animal labour input works out at 619 man-hours per year, which means an input of 1.7 hours per animal per day. Translated on per hectare basis, the labour employment works out at 457 man-days per hectare per annum. The operationwise labour input in 1978-79 revealed that the harvesting, transportation and chaffing of fodder accounted for as much as 58 per cent of the total labour input. The next important operation was feeding which accounted for 19 per cent of the labour input. The other operations of milking, watering, sweeping the animal shed and cleaning of animals accounted for 7 to 8 per cent of labour use each.

Employment in Crop Farming

Labour employment has been worked out for crop farming to compare it with labour input in dairying. The labour input figures are worked out for the important crops grown in the Punjab for the year 1976-77.[5] The

3. *Source:* (*a*) Gurmit Singh Gill: Economics of Dairying on Different Rural Dairy Farms in Ludhiana District of Punjab, M.Sc. Thesis, Punjab Agricultural University, Ludhiana, 1980; and (*b*) D. S. Sidhu *et al.*: Income and Expenditure Pattern of Punjab Farmers—Report for the Year 1978-79, Department of Economics and Sociology, Punjab Agricultural University, Ludhiana.

4. Gill: *op. cit.*; and Sidhu *et al.*: *op. cit.*

5. Vide Cost of Cultivation and Input Structure for Principal Crops in Punjab, Department of Economics and Sociology, Punjab Agricultural University, Ludhiana (unpublished).

average labour use per hectare has been worked out by giving weights with the area of each crop and the figure has been adjusted for the cropping intensity. The average annual labour input per cropped hectare for the general field crops in the State is estimated at 138.25 man-days per hectare against 457 man-days per hectare per annum for dairying. It may be noted that the per unit area labour input in general crop farming is only about 30 per cent of the labour use in dairying. In this context it has to be remembered that whereas in crop cultivation several operations have been mechanized the same is not the case in dairying.

Economics at Improved Level of Technology

This will reveal the gap between the existing and potential levels of productivity and returns. These returns are possible with good quality animals with recommended schedules of feeding and under ideal level of management. The economics at improved level of technology both for dairying and crop has been worked out on the basis of information available in the Punjab Agricultural University, Ludhiana.

Economics of buffaloes:—In the case of a good quality buffalo, yielding 2,200 litres of milk per lactation, the gross returns, paid-out expenses and the net returns per animal per year are estimated at Rs. 3,330, Rs. 2,541 and Rs. 789 respectively. The per hectare per annum net returns work out to Rs. 4,892. The comparative returns in the case of important crop rotations at improved level of technology are estimated at Rs. 5,070 per hectare per year. These figures show two things. First, that the productivity and net returns in the case of dairying at improved level of technology are about twice the level of prevailing level of technology. So is the case for crops. Secondly, it may be noted that the net returns at improved level of technology are again of the same magnitude for both the enterprises.

Economics of cross-bred cows:—The economics is worked out for cross-bred cows with a lactation yield of 3,000 litres of milk and at the sale price of Rs. 1.40 per litre. The gross returns, paid-out costs and the net returns are estimated at Rs. 4,143, Rs. 2,828 and Rs. 1,335 respectively per animal per year. This means that the net returns in the case of cross-bred cows (Rs. 1,335) are much higher than that of the buffaloes (Rs. 789). However, there are several constraints in the rapid adoption of cross-bred animals. These included the slow pace of breeding programmes of the hybrid cows, the delicate level of management and care, the unsatisfactory marketing arrangements for the sale of milk, the inadequate animal health cover facilities and also the relatively poor acclimatization of these hybrid animals. We are, therefore, of the view that for a long time to come we shall have to content with buffaloes as our mainstay for milk production and as such we should be more concerned with the economics and employment of dairying with buffaloes.

Economics of Dairying for Non-cultivators

The costs and returns for the non-cultivating dairy owners based on a sample of 40 respondents were worked out. It is seen that the gross returns, paid-out costs and net returns amounted to Rs. 1,280, Rs. 871 and Rs. 409 respectively for non-cultivators and Rs. 1,716, Rs. 1,328 and Rs. 388 respectively for cultivators. The gross returns are low for non-cultivators because of relatively less productivity of animals but they also spent less on maintenance. Thus, their net returns are a little higher than that of the cultivators but this difference is satistically non-significant. It is significant to note that the total labour cost was higher for the non-cultivators because of the higher input of family labour which comprised as much as 87 per cent of the total labour cost compared to about 71 per cent for the cultivators.

Important Results and Their Implication

The production of milk in the Punjab has increased entirely due to increase in the number of milch animals. The animal productivity is stagnant. While green revolution is a matter of fact, white revolution is still far away. There is virtually no element of commercialisation in dairying in the rural areas. This is primarily due to the fact that the economics of milk production is not that much favourable except in the case of cross-bred cows where the profitability is a little higher. But the cross-bred animals are increasing gradually due to a number of factors already discussed. For a long time, people shall have to depend upon buffaloes for millk production.

The economics of dairying can be made more favourable by improving the input-output price relationships as well as by improving the productivity of animals through better breeds, better feeding, health care and management of the existing stock. Better breeds are most needed but quality improvement is a long-term process. The pay-off can be quick through popularisation of improved feeding schedules and management practices. It is recognized that the extension service input in dairying is available to a much lesser degree than is the case for crop husbandry. More facilities are needed to bridge the gap between realised and potential levels of productivity in dairying. Also, milk marketing in Punjab is not very orderly, in spite of several milk plants in the State. The milk plants have not been able to wean away the milk producers from the milk vendors. This aspect needs to be tackled on priority basis.

Dairying is more labour intensive than crop farming. But this feature cannot be capitalised upon unless the basic constraints upon the expansion of dairy industry are removed. Also, there is not much need to add to the existing stock of milch animals because, after a point, animals compete with the resources going into crop production. The prime need is to improve upon the productivity of milch animals. The landless classes are doing equally well in dairying. The need to promote dairying is very great for these classes but the scope is rather limited unless ways and means are found to meet their increased fodder needs.