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Economics of Dairy Farming in India

M DINESH KUMAR, O P SINGH

Pointing out the analytical and conceptual flaws in the paper, “Do Producers Gain from Selling Milk? An Economic Assessment of Dairy Farming in Contemporary India” (*EPW*, 24 June 2017), this article explores the economics of milk production in India. It highlights, in particular, the need for any analysis of the dairy sector in India to take into consideration the interactions between crop and livestock production systems.

This note is in response to the article by Ghosh et al (2017) titled “Do Producers Gain from Selling Milk? An Economic Assessment of Dairy Farming in Contemporary India” (*EPW*, 24 June 2017). The analytical framework used by the researchers is not robust enough to examine if dairy production is economically viable for the producer. The data used and the nature of outputs in the study are not sufficient to conclude anything related to economics of milk production in India, despite the study covering four regions of the country. This probably stems from the researchers’ lack of familiarity with livestock farming systems in different parts of India.

Economics of Livestock Farming

Livestock farming in India is part of a composite farming system characterised by crop–livestock interactions (Singh 2004; Kumar and van Dam 2013). The by-products from several of the crops (crop residues, hay and straw) are used as input for dairy production, in addition to other inputs for which they have to directly incur costs (cattle feed, veterinary medicines, and artificial insemination). Animal dung and urine are used as inputs (bio-fertilisers and biopesticides) by farmers for improving soil fertility. To arrive at the economics of livestock farming, it is important to have realistic estimates of the cost of producing bio-fertilisers and the economic value of biopesticides.

Many times, paddy straw and wheat hay, pod of groundnut and shell of different types of bean are used as dry fodder and feed for the animals. In such cases, part of the cost of production of these crops will have to be allocated to the by-products based on what proportion of the market value of the total produce these by-products account for. When farmers have to purchase these inputs from the

market, the estimation of cost of production becomes simple and straightforward. Often, inputs such as green fodder have to be cultivated, in which case the cost of cultivation becomes the cost of that input.

The article is silent on many of these aspects, and instead, aggregate input costs and gross revenue figures are presented. The extent to which crop by-products from one’s own farm account for daily livestock input is an effect of the intensity of dairying. In some parts of western India (especially Gujarat), dairy farming is intensive with farmers growing irrigated fodder crops such as alfalfa. It is semi-intensive in northern India, with farmers mostly dependent on crop by-products from their own farm for feeding the livestock. It is mostly traditional in eastern India, including eastern Uttar Pradesh, Bihar, and West Bengal.

Under intensive dairy farming, milk yield and revenue are high, but the input costs are also high as farmers have to grow green fodder, use expensive cattle feed to increase the milk yield, and so on. In traditional dairy farming (practised in high rainfall, humid, and sub-humid regions of India), milk yield and revenue are low, but the input costs are also low, with animals grazing in the wild, and farmers depending on natural grasses and crop residues as fodder for animals, using small amounts of cattle feed. Family members perform the domestic labour for animal rearing. This could be due to the unique situation with respect to land and biomass availability. While the arable land availability is low, biomass is available round the year. The opportunity cost and the direct cost of using these inputs for dairy farming are negligible (Kumar and Singh 2008). The low land availability also creates surplus family labour that can be gainfully employed for animal rearing; for this the market value of labour should not be considered.

As is quite obvious from the discussion, while estimating income from dairy production, the authors considered the price at which the milk was sold. But a sizeable portion of total produce was retained by the dairy farmers—37% in Bihar, 27% in

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West Bengal, and 21% in Uttar Pradesh and Delhi (northern region in the study). Higher the amount of milk production per capita, lower the proportion of milk used domestically as found in states such as Gujarat and Punjab. This means that for traditional dairy farming by smallholders, it is all the more important to get the real economic value of the milk consumed by the household, and the actual economic cost of all inputs, including labour. By not considering the real economic value of the milk consumed domestically in estimating the gross revenue from dairy production, the authors have faltered seriously in their analysis of smallholder dairy farming, which in the authors' own words is largely subsistence.

There are many other problems in the analysis that could have induced huge errors in the estimation. The authors did not consider the income from dung and young stock while estimating the income from livestock farming. Also, it is quite common for dairy farmers in India to convert part of the milk produced into value added dairy products such as curd, butter milk and ghee, and sell in the local market. Obviously, this component was not considered in the calculations of annual revenue.

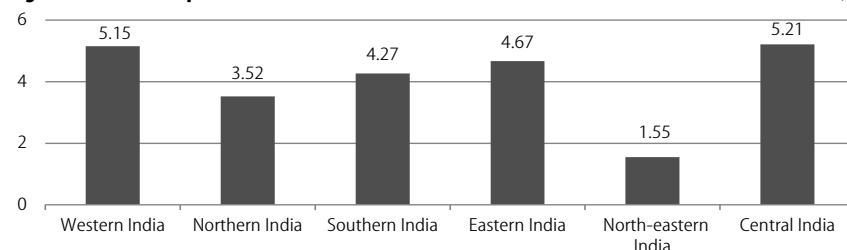
Problems of Data

The sample size chosen for the analysis by the authors is very small: Uttar Pradesh and Delhi (12), Bihar (17) and West Bengal (24). Given the kind of likely heterogeneity in production environment induced by the differences in types of livestock, variety, landholding size, access to water, availability of green fodder, access to market, and so on, this sample size is improper. The sampling is also improper and biased, with survey locations skewed heavily towards regions that are little known for commercial dairy farming. Punjab, Haryana and Gujarat, famous world over for high productivity, were left out. While per capita milk production is 1,032 gram per day in Punjab and 545 gram per day in Gujarat, it is only 219 gram per day in Bihar and 136 gram per day in West Bengal, much less than the national average of 334 gram per capita (GoI 2016).

The reported figures of milk yield also appear to be questionable. For example,

Figure 1: Annual Compounded Growth Rate in Milk Production

(%)



Source: GoI (2016).

the Jersey cow in Bihar was reported to have produced on average only 4 litres of milk per day, while the price of the cow was reported to be ₹20,000 per animal unit. The normal yield of this breed is around 10–15 litres per day. In the case of West Bengal, average milk production from cow and buffalo was estimated to be 3 litres per day per animal. The average price of milk per litre reported by the study was estimated to be ₹22 in West Bengal, ₹29 in Bihar and ₹37 in Uttar Pradesh and Delhi, which again is very much on the lower side.

The authors assumed that on an average a milch animal produced milk for 28 days in a month for only eight months in a year. Such an assumption is valid only for the local indigenous cows and buffaloes. The Jersey cow (in Bihar) produces milk for nine months and the farmers are advised to stop milking only in the 10th month. The authors considered that dry fodder (*bhusa* and *choker*) is purchased and green fodder is cultivated. But it is not clear from the article how the costs of feed and fodder were considered in the estimation of net income from milk production.

Another important point is that the scientific approach of estimating the cost of milk production should consider the “animal life cycle cost,” as the average daily intake of feed and fodder depends on the growing stage of the animal and whether it is in the milking stage or dry stage, and the estimates of income from milk production also depend on the productive life of the animal (number of months of milking against the total average life of the animal in months).

Missing the Big Picture

Basing their arguments on a minuscule sample of dairy farmers, the authors ventured out to argue that selling milk is

not profitable for the milk producers. However, they fail to explain the following macro level trends in India. First of all, dairy production is the only subsector of farm sector in India that has been growing steadily over the past couple of decades, whereas the cash crop sector, though growing, shows high degree of erraticism.

During the past three and a half decades (1985–86 to 2010–11), the lowest five-year average annual growth rate in dairy production was 4.1% and the highest was 7.1% (GoI 2016). The region-wise growth in milk production during the period from 1997–98 to 2015–16 strengthens our argument. The growth rate has been one of the highest in eastern India, with an annual compounded growth rate of 4.67%, in spite of low per capita arable land availability. The highest growth rate was recorded in central India (Madhya Pradesh and Chhattisgarh). The second highest growth rate was in western India, which included Gujarat, a state known for White Revolution. As a matter of fact, Gujarat and Rajasthan accounted for most of the growth in milk production in western India (Figure 1).

If dairy farming is not profitable, especially in eastern India where milk producers were reported to be making losses, how does one explain this phenomenon?

Though the authors unconvincingly argue that “a loss-making occupation can be arguably explained by unobserved peripheral transactions not taken into account in this study such as sale of calves and cow dung, the subsistence motivation can also justify the choice” (Ghosh et al 2017: 94), there are no empirical analysis provided to support the subsistence argument. These could show that the actual value of home consumption of the milk produced could surpass the annual losses incurred by the dairy farmers in the case of Bihar (₹9,000 per

family) and West Bengal (₹17,000 per family). It appears that the argument about “subsistence” and family nutrition were resorted to for justifying a flawed analysis that shows poor economic viability of dairy farming, without having proper data on the nutritional value of the milk produced in own farm.

There are many factors that have contributed to the growing importance of dairy farming. First, with the average landholding size reducing consistently over the years and water scarcity problems growing, the small and marginal farmers increasingly prefer dairy farming. This is because milk production is not land and water dependent when done on a small scale, since farmers can buy both green and dry fodder from within the village or from outside.

Second, procurement and marketing infrastructure for milk has remarkably improved over the years throughout the country, with dairy cooperatives and private dairies, and increasing demand for fresh milk from small towns and cities that are in close vicinity of rural areas, along with remarkable improvement in dairy technology. Third, the price of milk has been rising in India during the past one decade (Rajeshwaram et al 2014) owing to rapidly growing demand for milk and other dairy products as a result of rising per capita income. In fact, the wholesale price index (WPI) of milk has been increasing at an average rate of 10.5% since April 2006.

Finally, what the researchers seem to have ignored is the contribution of these dairy animals in meeting the family nutritional requirements in rural areas. The very fact that the small farmers keep a significant chunk of the milk produced for their own domestic consumption shows its critical importance in family nutrition, especially for feeding small children. If the producers have to get milk of the same quality (in terms of fat content) from the local milk vendors, the price that they have to pay will be much higher than what they get for the milk sold in the market. Even if a higher price is paid, there is no guarantee of the quality of milk, as milk adulteration with water and other ingredients is rampant in the villages. With rising price of

milk, this tendency is only increasing. Had this factor been considered, it would have raised the economic return from dairy farming substantially.

Subsistence vs Commercial Dairy Farming

The authors of the paper argue that in spite of dairy development programme, milk production in India has largely remained a subsistence activity (Ghosh et al 2017: 94). There are many factors that determine the ability of a farmer to engage in commercial dairy farming. Along with access to production technology that includes good breed of animals, veterinary doctors, artificial insemination and vaccines, access to agricultural land, including cultivated land and pastureland, and water are important.

The data on per capita gross sown area, per capita pastureland, and per capita wasteland in eight major Indian states (estimated on the basis of data on gross cropped area, area under grazing land, and area under wasteland and population from Census 2011 figures) shows that the per capita land available from common lands and cultivated area in arid Rajasthan is 0.50 ha. The per capita land availability is 0.256 ha for Haryana, 0.36 ha for Madhya Pradesh and 0.30 ha for Punjab. Against these, the figure for Bihar is only 0.073 ha. Land will be a major constraint in enhancing dairy production in states like Bihar.

While a few people will be able to take up intensive dairy farming even without having cultivated land by procuring green and dry fodder and even water from the neighbouring farmers or villages, the same will not work when the activity is taken up by millions of farmers from an entire region as the resilience of the farming system reduces (Kumar and van Dam 2013). The size of average operational holdings of Indian farmers has been declining consistently over the years, and in eastern India and north-eastern India, it is the lowest among all the six regions. Nearly 90% of the farmers in West Bengal are marginal landholders and the corresponding figure for Bihar is 83%. The amount of dry fodder these marginal farmers can obtain from the farm is therefore limited. Yet, they are

able to achieve a reasonable level of production because of the predominantly cereal-based crop production, with paddy grown in West Bengal in all three seasons and paddy–wheat system in Bihar.

Conclusions

The authors in the article had engaged in a fractional analysis of the dairy sector in India, which has led to conclusions that are not very useful for the policy-makers, from the point of view of identifying interventions for improving the economics of dairy farming and understanding its importance in nutritional security of rural households.

The analysis of dairy sector in India requires far more serious treatment and a more comprehensive approach keeping in view the following facts. First, it is part of a composite farming system in most situations, with interactions between crop and livestock production systems. Second, there is gainful employment of surplus family labour, all the more important for eastern India, where there is a high rate of rural unemployment. Third, along with earning income from sale of milk, family nutrition is an important reason for the small producer to rear milch animals.

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