

# Why Do Some Co-operatives Work But Not Others?

## A Comparative Analysis of Sugar Co-operatives in India

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*The co-operative sugar factories of western India (in Maharashtra state) are remarkably successful examples of local development initiative. This paper presents a comparative sociological analysis of these co-operatives in order to pinpoint the organisational factors which are crucial for their success. Comparative analysis of privately-owned sugar factories in India reveals a basic weakness in the cane supply relationship between the private factories and the sugarcane growers—a weakness which the co-operative factories have overcome. As a result, the co-operatives can operate at higher technical and economic efficiency than the private factories. Moreover, although the co-operatives receive some helpful subsidies from the government, much larger subsidies are directed to the private factories at the expense of the more efficient co-operatives.*

*The success of the co-operative sugar factories depends not only on a superior cane supply system (which resolves a problem specific to the sugar industry), but also on their ability to generate a stable alliance among the small, medium and large cane growers who are the shareholders. This alliance is made possible by two sets of factors: internal factors, which are specific to the technical requirements of sugar production; and external factors, which are rooted in the agrarian system of the region where these co-operatives have flourished. Comparisons with other types of co-operatives in other regions of India show that the presence or absence of similar factors determines whether a given type of co-operative will succeed or fail. Detailed comparisons with the successful dairy co-operatives of Gujarat show that co-operative alliances between small and large farmers may take different organisational forms under different regional conditions. Political organisation is also influenced by the nature and scale of the production process.*

*The general conclusion is that the probable success or failure of co-operative organisations can be predicted through such comparative analyses—analyses which compare co-ops with other types of private and co-operative enterprises, taking into account (a) the technical and organisational requirements of the production process, (b) the distribution of interests and possibilities for a stable alliance among the members, and (c) the regional agrarian systems which determine the natural and social environments of the co-operatives.*

THE key problem in most regions of the developing world is not simply a shortage of finance, nor a lack of improved technology, nor even a deficit of educated administrative personnel. The key problem is organisation. Most organisations that are intended to promote rural development, whether they are co-operatives, communes, government agencies, or whatever, work inefficiently. There are, however, a few exceptional organisations in this gloomy picture, and it is important to try to understand why and how they succeed in order to know whether it is possible to encourage their replication.

Co-operatives are an important instrument of development policy in many nations. They are expected to mobilise untapped resources for economic growth and to contribute toward more equitable distribution. They are a key element in many plans to help the poorest of the poor. The government of India has invested massively in co-operatives for rural development, as have many international agencies, including the World Bank. This paper concerns a set of highly successful co-operatives in India, the co-operative sugar factories of Maharashtra state. It is an attempt to explain their success through comparative analyses: by comparing these co-operatives with private sugar factories, and also by compar-

ing them with other kinds of co-operatives.

This study is a demonstration of the utility of sociological and anthropological research in development. It is sociological and anthropological in two senses: First, it is largely based on field research—that is, on direct observation, interviewing, surveying, etc, in the villages where these co-operatives are located. (However, analysis of published statistics on the sugar industry also plays an important role in this study.) Second, the interpretations presented here hinge on a comparative analysis of how organisations operate, and particularly on how the informal network of interests and alliances within these organisations affects their formal operation. This approach is comparable to some management studies of business firms and bureaucracies, but it is an approach which has rarely been applied intensively to the study of development organisations in the countryside.

India grows more sugarcane than any other country, and its sugar industry is among the world's largest. Millions of Indian farmers grow cane, and there are over 300 large-scale centrifugal sugar factories in the country, as well as a great number of artisan units producing crude sugar in several forms. Sugarcane and sugar production involve several competing kinds of enterprises,

some of them co-operative, some state-owned, some privately owned. Among the co-operative organisations, there are some types which have been remarkably successful, at least in certain regions. Many co-operative organisations, on the other hand, have failed in various degrees. The purpose of this paper is to compare those that succeed and those that fail, and to explain the pattern of success and failure.

In order to understand how sugar co-operatives work (or not), we must first locate them within the whole range of interlocking and competing sugar enterprises in India. The various kinds of enterprises—their origins, locations, and their strengths and weaknesses—are outlined in the first section of this paper. This section identifies the crucial organisational problem of the Indian sugar industry—the cane supply problem—which only the co-operative factories have been able to overcome efficiently. Sugar factories can operate efficiently only if they receive a steady supply of fresh cane during the crushing season. In India, sugarcane is grown by millions of village farmers; and it is difficult for factories owned by private capitalists to co-ordinate their operations with those of the farmers, particularly given the conflict of interest between farmers and factory owners over the price of cane.

The co-operative factories in Maharashtra state, owned by the cane growers, do not face this conflict and are thus able to co-ordinate their cane supply far more efficiently.

This point is demonstrated by comparative quantitative analysis in the second section. This section reviews the technical and economic performance of co-operative as compared with private sugar factories, showing that the co-operatives are indeed efficient and that they are not dependent on public subsidies. Technical and financial indicators which are standard in the industry show that the co-operatives are better at extracting sugar from cane and at doing so less expensively. Moreover, this section attempts to weigh the public subsidies which go to the sugar industry. While the co-operatives receive some state support, what is most remarkable is that they are net payers of a heavy subsidy to the state, which goes to support the less efficient private factories through a system of discriminatory sugar prices.

The third section considers why one type of sugar co-operative has been outstandingly successful, at least in one region, and why other types have not. Our analysis indicates that the successful co-operatives are based on an alliance of interests among large-, medium-, and small-scale cane growers. This alliance works, first, because it is made necessary by internal constraints in the sugar production process and, second, because external agrarian relations (of caste, class and power) make it possible. The internal constraint which most affects this alliance is the need for heavy industrial equipment to extract cane juice efficiently. This equipment must be used at full capacity if it is to be profitable. Consequently, the big farmers who dominate the co-operatives must ensure the loyalty of the smaller members, who supply in aggregate an important share of the cane. Common economic interests thus underpin the alliance between large and small farmers. In addition, there is a common cultural and political identity shared among large and small farmers in Maharashtra, since they belong mostly to the same Maratha caste. Rich and poor Marathas belong to the same clans and lineages within this caste, and economic mobility as well as kinship softens the perceived differences between them.

In the fourth section, this explanation is tested by comparison with other kinds of co-operatives in other regions, showing that variations in the internal and external factors cause predictable results in terms of the success or failure of other co-ops. The success of the famous dairy co-ops of Gujarat is partly the result of the same internal factors: there is the same need to use heavy industrial equipment at full capacity, meaning that the large dairy farmers need the participation of the smaller ones. Co-operative cane supply unions in northern India demonstrate the same effect in reverse, since

these unions do not own the heavy equipment which processes sugarcane. (The factories are owned by private capitalists.) As a result, the large cane growers have no need to encourage participation by the smaller ones in the cane supply unions, since their profits do not depend on the capacity utilisation achieved by the factories. Consequently, the cane supply unions are notoriously biased against the small growers.

In the fifth section we make this comparative analysis more concrete by discussing the politics and management of co-operative sugar factories in comparison with the equally successful dairy co-ops in Gujarat. Here we show that these two kinds of co-ops have different leadership styles, which can be explained by two factors. First, sugarcane is a crop of primary importance for the growers, while milk is only a supplemental source of cash income. Second, co-operative sugar factories are part of the daily lives of the farmers, while district-level dairy plants are not. Combined, these two factors lead to intense political involvement by village leaders and co-op members in the sugar factories, contrasted with less active membership participation under technocratic leadership in the dairy co-ops.

Finally, in the last section we summarise our findings and highlight the research strategies which can be applied from this exercise to the more general question of which kinds of development organisations are likely to succeed under what circumstances.

## I

### Sugar Enterprises

India has a peculiar mix of sugar enterprises, such as is not found elsewhere. In comparison with other countries, one of the strangest features of India's sugar sector is the almost complete absence of large-scale, factory-owned sugarcane plantations. In order to understand the special characteristics and problems of India's sugar enterprises, it will be helpful to consider why such plantations (or similar organisations) are so prevalent to other cane growing countries, and why they are quite uncommon in India.

Large-scale sugar plantations proliferated in the tropical countries long before cane-growing was mechanised. Heavy mechanisation, when it came, was obviously easier in large-scale units; but mechanisation was not the original force behind the spread of the plantation system. In many crops, family farms are often highly competitive against large enterprises run with gang labour, but this has generally not been true in the case of sugarcane. The reasons derive from the technical characteristics of the crop itself (see Attwood 1985; Shlomowitz 1984). First, sugarcane is both perishable and bulky; and second, it is most efficiently crushed and processed by heavy machinery. This second characteristic means that a sugar factory is a heavy capital investment. In order for this

investment to pay, it must be continuously supplied with an adequate amount of cane throughout the harvest season, thus enabling the machinery to work at full capacity. Moreover, because the cane is perishable, and the sucrose content declines if it is not crushed within 24 hours of harvesting, it is necessary for the factory operations to be closely co-ordinated with the planting and harvesting of the crop. Otherwise, there may be too much cut cane on hand at times, deteriorating before it can be processed, while at other times there may not be enough to keep the factory running at full capacity. Consequently, if the factory relies on independent suppliers, transaction costs are high and there are conflicts of interest which can damage efficiency. On the other hand, if the factory owns or rents the cane plantation, or if the cane growers themselves own the factory, those costs are reduced. The largest cost in sugar production is the cost of the raw material, so if the cane can be grown in full co-ordination with the factory operations, there is a better chance of success. That is why the factory-owned plantation is common in most cane-growing countries.

However, sugar plantations are rare in India. The reason is that, unlike the United States (in Hawaii and Louisiana), Brazil, Peru, the Caribbean Islands, South Africa, and Australia, India was not a land of new settlement during the period of European expansion. The good land in India was already occupied by village farmers; and, except in Bihar during the 19th century, European entrepreneurs did not have the coercive power to divest these villagers of their lands and consolidate their holdings into indigo or sugar plantations. As long ago as 1921, the Indian Sugar Committee (ISC 1921: 293) pointed out that there was simply not enough good land obtainable through voluntary purchase for sugar factories to establish consolidated plantations of their own (Attwood 1984a, 1985). That being the case, the Sugar Committee then weighed the pros and cons of compulsory acquisition, by the state, of lands which could then be rented or sold to the nascent sugar factories. On this point, the decision was quite clear and realistic: such acquisitions would be beneficial to the industry; but the political cost, in the form of peasant unrest, would be far too high (ISC 1921: 295-98). The Indian sugar industry was forced to limp along with a quite different and awkward cane supply system.

This industry first grew on a large-scale during the 1930s and 1940s in northern and especially northeastern India (Bihar and eastern UP), where the climate was humid, irrigation was inexpensive or unnecessary, and labour abundant. Under these conditions, sugarcane was grown without great care or expense by tens of thousands of village farmers, who rotated this crop with rice, their basic subsistence crop. Although

the cane itself was grown cheaply by the villagers, the transaction costs in getting a regular supply delivered to the mills were quite considerable. Each mill had to deal with thousands of growers scattered about the countryside. Each grower preferred, if possible, to harvest his cane at its peak and clear the field in good time for a second crop. Consequently, there was often a glut of cane brought to the mills during the peak season, which meant that some cane deteriorated while it waited to be crushed; and then supplies were short later in the season. The farmers, for their part, found that they could not be sure that a factory would purchase their cane when it was harvested, nor that they would be paid at a satisfactory rate. Consequently, the cane growers looked to an alternative market whenever possible. The alternative was *gur* production.

Long before the rise of the modern sugar factory, sugar was produced by artisan methods in India, and much is still produced by these means today. In fact, the total annual production of artisan sugars (*gur* and *khandsari*) still outweighs the production of factory white sugar. *Gur* or *gul*, which is the commonest type of artisan sugar, can be made by crushing the cane in a bullock-driven mill, then boiling the juice in large iron pans. This equipment is well within the means of the larger village cultivators (those with ten or twenty acres of land), and the smaller growers can either sell their cane to the *gur* maker or rent his equipment. However, *gur* production is not very efficient: small-scale crushers, especially those driven by bullock power, are unable to extract all the juice from the cane. It has been estimated that some 20 per cent of the juice is wasted in this way, literally going up in smoke (Hirsch 1961: 31).

Because the *gur* units are so numerous and small in scale, it has not been feasible for the government to tax or regulate them in the many ways that apply to the sugar factories. Their labour is not unionised, they need not pay minimum wages, nor the minimum cane prices fixed by the central government for the sugar factories; and all their product is sold on the open market, untaxed. They also benefit from schemes promoting small-scale industries. In contrast, 65 per cent of the sugar produced by the factories in recent decades has been purchased by the government as 'levy sugar', at rates below the free market rates. The other 35 per cent can be sold on the open market, but sales are subject to excise tax and monthly release quotas from the central government. In addition, the central government fixes a minimum cane price which must be paid to the cane growers by the factories. Moreover, the factory labourers are unionised and must be paid a minimum wage. For these reasons, the sugar industry in north India is in a strange condition: from time to time, the factory industry is unable to compete with the

artisan units. This is particularly true during some phases of the sugar cycle, which involves sharp oscillations in cane production and sugar prices every four years or so (Harrison 1981: 113).

Back in the 1930s, when the sugar industry had its first growth, it was subject to much less government intervention (see Hirsch, 1961: 71-93). However, even during the 1930s, the factories had problems competing with the *gur* units, particularly because there were such high transaction costs in obtaining regular cane supplies from thousands of independent village farmers scattered about the countryside. The first system which the factories adopted in attempting to reduce these transaction costs was the use of middlemen. Landlords and moneylenders, people to whom the cultivators were indebted, were appointed as cane supply agents. These agents could compel the cultivators to harvest and deliver their cane on a schedule which suited the sugar factories. They could also put a large share of the cane payments into their own pockets. Amin (1981, 1984) describes this system as inefficient and exploitative.

Toward the end of the 1930s, the state government of UP and Bihar attempted to remedy the problems in this system by establishing state-run co-operative cane supply unions. Most of the sugarcane purchased by the factories had to be supplied through these unions. The unions may have helped the factories to regularise their cane supplies, but they left much to be desired from the point of view of the growers, as we shall see.

Since the Second World War, the government has become increasingly active in the sugar sector, setting low sugar prices (to benefit urban consumers) and high cane prices (to benefit the growers). These interventions are often spasmodic and not part of a long-term strategy for the industry as a whole, with the result that both cane growers and factory owners have faced unstable economic conditions (Hirsch 1961: 75-93; Harrison 1981: 113-16). The result of this instability is to increase the conflicting political pressures on the government to intervene even more heavily and shortsightedly.

Many of the private mill owners have responded, over the last few decades, by neglecting to reinvest in new equipment. Their plants have become obsolete and even less able to cope with the demands of the cane growers and the government. Politicians have threatened to nationalise these 'sick' units, and some have been taken over temporarily by the state governments of UP and Bihar (Franda 1979), while others have been auctioned off for tax arrears (Brass 1965: 122). Other factories have been forced to keep their gates open, despite their professed inability to meet their costs. The result is a form of economic stagnation which may be described as a deadlocked class conflict, with neither the cane growers, the mill owners,

nor the government able to make any headway against the obstruction of the others. The roots of these problems are set in the awkward cane supply relationship between the factories, the cane growers, and the co-operative supply unions, with their underlying conflict of class interests.

Meanwhile, the old established sugar interests of northern India have been faced with the rise of vigorous new competitors to the south and west. These competitors are organised on new lines as co-operatives: not as co-operative cane supply unions, but as co-operative factories, with each factory owned by thousands of village cane growers. The first co-operative factory was organised in 1950 in western India, in the state of Maharashtra. It was a success, and by 1960 there were 14 such factories in the state; by 1970, there were 30 and by 1980 the number was 60. Maharashtra now produces more sugar than any other state, more than 35 per cent of India's total white sugar. Almost 90 per cent of the sugar produced in Maharashtra comes from the co-operatives, the rest from a few private factories which were established in the 1930s.

It must be emphasised that these co-operative sugar factories were established on the initiative of the cane growers themselves; they were not the outcome of a government plan. Moreover, the factories are managed by elected local leaders, not by government officials. The shareholders of each factory periodically elect a board of directors from among their number; and the board directs the operations of the factory, setting policies to be implemented by the technical and managerial staff. Each shareholder has one vote, regardless of the number of shares he owns. The voting shareholders are all cane farmers. One share commits the farmer to grow half an acre of sugarcane every year, and it also commits the factory to purchase this cane. The vast majority of shareholders are small- or medium-scale farmers.

The co-operative sugar factories of Maharashtra are successful because they have resolved the longstanding problem of the Indian sugar industry, which was cane supply. In the first place, the interests of the factory and the cane growers are no longer antagonistic, as they are in the case of the private factories in north India. Instead of trying to obtain their cane supply at the lowest possible rate, the co-operative factories try to do the opposite, paying the highest possible cane prices to their members. Net income is mostly distributed to the shareholders in the form of high cane prices, instead of being distributed in the form of dividends. So long as the factory can run efficiently, then, the farmers have a strong incentive to keep growing cane and selling it to the factory. As a result, more than 75 per cent of the cane grown in Maharashtra is now processed by sugar factories, as compared with less than 25 per cent in the north. The co-operative factories in Maharashtra

are so attractive that few cane growers prefer to produce *gur*, whereas the opposite is true in the north, as shown in table I.<sup>1</sup> As in the plantation systems found elsewhere, vertical integration stabilises cane supply.

As seen in the figure, the co-operative factories in Maharashtra, whose output was less than half of the sugar produced in the north in the late 1960s, have nearly caught up with the latter region in total output by the early 1980s; and today these two regions together account for about 70 per cent of total white sugar production in India.<sup>2</sup> Prior to 1979-80 (a year of severe crisis for the whole industry, brought on by a sudden about-face in sugar pricing policies by the central government), the co-operative factories in Maharashtra showed remarkable stability in their output (Mohite 1974: 71-73). The pronounced downturns of 1971-72 and 1975-76 hardly registered at all in Maharashtra, and it seemed for a while as if the co-operatives would be immune to the boom and bust cycles which had long plagued the sugar industry in India. These four-year cycles are caused by the long lags (normally 12 to 18 months) between the planting and harvesting of sugarcane. More cane is planted when sugar prices are high; but by the time the crop is harvested and paid for, the additional output is bringing prices down, so the next planting (often two years after the initial one) will start a trend toward lower cane production, which will lead in another one or two years to higher prices and a renewal of the cycle. Although the government intervenes heavily in the sugar market, it has not yet developed any mechanisms for stabilising this cycle, which is costly to farmers, factories and consumers alike (Harrison 1981). Indeed, the government's ad hoc reactions to price and supply conditions often accentuate this instability, as in the case of the sudden 'decontrol' of sugar prices in 1978-79, which led to an extreme crisis in the industry the following year.

Prior to this crisis, sugar production by the co-operatives in Maharashtra was markedly more stable than in the north or in the industry as a whole. While this is no

longer the case, at least for the time being, it should be possible to recapture this stability with appropriate policies. This earlier stability was brought about by the willingness of the co-operative factories to go on paying high prices for their members' cane even during the periodic slumps in the sugar market, thus stabilising cane and sugar output at some temporary cost to the factories. This stable cane supply relationship, in turn, was the key to long-term economic efficiency for the co-operative factories.

Vertical integration through common ownership is the basis for the worldwide efficiency of the factory-owned sugar plantation; the same efficiency derives from ownership running in the opposite direction. Apart from the general lack of antagonism between the co-operative factories and their cane suppliers, the former have pioneered a harvest and transport system which contributes enormously to their efficiency. The cane is not harvested and delivered to the factory by the shareholders. Instead, contract teams of migrant labourers are hired and directed by the factory. These teams do all the harvesting and transporting, working on a schedule laid down by the factory office. Consequently, there is a steady supply of fresh cane brought to the factory gate throughout the crushing season (October through April). This highly co-ordinated harvest and transport system gives the co-operative factories a big competitive advantage against the private factories in northern India.

Our point is not that the co-operative factories represent the only possible solution to the organisational problems of the sugar industry in India, but that they seem to represent the best solution discovered so far. (Other kinds of co-operative and state-owned enterprises have also been tried with much less success, as we shall see.) Indeed, the co-operative factories were modelled after a private sugar factory established in 1934 by a group of highly enterprising cane growers in Maharashtra (Attwood 1984a; 1985). However, there is still an important organisational difference: in a co-operative,

each member has just one vote—that is, the member's votes are not proportional to the shares they own. This arrangement gives much greater influence and security to the small and medium shareholders who make up the great majority of members. As we shall see in the third section, this security is vital for the efficiency of these co-operatives.

## II

### Technical and Economic Efficiency

The claims for the efficiency of the co-operative sugar factories were put forth in very general terms in the first section. In this section our task is to spell out these claims in greater detail and to consider whether they must be modified in the light of subsidies provided to the co-operative factories. Studies of co-operatives rarely attempt to make such evaluations, generally assuming that the mere existence of a co-operative is a good thing, generating social and economic benefits which could not be provided by other means. It must be stressed, consequently, that our findings in this section are preliminary and tentative, and they are limited at this stage by the data to which we have access.

Before commenting on the technical efficiency of the co-operative sugar factories, it should first be stressed that any general comparison between co-operative and private factories in India is also a comparison between regions. The private sugar factories are concentrated in northern India, which consists of the humid northeast, where wet rice predominates, plus the drier and cooler northwest, where wheat is the primary crop. The entire northern region is sub-tropical, which limits the yields from sugarcane, a tropical crop. In particular, the cool winters of the northwest (in the states of Punjab, Haryana and western Uttar Pradesh) limit cane yields; while in the northeast (eastern Uttar Pradesh and Bihar), flooding, waterlogging, and plant diseases,

TABLE I: STATEWISE PERCENTAGE UTILISATION OF SUGARCANE FOR PRODUCTION OF WHITE VERSUS ARTISAN SUGARS

State and Region	1976-77		1977-78		1978-79		1979-80		1980-81	
	WS	GK	WS	GK	WS	GK	WS	GK	WS	GK
<b>North</b>										
(from NE to NW)										
1 Bihar	51.6	34.2	62.9	22.9	81.6	4.2	46.1	39.7	60.8	25.0
2 Uttar Pradesh	22.0	64.0	26.7	59.5	25.3	60.9	19.9	66.3	20.1	66.1
3 Haryana	16.8	70.7	29.1	67.4	22.2	65.3	24.7	62.8	26.1	61.4
4 Punjab	15.5	72.2	16.9	70.6	15.0	78.8	13.1	74.4	14.8	72.7
<b>West</b>										
5 Maharashtra	66.6	23.7	82.5	8.0	85.5	5.0	66.3	24.2	80.0	10.5
All India	31.9	56.1	39.0	50.1	39.4	48.8	30.3	58.0	33.4	54.8

Notes: WS = per cent of cane utilised for the production of white (centrifugal) sugar.  
GK = per cent of cane utilised for the production of *gur* and *khandsari* (artisan sugars).  
(Remainder of cane used for seed, chewing, etc).

Source: "Co-operative Sugar Directory and Yearbook", 1982-83, Vol I: 408-09.

combined with dense population, widespread poverty and cheap labour, inhibit investments and improvements in the production of this crop.

In contrast with the north, most of the successful co-operative factories are located in the western state of Maharashtra. This is a semi-arid tropical region producing much higher cane and sugar yields at greater cost, due to the expense of irrigation and the greater scarcity of labour (Attwood 1984a; 1985). To some extent, the higher cost of cane in this region is offset by the much greater concentration of cane produced in a given area, which lowers transaction and transportation costs in getting the cane to the factory gate. These regional advantages and disadvantages, then, appear to balance out to some extent.

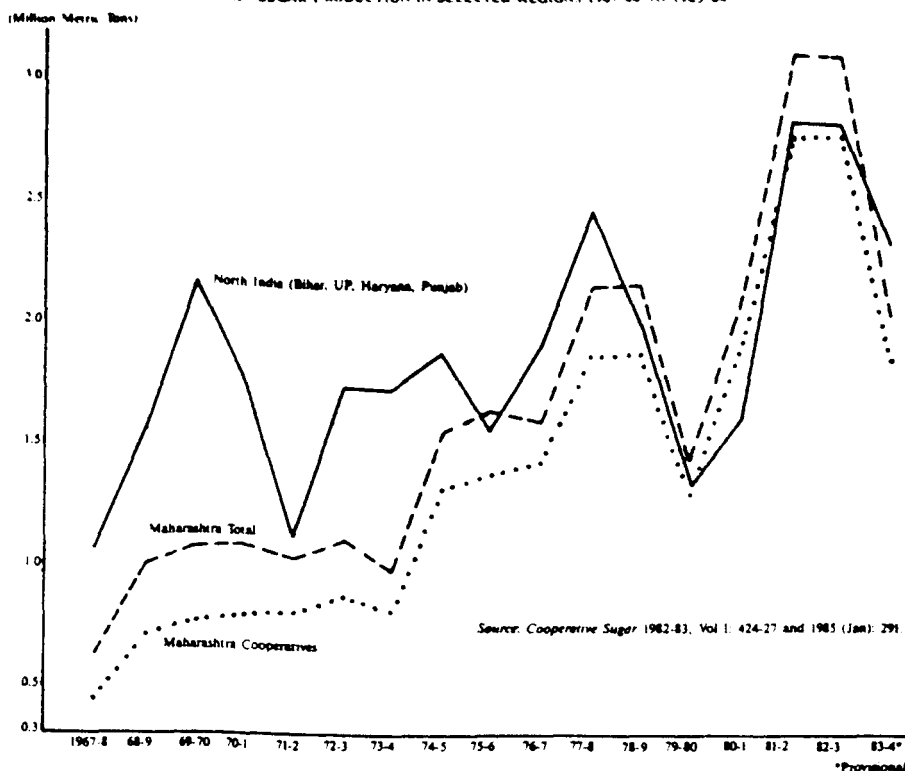
Another important regional difference is that the northern private mills were mostly established in the 1930s, while the western co-operatives were established after 1950. Consequently, the latter have newer and technically superior equipment. However, if the northern factories had operated efficiently, they should have been able to expand and refit at lower cost than the initial start-up costs of the co-operatives. Thus it is not clear that either region has an unbeatable locational or historical advantage.

Less than 2 per cent of the northern white sugar is produced in co-operative factories, nearly all the rest coming from private factories. Thus the production curve for the north in Figure 1 accurately portrays the operations of the private sector in that region. Likewise, as Figure 1 shows, the production curve for Maharashtra as a whole is closely tied to that for the co-operative factories in this region. In the late 1960s, the co-operatives accounted for 70 per cent of white sugar production in Maharashtra, and this proportion rose to 90 per cent by the end of the 1970s. Consequently, where regional data are not differentiated with regard to sector, the data for Maharashtra as a whole reflect the performance of the co-operative factories.

If the co-operatives outperform the private factories, this is due (in addition to regional differences) to some combination of the following: (1) superior organisation in terms of cane supply, as outlined in the first section; and/or (2) political leverage crystallised in the form of public subsidies. Before we examine subsidies, however, we first need to discuss technical efficiency.

One common measure of technical performance in the sugar industry is the recovery rate: that is, the weight of sugar produced from a ton of cane, expressed as a percentage. As shown in table 2, the average recovery rates for the co-operative factories in Maharashtra are the highest in India, about 10.9 per cent, while the private factories in the north are well below average. However, the recovery rate is heavily influenced by the quality of sugarcane, which varies from

FIGURE 1 SUGAR PRODUCTION IN SELECTED REGIONS 1967-68 TO 1983-84



region to region. It is more realistic, then, to compare the Maharashtra co-ops with the private factories in Maharashtra: in this case, the co-ops are still superior, though by a smaller margin. This is seen in table 2 by the slight superiority of the co-operative rates to the total average recovery rates in Maharashtra, since the totals include the private factories along with the co-operatives.

A better measure of technical efficiency is reduced overall extraction, a measure of how much of the sucrose actually present in the cane is extracted and crystallised by the factory. This measures the efficiency of the factory more independently from the quality of the cane which is supplied to it. During the 1960s, Maharashtra sugar factories (co-op and private) had the highest average reduced overall extraction rates in the country (Sugar Industry Enquiry Commission 1974: 47-49). More recent figures show that the extraction rates in Maharashtra consistently exceed the average for the country as a whole, while those in the north are below average, as seen in table 3.<sup>3</sup> The data in this table are not broken down by sector. However, as mentioned above, the northern production figures are overwhelmingly 'private', while the Maharashtrian figures are 90 per cent 'co-operative'. Other sources indicate that, when the co-operative factories in Maharashtra are compared with nearby private factories in terms of extraction rates, the co-operatives are as good or better (Marathe 1984:6).

Another measure of efficiency is capacity utilisation. In the late 1960s, no less than 79

per cent of the Maharashtra co-ops operated at over 100 per cent capacity, while only 22 per cent of the northern private factories exceeded this rate (Sugar Industry Enquiry Commission 1974:58). In recent years, the average capacity utilisation has been about the same for both co-operative and private factories in Maharashtra, as shown in table 4, though the co-operative factories are slightly better. Here again, we note that Maharashtra surpasses the national average, while the northern states (except for Punjab and Haryana, both relatively minor sugar producers) generally fall below average. Good capacity utilisation reflects two achievements: first, the avoidance of mechanical breakdowns; and second, the efficiency of the cane supply system. As a measure of technical efficiency, capacity utilisation is strongly related to economic efficiency (Chithelen 1983: A-131).

Turning now to a more direct discussion of economic efficiency, this can be measured by the average cost of converting a ton of cane into sugar. It is difficult, however, to make comparisons between the co-operative and private factories because they are organised quite differently and comparable data are not given in any single source. The co-operatives in Maharashtra include a large office staff and field labour force devoted to a centrally co-ordinated cane harvest and transport system, which costs an additional Rs 25 or more per ton of cane. On the other hand, the private factories in northern India do not organise the harvest and transport of the cane which they receive. In the jargon of the trade, their cane is purchased

'ex-gate' (at the factory gate), whereas the co-operatives in Maharashtra purchase their cane 'ex-field' from the grower and pay all the harvest and transport costs themselves. Consequently, when conversion costs are compared, the extra harvest and transport costs incurred by the co-operative factories must be excluded. Comparing only private factories between regions, the average conversion costs in Maharashtra are much lower than for the northern states. In the years 1978-79 through 1982-83, for example, average conversion costs in UP were Rs 84 per ton of cane, while the average for private sugar factories in Maharashtra was only Rs 70 (Indian Sugar 1984: 232-34). Figures compiled by Maharashtra's director of sugar (1978c: 5) for the years 1975-76 through 1977-78 show even lower conversion charges (an average of Rs 36 per ton excluding harvest and transport charges) for the co-operative factories.

Comparative figures also exist on the number of factories which have run at a loss. These figures must be used with some caution, since some of the co-operatives deliberately run at a loss, from time to time, in order to continue paying high prices for their members' cane (Chithelen 1983). In any case, during the 1960s, one-third of the private northern factories ran at a net loss for the decade, while only 22 per cent of the Maharashtra co-ops did so. Moreover, four out of five of these latter cases were just getting established in the latter half of the 1960s (Sugar Industry Enquiry Commission 1974: 27-30). In the early 1980s, 19 out of 67 co-operative factories (or 28 per cent of the total) were running at heavy losses in Maharashtra and categorised as 'sick' (Director of Sugar 1984: 20-21). On the other hand, in the late 1970s, an average of 52 per cent of the northern factories were running at a loss (Indian Sugar 1979-80, Vol I, Part I: 207). In the north, the main problems are obsolescent equipment and a clumsy cane supply system. Among the Maharashtra co-ops, the main problem for some of the newer units is that they have been established in areas without adequate cane supplies—a result of the growing political enthusiasm for co-operative factories in the state. While this

casts a shadow on the co-operative sector as a whole, it does not indicate that co-operatives are inherently inefficient, only that their political attractions have caused occasional abuse. In fact, there are a number of long-established co-operative factories which have shown excellent financial results over long periods.

The points discussed so far indicate that the co-operative sugar factories are generally no less efficient than the private factories; and we have also seen that most of the co-operative factories in Maharashtra demonstrate efficiency which is far above the average for any type of sugar factory in India. However, the possibility still remains that even the most efficient co-ops are so heavily subsidised that their efficiency is artificial, not a result of fair competition.

This is a subject which has engendered almost no published data and no systematic analysis. Consequently, we are here embarking into the unknown with the use of very limited information. We begin by considering the various ways in which the state and central governments subsidise the co-operative sugar factories.

The central government subsidises co-operative sugar factories by restricting new licensing to co-operative units. This does not, however, prevent the old private factories from expanding. Moreover, the co-operative factories, at least in Maharashtra, have been established in local areas where

the private factories were extremely reluctant to locate. This occupation of different geographic niches hinges on the dynamics of the 'irrigation frontier', which has been explained elsewhere (Attwood 1985). Within Maharashtra and within India as a whole, the co-operative factories now predominate in areas which the private factories were unable to exploit earlier. Consequently, it is doubtful that licensing restrictions have held back the growth of the private sector to any great extent.

The state government of Maharashtra subsidises the co-operative sugar factories in several ways. It buys shares in these factories; it guarantees loans from the industrial finance corporation and similar agencies (agencies which lend at equivalent rates to the private sector); it sometimes suspends the cane purchase tax (as, for example, during 1978-79, when the entire sugar economy was in crisis), particularly in the case of weaker units; and it sometimes allows these weaker units to postpone depreciation in their accounting. As noted, the weaker units are in a minority, so these latter subsidies do not go to the co-operative sector as a whole. Likewise, loan guarantees are not costly to the government for the great majority of factories which are healthy. (Loans taken to establish or expand the co-operative factories are generally paid back within a decade or so.) The one subsidy which does appear to be a major cost is the purchase of shares by

TABLE 3: STATEWISE AVERAGE REDUCED OVERALL EXTRACTION OF SUGAR (As Per Cent of Sucrose Present in Cane)

State and Region	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
North (from NE to NW)						
1 Bihar*	83.52	81.67	80.95	81.14	81.83	81.84
2 Uttar Pradesh***	83.02	81.09	81.42	82.25	82.74	82.40
3 Haryana	82.64	82.50	83.13	83.13	82.79	83.04
4 Punjab	84.80	84.28	84.27	84.84	82.11	83.23
West						
5 Maharashtra	83.87	83.21	83.67	83.64	83.49	83.87
All India**	82.66	81.89	82.08	82.71	82.69	83.39

Notes: \* Unweighted average for two zones: North and South Bihar.

\*\* Unweighted average for three zones: East, Central, and West UP.

\*\*\* Unweighted average for 21 states and zones.

Source: Indian Sugar Year Book, 1979-80, vol I, part II: 61, and 1981-82, vol I: 312.

TABLE 2: STATEWISE AVERAGE RECOVERY OF SUGAR AS PER CENT OF CANE (BY WEIGHT)

State and Region	1977-78		1978-79		1979-80		1980-81		1981-82		1982-83	
	C	T	C	T	C	T	C	T	C	T	C	T
North (from NE to NW)												
1 Bihar	—	9.16	—	8.86	—	9.11	—	9.17	—	9.00	—	8.32
2 Uttar Pradesh	8.95	9.06	9.22	9.28	9.79	9.77	9.43	9.47	8.91	9.13	9.58	9.67
3 Haryana	8.25	8.12	8.83	8.69	8.97	9.35	8.85	8.43	8.77	8.59	10.20	9.47
4 Punjab	9.32	9.02	9.62	9.43	10.32	10.14	8.90	8.67	9.90	9.71	10.76	10.62
West												
5 Maharashtra	10.90	10.89	10.96	10.95	10.65	10.60	11.07	11.04	10.71	10.70	10.97	10.95
All India	10.11	9.59	10.31	9.78	10.30	9.88	10.51	9.98	10.08	9.66	10.36	9.95

Notes: C = co-operative factories.

T = total factories in the state (co-operative, private and state-owned).

Source: Co-operative Sugar (January 1985): 292.

the state government and the National Co-operative Development Corporation, since often no dividends are paid on these shares. The reason for this is that the farmer-members receive their share of net revenues in the form of high cane prices. Except for those earnings which are set aside for reinvestment (and a considerable amount of capital formation has taken place in this manner, amounting to more than Rs 850 million or \$ 85 million by 1980, according to the Maharashtra State Co-operative Sugar Factory Federation [MSCSFF 1980: 97]), most of the rest are disbursed in the form of high cane prices. Frequently, no dividends are paid to the shareholders, including the government.

It is possible to make a rough estimate of the income foregone by the government as a result of unpaid dividends. In 1977-78, for example, the government held shares worth Rs 390 million in the co-operative sugar factories, not counting those shares which had been redeemed (Director of Sugar 1978a: 7). Let us assume that no dividends were paid that year. If this investment had been in the form of a loan, it would have fetched perhaps Rs 39 million (at 10 per cent per year) or Rs 58.5 million (at 15 per cent) in annual income for the government. (We make no effort at this stage to estimate more precisely what the interest rates on such loans would have been.) Let us say that the interest foregone was equivalent to about Rs 50 million, or about \$ 5 million, per year. Had this amount been charged to the co-operative factories, their total costs would have increased by less than 3 per cent. (In 1977-78 the Maharashtra co-operatives produced 1.822 million metric tons of sugar at an average cost of Rs 927 per ton, for a total cost of Rs 1,689 million or about \$ 169 million [Director of Sugar 1978a: 20; 1978b: 5].) This sub-sidy does make a difference, then, but hardly a decisive one for the co-operatives as a whole. Unless the withdrawal of this subsidy coincided with one of the periodic troughs in the sugar cycle, the additional 3 per cent cost could be absorbed with little difficulty by most of the factories. As far as we can tell, this is the largest sub-

sidy which the co-operative factories receive.

Or at least the largest positive subsidy. In order to put this subsidy in perspective, we should also note that the co-operative factories (as well as the few private factories operating in Maharashtra) are the recipients of a large negative subsidy from the central government: in other words, they pay a heavy subsidy to that government. This subsidy is extracted in the form of differential sugar prices. The central government normally compels all the sugar factories in the country, both private and co-operative, to sell 65 per cent of their output to the government for distribution at low prices through a system of ration shops. However, this 'levy sugar' is not purchased at a uniform rate: different rates are set for different regions of the country. Levy sugar prices are supposedly calculated on a cost-plus basis, so the inefficient sugar factories of the north are paid much higher rates than the more efficient factories to the west and south, as can be seen in table 6. Thus, in selling levy sugar to the central government, the co-operative factories are subsidising that government, the northern private factories, and the urban consumer.

It is possible to make a rough estimate

of the size of this subsidy in the following way. First we find the average difference between levy sugar prices in the north and Maharashtra for a given year, then we multiply this difference times the amount of levy sugar produced by the Maharashtra co-ops. For purposes of illustration, we again use the crop year 1977-78, because data on production costs happen to be available. In that year, the average levy sugar price in the north was Rs 1,910 per ton of sugar; the corresponding price in Maharashtra was Rs 1,646 (see table 5)\*. This means that a ton of levy sugar produced in northern India received a bonus of Rs 264 over the levy sugar produced in Maharashtra. The co-operative factories in Maharashtra produced 1.822 million tons of sugar that year, of which 65 per cent, or 1.184 million tons, had to be sold as levy sugar. Multiplied by the rate of Rs 264 per ton, the bonus paid for northern sugar, the total income foregone through differential pricing comes to Rs 313 million (about \$ 31 million) for that year. In other words, the co-operative factories in Maharashtra were forced to pay roughly this amount as a subsidy to the central government, the northern private factories, and the urban consumer. This, of course, far out-

TABLE 5: LEVY PRICES FOR D-29 GRADE SUGAR EXCLUDING EXCISE DUTY

Region, State and Zone	1977-78 Levy Prices (Rupees/100 Kg)			1977-78 Sugar Production	
	Government Order of 22-12-1977	Government Order of 1-3-1978	Unweighted Average for 2 Periods	Thousand Tons	Per Cent of Total Northern Production
North					
1 Bihar North	217.24	235.27	226.26	277	11.6
South	274.60	292.63	283.62	9	0.4
2 UP East	202.91	220.94	211.93	475	19.8
Central	168.15	186.18	177.17	762	31.8
West	163.79	181.82	172.81	624	26.1
3 Haryana	169.73	187.76	178.75	148	6.2
4 Punjab	214.75	232.78	223.77	99	4.1
Total North			191.04*	2394	100.0
West					
5 Maharashtra	155.56	173.59	164.58	2095	—
All India average	169.87	187.90	178.89	6461	—

Note: \* Weighted according to per cent of northern sugar production in each zone (column five). Source: Co-operative Sugar (January 1985): 291, 297.

TABLE 4: STATEWISE AVERAGE CAPACITY UTILISATION (AS PER CENT OF INSTALLED CAPACITY)

State and Region	1979-80		1980-81		1981-82		1982-83		1983-84	
	C	T	C	T	C	T	C	T	C	T
North (from NE to NW)										
1 Bihar	—	48.7	—	57.2	—	100.1	—	106.5	—	64.7
2 Uttar Pradesh	56.5	66.1	69.1	78.7	131.5	131.3	111.9	125.1	94.2	102.3
3 Haryana	46.0	78.4	60.3	88.8	123.8	148.3	133.3	156.9	119.1	148.3
4 Punjab	110.8	94.6	94.6	66.2	172.9	169.3	177.1	171.6	177.1	165.9
West										
5 Maharashtra	77.1	74.9	103.9	102.5	146.7	145.8	147.2	145.7	96.3	94.2
All India	66.4	64.6	87.8	81.6	136.5	130.7	130.2	125.4	86.4	86.0

Notes: C = co-operative factories. T = total factories.

Source: Co-operative Sugar (January 1985): 293.



weighs the positive subsidy of Rs 50 million received from the state government. Had the Maharashtra co-operatives been paid at the same rate as the northern factories, their revenues from levy sugar sales would have increased by 16 per cent. Conversely, if the cost of this negative subsidy had been included in the calculation of total operating expenses (Rs 1,689 million as shown above), the latter would have been raised by 18.5 per cent. It is evident, then, that this subsidy is very costly to the co-operative factories.

It should also be noted that the high levy sugar prices paid to the northern factories were still well below the average price of sugar on the open market, which was Rs 3,450 per ton in Bombay during 1977-78 (Indian Sugar 1979-80, Vol I, Part II: 52). We do not see any easy way to estimate what the open market price would have been if the levy system had been abolished, thus tripling the supply of sugar available on the market. The equilibrium market price might have fallen below the bonus price of levy sugar in the north. However, if the differential pricing of levy sugar keeps prices artificially low in Maharashtra, it also keeps production artificially high in the north. In a competitive economy, sugar production would have fallen in the north, reducing total supplies on the market, and thus the equilibrium price might have been Rs 2,500 per ton or even more. If we compare this estimate of Rs 2,500 with the levy sugar rate in Maharashtra (Rs 1,646 per ton) and calculate again the total income foregone by the co-operative factories, it comes to Rs 1,011 million per year—say about \$ 100 million. This is an extremely rough estimate, but it illustrates the point that the co-operative factories in Maharashtra, far from being net beneficiaries of state intervention, are compelled to subsidise the central government, the northern private factories, and the urban consumer at a fairly heavy rate.<sup>5</sup>

To summarise the points in this section, the technical efficiency of the co-operative sugar factories in Maharashtra is much higher than the average for the northern private factories, in part due to locational advantages. A number of co-operative fac-

ories have run at a loss, but a higher proportion of northern private factories have done the same. Moreover, loss-making is inherent only in co-operatives which have been badly sited in terms of access to adequate cane supplies. Turning to the difficult problem of measuring subsidies to the co-operatives, in the case of healthy units, most of these subsidies are not a significant cost to the public. However, there is one subsidy which is costly: the government of Maharashtra has purchased shares in the co-operative factories, for which it does not receive dividends. In estimating the size of this subsidy, however, we find it is smaller than the negative subsidy which flows out of the co-operative factories to the central government and thence to the inefficient private factories of northern India. This negative subsidy is created through the pricing system for levy sugar, which the central government purchases at much higher prices from the more inefficient factories.

Our conclusion is that the occasional problems of the co-operative factories are not inherent in the co-operative organisation as such, but rather stem from the political environment in which they operate (and are thus remediable, in theory, by better policy choices). At the broadest level, the central government's sugar pricing system creates problems for the whole industry, due to its lack of mechanisms for damping down the production and price fluctuations which characterise the sugar cycle (Harrison 1981). Moreover, levy price discrimination against efficient units harms the co-operative factories in Maharashtra while protecting inefficient private factories in the north. Finally, the state government has encouraged a number of co-operative sugar factories for political reasons, leading to the establishment of several weak units without adequate cane supplies in their vicinity. The state government is then forced to subsidise these units in various ways, at least temporarily. However, the healthier units have shown that they can function very efficiently without subsidies.

Thus in a national sugar economy which combines an unusual set of cane and sugar enterprises, the co-operative sugar factories

of western India have established themselves in a very competitive position. They are not harried to any great extent by swarms of *gur* units draining off their cane supplies, nor are they faced with serious competition from most of the private sugar factories. The key to their success has been the resolution of the awkward cane supply relationship which weakened the Indian sugar industry from its inception.

This explanation of the success of co-operative sugar factories is very general, however. We must also ask another basic question, which pertains not to sugar co-ops specifically but to all co-operatives generally: how is it possible for the members to co-operate? What prevents the big farmers from exploiting the co-operative to the disadvantage of the smaller ones?

### III

#### Basis for Alliance

The argument of this section is that the co-operative sugar factories in Maharashtra are able to function efficiently due to a successful alliance between large, medium and small cane growers. The explanation for the success of this alliance is two-fold: First, there are technical and economic factors within the enterprise itself which compel the larger farmers to promote the steady participation of the smaller ones. Second, the structure of agrarian relations in the region as a whole is favourable toward pragmatic innovation and a sense of common purpose among large and small farmers. These factors are explained in this section, and they are tested in the next section by comparison with other kinds of co-operatives in other regions. These comparisons show that both the internal structure of class interests and the external environment of agrarian relations help determine the success or failure of co-operatives.

First, consider the internal factors, specifically the class interests of small and large cane growers and the benefits they receive. Cane growers in a given area, say 15 to 100 villages, form a co-operative factory. The vast majority of growers hold three

TABLE 6: DISTRIBUTION OF SHARES OWNED BY MEMBERS OF CO-OPERATIVE SUGAR FACTORIES IN MAHARASHTRA STATE (1977-78)

	Number of Members with Shares Equivalent to Annual Cane Acreage of					Total	Units
	0.5-1.0 Acre	1.5-2.0 Acres	2.5-3.0 Acres	3.5-4.0 Acres	4.5-9.0 Acres		
Distribution of members by annual cane acreage	1,11,045	61,310	25,260	11,704	14,569	2,23,888	Number of of members
Estimated average annual cane acreage in each column	0.75	1.75	2.75	3.75	6.75	1.80	Acres
Estimated total annual cane acreage in each column (line 1 multiplied by line 2)	83,284	1,07,293	69,465	43,890	98,341	4,02,273	Acres
Per cent of estimated total annual cane acreage (line 3) in each column	20.70	26.67	17.27	10.91	24.45	100	Per Cent

Source: Maharashtra State Co-operative Sugar Factory Federation 1980:94, 102-03.



shares or less, each share equivalent to one-half acre of annual cane production. Sugarcane is usually grown on a three-year rotation with other crops, so annual cane acreage is equivalent to at most one-third of the grower's perennially irrigated land. In other words, three shares (at one-half acre of cane apiece) are equivalent to 1.5 acres of annual cane, which corresponds to at least a 4.5 acres holding of irrigated land. Not all of the small shareholders are small landowners, since shares are sometimes divided among several family members; but the majority of shareholders are certainly small- and medium-scale farmers, owning less than 10 acres of irrigated land.

Individually, the small and medium growers supply insignificant amounts of cane to the factories; but collectively, they supply perhaps 40 or 50 per cent or more of the total cane. This can be demonstrated with estimates derived from the distribution of shares owned in the co-operative factories (table 6). The top row in this table gives the distribution of shares owned in 1977-78 among all producer-members (cane growers) in 57 co-operative factories. According to these figures, 88 per cent of the members grow three acres of cane or less (that is, they hold six shares or less). Because each share is equivalent to one-half acre of annual cane production, it is possible to make a fairly close estimate of the average annual cane acreage among the shareholders grouped in each column. For example, the 1,11,045 shareholders in the first column must hold either one or two shares, equivalent to either 0.5 or one acre of cane. Taking the simple mean between these limits gives an estimated 0.75 acre per shareholder, which cannot be very far from the real value. Likewise for the next three columns. The only column which presents a problem is the fifth one, for the upper limit beyond 4.5 acres is not given in the original source. We have estimated this upper limit to be nine acres on the basis of other evidence<sup>6</sup> and then taken the midpoint between 4.5 and nine acres as our estimated average. Once these estimates in the second row of table 6 are in place, it is easy to calculate the total and percentage distributions of annual cane acreage, as given in the bottom two rows. This shows that 21 per cent of the cane acreage is owned by small farmers with at most one acre of annual cane (equivalent to three acres of irrigated land). Likewise, 65 per cent of the acreage is owned by small- and medium-scale farmers with a maximum of three acres of annual cane (equivalent to nine acres of irrigated land). (Definitions of medium-scale farmers might range upward to fifteen acres or so, but we are adopting a conservative approach.)

The data and estimates in table 6 must be treated with some caution, for the effect of the state's land ceiling act was to cause farm families to divide up the registered ownership of their lands, which were previously

registered in the name of the eldest male. Thus, while the table gives a reasonably accurate estimate of the distribution of lands held by individual shareholders, it underestimates the proportion of land held jointly in large families with large landholdings, since such families may include several members with, say, four or five acres of annual cane, giving a total irrigated landholding of 30, 50 or even more acres. Let us suppose that the wealthier families (those with more than three acres of annual cane in the table) actually hold twice the amount of land suggested by the distribution of individual shareholders. That is, suppose that these families hold 70 per cent instead of 35 per cent of the cane land. This is a generous and unlikely estimate, but it makes an important point. Even if we stretch our estimates that far, a significant share (30 per cent) of the total cane land still remains with the small- and medium-scale landholders. At this stage, we cannot make a more accurate guess at the familial distribution of cane lands among co-operative factory members, but the table indicates quite clearly, in any case, that there is a large "middle class" with a significant share of the cane supplied to these factories.

There is no question that the small- and medium-scale farmers benefit from the services which the sugar factories provide: these factories guarantee crop loans from village credit co-ops and provide automatic repayment; they help to establish ancillary organisations, such as lift irrigation societies, poultry co-ops, etc; they distribute improved seed, chemical fertiliser, and research information; they provide soil testing services; they organise the harvest and transport of cane through contract teams; they process the crop into sugar; and they market the sugar and distribute the profits in the form of high cane prices to the member-farmers. (In addition, the factories provide many other economic and social services, as described in the Appendix.) The importance of the co-operative sugar factories to all their members is indicated by the fact that at least 75 per cent of the members attended those annual general body meetings which we have observed (where questions were raised from the floor and decisions were sometimes vigorously debated) and that nearly 100 per cent of the members voted in the regular elections of the boards of directors (Baviskar and Attwood 1984).

A sample of 85 farmers near one co-operative factory was surveyed by Attwood in 1970 and again in 1979 (Attwood 1979a; forthcoming). This survey documented the general benefits obtained from the expansion of the local economy, caused in large part by the success of the sugar factory, which began operating in 1957. Fully 64 per cent of the small farmers (those with 2.5 acres or less of irrigated land) had a higher standard of living at the end of the decade, and 16 per cent had expanded their holdings.

(The average acreage expansion by small holders was much greater than that of the medium- and large-scale farmers included in the same survey.) Again, 70 per cent of the small holders invested more than Rs 1,000 per family during the 1970s, and their average rate of investment per acre was much higher than that of the medium- and large-scale farmers; Rs 5,000 as compared with Rs 2,000 per acre for the latter. (Much of the investment was in agriculture, but a lot was also in ancillary business activities.) Thus the small farmers clearly benefited from membership in the co-operative factory; and they had no general complaints about its operation.

Each large farmer certainly grows more sugarcane and earns a larger total income through supplying cane to a co-operative factory, but he could often earn such profits even before the co-operative factories were organised (Attwood 1979a; 1984a; 1985; Baviskar 1980). A small cane grower earns less total profits, but the co-operatives help to make him viable. Since the big farmers would profit with or without the co-operative factories, but the small farmers might not survive at all, it can be argued that the latter benefit even more than the former.

The large farmers dominate the elected boards of directors, and they use these elected positions to manoeuvre for even greater power in state party politics (Baviskar 1980). These 'sugar barons' are wealthy and powerful figures in the countryside, but they are certainly not a closed or reactionary elite. Many of the sugar factories function quite efficiently, despite their factional quarrels, just because there is no closed elite. Any group of leaders which impairs the operation of the factory will be thrown out in the next election. The elected directors, in consultation with their technical and managerial employees, make the basic policy decisions and are held responsible for them. Leaders respond first to their most loyal constituents (members of the same kin or caste groups), but they also know that they must be able to appeal to a diverse set of other constituencies in order to get re-elected (Attwood 1979b).

What else holds these leaders in check? What prevents an oligarchy of large farmers from exploiting the co-operative factories to the detriment of other members? Part of the answer lies in the technical characteristics of the production process. As mentioned in the first section, sugarcane is most efficiently processed by heavy industrial machinery. The co-operative sugar factories process from one thousand to several thousand tons of cane every working day. Truly efficient production, then, requires large-scale, expensive machinery. Such machinery cannot be run at a profit unless it is used at full capacity during the crushing season.

Now, what would happen, given these constraints, if the large cane growers (who are also the co-operative leaders) decided to

manipulate the factory system primarily for their own advantage, to the exclusion of the small and medium growers? The answer is clear.

If the latter felt they were being treated unfairly, they would reduce their cane production or use their cane to manufacture gur, as happens so often in northern India. If a large number of small and medium farmers stopped supplying cane to a factory, two results would occur. First, the capacity of the machinery would be substantially underutilised, due to the loss of a large share of the total members' cane. Second, the factory would not make profits, and these profits could not be paid to the growers in the form of high prices for their cane. In other words, the large growers who govern the factory would be cutting their own throats if they tampered with the cane supply system to the disadvantage of the small and medium growers. Controlling, as they do, at least 30 per cent and perhaps 50 or 60 per cent of the total cane supply, the small and medium growers collectively have a potential veto over the survival of the co-operative factories. The leaders face a simple choice: run an efficient factory, with a fair cane supply system, or else operate an unfair supply system which leads to financial ruin for the factory. Every member of the co-operative factory knows that these are the operative conditions, and that they stem from the basic technical constraints just mentioned: the necessity of large-scale industrial equipment, owned by the cane growers, which can only pay for itself if used at full capacity; and the necessity of a stable and therefore strict and fair cane supply system.

Since the co-operative factories were established and vigorously expanded by the large growers acting as leaders for the other farmers, it is necessary to explain not only the forces leading toward full capacity utilisation but also those leading toward expansion. In the early years of the co-operative factories (the 1950s), the main force impelling the cane growers to organise these factories was undoubtedly the desire to find a wider market for their cane—that is, to find an alternative to the gur market (Baviskar 1980). This was a classic case of investment stimulated by potential forward linkages (cf. Hirschman 1958). Once the co-operative factories proved successful, other forces came into play to encourage expansion of existing capacity. As in their industries, potential economies of scale offered economic rewards for expansion. In addition, the co-operative factories became established as powerful political institutions, and as a result, the factory leaders became interested in expanding their constituencies. Once the new capacity was installed, of course, the leaders were impelled to maintain full utilisation by the forces described above.

As we shall see momentarily, however, the capacity-utilisation thesis is not sufficient to explain the performance of co-operative

sugar factories in the other parts of India, where they tend to be less successful. Consequently, we shall also argue that the success of the co-operative factories in Maharashtra depends partly on their environment—on the structure of agrarian relations in this region.

As a dry region with a very insecure agricultural system, Maharashtra historically had relatively low population densities and a comparatively loose and competitive stratification system. As in the semi-arid northwestern region (Punjab, Haryana, and western UP), the villages were dominated by clans of fighting 'yeoman peasants'. Within these clans, social mobility was common, and enterprising leadership was often rewarded (see Attwood 1984b, 1987). In addition, these clans of land holding peasants belong mostly, though not entirely, to a single, loosely-defined caste, the Marathas. The Maratha caste possesses a common cultural and political identity which makes it easier for large and small farmers to perceive common interests. Consequently, while the structure of caste and clan relationships does not necessarily promote widespread solidarity among Marathas, it at least makes possible pragmatic alliances between large and small farmers wherever the situation warrants. Large farmers' skills and resources are seen as necessary to organise and manage the co-ops, while participation by the small farmers is seen as necessary for the reasons just discussed.

This pragmatic alliance-making has long been evident on a small, everyday basis in the customary arrangements for organising plow teams and for sharing the use of irrigation wells (ibid). It was also a powerful adaptive and innovative mechanism, even before the co-operative sugar factories appeared on the scene. Beginning in the 1920s, for example, a number of voluntary organisations for promoting rural education spread across western Maharashtra (Kakrambe 1983). With government support, co-operative credit and marketing societies also grew up at that time. Finally, there was a vigorous non-brahmin movement, which grew in opposition to the rising political power of urban elites. (See Attwood 1974a; 1974b; and 1979b for details.) This vigorous growth of new institutions, organised and promoted by rural leaders, indicated good prospects for the co-operative sugar factories which came later, since these earlier institutions provided political and administrative experience for the leaders.

There was also another way in which the regional environment improved the chances for successful co-operatives. Like the semi-arid northwest, western Maharashtra benefited over the last century from the construction of several large-scale canal irrigation systems. These temporarily created what we call an 'irrigation frontier' (Attwood 1980; 1985). As in the northwest, this frontier encouraged migration, economic mobility

and innovation. The northwest is now famous as the heartland of the green revolution in wheat production and, consequently, as a region where small- and medium-scale industries are growing fast. The geographic scope of the irrigation frontier in Maharashtra was more limited because irrigation was far more expensive than in the northwest. Nevertheless, economic mobility and innovation within the canal areas have been equally intense. We attribute this to the historically loose and competitive stratification system, combined with relatively low population density and high labour costs (due to the aridity of the region), combined with the new economic opportunities due to irrigation. The result has been a great deal of economic mobility, migration and innovation, all helping to soften the perceived differences between rich and poor farmers.

The co-operative sugar factories arose, then, out of a long series of economic and political innovations which began after the first large-scale irrigation canal was constructed in this region in 1885. Many of the pioneering innovations were made by small farmers, who proved the quality of their ideas by becoming big farmers (Attwood 1979a). A local economy open to this type of competitive achievement enabled new organisations, like the co-operative factories, to be created and tested by those whose interests were most at stake, the farmers themselves.

To summarise the argument of this section, the success of the co-operative sugar factories depends on an effective alliance between large and small cane growers. The success of this alliance depends, in turn, on two sets of factors, internal and external. The internal factors revolve around the technical necessity for using heavy industrial machinery, owned by the farmers, which can only pay if used at full capacity. Full capacity, in turn, can only be attained if the small farmers are encouraged to supply cane on a regular basis. The external factors, on the other hand, revolve around the regional structure of agrarian relations (including clan, caste and class relationships) and also around the impact of the irrigation frontier.

#### IV

#### Comparisons with Other Co-operatives

At this point, it becomes possible to examine similar kinds of co-operatives in other parts of the country, in order to see whether the foregoing explanations bear up under co-operative testing. The first comparison will be with the co-operative cane supply unions of northern India, mentioned in the first section.

These cane supply unions were organised in the late 1930s and run entirely by government officials: most of the cane growers felt that they had little or no control over the activities of their unions (Hirsch 1961:

111-16). Though each union had officers elected from among the growers, these officers did not seem to be active in the administration of the unions. Moreover, it seems likely that the officers were, and perhaps still are, the same middlemen who used to procure cane for the private factories on a more informal basis (see Amin 1984: 266). For example, Hirsch (1961: 100-01) tells the story of a landlord who was approached by both mill owners and government officials to become a union director in 1937. Amin (1984: 272-77) reports that, when the cane supply unions were getting started in the late 1930s, local landlords and moneylenders often managed to subvert the controls which the unions were supposed to exercise over cane deliveries and payments, and complaints were made by the small growers against dishonesty in many of the unions. Hirsch (1961: 111-116) mentions later widespread accusations of favouritism in the allocation of cane purchase slips; and he goes on to describe an unsuccessful attempt by some 7,000 cane growers to boycott their unions and sell cane directly to the factories.

Verma (1983: 56-77) has studied the inequities in one co-operative cane supply union in central UP. This union was always helpful to the big cane growers, arranging early harvests, timely payments, and irrigation equipment loans for them. Some of these benefits (except the loans) also went initially to the small growers, but their benefits have declined drastically since about 1950. The large farmers have conspired with the mill owners and the government bureaucrats who run these co-operatives to take most of the benefits from the union's operations.

Why should the cane supply co-ops, dedicated to the common interests of the cane growers, work so poorly and unfairly in northern India, when the co-operative sugar factories work so well in western India? In the northeast, the old heartland of the sugar industry, it can be argued that the stratification system contributes to disunity among the cane growers. This is a region of predominantly wet rice agriculture, and like other such regions, historically had dense populations, rigid and polarised class systems, conservative landed elites, and few opportunities for rising village entrepreneurs (see Amin 1984; Ludden, forthcoming; Stokes 1978). It also appears that clan and caste relationships in the northeast, far from providing opportunities for alliances between large and small farmers, may intensify the economic divisions between them. That is, high-caste, non-cultivating landlords confront middle and low-caste tenants, small farmers, and agricultural labourers. The disparity of caste status and of economic skills and experience (since the high-caste landlords do not participate intensively in the production process) means that there is less cultural identity between rich and poor villagers to strengthen co-operative alliances.

In other words, agrarian relations and status distinctions appear to have set in a more rigid mould, inhibiting innovations and pragmatic alliance-making between classes.

However, the social environment does not completely explain the failure of the cane supply unions, for these unions have similar problems in the northwestern region, where the stratification system is looser and less polarised, as in Maharashtra (see Hirsch 1961: 111-16; Brass 1980).

In our opinion, the most crucial problem with the co-operative cane supply unions is that they assume common interests among the cane-growers but do nothing to create or strengthen those interests. The large farmers who dominate the co-operative sugar factories of Maharashtra must encourage a steady supply of cane from the small farmers, or else the factories will run at a loss, and the members will not receive good prices for their cane. In the case of the northern cane supply unions, on the other hand, there is no such complementarity of interests. The larger farmers are not injured if the small farmers are unable to sell their cane; on the contrary, they benefit from restricted competition. Since the larger farmers have no stake in the overall profitability of the private sugar factories, they have no stake in an equitable cane supply system. Their only rational goal is to seek to dispose of their own cane at the best time and the highest possible price.

This comparison between the northern cane supply unions, on the one hand, and the western co-operative sugar factories, on the other, reveals the frailty of much co-operative planning. It is, of course, well understood by planners that large and small farmers often have competitive or divergent interests. Much of the planning and exhortation assumes, however, that these divergences can be overcome either through bureaucratic controls or through the organised strength of the small farmers. Both, however, are extremely thin reeds on which to build a complex organisation. If the organisation does not create an economic reason for the large farmers to encourage the participation of the smaller ones, it may not provide even a semblance of efficiency, much less of equity.

If co-operative cane unions are doomed to failure, according to this analysis, then perhaps the north Indian sugar industry could be revived through the spread of co-operative sugar factories—a proposal which has received serious official consideration. However, if our portrayal of agrarian relations in the humid and densely populated northeastern region is at all accurate, it would appear that successful alliance building between small and large cane growers is less likely to occur there than in Maharashtra. This may account for the very slow rate at which co-operative factories have been established in the northeast.

In the semi-arid northwestern region, on the other hand, geographic conditions and

agrarian relations are similar to those in Maharashtra, so we would expect that co-operative sugar factories should be successful there. However, this appears not to be the case. Hirsch (1961: 58) even mentions a case where the cane growers declined to take over a "sick" factory and run it as a co-operative, despite encouragement from the government. The main reason seems to be that sugarcane is a less profitable and less important crop than it is in Maharashtra, so there is less incentive to overcome the organisational problems of the industry. The cool winters in the northwest mean that cane will not yield as well as it does in southern and western regions; and wheat, on the other hand, is a more successful crop than it is further south. Thus the farmers have not attempted to reshape their production systems (as they have in Maharashtra) to suit the demands of sugarcane (Attwood 1984a, 1985). On the contrary, they have followed a cost-minimising rather than yield-maximising strategy for cane, as shown in a stimulating paper by Batra (1987) on a co-operative sugar factory in Haryana.

In this part of Haryana, the labour used on sugarcane is arranged through an exchange of services between small and large farmers, involving several crops and resulting in constraints on the timing and quantities of labour used on the cane. Large farmers lend their tractors to small ones for quick plowing and replanting after the summer crops are harvested. In return, the small farmers provide labour on the large farmers' can fields later in the season. In addition, they provide harvest labour in exchange for cane tops, which serve as fodder for their cattle. This supply of exchange labour is limited both in total quantity and seasonal availability (*ibid*). The returns from cane (in competition with other crops, particularly wheat) evidently do not encourage the use of additional, paid labour. Thus sugarcane is grown on a low-cost, low-yield basis, unlike the situation in Maharashtra.

Since the cane crop is less paramount and since the relations of production are therefore shaped to fit other ends, it appears that the farmers in this region are less interested in the organisation and management of their co-operative sugar factories. These factories have not attempted to set up the centrally-organised harvest and transport systems created by the co-operative factories in Maharashtra, thus leaving the fundamental cane supply problem partially unresolved (*ibid*). If a co-operative is large, complex and expensive, and at the same time does not occupy a crucial position in the local production system, its organisational problems may be neglected by entrepreneurs preoccupied with other concerns.

As a third and final comparison, let us consider the famous Amul dairy co-operatives of Kheda district, Gujarat. As discussed at greater length in another paper (Baviskar and Attwood 1984), dairy processing on a

large-scale also requires expensive industrial equipment, necessitating full capacity utilisation in order to run at a profit. Moreover, milk is perishable like cane and must be processed quickly. This means, again, that the milk suppliers and the processing unit must have a stable and reliable relationship, perceived as fair by all concerned. If not, capacity utilisation will dwindle and profits will evaporate. Consequently, as in the case of sugar, milk processing provides the technical basis for an alliance between large and small farmers. Whether this alliance actually succeeds will depend, of course, on external factors such as the agrarian structure of the region and the extent to which the farmers are committed to dairy production. In the case of the original Amul dairy, it is clear that these factors were favourable, since (as with the co-operative sugar factories) Amul was established not through a government programme but through the initiative of local farmers and their leaders.

The milk co-operatives were organised initially by leaders from the enterprising caste of patidars. Patidars were relatively large farmers while barias and other castes were small farmers and share croppers. The patidars not only allowed but encouraged other castes to join the milk co-ops because more milk ensured greater profits. When the capacity of Amul dairy was expanded in 1956, 1964 and again in 1970, more and more villages in the district were included in the union. The new villages added to the union were outside the patidar-dominated Charotar area. This continuous expansion has meant that a majority of the village dairy co-ops are now controlled by barias. Thus, in the expansion of milk co-ops in Kheda district, there was a willingness to join hands with different castes and classes for a common purpose. It was in the interest of patidar big farmers to encourage a large number of small farmers from their own and other castes to participate. In other words, the milk co-ops in Gujarat share the main features of class interests and alliances with the Maharashtra sugar co-ops.

To summarise the argument of the last two sections, we have tried to show that the success of the co-operative sugar factories depends on an alliance between larger and smaller cane growers, and that this alliance is made possible by both internal and external factors. The internal factors are those compelling full capacity utilisation, which mean that the factory leaders must encourage small cane growers to remain loyal to the organisation. The external factors are those which shape the agrarian structure of the region, including the dynamics of clan, caste and class relationships, as well as the dynamics of irrigation and population. In comparing the co-operative factories in Maharashtra with other types of co-operatives in other regions, we have shown that both sets of factors must work together in

order to produce a successful class alliance and a healthy organisation.

## V

### Politics of Milk and Sugar

The preceding sections have sought to explain why the sugar co-ops work. Now let us consider how they work, in particular how they are led and administered. In doing so, we shall draw some brief comparisons with the politics of the dairy co-operatives in Gujarat, which we have also studied at first hand (see Baviskar 1987, forthcoming).

Sugar co-ops in Maharashtra and milk co-ops in Gujarat are among the few successful examples of co-operatives in India. It is significant that they both emerged due to local initiative at the same time, just before independence. The milk producers in Kheda district met at Samarkha village near Anand in 1946 and decided to form a milk co-operative. The sugarcane growers in Ahmednagar district held a meeting also in 1946 at Shrirampur town to form a co-operative sugar factory. In both cases, the leaders of the locally dominant castes (marathas in Maharashtra and patidars in Gujarat) took a leading part in setting up the co-ops.

However, these co-ops developed on different lines in other respects, particularly in their articulation with regional politics. A close-knit relationship emerged between sugar co-ops and state politics in Maharashtra, while milk co-ops in Gujarat were characterised by a disjunctive relationship. Politicians became stronger and managers and technocrats played a secondary role in the sugar co-ops, while it was the reverse in the case of the milk co-ops.

Cane growing is a vital activity for each sugar factory member. His entire economic life depends on it. As a result, each member is keenly interested in who controls the co-op. The factory is controlled and managed by an elected board of directors, who elect from among themselves the chairman and vice-chairman. From the beginning, the government of Maharashtra has followed a policy of allowing the boards to take all important decisions without any outside interference, so long as they function within the limits of the co-operative societies act. This makes the directors and chairmen very powerful indeed.

The position of director in a sugar co-op is characterised by prestige, patronage and power. Directors exercise patronage through the distribution of jobs and contracts to their kinsmen, castemen and fellow-villagers. They wield power as decision-makers affecting the lives of a large number of people directly or indirectly connected with the co-op. In addition, they also enjoy many fringe benefits such as using the factory's vehicles, guest house and other resources. The chairmanship of a factory is considered more important than a junior ministership in the state government; but the two are not

mutually exclusive. In some cases, the directorship of a sugar factory paves the way for membership in the legislature, and the chairmanship can lead to a ministership. In short, a leadership position in a sugar co-op is an avenue for political mobility.

The attractiveness of a directorship creates intense competition among the leaders. The elections to sugar co-ops are major political events in the state. In some ways, they create even greater excitement than the general elections. The leaders invest a lot of money, energy, organisation and other resources to get elected. The interest of the members is equally marked. The voting turnout is almost 100 per cent in these elections, in contrast to the apathy found in co-operatives elsewhere.

The co-operative sugar factories are but one structure of power at the local level. They are closely linked with other co-operatives, with local government councils, and political parties. The interlocking of power structures further intensifies the struggle for positions and makes politics all-pervading.

What are the implications and consequences of this close-knit relationship between regional politics and sugar co-ops in Maharashtra? The success of the sugar co-ops has strengthened the power of the leaders who control them. The elected leaders take all important decisions in these factories. The managers and technocrats, although highly qualified and well paid, play a secondary role. Over the years the elected leaders have acquired the knowledge and skills necessary for running a sugar factory, with the result that they are able to evaluate the advice given by technocrats and managers and often take decisions rejecting such advice. Because of their control over resources and easy access to ministers and higher government authorities, they often dominate over the local government bureaucracy.

The sugar co-ops have also strengthened the position of the dominant maratha caste. In every sugar factory there are shareholders belonging to a large number of other castes, such as malis, Dhangars, etc; but the marathas enjoy a clear superiority of numbers. Thus the majority of directors and chairmen are marathas. Since the marathas are also preponderant in other power structures, including the party and the government, the maratha leaders in the sugar co-ops have acquired a tremendous sense of confidence. One consequence is that they have brought about rapid development in the fields of education, health and other welfare activities in the areas where the sugar co-ops are located. (See Appendix)

While there is a close-knit relationship between sugar cooperatives and politics in Maharashtra, the relationship is disjunctive in the case of the Amul milk co-operatives in Gujarat. There is no intense competition to get elected either to the managing committees of the village milk co-ops or to the

board of directors of the district union. While the elections to sugar co-operatives in Maharashtra are heralded as big events, the elections to milk co-ops in Gujarat are very tame affairs. There is a general lack of interest in getting elected. This may be illustrated by the fact that in 700 out of 895 village societies in Kheda district, elections went uncontested in 1981-82 (A S Patel 1987).

The district Union (Amul dairy) is a famous and prestigious organisation. Its annual turnover is over Rs 750 million (about \$ 75 million). It includes hundreds of thousands of milk producers all over the district. However, its elected directors do not enjoy any significant powers; everything is decided by the managers and technocrats. Again, unlike in Maharashtra, there is no intimate relationship between the union and other structures of power, such as other co-operatives, local government councils, and political parties.

In the beginning, important state and national leaders had close ties with Amul, and their political links helped Amul get established. As Singh and Kelley (1981) have pointed out, these leaders used their political influence against the Polson dairy and later against the Aarey milk colony owned by the government. They secured generous loans and grants from the government and from international agencies. These leaders were also instrumental in mobilising the milk producers in the villages and expanding the area of operation of the union. As the union prospered, the political leaders' role declined and that of the managers and technocrats expanded. Although political influence was used for the benefit of the union, control over the union does not appear to have been used to advance the political fortunes of individual leaders, their factions, or their parties. One indication of this is that, although the Congress(I) is in power in the state as a whole, the union is still headed by leaders who are identified with the opposition Janata party.

So far there have been few attempts to explain this phenomenon. In a recent paper, A H Somjee (1982: 130) notes that, as the dairy expanded, the decisions became more technical and complex. The 'knowledge gap' between the technocrats and politicians gave the former an upper hand. The perishability of milk required the organisation to work efficiently and strictly by the clock. Only the technocrats, given a free hand, could provide that efficiency.

The perishability of milk does not make a convincing argument, however. Sugarcane, once harvested, is also perishable, and it requires equally efficient organisation to harvest and process. The local leaders in Maharashtra were also initially ignorant about factory technology and dependent on the technocrats. In course of time, they acquired the necessary knowledge to enable them to take their own decisions. In the case of Amul, even after 35 years of experience,

such leaders do not seem to have emerged.

In a recent paper, Sujata Patel (1984) has provided another explanation for this phenomenon in terms of political rivalry between the two major castes in the district, patidars and barias. She argues that domination by technocrats is a result of deliberate policy on the part of the patidars to maintain their control over the organisation *vis-à-vis* their political rivals, the barias. Amul is very much a creation of the patidar patels—the dominant landowning and enterprising caste in the district. Its chairman and the majority of directors have always been patidars. Initially, the village societies affiliated to Amul were concentrated in the fertile, irrigated Charotar area dominated by patidars. As the capacity of the dairy expanded, its area of operation expanded to more distant villages in the district. Most of the new villages were baria-dominated. As compared to the patidars, barias are poorer (mostly small landholders and agricultural labourers) but numerically stronger. They constitute 45 per cent of the district's population as against the patidars' 14 per cent. Already 55 per cent of the village societies have baria chairmen while patidars are chairmen only in 37 per cent (A S Patel 1987). The patidars know that, in an open political contest they could not win against the barias, as they have found by experience in the state assembly and cabinet. They, therefore, deliberately attempted to depoliticise the affairs of Amul to avoid its being taken over by the barias.

There is, no doubt, a great deal of plausibility in this argument, but the question still remains why the barias have been taken in by this strategy. Why have they not tried to overthrow the patidars and capture the union, even if the technocrats were dominant? After all, they have been pushing the patidars from positions of power in the state government and the Congress party. In a full scale political contest in Amul, the patidars would be the losers. It is, therefore, in their interest to keep Amul free from open political rivalry. But the question still remains, why the barias have not seen through this strategy and made a bid to capture Amul. Since the barias are with the Congress(I) and dominate the state government, and the local patidars are associated with the opposition Janata party, this should provide an additional incentive for them to remove the patidar control over Amul.

Let us consider some alternative explanations. It is easier to understand the peculiarities of milk and sugar politics if we compare them with each other. In the first place, it is clear that the environments in which the co-operatives are embedded (the agrarian systems of caste, class and power relationships) exert a strong influence on co-operative politics. The marathas have unquestioned dominance in the sugar co-ops of Maharashtra, whereas the patidars and barias must arrive at a balance of power in

the milk co-ops of Gujarat. How they arrive at this balance is explained, we believe, by two internal differences between the milk and sugar co-ops (Baviskar, forthcoming). In the first place, a sugar co-operative is a single-tier organisation. Each cane grower votes for the board of directors on the basis of 'one member, one vote'. The members are also in regular touch with the factory for their own business, meeting the managers and technocrats as well as the chairman and other directors.

The milk co-ops, on the other hand, are two-tier organisations. There is the milk producers' co-op at the village level and the co-operatives union at the district level. Individual milk producers are members of their village co-ops, and these co-ops in turn are shareholders of the district union. Elections to the union board of directors are indirect. Each village co-op nominates one representative to vote in these elections; in most cases, the chairman gets nominated. The 895 representatives then elect twelve union directors. This restricts the scope for individual milk producers to participate in the elections, and the election campaign is a relatively quiet affair. The milk producers have little direct contact with the district union. Thus, the nature of the organisation influences the relative degree of involvement of sugarcane growers and milk producers in their respective co-ops.

In the second place, the amount of income derived from sugar and milk also influences the degree of interest and involvement in the politics of these co-ops. For almost all members of a sugar co-op, sugarcane is a major source of family income. Since the livelihood of the family depends on the price paid for sugarcane and on other benefits derived from the co-op, the members take a keen interest in its affairs. Although income from milk is an important addition to a family's resources, for most households it is only a secondary source. This leads to subdued interest and less intense involvement in the politics of milk co-ops.

If co-operative politics is shaped by the importance of the co-operative as a source of income, then we might also expect that the nature and intensity of sugar politics varies with the importance of sugarcane as a crop. As mentioned earlier, this is demonstrated by Batra's (1987) study of a co-operative sugar factory in northwestern India. Sugarcane is a crop of secondary importance in this region; and as a result, the elected factory leaders seem eager to use their positions as a source of graft but leave the policy decisions to the managerial staff. Consequently, this co-operative factory shares many of the weaknesses of the northern private sugar factories, particularly in its lack of centralised harvest and transport system.

We conclude from these comparisons that there is no general rule about the optimal balance of power between co-operative

politicians and technocrats, nor about the healthiness of linkages between co-operatives and politics in other arenas. The argument has been made that intense political competition in Maharashtra's co-operative sugar factories creates a system of checks and balances against the power of any single clique of local leaders, forcing these leaders to attend to the needs of their constituents, to broaden their alliances, and to keep their factories running efficiently (Baviskar 1980; Baviskar and Attwood 1984; Attwood, forthcoming). However, co-operative politics operates in less salutary ways in northern India, where sugarcane is less important and where the agrarian class structure (particularly in the northeast) is also less conducive to open competition and to checks on the abuse of local power positions. On the other hand, it is possible for co-operatives like the Amul dairy to function quite effectively without intense political rivalry among the leaders. In short, the internal patterns of co-operative politics and also the ways in which these patterns interlink with other political arenas depend, first of all, on the regional agrarian systems in which the co-ops are embedded, and secondly, on the co-op's internal organisation and the amount of income which it represents to its members.

## VI

### Conclusions

This paper presents an exercise in the comparative method, which has been used to explain why co-operatives of a certain type in a certain regional setting have been highly successful, whereas many other co-operative (and private) enterprises have not been so successful. In the first section, we compared the co-operative sugar factories of Maharashtra with other kinds of sugar enterprises. Here we noted that the co-operative factories, by uniting the interests of cane growers and factory owners, have overcome the unstable cane supply relationship which has been a basic weakness in the private sugar industry for many decades. Consequently, as shown by quantitative comparisons in the second section, the co-ops extract more sugar at lower cost than the private factories. Moreover, the co-ops must pay for their efficiency by subsidising the private factories through a system of discriminatory sugar prices.

Only through such comparative analysis does it become possible to determine whether co-operatives are really necessary and useful in a given economic niche. The question which must be asked of any given type of co-operative is this: does it provide a better integration than alternative enterprises of the diverse interests connected with a particular product or service? If not, the members may find that enterprises in the private sector provide them with better services.

In the third section, we considered the alliance between large and small cane growers which underpins the co-operative sugar factories. We found that this alliance is rooted in a combination of internal and external factors. The latter include an agrarian system in which large and small farmers belong mostly to the same caste and thus share a cultural and political identity. Moreover, the 'irrigation frontier' in this region has stimulated economic mobility, migration and innovation, further softening the perceived differences between rich and poor farmers. The internal factor which promotes alliance between large and small cane growers is the need to invest in heavy industrial equipment for processing sugarcane. This heavy equipment will bring a profit only if it is used at full capacity; consequently, the big cane growers who control the sugar factories find it in their interest to encourage the steady participation of the small growers.

In the fourth section, this reasoning was extended to explain the success of another set of co-ops where heavy industrial equipment is required—the dairy co-ops of Kheda district in Gujarat. We also showed, through a comparative analysis of co-operative cane supply unions in northern India, that ownership of this heavy equipment is the crucial factor. Without such ownership, the big cane growers have no interest in encouraging participation by the smaller growers, since their profits do not depend on the capacity utilisation achieved by the private factories. Likewise, we also showed, through comparison with a co-operative sugar factory in northwest India, that the requisite pattern of ownership is still not enough to ensure success if the potential returns to the co-operative leaders and members are too low, due to the secondary value of the crop, to offset the costs of managing the enterprise carefully.

Finally, in the fifth section, we compared the style of leadership and politics in two sets of successful co-operatives, the sugar factories of Maharashtra and the dairies of Gujarat. Here we have shown that co-op sugar factories are arenas of intense political competition by the leaders and widespread participation by the members. In contrast, the dairy co-ops have much lower levels of political participation and are governed by technocrats rather than by village leaders. At least two factors are responsible for this difference. First, sugarcane is a much larger source of cash income than milk, causing the cane growers to be more actively concerned with the operation of their factories. Second, the sugar factories are accessible on a daily basis to their members, whereas the dairy co-ops are two-tier organisations, with the central processing plant located far from most of the villages which supply it. Thus it is less feasible for the village leaders and members to keep constant tabs on the management of the dairy co-ops. This sec-

tion shows the need for comparative organisational analysis in promoting co-operatives, since the leadership pattern which is appropriate in one type may not be at all effective in another, even when other conditions are similar.

Co-operatives in different parts of the world, including India, have suffered from inadequate understanding and wrong expectations by planners and policy makers. Co-operatives have often been imposed from above as a remedy to solve all problems—to increase production, raise incomes, and bring about equitable distribution. Planners often assume that people will co-operate simply because it is in their interest to co-operate. If the co-operatives fail, either the people or the co-operative form of organisation is blamed.

Social scientists have not been very helpful in correcting the perspectives of planners and policy makers. Most studies of co-operatives and their performance tend to be mechanical, judging them by the volume of business without going into the deeper processes (the informal organisation of conflicts and alliances) involved in the functioning of these organisations.

The comparative analysis presented here reveals the frailty of much co-operative planning, exhortation, and analysis. It is often assumed that merely organising a co-operative will create a framework of common interests between larger and smaller farmers. However, we have emphasised here the importance of understanding the technical and social bases on which an alliance might be grounded. Class interests and regional politics are rarely discussed in co-operative planning and analysis, except when it is necessary to explain why co-operatives have failed. We are proposing here that this type of analysis is also necessary in order to determine which co-ops will succeed and why.

Only through comparative organisational analysis does it become possible to determine whether co-operatives are really necessary and useful in a given economic niche. There are three basic comparative questions which must be answered to decide whether co-operatives are likely to succeed in a given context. The first question is whether a certain type of co-operative can solve vital organisational problems which have not been solved by competing enterprises of other types. If not, the co-ops are less likely to succeed, regardless of how desirable they might seem on ideological grounds, since the members may find that private enterprises provide them with better service. The second question is whether the more powerful members will have any real economic interest in encouraging participation by the less powerful members. If the larger farmers have an economic stake in the participation of the smaller ones, the co-operative is more likely to be run equitably and efficiently. If the interests of the large



farmers run in the opposite direction, co-operative performance will probably be inequitable, regardless of the administrative controls which are applied. The third question is whether a certain type of co-operative is appropriate for a given agrarian system, including the crops grown, the distribution of caste, class, and political interests, and so forth. Co-operatives which work very well in one region may not fit at all in others.

Efforts to transfer technology to the countryside—whether these efforts are geared to huge irrigation projects or to cottage industries—ultimately stand or fall on the ability to create new organisations which are adaptable to the natural and social environments of a given region and which unleash new flows of entrepreneurial skills, investment, and production. Management experts, whether in private business or public administration, understand these general problems; but it is unfortunately rare for comparative social analysis to be applied to development organisations which are rooted in the countryside. Particularly in the third world, it is not possible to capture all the crucial aspects of an enterprise, or a set of enterprises, through a few statistical indices or equations. Organisational aspects must receive serious attention in their own right. When rural development projects are being designed and evaluated, a great deal of wastage might be avoided if these aspects were taken into account.

This point may be illustrated with reference again to the sugar and milk co-operatives. Because co-operative sugar factories have succeeded in Maharashtra, there is a temptation to promote them in other parts of the country, without taking account of variations in agrarian systems. As mentioned, co-operative sugar factories have not done well in the north because of such variations. Likewise, under Operation Flood, there is an attempt to replicate Amul-type milk co-operatives all over the country. These replication efforts may encounter serious problems because of regional variation in agrarian conditions. For example, the original Amul dairy was established by enterprising and experienced dairy farmers with access to a huge urban market—conditions which are not duplicated in many other parts of the country (George 1987).

Our final point concerns the replicability of this type of analysis. We are convinced that this system of comparative analysis (comparing co-ops with private enterprises; comparing them with different kinds of co-ops; and comparing them with similar co-ops in other regions) can be applied to a wider range of co-operatives, voluntary organisations, and development organisations in general. We are presently embarking on a long-term research project, involving about 20 Indian and Canadian researchers, to test the applicability of this approach to a wide range of co-ops and rural development organisations—for example, to

different types of irrigation management organisations. Our general goal is to understand what kinds of organisations are most efficient and/or most equitable in solving specific development problems in specific regions. We believe this is possible through comparative analyses combining social, political, economic, and environmental data collected through field research.

## Appendix

### CONTRIBUTIONS OF SUGAR CO-OPS TO OVERALL DEVELOPMENT IN THEIR AREAS

It is widely recognised that the sugar co-operatives in Maharashtra have made significant contributions to economic progress for their members. However, sugar co-ops have also undertaken many activities which benefit not only their members, but the community at large. Almost every factory has contributed significantly to the creation of educational and health facilities. They have also contributed to the creation of employment opportunities by setting up ancillary industries. In the following account we focus mainly on the Kisan factory studied by Baviskar (1980). We must emphasise that this case is not an exception; there are some factories which have done even more. Other examples given here are from the Olegao factory, studied by Attwood (1974a; 1977; 1979b), as well as from general compilations by the director of sugar (Rane 1983; Director of Sugar 1984), and by the Maharashtra State Co-operative Sugar Factory Federation (MSCSFF 1980).

#### DEVELOPMENT SCHEMES AND INFRASTRUCTURE

Most of the co-operative sugar factories in Maharashtra have taken the initiative in launching various schemes for the benefit of their members and other people in their areas. Different factories have concentrated on different schemes, depending upon the needs and interests of their areas. For example, in Satara, Sangli and Kolhapur districts, where there is no significant canal irrigation, the co-operative sugar factories undertook lift-irrigation schemes for the benefit of their cane growers. In groundnut-producing districts, they helped in setting up oil-processing co-operatives and solvent extraction plants. In cotton-growing areas, they helped establish co-operative ginning and pressing units. Some factories have established pulp and paper mills; others have started distilleries and chemical plants; still others have set up printing presses, cattle feed plants, and co-operative banks. Once there is a co-operative sugar factory in an area, it becomes a focal point of further growth. Local leaders use the factory's resources for initial expenditures, technical expertise, and organisational experience in order to persuade the local people to participate and to

convince the government authorities that these schemes will work.

For example, Kisan factory was instrumental in setting up a second co-operative sugar factory (Sanjivani), whose area of operation more or less coincides with that of Kisan. Kisan, Sanjivani and Ganesi (the third co-operative sugar factory in the area) have jointly set up a co-operative distillery to manufacture industrial alcohol from molasses. Other groups of co-operative factories have followed this example.

In addition, Kisan has selected twelve dry villages in its area for irrigation projects. These villages are situated 'above' the irrigation canal, so they are unable to use canal water in the normal way. The factory has encouraged farmers in these villages to form co-operative lift-irrigation societies to pump water from the canal to their fields. The factory provided the initial technical and financial help of about Rs 50,000. Eight such schemes have been started, enabling the small farmers in these villages to cultivate sugarcane. The factory also spent about Rs 17,000 to prepare plans and estimates for the construction of six percolation tanks in other dry villages. These tanks help farmers to draw more water from their wells. So far Kisan has contributed over Rs 2,00,000 for the development of irrigation facilities in the dry areas.

Other co-operative sugar factories have undertaken similar projects. By 1977 the Pravara factory had constructed 55 percolation tanks, 40 lift irrigation schemes, and other irrigation facilities. Likewise, the Shetkari factory managed 46 lift irrigation schemes; the Panchaganga factory invested about Rs 30 million in lift irrigation; and the Rahuri factory spent about Rs 2.6 million for the same purpose (MSCSFF 1980: 107-17). The Olegao factory, like some others, undertook the construction of barrages on a nearby river in order to provide irrigation water. A total of about 1,25,000 acres have been brought under irrigation schemes promoted by the co-operative factories (Director of Sugar 1984:4).

The Kisan factory has taken a lead in launching intensive cultivation of sugarcane, wheat, and rice in the surrounding villages. The scheme for sugarcane covers about 1,000 acres, that for wheat about 3,000 acres, and the one for rice about 750 acres. The factory takes the initiative in obtaining credit from the district central co-operative bank on behalf of the farmers; and its technical staff supervise the operation of the schemes in collaboration with the government's department of agriculture. This enables the farmers (Kisan shareholders and others) to increase production of these crops.

Like several other sugar co-operatives in Maharashtra, Kisan has helped local people through its animal husbandry centres and dairy development project. It runs four veterinary centres which also provide ar-



tificial insemination. Kisan has spent over Rs 1,00,000 on this work. It is significant to note that not only the shareholders' animals but also those of other people in the area and those of the migrant bullock-cart drivers (who come to the area from other districts to transport sugarcane from field to factory) are treated free of charge. The Olegao factory and nine others have similarly established centres for artificial insemination and veterinary care (Director of Sugar 1984:6).

In collaboration with Sanjivani, Kisan has formed a milk producers' co-operative union which collects milk from the villages and sells it in the cities. This has provided supplementary income, particularly to small farmers. Currently, co-operative societies in 19 villages with a daily production of over 2,000 litres of milk participate in the programme. Likewise, the Pravara factory has set up a milk chilling plant with a capacity of 20,000 litres per day, while the Warana factory has established a plant which processes nearly 45,000 litres per day into fresh milk, skim milk powder, butter, etc. (MSCSFF 1980: 107-10).

Kisan has developed and maintained a network of roads in the area. During the last 20 years it has spent over Rs 27,53,000 for this purpose. It has, of course, a self-interest in maintaining good roads in the area because it must transport sugarcane by trucks and bullock carts from the fields to the factory. Kisan has also been instrumental in expanding post, telegraph and telephone facilities in the area.

The Maharashtra sugar co-operatives have jointly set up a sugar research institute in the state. Till recently there was only one such institute in the country—the National Sugar Institute located at Kanpur in Uttar Pradesh. The new institute trains sugar technologies and conducts research in the engineering, manufacturing and other technical aspects of the industry.

The sugar co-ops in Maharashtra have also jointly set up a co-operative heavy engineering corporation to manufacture machinery for sugar factories. The corporation has successfully completed several contracts on a turnkey basis, setting up plants and machinery for new factories. In this field too the co-ops are successfully competing with established joint stock companies and multinational corporations.

#### SOCIAL WELFARE

The co-operative sugar factories in Maharashtra have also contributed significantly to the creation of welfare facilities, particularly in the fields of health and education. When Kisan was set up there was only one secondary school in the area. The factory took the initiative in starting a primary and secondary school for the children of employees as well as people in nearby villages. It adopted a novel procedure for financing these schools. It appealed to

the shareholders to contribute 25 paise (Re 0.25) per ton of cane supplied to the mill. A resolution was passed at the annual general body meeting of shareholders to this effect, and there is a continuing deduction of 25 paise per ton of cane. In this way a substantial amount becomes available every year without much effort or administrative cost. The factory crushed over 4,00,000 tons of cane in 1974-75 and thus collected over Rs 1,00,000 for educational purposes in a single year. As the demand for secondary education increased, four more secondary schools were started in different parts of the area. All schools have hostels for students from villages at a distance. Sanjivani and Ganesh follow the same procedure to finance schools in their respective areas. In 1964, the three factories together started two colleges teaching arts, science and commerce, which are again supported by funds collected from shareholders. Likewise, deductions from the cane prices paid to members of the Olegao factory have supported the establishment of primary and secondary schools, as well as nearby college. The Pravara factory is sponsoring 12 primary and secondary schools, a girl's high school and a college; and many other co-operative factories are sponsoring similar educational projects (MSCSFF 1980: 107-117).

As the economic condition of the cane growers improved they started sending their children to better-equipped, English-medium residential schools in Pune and other centres of higher education. It was, however, only the rich farmers who could afford to send their children to these expensive schools. In 1971, Kisan factory established an English-medium residential school, called Gautam Public School, on a 69-acre plot of land near the factory premises. The school is well-equipped in terms of staff, buildings, playgrounds, library and laboratories. About 400 children, mostly of cane growers in the area, study there. The parents incur an annual expenditure of about Rs 3,000 per child. Several other sugar co-operatives in Maharashtra have started similar schools. During the last two decades, Kisan has spent over Rs 41,30,000 on the development of modern educational facilities in the rural areas, partly from its own funds and partly from its members' contributions.

Soon after Kisan was set up, it established a health centre on the factory site with qualified medical staff, equipment, and medicines. The centre has a few beds for treating patients, and an ambulance. Although the centre is used more frequently by the residents of the factory township, it is also open to people in the surrounding villages. It has proven a great boon to the villagers, who in the past had to consult doctors at a considerable distance. Every year over 15,000 patients are treated at the centre. The Pravara factory has gone further, creating a medical trust of Rs 5 million, and

establishing a hospital with 150 beds (MSCSFF 1980: 108). All the other factories have established dispensaries, and most have organised family planning camps (Rane 1983: AS25).

In 1976 the state government launched a programme to construct houses for landless labourers. Each shareholder contributed 75 paise per ton of cane supplied. A sum of Rs 2,97,000 was raised and handed over to the government for housing landless labourers in the factories' areas of operation. By 1980, a total of 45,000 houses for landless labourers had been constructed with contributions from the co-operative sugar factories (Director of Sugar 1984: 7).

Other projects have been started for the benefit of the lower castes (the scheduled castes and tribes and the nav buddhas). The Panchaganga factory has taken over the debts of lower-caste small farmers within its command area and assumed cultivation of their lands until the debts are repaid, in order to make them eligible for new credit as soon as possible. Other schemes have been implemented by the co-operative factories with financial help from the state government: for example, a credit scheme for small farmers from the lower castes (Rane 1983: AS23).

#### RESPONSE TO EMERGENCIES

During emergencies and natural calamities the resources of the factories proved extremely useful for organising relief and other activities. On all such occasions the leaders and shareholders have contributed generously.

During 1970-73 most parts of Maharashtra suffered from serious drought. In 1971-72, the Kisan shareholders contributed 50 paise per ton of cane supplied and raised over Rs 1,50,000 for the drought relief fund. The drought continued the following year, seriously affecting many more people. Kisan factory mobilised its resources in a big way for organising relief work. In most districts, both the kharif and rabi crops were lost, there was a shortage of foodgrain and fodder, and in some places even drinking water was not available. The factory contributed over Rs 1.6 million to the chief minister's drought relief fund, distributed cloth worth Rs 2,12,000 to the affected people, helped students in drought-affected areas with over Rs 30,000 contributed fodder and molasses worth Rs 1,47,000 to the cattle camps in the district, and spent over Rs 35,000 on the construction of percolation tanks in six villages in the area. Thus Kisan alone spent over Rs 20,37,000 on relief work during this period. The state government's success in organising relief work during this critical period owed a great deal to the initiative, resources, and infrastructure created by the sugar co-operatives.

What has been achieved by the sugar co-ops is remarkable in another way. All these programmes and activities have been under-

triken by local initiative, mostly using local resources. No government department would have been able to plan and execute all these activities within such a short period. The government departments have now realised the importance of the factories in the life of the local people and have, therefore, been relying increasingly on their help and co-operation. It is much easier and more effective to mobilise people for relief work voluntarily than by the dictate of government officials.

### Notes

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- 1 With regard to this table, it should be noted that nearly 80 per cent of the northern cane is grown in the state of Uttar Pradesh—that vast, north-central state which spreads along the Ganges valley from the humid north-eastern rice zone to the semi-arid north-western wheat zone. The other three states, Bihar (in the northeast) and Haryana and Punjab (in the northwest), account for only about 5 per cent, 9 per cent and 8 per cent, respectively, of northern cane production. Consequently, the overall weighted average for the north is close to the average for UP.
- 2 About 75 per cent of the white sugar produced in the north comes from UP, so the curve for that state (which is not reproduced here) would be virtually the same as the northern curve as a whole, though somewhat lower.
- 3 It may be noted that one northern state, Punjab, has some higher extraction rates than Maharashtra; however, Punjab is not a major producer, accounting for only about 5 per cent or 6 per cent of sugar production in the north.
- 4 This table lists levy sugar prices for the different states and the sugar zones within these states and also shows the per cent of northern sugar produced in each zone. These percentages (in the last column of the table) were used in weighting the average levy price for the whole northern region, which comes to Rs 191 per quintal, or Rs 1,910 per ton. During 1986-87, the government reduced the levy sugar quota to 50 per cent of the total production. Consequently the quota for free sale increased to 50 per cent.
- 5 We leave aside the more difficult question of how big a subsidy is paid from the entire sugar industry, private as well as co-operative,

to urban consumers through the levy price system.

- 6 The state's Land Ceiling Act of 1961 specifies that each person may own a maximum of 18 acres of canal-irrigated land or 27 acres of well-irrigated land suitable for cane growing (Maharashtra Government 1974: 183-86). Under normal crop rotations and irrigation rules, farmers could devote a maximum of one-third of this area to a new crop of sugar-cane each year. Thus the maximum annual cane acreage would be nine acres per land owner.

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