

Restructuring of Agri-Food Market Chains and Smallholder Dairy Producers' Participation in India¹

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Introduction

India which is one of the largest agricultural based economies remained closed until the early 1990's. The new economic policy of 1991 stressed both external and internal sector reforms. The external reforms comprised of reforms in exchange rate, trade and foreign investment policies. As against this, the internal sector included reforms in industrial policy, price and distribution controls, restructuring in financial and public sector etc. These structural adjustment and stabilization programmes reduced controls and state interventions in Indian agriculture including dairy sector. Signing of Uruguay Round Agreement on Agriculture (URAA) in 1994 made India's intentions clear to follow a liberal agriculture policy.

Rapid changes are taking place in the structure and governance of agrifood markets in developing countries including India. The food industry changes include consolidation, institutional, organizational and technological transformation and multinationalization. These changes are occurring very quickly in many developing countries and are bringing rapid changes in the organizational, institutional and technological practices all the way "upstream" in the agrifood systems. Socio-economic factors (income, population, tastes and preferences) on the demand side and various supply side factors such as trade liberalization, privatization and modernization of agro-processing and retailing sector are major drivers of changes. Supermarkets in India presently account for a very small share of fresh agricultural produce retail sales. However, sales are growing. Small scale agriculture, which supports the livelihoods of majority of rural households, is poorly prepared for these changes, which brings opportunities but also can drive domestic producers out of traditional markets, and impose high barriers to entry into new markets.

A major problem in the agricultural sector in developing countries including India is the weak linkages of farmers with agri-input suppliers and output markets. However, recently some large traders, agribusiness and food processing companies, often as part of their own restructuring, have started contracting with farmers and rural households to provide basic inputs in return for guaranteed and quality supplies. This process of interlinked contracting is growing rapidly in Indian agriculture but some government policy interventions still restrict participation of private players in output and input markets. The

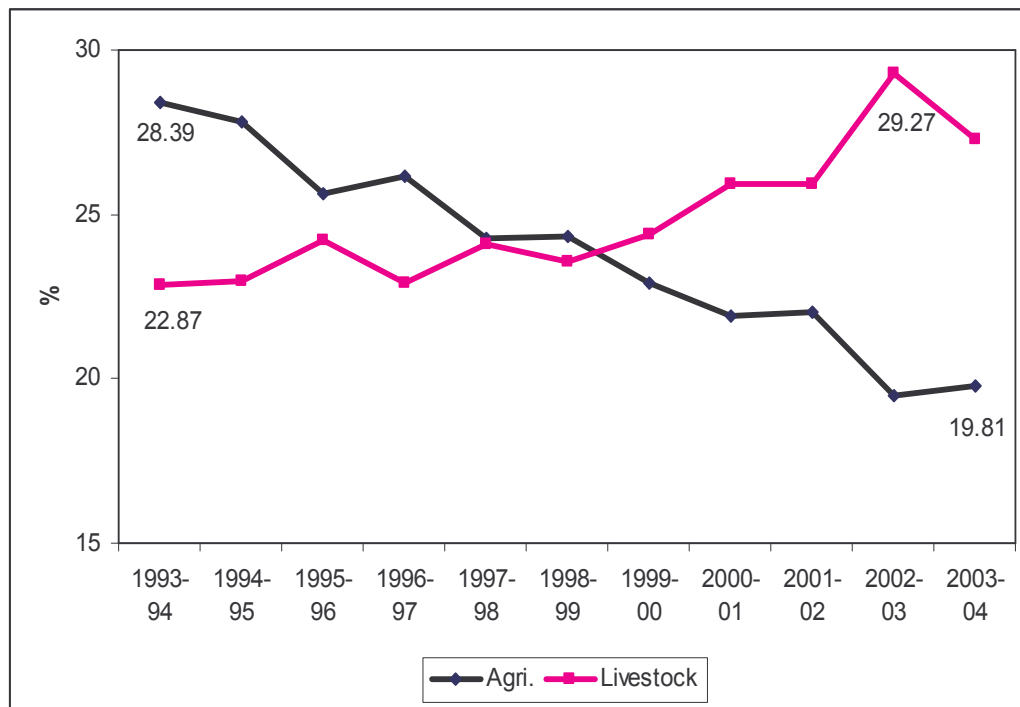
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problems are made even worse by the lack of public institutions necessary to support market-based transactions, such as those for enforcing contractual agreements. In the absence of appropriate public institutions, private contractual initiatives, often from large food and agribusiness companies, are emerging to overcome these obstacles.

Role of Livestock Sector in Indian Economy

Though contribution of agriculture to national GDP has declined during the last few decades, livestock sector has been among the few high-growth sectors in rural India (Figure 1). Livestock sector accounted for 22.87 percent of agricultural GDP in 1993-94, which increased to 29.27 percent in 2002-03. The share of livestock in the gross value of agricultural output has increased from 18.6 per cent in 1971-72 to 24.4 percent in 1991-92 to 27.5 per cent in 2003-04 (CSO, 2006). The dairy sector contributed the largest share in agricultural GDP. Among crop and livestock products, milk group remained number one farm commodity in terms of its contribution to the gross value of output from agriculture. The value of milk group was Rs. 115,970 crore in 2004-05, which was much higher than value of output from rice (Rs. 70,462 crore), the second largest contributor to agricultural sector. The contribution of livestock sector as a whole is significantly higher (Rs. 173,350 crore) than contribution of foodgrains (Rs. 156,761) in 2004-05 (CSO, 2006). The large contribution that livestock sector makes to the national economy is a reflection of multiple roles that livestock plays in the farming systems in the country.

Figure 1 Share (%) of agriculture in national GDP and livestock sector in agricultural GDP (at 1993-94 prices)



Source: CSO (2006)

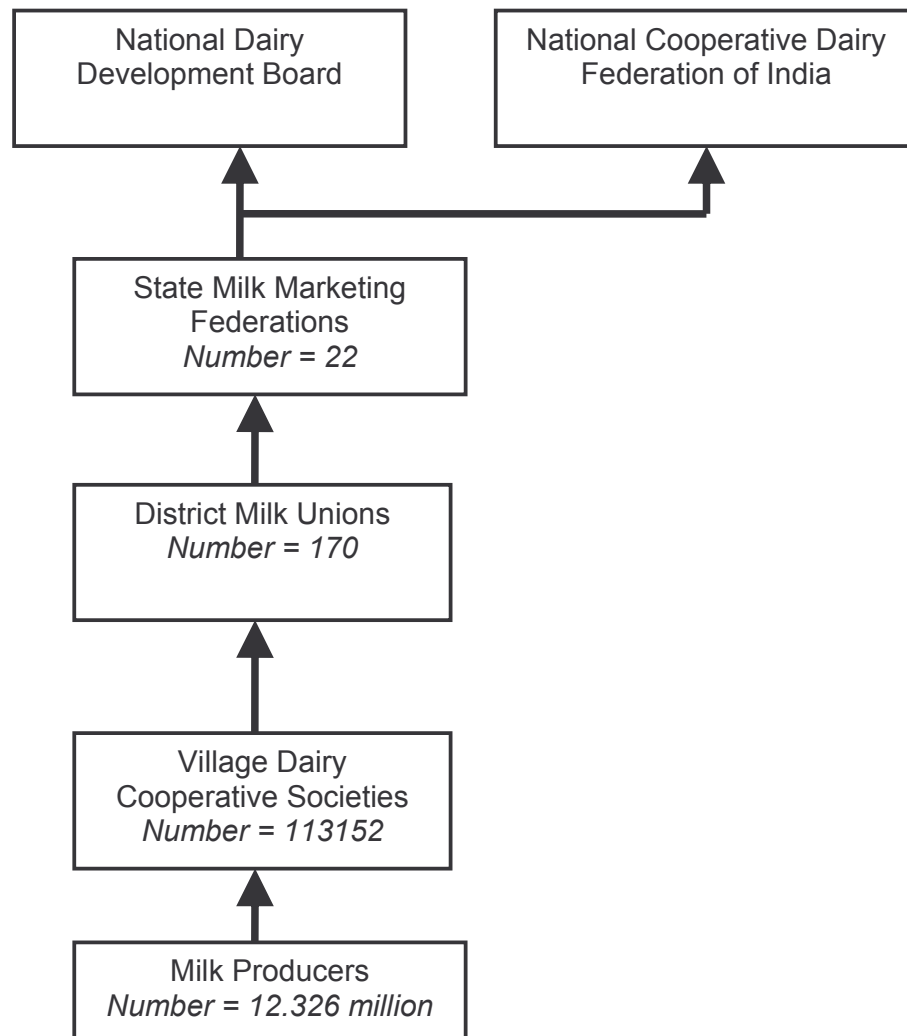
Until late sixties, India's dairy sector was by and large traditional and stagnant. The dairy policies of that era were consumer oriented and producers' interest

did not receive much attention. However, an important landmark of that period was adoption of Anand Pattern Dairy Cooperative Societies (APDCSs) and establishment of the National Dairy Development Board in 1965 to replicate APDCSs throughout the country. Under this programme small farmers were organized into dairy cooperatives, linked to chilling centre/milk processing plants and finally to consumers and shared the profit earned from sale of milk and dairy products (Figure 2). Due to this innovative model, from chronic shortages of milk, India has today emerged as the largest producer of milk in the world crossing 90 million tonnes. This success story of Indian milk production has been written primarily by millions of smallholder producers, who dot the landscape of milk production in the country. Although the yields have remained quite low compared to the world standards yet the sector has not only survived but flourished. Several factors appear to have helped it flourish. The “*Operation Flood*” one of the world’s largest dairy development programmes, which helped to create strong network and linkages among millions of smallholder producers, processors and urban consumers, was an important instrument in achieving this success. However, it all happened under autarky and highly regulated domestic markets. Commercial imports and exports of almost all dairy products had been banned for most of the time and processing activity had been controlled through licensing which favored cooperatives over private entrepreneurs. Since early 1990s, India embarked upon liberal policy framework, which got reinforced with the signing of URAA in 1994. The dairy industry was delicensed in 1991 and private sector including multi-national companies (MNCs) was allowed to set up milk processing and product manufacturing plants. However, in 1992, some controls were brought back through the 'Milk and Milk Products Order' (MMPO) with a view to have an 'orderly growth' of dairy industry in India, which was amended in 2002 and all restrictions in dairy processing sector were removed. In post-liberalization period, there has been significant increase in number of private dairy processing plants in the country after delicensing. For example, number of private dairy plants has increased from 250 in 1996 to 493 in 2006, while in cooperative sector it has increased from about 190 to 246. The installed capacity has almost doubled between 1996 and 2006 in case of private as well as cooperatives (GoI, 2006a). Average installed capacity of cooperative sector was about 149 thousand litres per day compared with nearly 93 thousand litres per day on March 31, 2006. It is interesting to note that number of private dairy processing plants has increased significantly but cooperatives have gone for capacity expansion.

Given the rapid and dynamic growth of dairy sector in India, as well as growing demand for milk and dairy products and importance given by the government, it is important to understand the dairy value chain from farm to consumer. Opening-up of the Indian dairy sector might provide opportunities for smallholder producers, but can also drive domestic producers out of traditional markets and impose high barriers to enter into new markets. Therefore, there is a need to understand impact of changing market structures on small-scale producers and to identify and assess strategies by which small-scale producers can participate in these evolving markets. However, this paper is limited in scope and examines restructuring of dairy industry paying particular attention to the national patterns in production, processing, and marketing.

The study has been conducted in two interlinked modules cast at different levels viz. the national–meso level, and the local meso-level. National meso-level study is based on semi-structured interviews and group discussions with major stakeholders in dairy industry including farmers, milk processors (organized as well as unorganized sector), supermarkets, grocers, wholesalers, farmers’ leaders, community leaders, procurement functionaries, other players in dairy chain, key informants like Government, NGO’s and business leaders. The local meso-level study is based on semi-structured focus groups meetings using “Participatory Rural Appraisal” (PRA) technique.

Figure 2 Three-Tier “Anand Pattern” of Dairy Development in India



Source: Annual Reports of National Dairy Development Board

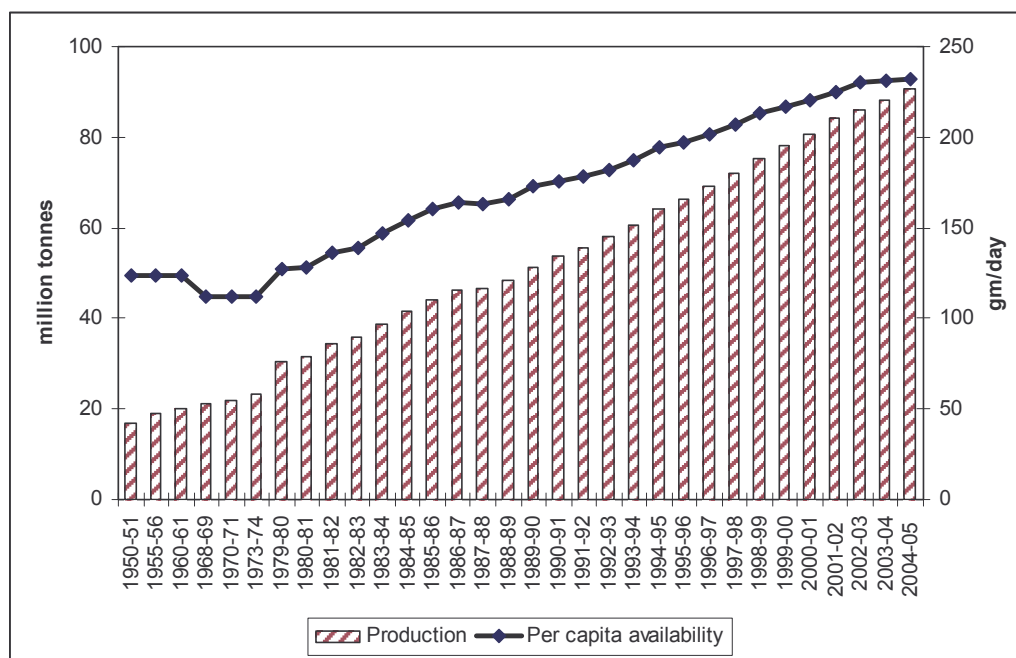
Results:

Milk Production Trends

Performance of Indian dairy sector during the last three decades has been very impressive. Milk production has increased from 22 million tonnes in 1970-71 to about 91 million tonnes in 2004-05. Therefore, from being a

recipient of massive material support from the World Food Programme and European Economic Community in the 1960s and early-70s, India has rapidly positioned itself as the world's largest producer of milk. The trends in milk production in India during the last five decades are shown in Figure 3. Production has almost tripled during the last two decades while milk cow number has been declining (Sharma, 2004). Growth in milk per cow and increase in number of crossbred cows reconciles the increasing total production with decreasing number of cows. From 524 kg per year in 1980, average milk production per cow has almost doubled to 976 kg in 2002 but still lower than world average. The number of buffalo increased from 69.78 million to 97.92 million and milk yield increased from 964 kg per year in 1980 to 1455 kg in 2002.

Figure 3 Trends in production and per capita availability of milk in India: 1950-51 to 2004-05



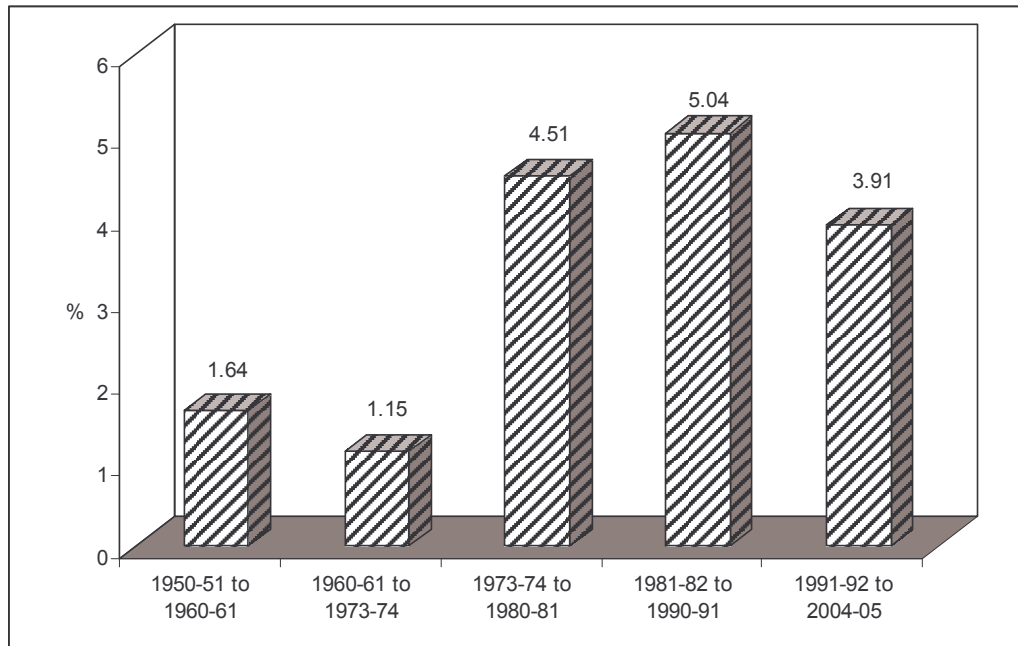
Source: GOI, 2006b

Despite being the largest milk producer in the world, per capita availability of milk in the country is one of the lowest in the world, although it is high by developing country standards. The per capita availability of milk, which declined during the 1950s and 1960s (124 gm per day in 1950-51 to 121 gm per day in 1973-74), expanded substantially during the 1980s and 1990s and reached at about 232 gm per day in 2004-05. However, it is still below the world average of 285 gm per day and the minimum nutritional requirement of 280 gm per day as recommended by the Indian Council of Medical Research (ICMR).

The annual compound growth rate in milk production during the first decade after independence was about 1.64 per cent and this growth rate declined to 1.15 per cent during the decade of 1960s (Figure 4). The Government of India initiated major policy changes in dairy sector during the early 1970s to achieve self-sufficiency in milk production. Milk production grew at annual

compound growth rate of about 4.5 percent between 1973-74 and 1980-81, which increased to about 5 percent in the eighties. However, growth in milk production showed deceleration in the post-reforms period and grew at annual compound growth rate of 3.9 percent between 1991-92 and 2004-05. The expansion of dairy industry was achieved through extensive intervention by the Indian government, as well as through increased demand driven by increased population, higher incomes and urbanization.

Figure 4 Annual compound growth rate (%) in milk production in India: 1950-51 to 2004-05



Milk Procurement and Processing Trends

Processing and marketing are the two important components for growth of smallholder dairying. Like other developing countries of the world, India has co-existence of ‘organized’ and ‘unorganized sector’, also being referred as the ‘formal’ and ‘informal sector’. Informal/unorganized sector is also termed as “traditional sector” comprising of marketing of liquid milk and traditional products such as locally manufactured *ghee* (butter oil), paneer (cottage cheese) and indigenous products like sweets.

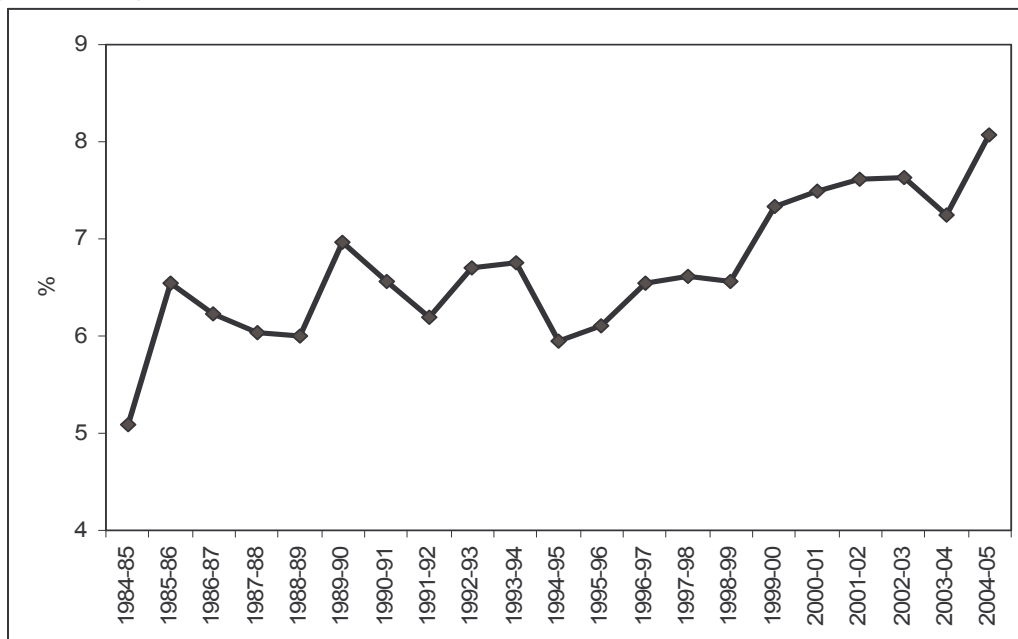
Dairying historically has been an unorganized activity in India (Sharma, 2004) while organized or formal sector is relatively new and small. The Indian Government has adopted a *laissez-faire* approach to the informal sector and has allowed it to expand with growth in demand and serve small farmers and resource poor consumers alike. The present status of dairy processing is the result of demographics, socio-economic factors, tastes and preferences, traditions, and infrastructure limitations. A primary characteristic of milk processing and distribution in India is dominance of the informal/ unorganized sector. There are no reliable estimates of marketed surplus of milk in the country. However, industry estimates reveal that about 40 to 50 percent of total milk produced is retained by the households for self-consumption and

remaining is sold in the market. According to one estimate, about 32 percent of the milk produced is retained on the farm for self consumption but the amount retained on farms varies from area to area and is influenced by the herd size, family size, and other socio-economic factors. Of the remaining 68 percent leaving the farm, approximately 75 percent goes to unorganized or informal sector and the remaining 25 percent is handled by the formal sector (Sharma and Singh, 2006).

The large informal sector exists partly because consumers are not willing to pay the additional costs of pasteurization and packaging, which can raise retail prices by 50-100 percent. Moreover, consumers often consider raw milk and traditional products obtained from reliable vendors as fresh and of better quality than processed dairy products (Sharma et al., 2003).

The formal sector comprising of cooperatives, government and private players procure about 15-20 percent of the total milk produced, showing that the bulk of trade in milk is in hands of informal sector. In organized sector share of cooperatives is higher compared to private sector. Procurement of milk by the cooperatives as percentage of the total milk produced has increased during the last two decade from 6.64 percent in 1995-96 to 8.07 percent in 2004-05 (Figure 5). However there are large variations in share of cooperatives across different States varying from nearly 2 percent of total production in States like Madhya Pradesh, Haryana, Uttar Pradesh to as high as nearly 32 percent in Gujarat. Other States having higher share in milk procurement are Karnataka (25.15%), Tamil Nadu (15.15%) and Maharashtra (15%) in 2004-05. The share of cooperative sector witnessed a declining trend in many States including Punjab, Haryana, Andhra Pradesh, Maharashtra, Tamil Nadu and Uttar Pradesh after amendments in the Milk and Milk Products Order (MMPO) in 2002, when restrictions on setting up new processing facilities and milk shed area concept was repealed.

Figure 5 Growth in milk procurement by cooperatives (% to total milk production)

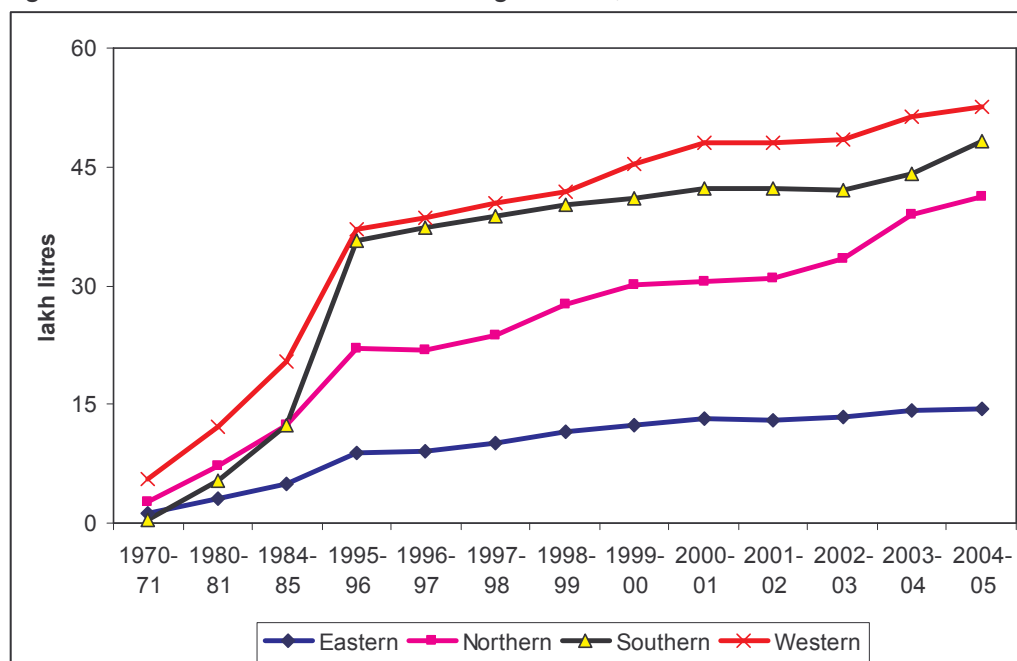


Milk Marketing Pattern

Trends in fluid milk marketed by cooperative sector in the country are presented in Figure 6. The figure clearly shows that there has been a significant increase in pasteurized liquid milk marketed by organized cooperative sector. It has increased from less one million litres in 1971-72 to about 15.7 million litres in 2004-05. However, there are regional variations. For example quantity of fluid milk marketed in Western region is the highest followed by Southern, Northern and lowest in the Eastern region. In Northern and Eastern regions, about half of this milk is marketed in Metro cities of Delhi and Kolkata. While in Southern region, share of Metro city, Chennai, is about 15 percent and States like Karnataka and Andhra Pradesh have about 55 percent share in liquid market, which is mainly due to large demand for quality milk in big cities like Hyderabad and Bangalore.

In Western region due to high demand for quality milk in Mumbai, share of metro city is nearly 50 percent and due to strong presence of cooperatives in Gujarat, its share in the region is about 22 percent. The above trends clearly indicate that demand for quality pasteurized milk is significantly higher in big cities like Delhi, Mumbai, Kolkata, Chennai, Ahmedabad, Bangalore, Hyderabad, etc. and is expected to increase in medium-sized cities in near future. With spread of modern retail chains in urban and semi-urban areas, availability of quality milk and dairy products is expected to improve which in turn would provide better access for milk producers and processors to the markets. However, required investment in appropriate rural infrastructure (supply chain) is lacking in most parts of country and there is a need for Public-Private-Partnership (PPP) in this area. Appropriate policies and incentives need to be put in place.

Figure 6 Trends in fluid milk marketing in India, 1970-71 to 2004-05



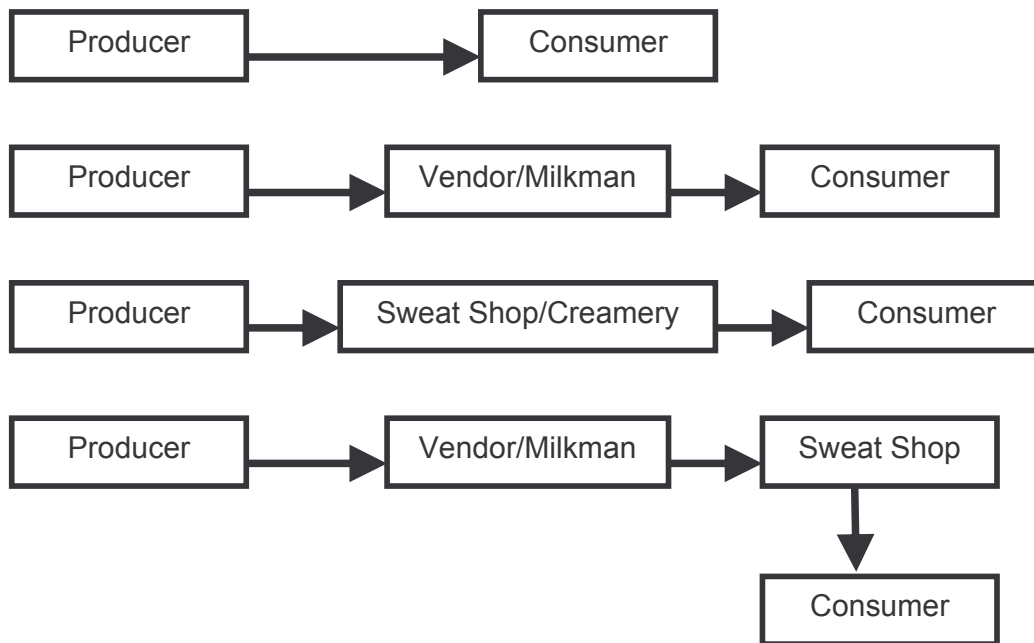
Source: Annual Reports of National Dairy Development Board

Marketing Channels and Institutions

Milk in India is marketed through different channels and share of organized sector has marginally increased during the last two decades. Based on discussion with industry leaders, farmers, and other stakeholders in dairy value chain and PRAs, we have tried to map important milk marketing channels and are presented in Figures 7-9.

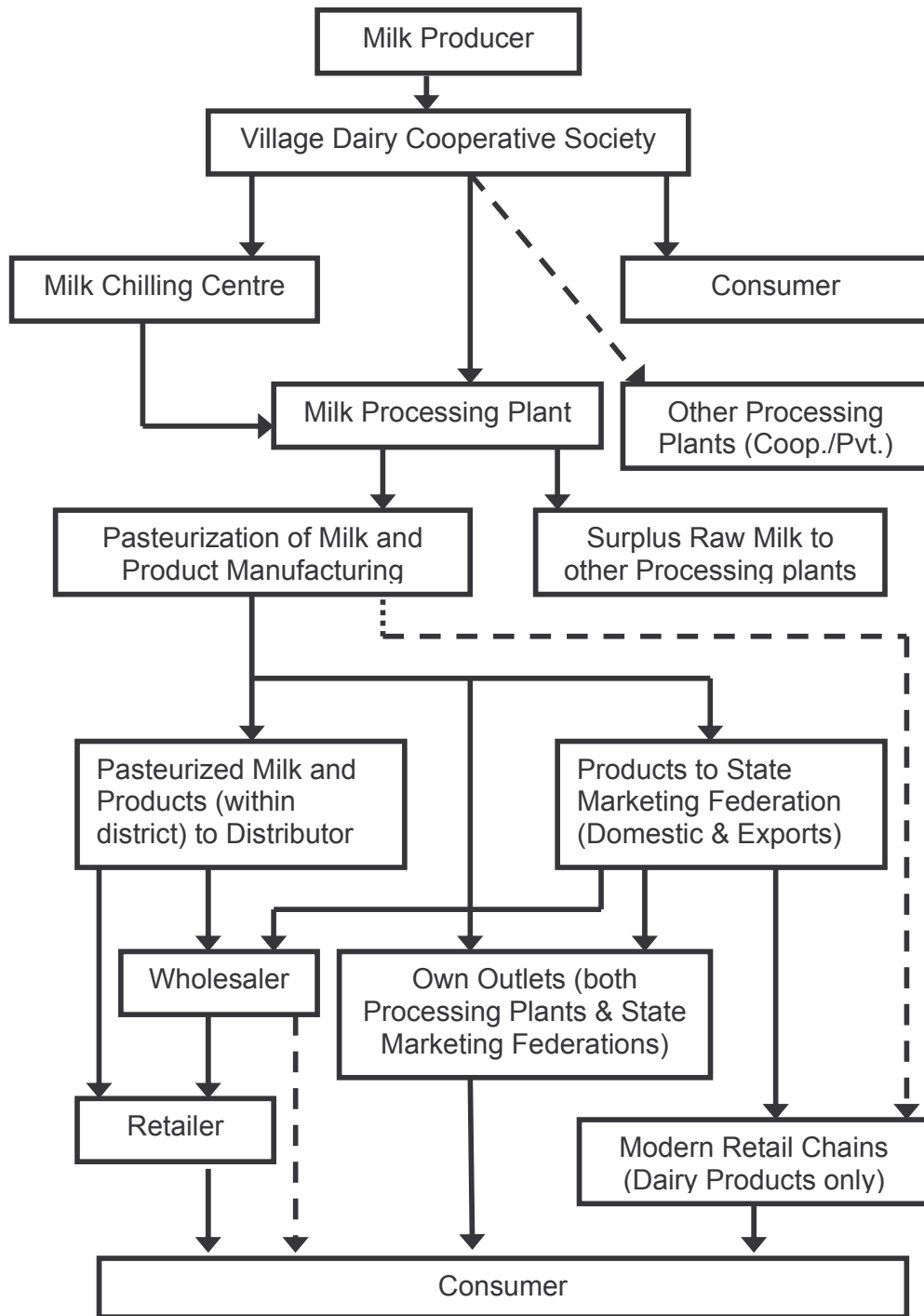
Small and marginal farmers and landless labor rear one or two milch animals mostly on farm by-products or cutting fodder from common property resources. They retain some quantity for home-consumption and surplus is sold in the market. Since the quantity of milk to be sold is small, it is not economical for these farmers to go to cities/urban areas to sell milk. So farmers are left with three choices: (i) sell milk to the milk collection centres of cooperatives society if it exists in the village, (ii) sell to collection centre of a private plant or (iii) sell it to the intermediary/milk vendor/sweet/tea stalls or directly to consumers in the village. Selling milk to vendor/intermediaries has advantages, since he collects milk from producer's doorstep, has pricing flexibility pays on daily-basis, and even provides credit for purchase of dairy animals and feeds which is deducted from monthly payments. At the same time vendor supplies milk at doorstep of consumers and takes payments at the end of month or after two weeks.

Figure 7 Important marketing channels in unorganized sector



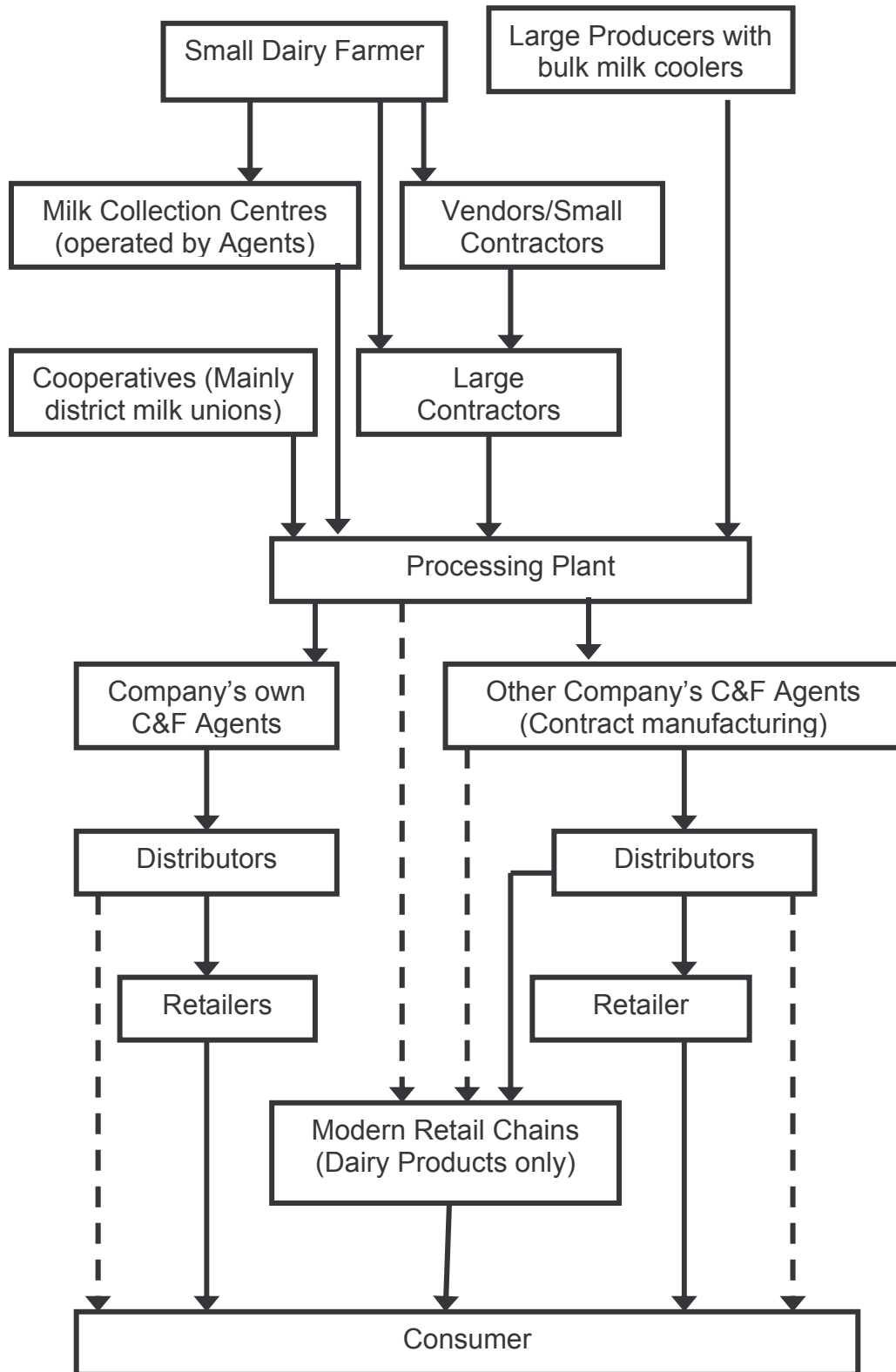
The producers who are members of dairy co-operative society sell their milk at collection centre set up by cooperatives after getting it tested for fat and SNF. As such he receives remunerative price for the produce. The farmers normally receive payment after about a week or 10 days as decided by the society. The cooperatives in turn provide various inputs and services such as artificial insemination, veterinary health care, feed, etc. At the end of the year, society after meeting all expenditure out of its profits gives bonus to all members in proportion to milk supplied by members.

Figure 8 Important marketing channels in cooperative sector



The third option with producers is to supply milk to private milk plants operating in the area. Though there is no demarcation of milk shed area of a particular plant after amendments in MMPO in 2002, all players are free to collect milk from anywhere and compete with each other for raw milk. It was observed that unorganized sector is still an important marketing channel in many parts of the country but its importance is declining due to consumers' awareness about hygiene and quality issues.

Figure 9 Important marketing channels in organized private sector



The share of organized sector is much higher in western region compared with other parts of the country. There has not been a significant impact of opening up of dairy industry on the procurement pattern in most parts of the country but in some States like Punjab, Haryana, Uttar Pradesh, in Northern region competition among cooperatives, private processing plants and informal sector.

Some dairy cooperatives have initiated some steps to consolidate their position in the market. For example, recently all 13 members (district milk unions owning milk processing plants) of the Gujarat Cooperative Milk Marketing Federation Ltd. (GCMMF), one of the largest dairy cooperative in the country decided to consolidate their position under the umbrella brand name "Amul". Currently, these dairies market their produce mainly fluid milk and some other dairy products under their brand names within their districts but outside they are all marketed as Amul by the State federation. This consolidation would significantly reduce marketing expenses of district unions. A strong formidable brand will build a clear identity that the consumer can connect to. It will also enable the organization to manage the brand better, increase brand efficiency and ultimately benefit the consumer as the price benefit ratio will increase. Such efforts are required at regional and national level to compete with other players.

Shift in Marketing Channels

It was observed that milk producers are shifting from one marketing channel to another channel. The major shift was from vendor/unorganized channel to organized private and co-operative sector. This shift is attributed to provision of services like artificial insemination, veterinary services, feed supply, price based on quality of milk, assurance of regular payment, credit facilities and other technical inputs provided by organized sector. This wide range of inputs and services and credibility of the organized sector (private as well as co-operative systems) has become a better alternative to the informal vendor system. The organized sector marketing options have capitalized the weaknesses of informal vendor system and have made in-road into the un-organized dairy sector. On the other hand, it was interesting to note that a remarkable shift is noticed from the co-operative to vendor system and private sector mainly during lean season due to flexibility in pricing by unorganized sector and even private players.

Concluding Observations and Policy Implications

Dairying in India plays an important role in the national economy and also in the socioeconomic development of millions of rural households. The Operation Flood program (OF) based on cooperative movement has been important in dairy development in different parts of the country and undoubtedly has played an important role in keeping smallholders involved with this fast-growing sector. During the past three decades, milk production as well as per capita availability of milk has increased significantly. The Indian dairy sector has become progressively more liberalized since 1991, with a major amendment in 2002 in the Milk and Milk Products Order (MMPO) that restricted the ability of private dairies to procure milk in areas being served by the parastatal cooperative sector. The structure of dairy production and processing has changed considerably

during the last decade. The number of private dairy processing plants has increased significantly but cooperatives have gone for capacity expansion.

Restructuring of Indian dairy industry is taking place at a faster rate in processing sector while restructuring at marketing and production side is slow. However, some changes are also taking place in production and procurement segments. The share of organized sector in milk procurement and marketing is increasing but unorganized sector is still a dominant market player. It is expected that scaling-up in milk production will take place with entry of organized players in agri-food sector in order to reduce transaction costs and ensure quality raw materials by large players. However, fear is that with increasing power of private companies and large modern retail chains, smallholder producers might face significant market uncertainties if appropriate safeguards are not put in place.

Marketing is dominated by sales of farmers to unorganized sector mainly vendors in most parts of the country but in some States like Gujarat sales of milk to dairy coops is major marketing channel. There is no penetration of new retailing institutions at farm level but it is expected that with entry of companies like Reliance the situation might change. In organized sector, buyers provide various inputs and services such as breeding, animal health care, feed and fodder, etc. to the farmers.

In some cases farmers shift from one marketing channel to another marketing channel due to provision of services like artificial insemination, veterinary services, feed supply, price based on quality of milk and assurance of regular payment, bonus, credit facilities and technical inputs provided by organized sector. Due to increasing competition within the sector and increasing role of modern retail sector in the country, some of large players have initiated some steps to countervail market power of modern retailers. For example, recently all 13 members (district milk unions) of the Gujarat Cooperative Milk Marketing Federation Ltd. (GCMMF) decided to consolidate their position under the umbrella brand name "Amul". This consolidation would significantly reduce marketing expenses of district unions. A strong formidable brand will build a clear identity that the consumer can connect to. It will also enable the organization to manage the brand better, increase brand efficiency and ultimately benefit the consumer as the price benefit ratio will increase.

The major implications of this study are:

It is certain that on demand side, producers would face more competition with opening of markets and increasing importance of food safety and hygiene. There is unprecedented growth in modern retail sector, which is bound to increase in future. In order to countervail the market power of large modern retailers (national as well as multinationals); it is extremely important to organize smallholder producers and processors to increase their bargaining power. In addition, cooperatives/producers' association would help in overcoming high transaction costs.

Public policies should focus on reducing transaction costs by making public investment in rural infrastructure for dairy development such as cold chain, rural

roads, supply of power, and also encourage private investment in post-harvest management practices, and improve intermediary organizations to reduce transaction costs between producers and market partners. The focus of government should shift from regulation to facilitation.

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