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Formal versus informal: Efficiency, inclusiveness and financing of dairy value chains in Indian Punjab

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ABSTRACT

Using a unique set of household-level data from the Indian state of Punjab, this paper assesses the performance and financing of dairy value chains at their upstream. We find co-existence of formal value chains driven by dairy cooperatives and private processors including multinationals and informal value chains driven by vendors or local traders and consumer-households. The resource-rich dairy farmers prefer partnerships with private dairy processors or vice versa. The small dairy farmers are more dependent on informal channels for the sale of their produce. Although, there is no significant difference in milk yield across herd sizes and value chains, the farmers associated with cooperative value chain earn more profit. The findings also indicate the practice of scale-based price discrimination in the formal segment, especially by the multinationals. Further, more than half of the dairy farmers finance their dairying activities borrowing from the formal as well as informal sources. The chain-based financing is restricted to the value chains driven by the local traders and private domestic processors. The financing by commercial banks is limited and is biased in favour of resource-rich dairy farmers.

1. Introduction

In India, dairying is one of the important sources of livelihood for the marginalized sections of population, including landless and small landholders. The dairying including animal husbandry contributes one-fifth to the country's gross domestic product from the agricultural sector and engages more than half of the farm households, two-thirds of whom cultivate landholdings measuring less than or equal to 1 ha.[1] And, the evidence shows that dairying is concentrated among small landholders and is more pro-poor than the cropping activity (Birthal and Negi, 2012). Nonetheless, the majority of small landholders practices dairying as a subsistence activity because of their poor resource endowments and lack of access to markets and financial resources.

The milk market in India is segmented into formal or organized and informal or unorganized sectors. The formal sector includes dairy cooperatives and private processors (domestic as well as multinationals) and procures 23% of the total milk production - cooperatives, 9% and private processors, 14%. The formal sector, however, has a better presence in the dairy-developed regions and is often biased towards the resource-rich dairy farmers. The small dairy farmers, particularly in the remote areas, depend more for the sale of their produce on informal channels, viz. milk vendors or local milk traders, *halwais* (sweet-makers), small-scale dairy processors and consumer-households (Sharma, 2015). An example that best captures this dichotomy is that of dairy cooperatives. In 2015-16, approximately 56% of the milk procured by the dairy cooperatives came from two states, viz. Gujarat and Karnataka, as against their share of only 12% in the national milk production (NDDB, 2016). Likewise, the private dairy processers are also concentrated in the dairy-developed states, like Maharashtra, Punjab, and Haryana.

While the formal milk marketing system is under-developed, the local rural markets are thin, and milk sales in distant urban markets are not remunerative for the small dairy farmers due to the higher fixed costs in relation to the size of marketable surplus. Birthal et al. (2005) have estimated that marketing and transaction

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[1] The households cultivating landholdings of less than or equal 1 ha control 59% of the total population of adult female bovines in the country, with an average herd size of 0.71 female bovines per household.

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costs guzzle about one-fifth of the sale price of milk when sold directly to the consumer-households and small-scale processors in urban markets. A sizable proportion of the small dairy farmers in India, thus, sell milk locally to the vendors or traders who often pay them even less than the market price.

The small dairy farmers also face significant barriers in accessing credit from financial institutions, such as commercial banks and credit cooperatives. For example, of the total loan advances to agricultural sector by the financial institutions, the dairying (including animal husbandry) accounts for hardly 5% (Birthal and Negi, 2012). Though, the credit requirement of small dairy farmers is not big, the financial institutions are reluctant to lend them because of the higher transaction costs and lending risks (Miller and Jones, 2010; Shwedel, 2010; IFC, 2012; Kumar 2013; Chen et al., 2015). The small farmers, thus, resort to borrowings from the informal sources, viz. moneylenders, traders and input dealers, who often charge high rates of interest.

It is, however, recognized that some of the constraints related to farmers' access to markets and credit can be mitigated following a value chain approach that brings farmers, aggregators, traders, processors and financial institutions together (Meyer, 2007; Casuga et al., 2008; Miller and Jones, 2010; Trienekens, 2011; Chen et al., 2015). For processors and retailers, the fast-growing demand for dairy products (Joshi and Kumar, 2016) is an opportunity to expand their business by integrating the 'front-end' activities (i.e., wholesaling, processing and retailing) with the 'back-end' activities of production following a value chain approach. For the financial institutions, a value chain can help improve their outreach to smallholders, and reduce transaction costs and lending risks. The chain actors are usually more-informed about the activities, performance and relationships of each other and the financial institutions can access this information at little or no cost (Meyer, 2007; Casuga et al., 2008; Miller and Jones, 2010). More importantly, a value chain with its product market orientation can act as guarantee or collateral against loan advances.

Recent evidence shows that modern value chains contribute to improving efficiency as well as scale of production, and mitigating production and market risks (Holloway et al., 2000; Patrick, 2004; Birthal et al., 2005; Ramaswami et al., 2006; Minten et al., 2007; Birthal et al., 2008; Roy and Thorat, 2008; Barrett et al., 2012; Chen et al., 2015; Trifkovic, 2015; Mutura et al., 2016). Therefore, to expand the market choices for dairy farmers and empower them to capture benefits of the fast-growing demand for value-added products, the Government of India has gradually opened up the dairy industry for greater participation of the private sector. And, this has influenced the pace of development of dairy industry and value chains positively.

There are several studies on milk marketing in India, and to the best of our knowledge only a few (e.g., Staal et al., 2006; Birthal et al., 2008; Vandeplas et al., 2013; Sharma, 2015) have analysed farmers' choice of a value chain and its impact on farm performance. Further, there is also limited empirical literature that critically examines the links between product and financial markets in the context of a value chain framework. In this paper, we try to fill these gaps. We analyse the formal and informal dairy value chains for their inclusiveness and efficiency at upstream, i.e. at farm level. And, to understand the linkages between value chains and financial institutions, we also examine how farmers finance their dairy-related activities.

The paper builds on the premise that (i) scale of production is the principal differentiator of farmers' choice of a value chain—the resource-rich dairy farmers are more associated with formal value chains, while the small dairy farmers sell their produce to informal channels; (ii) farmers associated with formal value chains earn more profit than those associated with informal value chains; and (iii) chain-based financing of dairying is limited, and access to credit from financial institutions is biased in favour of resource-rich farmers.

The rest of the paper is organized as follows. In the following section, we discuss in brief the trajectory of dairy development in India and its enablers. The sampling procedure and data are discussed in section 3. Section 4 describes the empirical methods employed to assess (i) dairy farmers' choice of a value chain and its effect on farm performance or efficiency, and (ii) linkages between value chains and financial institutions. Section 5 discusses the structure of milk production and its pattern of sale to formal and informal channels, and assesses their efficiency and inclusiveness. Section 6 discusses the dairy farmers' access to credit from both within and outside the chain. Conclusions and their implications are presented in the last section.

2. India's dairy sector: status and policies

In the past few decades, India's dairy sector has not only grown but also undergone a structural transformation. From a subsistence activity during the 1960s and 1970s, the dairying in India has gradually emerged as the largest agricultural activity (Birthal and Negi, 2012). In Table 1, we track key indicators of dairy development in India. The milk production, which had hardly exceeded 25 million tons until the mid-1970s, increased to 146 million tons in 2014-15 (GoI, 2015). It now accounts for one-fifth of the gross value of output of the agricultural sector–more than the combined share of rice and wheat, the main staple food crops in India. In the development literature, this progress in Indian dairying has been termed as the 'White Revolution'.

The two important factors that have contributed to this revolutionary progress in dairying are: (i) institutional changes in milk marketing system, and (ii) technological advancements in animal breeding, health and nutrition. Realizing that markets can kick start dairy development, the Government of India, following a value chain approach, evolved a three-tier marketing structure for milk, i.e. the village-level dairy cooperative societies at the bottom, a union of these societies at the district level, and a federation of milk unions at the state level under a program Operation Flood[2] that was launched way back in 1970. And, by 1996 when this program came to an end, the number of village-level dairy cooperatives had reached to 75 thousand, procuring about 7% of the 66 million tons of milk produced in the country.

The dairy cooperatives were protected from the internal as well as external competition. The entry of private sector was regulated through licensing, quotas and zoning, and the imports of dairy products were controlled through quantitative restrictions and tariffs. In 2013-14, the country had 162 thousand dairy cooperative societies sourcing 12.5 million tons of milk from 15 million dairy farmers. There was also a considerable emphasis on the genetic enhancement of low-yielding local cows using the semen of high-yielding exotic cattle. In 2012, the crossbreds comprised 28% of the total milch cows, and contributed one-fourth to the total milk production (GoI, 2015). Not only that, over time there has been a

[2] Initially, the Operation Flood program was implemented using food-aid from the European Union through the World Food Program. Its first phase (1970–1980) was financed through sales of skimmed milk powder and butter oil received as aid. During this period, 18 premier milksheds were linked to consumers in metropolitan cities of Delhi, Mumbai, Kolkata and Chennai. Later on, this program was continued but availing loans from the World Bank. In its second phase (1981-85), the number of milksheds increased to 136 serving 290 urban markets. The development of milksheds remained important in its third and final phase (1985–1996) also, but it was more focussed on the development of infrastructure essential for strengthening market linkages.