OPERATION FLOOD: LITERATURE REVIEW AND RECONCILIATION

Nalini Kumar

(An Earlier draft of this paper was used as the Background Paper for OED-IRMA Workshop on Impact of Operation Flood held at IRMA, March 17-18, 1997)

Institute of Rural Management Anand
Post Box 60, Anand-388001, India
August, 1997
Contents

1. Introduction ................................................................................................................. 1
   Key Players in the Field ............................................................................................... 1
   The Impact of Operation Flood ..................................................................................... 2
   Women in Operation Flood ........................................................................................ 3
   Implementation of Operation Flood ............................................................................... 4
   Sustainability .................................................................................................................. 4

2. Key Players in the Field .......................................................................................... 5
   The Indo-Dutch Group .................................................................................................. 5
   Other Players ................................................................................................................ 6

3. Production Impact of Operation Flood .................................................................. 7
   Background .................................................................................................................... 7
   Evidence of Increase in Milk Production ...................................................................... 7
   Causes of Growth in Milk production .......................................................................... 10

4. Socio Economic Impact of Operation Flood ........................................................ 13
   The Evidence ............................................................................................................... 14
   Why was OF considered appropriate for the Poorest? .................................................. 15
   Constraints faced by the landless ................................................................................ 16

5. Women and Operation Flood .................................................................................. 19
   Women in the Dairy Sector .......................................................................................... 19
   Impact of Modern Dairying on Women ....................................................................... 21
   Constraints faced by omen ......................................................................................... 23

6. Implementation of the Anand Model ....................................................................... 24
   The Institutions ............................................................................................................ 24
   Replication of the Model .............................................................................................. 26

7. Sustainability ............................................................................................................... 29
   Background .................................................................................................................... 29
   The Dependency Debate ............................................................................................. 31

8. Conclusion .................................................................................................................. 34

9. References .................................................................................................................. 39
## ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amul</td>
<td>Registered brand name of Kaira District Cooperative Milk Producers’ Union Limited, whose dairy at Anand bears the same name.</td>
</tr>
<tr>
<td>BAIF</td>
<td>Bhartiya Agro Industries Foundation</td>
</tr>
<tr>
<td>BO</td>
<td>Butter Oil</td>
</tr>
<tr>
<td>DCS</td>
<td>Dairy Cooperative Society</td>
</tr>
<tr>
<td>EEC</td>
<td>European Economic Community</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agricultural Organization</td>
</tr>
<tr>
<td>ICDP</td>
<td>Intensive Cattle Development Program</td>
</tr>
<tr>
<td>ICSSR</td>
<td>Indian Council of Social Science Research</td>
</tr>
<tr>
<td>IDC</td>
<td>Indian Dairy Corporation</td>
</tr>
<tr>
<td>IDPAD</td>
<td>Indo Dutch Program on Alternative in Development</td>
</tr>
<tr>
<td>IRDP</td>
<td>Integrated Rural Development Program</td>
</tr>
<tr>
<td>IRMA</td>
<td>Institute of Rural Management, Anand</td>
</tr>
<tr>
<td>IMWOO</td>
<td>Institute of Social Science Research in Developing Countries, The Hague</td>
</tr>
<tr>
<td>KVS</td>
<td>Key Villages Scheme</td>
</tr>
<tr>
<td>NCDFI</td>
<td>National Cooperative Dairy Federation of India</td>
</tr>
<tr>
<td>NDDB</td>
<td>National Dairy Development Board</td>
</tr>
<tr>
<td>NGO</td>
<td>Non Governmental Organization</td>
</tr>
<tr>
<td>OF</td>
<td>Operation Flood</td>
</tr>
<tr>
<td>SC</td>
<td>Scheduled Castes</td>
</tr>
<tr>
<td>SEWA</td>
<td>Self Employed Women’s Association, Ahmedabad</td>
</tr>
<tr>
<td>ST</td>
<td>Scheduled Tribes</td>
</tr>
<tr>
<td>SUMUL</td>
<td>Surat District Cooperatives Milk Producers’ Union</td>
</tr>
<tr>
<td>WFP</td>
<td>World Food Program</td>
</tr>
</tbody>
</table>
OPERATION FLOOD:
LITERATURE REVIEW AND RECONCILIATION

1. INTRODUCTION
The Indian dairy industry has changed radically in the last three decades. Milk production, which was stagnant between 1950 and 1970, has tripled since the early 1970s. Despite the tremendous growth in population, per capita availability of milk has increased from 132 gm per day in 1951 to 193 gm in 1994. Operation Flood (OF), launched in 1970, has played an important role in this transformation. The history of the Kaira District Cooperative Milk Producers’ Union Ltd., popularly known as Amul, and the dairy cooperative movement were covered extensively in a previous literature review (Alderman, Mergos and Slade 1987). The present review deals primarily with the literature since 1987.

OF has generated a large and controversial literature. However, no longitudinal studies exist to gauge its precise impact. Given the vast size and diversity of the country, it is not useful to generalize on the basis of area specific case studies, valuable though these are in describing location specific impact. Moreover, a lot of evidence on OF in the literature is anecdotal. In addition, it is clearly evident that over time because of its enormous physical and financial size, expectations from OF have grown. The program was and is a dairy production program with beneficial side effects. Much of the critical literature ascribes miscellaneous objectives to OF and then criticizes it for not meeting them.

Key Players in the Field
The most active group has been the Indo-Dutch Scholars. These scholars maintain that their empirical findings do not confirm the “grand claims made for the Operation Flood program as a success story of global significance” (Doornbos, Stuijvenberg and Terhal 1987, 377). Their work is a collaborative effort jointly administered by the Indian Council of Social Science Research (ICSSR), New Delhi and the Institute of Social Science Research in Developing Countries (IMWOO), The Hague. Two books (Doornbos and others 1990; Doornbos and Nair 1990) cover the group’s concerns about the production, socioeconomic impact of OF, and its implementation and sustainability.

The Impact of Operation Flood

Production Impact

Available studies use control villages (with and without approach) to assess the impact of cooperatives on milk production. The 1987 literature review, which examined several studies based on the above methodology, reports that the differences in the findings for the control and dairy cooperative society (DCS) villages indicate that production was substantially higher in the latter (Alderman, Mergos and Slade 1987, 41).

Official figures indicate that milk production in the country has grown substantially since the 1970s. The debate in the post-1987 literature is mainly on how much credit for this growth goes to OF. Program supporters would like to give it most of the credit. Others argue that a combination of factors, in addition to OF, brought about the dramatic increase in milk production (see Chapter 3). They argue that factors such as assured procurement prices for producers, technological progress, and the increased availability of fodder (a byproduct of the green revolution) were crucial.

Socioeconomic Impact

The 1987 literature review stresses the importance of drawing a distinction between absolute and relative changes in income. Alderman, Mergos and Slade (1987, 73) note, “Although the projects may have a positive effect on average incomes and on the incomes of the poor, these income changes may not be equally distributed.” After more than a quarter century, there appears to be consensus on the program’s positive impact on incomes. But critics argue that OF has had a limited impact on the status of the poorest sections of Indian society (the landless) (see Chapter 4). The debate on OF’s impact on the poorest arose because claims were made at the time of the program’s inception that OF had unlimited capacity to improve their status. When the poorest did not benefit as much as had been expected, OF was criticized for being overly ambitious.

Women in OF

Gender issues have been given considerable attention in the literature on dairying. As elsewhere, two radically different viewpoints are found. Critics argue that the process of commercialization and modernization in dairying has generated hidden costs and increased the workload of women, who provide most of the labor (see for example, Sharma and Vanjani 1993). Advocates argue that OF provides an opportunity for women to improve their economic and social status (Somjee and Somjee 1989, among others) and conclude that OF has been positive for women.

The literature draws attention to the social and cultural constraints that hinder women’s active participation in modern dairying and the efforts being undertaken by the government, nongovernmental organizations (NGOs), and cooperatives to overcome them (see Chapter 5), however, such efforts have not always produced desired results. Azad (1985, 9) notes that often “Government planning and policy making bodies that endeavor to integrate rural women in the development process, meet with little success due to lack of vision, poor and inaccurate data base as well as lack of consciousness at the implementation level.”

Implementation of OF

The National Dairy Development Board (NDDB), created in 1965, and the Indian Dairy Corporation (IDC), set up in 1970, have been responsible for implementing OF. The NDDB’s relationship with the states and central government, and the nature of the
cooperative organization it has helped to build, have been debated extensively in the literature. Critics argue that the NDDB enjoys too much autonomy in carrying out its operations and follows a “top-down strategy” that is not in keeping with the spirit of the Anand pattern⁴ (see Chapter 6). But advocates consider OF’s mode of operation highly successful, pointing out that the government looks favorably on the organization and has placed more primary commodities under the OF umbrella.

**Sustainability**

A key issue that has been the subject of much debate in the literature is the question of whether OF has made India self-sufficient in dairy products. Since OF is supported with grants and aid received from international agencies, critics argue that, over time, “The funds generated by the sale of donated commodities have become essential for maintaining the financial viability of the program” (Doornbos and Gertsch 1994, 935). Advocates argue that the aid has helped build physical capacity in the country and that without such aid, any program might have been far less ambitious (Fulton and Bhargava 1994, 45). The Indo Dutch critics however feel that the question of whether the institutions implementing OF have made the Indian dairy sector vulnerable to external conditions needs further careful examination (Doornbos and Gertsch 1994, 945).

2. KEY PLAYERS IN THE FIELD

**The Indo-Dutch Group**

These scholars, who have been working together for nearly a decade, are among OF’s most persistent critics. With funding from the Indo-Dutch Program on Alternative in Development (IDPAD), researchers from Indian and Dutch universities have investigated and written about OF. They maintain that their empirical findings do not confirm the “grand claims made for the Operation Flood program as a success story of global significance” (Doornbos, Stuijvenberg and Terhal 1987, 377). Their criticisms range from mild disagreements about the program’s achievements to total repudiation of OF’s usefulness. They argue that OF’s contribution to increased milk production in the country has been negligible and its impact on poverty limited. They are also concerned about the practicality of replicating the Anand pattern in widely differing regions of the country and about what they see as the dependency OF has created in India on imported supplies of milk powder.

The Indo-Dutch Scholars believe that after 20 years of OF, the Indian dairy economy has changed considerably, reducing options for “alternative scenarios,” especially in regions that have concentrated on large-scale investment in infrastructure and built up new institutions (Doornbos and others 1990, 314). Drawing from their own and others’ work, Doornbos and his colleagues prescribe four alternatives to OF: i) a rural milk production system based on goat- and sheep-rearing (to better meet the needs of the poorest) and on buffaloes; ii) a locally based system that would encourage rural milk consumption and local processing and marketing; iii) a network for marketing milk in urban areas that would build up trade between urban centers and adjacent villages; and iv) a “multimodel” approach that would replace the single Anand model (Doornbos and others 1990, 321). Another scholar, Shanti George (1987, 1654) has provided an example of what she considers an alternative model for the dairy sector in India called “Operation Counter Flood.” This model while emphasizing phasing out of dairy imports and maintaining the complementarity between agriculture and dairying has several of the ingredients which Doornbos and his colleagues have outlined above.
Other Players

Among other important writings on OF by critics, advocates, and analysts are Chen and others (1986), Parthasarthy (1991), Gertsch (1990), Aneja (1994, 1991), Mascarenhas (1993, 1988), Patel (1988), T. Shah (1991), D. Shah (1993, 1992), Franco and Chand (1991) and Somjee and Somjee (1989). D. Shah (1992) examines the economic impact of cooperativization in Surat district in Gujarat. In a review article on the Indo Dutch study (Doornbos and others 1990), D. Shah (1993, 377) asserts that the study does not provide genuine alternatives to OF, as most of the measures suggested have been tried before or are irrelevant. Franco and Chand (1991) evaluate dairy cooperatives affiliated with the Surat District Cooperatives Milk Producers’ Union (Sumul) in the tribal belt of South Gujarat. They conclude that though the cooperatives have benefited the tribal community as a whole, they have some very significant limitations. The authors argue that though the potential of OF is large it has not been able to benefit the poorest to the extent possible primarily because of its inability to reach the landless laborers and marginal farmers. Somjee and Somjee (1989), in a longitudinal field research study spanning two decades, examine the performance of four milk cooperatives in western India (Amul, Dudhsagar, Sumul, and Sabar). The authors concentrate on the social and economic constraints affecting the poor and the largely successful efforts of socially concerned individuals from the dairies to reach them. Mascarenhas (1988) examines the process of replication of the Anand model under OF I and II. The author evaluates the OF program for its socioeconomic impact and developmental role, using Karnataka for an in-depth study. Chen and others (1986) present several case studies that focus on bringing the millions of women in the dairy sector into the mainstream of dairy development. They outline a number of recommendations which emerge as lessons from the case studies (see Chapter 5).

Two detailed empirical research studies (Mergos and Slade 1987; Alderman 1987), throw substantial light on OF. The former uses farm household data from 12 villages in Madhya Pradesh to test the hypotheses related to the production and distribution effects of the project. The latter uses multivariate regression analysis on household level data from 42 villages to test the hypotheses on production and income effects of dairy cooperatives in Karnataka. Other valuable empirical data are available in the impact study of the Madhya Pradesh Dairy Development project financed by the World Bank (Singh and Acharya 1986). The authors studied 12 villages in 3 milksheds in the state to assess the direct and indirect impact of the World Bank supported project. The World Bank documents, and a recently undertaken collaborative study by the Government of India and the Swiss Development Cooperation (Kurup, 1995) provide valuable information on the livestock sector and Bank financed OF projects in the country. The Institute of Rural Management, Anand (IRMA) has also recently published a three volume proceedings of a workshop on “Rediscovering Cooperation”, 1996 which includes many useful papers on dairy cooperatives, besides papers on other cooperatives.

3. PRODUCTION IMPACT OF OPERATION FLOOD

Background

Efforts to improve dairy production in India began under the First Five Year Plan (1951-56). More than half of the expenditures on dairy development under the First and Second Plans were on crossbreeding and artificial insemination. Government programs such as the Key Village Scheme (KVS) and the Intensive Cattle Development Programs (ICDP) emphasized using improved breeds of cattle to enhance milk production. But the total public sector outlay on the dairy sector was not very large – in fact, until the end of the Seventh Five-Year Plan, funds for the Animal Husbandry and Dairying sector equaled about 1 percent of the total public sector expenditures (J. George, 1988). Financial
investment in the sector received a tremendous boost with the inauguration of OF in 1970.

**Evidence of Increases in Milk Production**

No longitudinal studies have been done of the impact of OF on milk production. Available studies are comparative (with and without approach), using villages that have not been part of OF as controls. The 1987 literature review, which examined several such studies, reports that differences between control and DCS villages indicate that milk production was substantially higher in the latter (Alderman, Mergos and Slade 1987, 41). Fulton and Bhargava (1994) reach a similar conclusion after examining four studies conducted before 1988.

On the basis of an econometric analysis of data from nine projects and three control villages in Madhya Pradesh, Mergos and Slade (1987, 85) conclude that milk production over a five-year period was about 17.5 percent higher in project households than in nonproject households. The authors also provide descriptive statistics on milk output, production inputs, and animals in project and control villages showing that DCS villages had higher output levels than control villages.

**Table 3.1: Summary of Four Micro Level Studies**

<table>
<thead>
<tr>
<th>Study (Identified by lead author)</th>
<th>Comments</th>
<th>Sample size (Households)</th>
<th>Time Period</th>
<th>Results (litres of daily milk production per milch animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jain, JL (1982)</td>
<td>Replication of an earlier study of producers in six villages in one district. Figures based on the averages across the households for three seasons in the year.</td>
<td>78</td>
<td>1976</td>
<td>4.45</td>
</tr>
<tr>
<td>Patel, SM (1975)</td>
<td>Based on a sample from 24 villages in three districts</td>
<td>450</td>
<td>1974</td>
<td>6.10</td>
</tr>
<tr>
<td>Singh, K (1982)</td>
<td>Based on a sample of milk producers in six villages across three different states</td>
<td>1100</td>
<td>1980</td>
<td>2.58</td>
</tr>
<tr>
<td>Alderman, H (1987)</td>
<td>Based on a sample of milk producers in 62 villages in one state. Five different rounds of data were collected.</td>
<td>806</td>
<td>1980-83</td>
<td>Round1 3.60**</td>
</tr>
</tbody>
</table>

* Other villages refer to the organized milk collection by the Delhi Milk Scheme

** It was not possible to calculate values for liters of daily milk production per milch animal given the data reported by Alderman. Therefore these figures represent liters of daily milk production per household.

Source: Fulton and Bhargava (1994)
Table 3.2: Milk Output, Numbers of Milch Animals and Input Use for Milch Animals Owners*

<table>
<thead>
<tr>
<th>Output &amp; Stocks</th>
<th>DCS Villages</th>
<th>Control Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk Output (lt/day)</td>
<td>2.91 (3.86)</td>
<td>2.83 (5.35)</td>
</tr>
<tr>
<td>Area of Land Owned (bighas)</td>
<td>16.56 (20.31)</td>
<td>14.90 (18.67)</td>
</tr>
<tr>
<td>Land Under Irrigation (%)</td>
<td>0.108 (0.222)</td>
<td>0.094 (0.194)</td>
</tr>
<tr>
<td>Number of Bullocks</td>
<td>1.85 (1.75)</td>
<td>2.23 (2.20)</td>
</tr>
<tr>
<td>Number of Milch Animals</td>
<td>4.31 (3.66)</td>
<td>4.38 (3.56)</td>
</tr>
<tr>
<td>Share of Buffaloes (%)</td>
<td>0.33 (0.37)</td>
<td>0.24 (0.33)</td>
</tr>
<tr>
<td>Number of Crossbred Cows</td>
<td>0.024 (0.195)</td>
<td>0.009 (0.098)</td>
</tr>
<tr>
<td>Market Value of Milch Animals (Rs)</td>
<td>3,108 (3,468)</td>
<td>2,928 (4,433)</td>
</tr>
<tr>
<td>Input Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor Input (Hrs/day)</td>
<td>4.73 (7.93)</td>
<td>6.21 (14.8)</td>
</tr>
<tr>
<td>Green Fodder (kgms/day)</td>
<td>30.83 (44.64)</td>
<td>35.96 (62.51)</td>
</tr>
<tr>
<td>Dry Fodder (kgms/day)</td>
<td>17.46 (32.28)</td>
<td>14.99 (28.12)</td>
</tr>
<tr>
<td>Purchased Concentrate (kgms/day)</td>
<td>1.46 (3.00)</td>
<td>1.32 (4.74)</td>
</tr>
<tr>
<td>Home produced concentrate (kgms/day)</td>
<td>0.29 (0.88)</td>
<td>0.46 (2.65)</td>
</tr>
<tr>
<td>Share of Milch Animals Lactating</td>
<td>0.59 (0.34)</td>
<td>0.55 (0.35)</td>
</tr>
<tr>
<td>Exposure to the project (years)</td>
<td>4.84 (2.73)</td>
<td>na</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>979</td>
<td>411</td>
</tr>
</tbody>
</table>

na: not applicable. SD: Standard Deviation. 1.0 bigha=0.23 hectares
* Pooled data over all villages for both seasons for households with milch animals.

Kumar and Singh (1993) assess the impact of milk cooperatives in Rajasthan on the rural economy, analyzing data on 90 households in 2 districts. The authors point out, “Total production of milk per household per day in the villages covered by the cooperative societies was almost one and a half times (6.92 litres) that in the control villages (4.93 litres)” (231). Mattigatti and others (1993, 149) evaluate the impact of OF on cow milk production in Dharwad district in Karnataka state, concluding that the introduction of dairy cooperatives helped boost farmers’ production of cow’s milk.

Though official figures indicate that milk production in the country has grown substantially since the 1970s, the accuracy of these figures has been challenged (Doornbos and others 1990; Mishra and Sharma 1990). Mishra and Sharma (1990, 126, 133) calculate a “feasible milk yield growth rate” from available information on growth rates for feed and fodder. The authors stress that a “warranted or required growth” of milk yields is associated with a given growth rate for milk production. Comparing the feasible growth rate with the warranted growth rate, they conclude that the actual rate of growth of milk production before 1970 was higher than official estimates. But from 1971-72 to 1985-86, it was lower. When recalculated to allow for an increasing proportion of crossbred cows their recalculated “feasible milk yield growth rate” drops to a level compatible with reported statistics.

**Causes of Growth in Milk Production**

The debate in the post-1987 literature is mainly on how much credit for growth in milk production should OF receive. Program supporters would like to give OF most of the credit. Others argue that a combination of factors in addition to OF brought about the
dramatic increase in milk production. They argue that assured procurement prices for producers, technological progress, and the increased availability of fodder (a byproduct of the “green revolution”) were crucial. In one of their more temperate comments, the Indo-Dutch scholars maintain that the upward trend in milk production is clearly related to the “Combined impact of all factors inducing change in the Indian dairy economy” (Doornbos and others 1990, 121). They go on to explain, “With the exception of some advanced regions, the large increases in milk procurement under OF seem due mainly to a shift in marketing channels (i.e. farmers switching from sales to ghee traders to cooperatives), rather than to any sizable increase in milk production” (Doornbos, Stuijvenberg and Terhal 1987, 378).

Aneja (1994, 32) maintains that an assured market and fair prices now available to Indian milk producers, even during the flush season played a major role in increasing milk production. He points out that milk producers receive approximately two-thirds of the consumer price. Nair (1985, 57) has identified an increase in the availability of feed for farm animals as a possible cause of increased milk production. Doornbos and others (1990, 123) refer to the same study by Nair when they argue that farmers in the “Green Belt” states of the country are able to keep more milch animals because of the availability of more feed.

Others refer to the positive impact of technological progress in the livestock sector. A 1996 World Bank document describes the research and training activities of the Indian Council of Agricultural Research and its subsidiary institutions, state agricultural universities, and private institutions and NGOs like the Bhartiya Agro Industries Foundation (BAIF). Describing the BAIF’s crossbreed dairy program, Satish and Farrington (1990, iii) note that the NGO, which began experimenting with semen-freezing technology in 1975, now produces nearly 10 percent of the national crossbred dairy herd and operates approximately 500 cattle development centers covering 1.5 million families in 6 states. Munshi and Parikh (1994) attempt to decompose the growth of milk production on the basis of an aggregate milk supply model. Their model considers the number of cooperative societies to be a measure of technological progress which they conclude was largely responsible for this growth in milk production. The authors note that “The cooperative network provides a natural channel for the dissemination of information as well as an infrastructure base for the adoption of new technology ” (204).

T. Shah (1987, 202) asserts that OF addressed the key problem that had maintained the dairy industry at a “low level equilibrium.” Most of the earlier crossbreeding and related programs to increase milk production did not achieve significant results because scant attention was paid to farmers’ need for extension, veterinary health services, improved fodder, and access to markets. By providing for the procurement, processing, and marketing of members’ milk, Shah argues, the cooperative system “attacked the crucial link between traditional dairying and its demand system.” He observes:

“A good deal of research into the economic impact of dairy cooperatives has shown that the creation of a better marketing infrastructure itself is enough to bring about major increases in a village’s milk production. Most such research has viewed the output increasing effect of dairy cooperatives as a one shot threshold effect. Recent research conducted by the Institute of Rural Management, Anand (IRMA), however, indicates that the establishment and maturing of dairy cooperative institutions sets into motion a gradual and long drawn out process of modernization and growth based mainly on achieving fuller utilization of the ‘slack’ built into the traditional system (203-205)”.
Singh and Acharya’s (1986) impact study covering three milksheds in Madhya Pradesh supports the above viewpoint. Their analysis was based on a randomly selected sample of 604 households in 9 DCS villages and 265 households in 3 control villages. The authors noted that in villages exposed to cooperatives, the average increase in the quantity of milk sold per household was greater than the average increase in milk production (210). Kumar and Singh (1993, 231) also argue that higher production in villages with cooperatives can be attributed to the relatively well-developed marketing infrastructures these villages enjoy.

At the extreme are critics like Parthasarthy (1991), who doubt whether OF can be given any credit at all for increased milk production. Parthasarthy says, “The association of higher rates of growth of milk production with Operation Flood I, which began in 1970, may give a false impression that it is the cause, and the improvement in the rate of growth, the effect” (A-178). He reproduces data from government documents to show that most states with high growth rates for milk production were not covered by dairy cooperatives at the close of OF I. He states firmly, “There is only a weak causal relationship between dairy cooperatives and the higher rate of growth” (A-179). He argues that the quantum jump in milk production in the 1970s was mainly due to the “shift from low yield cows to high yield buffaloes” (A-178). Parthasarthy provides data which shows that while there was an approximately 11% increase in the number of milch cows between 1961 and 1982, the she buffalo population in milk increased by nearly 40% over the same period.

Table 3.3: State Wise Distribution of Milk Production, 1971-72 and 1987-88 ('000 tons)

<table>
<thead>
<tr>
<th>State</th>
<th>1971-72</th>
<th>1987-88</th>
<th>Annual Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orissa</td>
<td>336</td>
<td>394</td>
<td>1.0</td>
</tr>
<tr>
<td>Bihar</td>
<td>1747</td>
<td>2650</td>
<td>2.6</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>2539</td>
<td>4000</td>
<td>2.9</td>
</tr>
<tr>
<td>Gujarat</td>
<td>1786</td>
<td>3200</td>
<td>3.7</td>
</tr>
<tr>
<td>Haryana</td>
<td>1506</td>
<td>2800</td>
<td>4.0</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>4299</td>
<td>8210</td>
<td>4.1</td>
</tr>
<tr>
<td>Punjab</td>
<td>2142</td>
<td>4450</td>
<td>4.7</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>1186</td>
<td>2610</td>
<td>5.1</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>1125</td>
<td>2950</td>
<td>6.3</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>1125</td>
<td>3220</td>
<td>6.8</td>
</tr>
<tr>
<td>Karnataka</td>
<td>762</td>
<td>2310</td>
<td>7.2</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>926</td>
<td>3100</td>
<td>7.8</td>
</tr>
<tr>
<td>Assam</td>
<td>151</td>
<td>613</td>
<td>9.2</td>
</tr>
<tr>
<td>Kerala</td>
<td>284</td>
<td>1410</td>
<td>10.5</td>
</tr>
<tr>
<td>West Bengal</td>
<td>485</td>
<td>2700</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Source: G Parthasarthy (1991)

4. SOCIOECONOMIC IMPACT OF OPERATION FLOOD

The 1987 literature review stresses the importance of drawing a distinction between absolute and relative changes in income. “Although the projects may have a positive effect on average incomes and on the incomes of the poor, these income changes may not be equally distributed”(Alderman, Mergos and Slade 1987, 73). After more than a quarter century of its existence, there appears to be a consensus on the program’s positive impact
on incomes. But critics argue that OF has had a limited impact on the status of the poorest sections of Indian society (the landless).

The Evidence

Franco and Chand (1991, 213-214) who studied dairy cooperatives in the tribal belt of South Gujarat, state that in the Zankhvav taluka, average annual net income per cooperative member increased from Rs. 2180 to Rs. 3020 in three years (from approx. $172 to $239).\(^9\) The authors also add that “To say that the landless laborers and marginal farmers are relatively outside the cooperatives is to state a true fact” (219). Baviskar (1988, 359) studied dairy cooperatives in Gujarat to examine their effectiveness for poverty alleviation. He similarly concludes that though dairy cooperatives brought several benefits to the milk producers they increased the income gap between the large and the small farmers.

Parthasarthy (1991, A180-181) has done an interesting analysis to see whether participation of the land poor in milk production is higher in a state where cooperatives are significant in comparison to the all India level. Comparing the state of Gujarat with the all India average, he finds a much better participation of the land poor households in Gujarat. However, Punjab which benefited immensely from the green revolution and also progressed in establishing dairy cooperatives records even better levels of participation. Parthasarthy finds that in Punjab, for every 100 small farmer household (1.01 to 2.02 h) there were 126 bovine in milk as against 52 in Gujarat and 48 for all India. Parthasarthy argues that performance of the land poor is better when there is growth in dairy cooperatives along with high rate of growth of agriculture. He however found low participation rates among the landless in both the states: 9 out of 100 in Punjab and 17 out of 100 in Gujarat. He concludes that the large majority of the landless households could not participate in dairying even in a state which records high rates of agricultural growth and substantial progress in building cooperatives.\(^10\)

Singh and Acharya (1986, 206) reach a very different conclusion on the basis of their Madhya Pradesh study, which covers 12 villages in three milksheds. Of these villages 9 had a DCS and the other three villages were used as control villages. The analysis is based on a randomly selected sample of 604 and 265 households in the DCS and control villages respectively. The authors conclude that in villages exposed to OF the landless and poorer households had “Markedly higher milk production per household than their counterparts in the control villages.” They add that “The lower caste and SC/ST\(^11\) households had higher milk production per household than the upper caste households”. From his study of two large cooperative milk unions in Bihar, Singh (1996, 137-145) concludes that more than three fourths of cooperative members belong to the “weaker sections”\(^12\). Fulton and Bhargava (1994, 42) also note (on the basis of NDDB data) that “A key characteristic of the individual producers is their small scale of operation with an average daily collection per member of 1.4 liters. Thirty-five percent of the milk producers were landless while another 28% were marginal landholders.” One is tempted to conclude that India is a large country, with a variety of experiences.

Why was OF considered appropriate for the Poorest?

The debate on OF’s impact on the poorest arose because claims were made at the time of the program’s inception about its unlimited capacity to improve their status. The National Commission on Agriculture observed in its 1976 report on Rural Employment,

> “Next to crops, animal husbandry programs have got the largest employment potential. The most important feature of these programs are that they provide subsidiary occupation, offer gainful employment at the location itself and make
better utilization of female and child labor. Most of these programs are particularly suitable for weaker sections of the rural community and have redistributive effect on rural income in favor of them” (Quoted in Mascarenhas 1988, 47).

Baviskar explains that OF was considered a means of overcoming the barriers of caste, class and power, something earlier rural development programs had been unable to do (Baviskar 1988, 346). He notes, “Since milk production does not require much land, but mainly family labor which the poor have amply, the landless poor can easily and profitably participate in the white revolution, deriving employment and additional income from it. Since milk is not a polluting substance in Hindu religious ideology, people belonging to any caste, even the lowest, can and do participate in producing milk. Also cooperatives which organize only milk producers can successfully bypass the constraints of village power structure.”

Similarly, Parthasarathy (1991, A179) cites a number of reasons why the ‘white’ revolution was thought to be more equitable than the ‘green’ one. He notes: as a resource the distribution of milch cattle is less inequitable than land; higher income elasticity of demand for milk in comparison to cereals, provides more opportunities for the employment of landless in a growing dairy industry; it is easier to provide the poor with cattle resources than providing them with land; there is greater scope for the employment of women in the dairy industry with favorable consequences for family health and nutrition.

Hence, when the poorest did not benefit to the extent visualized, OF was criticized for being overly ambitious. Critics derived satisfaction in building strawmen and then reducing the achievements of the program to naught. However, debate on the issue seems to have subsided since Dr. Kurien in 1987 emphasized the limited poverty removal capacity of the program in the following words:

“Operation Flood is not an all purpose poverty removal program. It cannot be, because it focuses clearly on a single productive activity, dairying, while the ranks of the rural poor include many different categories of the disenfranchised: the old, the infirm, the tribals, the landless, the small farmers, the artisans and so forth. (Similarly, OF) is not an all purpose development program, aimed at removing economic and social inequalities existing in rural India for centuries at one stroke” (quoted in Verhagen 1990, 253).

On similar lines, Somjee and Somjee (1991, 141) conclude,

“The phenomenon of rural poverty-and the attempts to reach out to the rural poor with the help of post-independent India’s most efficient agency of rural development, i.e. milk cooperatives-when sought to be understood in any specific area, within the framework of its broader social contexts, turns out to be far more varied and complex than our social sciences theories would have us believe. This is because its roots stretch out into cultural, political, and human sources besides the economic.”

**Constraints faced by the landless**

The literature discusses the constraints which hinder the active participation of the landless in dairying. Though Baviskar (1988, 352) identifies four major constraints on the ability of households to undertake milk production – the money to buy a buffalo; availability of fodder; space to house a buffalo; someone to look after the buffalo – he considers fodder to be the most serious. The landless lack the resources to buy, and the land to grow it. Joshi (1990, 112) observes that in Saurashtra:
“The landless have to depend on village pastures for feeding their animals. Although pastures are available in large parts of Saurashtra, they are overgrazed. Therefore, the animals remain underfed. Moreover, the landless cannot always afford to buy fodder from the open market nor do they have access to the pastures owned by the landed classes.”

Program supporters like Somjee and Somjee (1989, 101) who have lauded the success of the SUMUL dairy which gets 70% of its milk supply from tribal villages, admit that in converting “the milk less Adivasis into milk producers” SUMUL did not face a fodder constraint as the Adivasi villages were located either on the edge of forests or had easy access to them. Describing the development of the dairy industry in Karnataka, Mascarenhas (1988, 201) mentions that even large farmers find it difficult to set apart a certain amount of land for fodder cultivation as it means taking away scarce land from crop production. Mergos and Slade (1987, 99) while studying the distribution effects of milk production in an OF project area in Madhya Pradesh find the capital and feed constraints to be ‘critical’ for households. They note that since the dairy project does not meet the credit constraint, participating households have to fend for themselves. They conclude,

“The project cannot reach directly those farm households that are the poorest of the poor, those without either land or animals.”

**Box 4.1**

Describing the efforts of the Amul cooperative in converting the landless into milk producers, Somjee and Somjee (1991, 13) say,

“To begin with such an effort called for the conversion of a part of village gauchar (common grazing land) into a fodder farm for growing fodder for the animals of the landless. The existing gauchars, in almost all villages, are sadly neglected and are of very little use. But such a scheme brought Amul face to face with the state bureaucracy which alone had the authority to give permission for such a transformation.

With great difficulty Amul got permission to set up community fodder farms in eight villages of the district. Out of those, unfortunately, only two served their intended purpose. The remaining six turned the fodder cooperative for the poor into a resource for only those who could afford the price of it.”

Verghan (1990, 241) considers the fodder barrier to be stronger than the ‘credit barrier’. He says that “The formation of village cooperatives, and the setting up of modern dairying infrastructure, together with the extension of various inputs such as veterinary care, artificial insemination and balanced cattle feed are expected to improve the economics of milk production ……however, they are unlikely to improve the resource position of the poor, especially of the landless laborers in terms of fodder.” Verghan has cited critics who argue that increasing commercialization of agriculture may well make the landless worse off as traditional relations of sharing fodder break down (242). Franco and Chand (1991, 12) note that “OF has strengthened the acquisitive tendency of the rich farmers. They not only attempt now to privatize the available common land, but doing away with the traditional understanding that the poor may collect crop residue and grass without payment, they start selling it.”

Though Government poverty alleviation programs like the Integrated Rural Development Program (IRDP) provide subsidized loans for the purchase of dairy cattle, critics argue that their impact is limited because of their inability to overcome the fodder barrier. J. George (1988, 8) argues that though the objective of programs like IRDP is to provide income earning opportunities for the poorest through provision of assets like milch cattle, they are unlikely to be successful merely by distributing animals in the absence of
attention to marketing facilities and fodder requirements. Chen and Athreya (1986, 66) notice that though several NGOs provide loans to the poor for cattle, few simultaneously meet their fodder needs. The authors argue that “Subsistence dairying by landless or land poor households is based on access to common grazing grounds and to sources of green fodder (wild grasses, field wastes). The fodder crisis in India is as great, if not greater than the much talked-about fuelwood crisis.......In many communities, the poor are being denied access to common grazing lands or to field wastes, which have acquired a commercial value as the demand for agricultural wastes both for fodder and industrial purposes has increased.”

5. WOMEN AND OPERATION FLOOD

Gender issues have received considerable attention in the literature on dairying. Many critics think this to be a favorable development since women’s contribution to dairying was given little attention in the past. Shanti George notes. “The subordinate gender’s contribution to a subordinate activity (dairying) has for long been almost unacknowledged in the literature on rural development” (1991, 267).

Women in the Dairy Sector

Women’s important contribution to the dairy sector is now well recognized. Sen and Rani (1990, 811) note that women constitute 93 percent of the workers in dairying and animal husbandry, though their level of involvement varies from state to state. Jamal (1994, 27), quoting a study by Agarwal for Uttar Pradesh, notes that on an average, farm women spend approximately 3 hours per day on animal husbandry related activities. Women perform a wide array of tasks in the dairy sector. They process the milk, clean, feed, milk and tend the animal, collect the fodder, collect and process the cattle dung for fuel. Membership of landholding and livestock holding class determines the time devoted by women to dairy activities (Mitra 1986, 13). For poor women, dairying is often an additional job, which they carry out along with other wage or non-wage work. Women from rich families in rural areas mainly supervise hired labor and do very little of the physical work themselves.

Critics argue that adequate representation is not given to women in dairy cooperatives and unions. Fulton and Bhargava (1994, 42) note (from NDDB reports) that in 1990-91 women made up only 15.5 percent of the 7.40 million members in the cooperatives. Bennett (1993, 29) notes,

“The membership in most of India’s 58,885 village level dairy cooperative societies (DCSs) is heavily dominated by men, even though female members do most of the dairy production work. Although there are now 1,086 all-women DCSs in India, gender disaggregated data on membership for the remaining 57,799 are not available. Women constitute less than 3% of total DCS board members.”

On the basis of their study in 3 districts of western India, Rangnekar and others (1994, 53) observe that many women are not even aware that their work of tending cows and buffaloes is an important economic activity. Analysts argue that this merely shows that though women are the actual managers of the milk economy, when it comes to participating in village or district level organizations, they get pushed aside and men take over. This practice is so deep rooted that women rarely complain (Somjee and Somjee 1989, 51).

The literature draws attention to the conscious efforts being undertaken by government agencies, local communities, non-government organizations (NGOs) and women ‘activists' to increase the participation of women in modern dairying. Manoshi Mitra
(1986, 16) mentions that though the Anand pattern normally allows for the setting up of one cooperative per village, an exception is made if the demand is for the setting up of a women’s only cooperative. Such efforts have sometimes produced spectacular results. Dieckmann argues that “Encouraged, motivated and organized women can easily perform traditionally men’s jobs” (1994, 27). Somjee & Somjee (1989, 24–28) describe the efforts of the rural community of Khadgodhara, (a part of Amul dairy) to bring their women, who are the actual managers of the milk economy, to the forefront. In this effort, the women themselves played a major role. Through their untiring effort, determination and enthusiasm they were successful in running a women’s only milk cooperative. Though the Amul officials were initially reluctant to allow for the opening of a milk cooperative in Khadgodhara, as there was one in an adjoining village, they agreed when the demand was for a women’s only cooperative for the community. The authors note that since the women of the village knew that their performance was being judged by the men, they felt challenged and were determined to succeed against all odds. Obsession with success brought even divisive elements together.

However, such conscious efforts have not always produced the desired results. Azad (1985, 9) states that often “Government planning and policy making bodies that endeavor to integrate rural women in the development process, meet with little success due to lack of vision, poor and inaccurate data base as well as lack of consciousness at the implementation level.” Manoshi Mitra’s (1986, 16-17) example of a women’s cooperative in Kheda district brings to light the problems that emerge in women’s cooperatives despite the efforts undertaken by organizations like the NDBDB. The women’s cooperative, which did very well for sometime, became dependent on male secretaries and teachers as technical skills and leadership qualities were lacking in the women. Overtime fraud, falling profits and losses made the cooperative defunct. Mitra mentions that problems also arise when a cooperative is made into a women’s cooperative in name only as in the case of a village in Vaishali district in Bihar. In this situation, women are manipulated by men, and the class caste biases of the original cooperative continue to influence the female members. Mitra stresses that to ensure that benefits reach poor women, conscious efforts need to be made to promote leadership and technical skill amongst them at the pre-cooperative stage.

The previous literature review (Alderman, Mergos and Slade 1987, 16) referenced Devaki Jain’s observation about the NDDB being favorably disposed towards increasing the participation of women in dairying. Marty Chen and Anila Dholakia (1986) provide a case study of the role played by the Self Employed Women’s Association (SEWA) in collaboration with NDDB in promoting women’s involvement in livestock maintenance and milk production in a dry zone of Dholka block in the Ahmedabad district in Gujarat. The study illustrates the various obstacles in organizing poor women and offers valuable lessons for government and NGOs with similar aims. As in Mitra’s study above, it stresses the importance of organizing and educating women at the pre-cooperative stage; exercising caution in selection of group members; proper supervision of the activities of the cooperative in its initial stages; and clear procedures and norms.

**Impact of Modern Dairying on Women**

Two radically different viewpoints are found in the literature about the impact of commercialization and modernization in the dairy sector on women. Critics argue that these processes have generated hidden costs and increased the workload of women who provide most of the labor. They argue that modern dairying reduces women from ‘doers and deciders’ to ‘doers only’ (Shanti George 1991, 273). Advocates on the other hand argue that OF provides an opportunity for women to improve their economic and social status (Somjee and Somjee 1989, among others).
Dilip Shah (1992, 152) who studied the impact of cooperatives in the Surat district of Gujarat observes that cooperativization led to a rise in workload for women involved in dairying. Sharma and Vanjani (1993, 1387) carried out an assessment of the impact of OF on the lives of women in a village in Alwar district of Rajasthan. Looking at women’s participation in dairying in Shankpur village, the authors argue that formation of women’s cooperatives creates more unpaid work for them and increases their stress. The authors add that women did not benefit in terms of nutrition either. “Women are the last to benefit from any increase in family consumption. Improvement of their health and nutritional status will require a restructuring of the family power structure and associated gender roles”. Meera Chatterjee’s observation (1990, viii) supports this viewpoint:

“Gender is a significant determinant of nutritional levels, accounting for lower caloric intakes and consequent poorer nutritional status among females. ….. Among the poor, resources such as food are limited, and females receive a smaller share than males. But as women have a relatively high economic value, they may be maintained above the survival line.”

The Indo Dutch critics also do not hesitate in admitting, “An improvement in the food situation of households in general does not guarantee that the nutritional status of vulnerable groups, young children and lactating and pregnant mothers has become satisfactory” (Doornbos and others 1990, 215). They argue however that it is important to distinguish between those women who substitute dairying for agricultural labor and those who take up dairying as an additional activity besides wage labor. They argue that where dairying substitutes for agricultural labor an improvement in the position of women producers can be expected (179).

Singh and Acharya (1986, 133, 136, 138) in their impact study of the Madhya Pradesh Dairy Development Project tested whether the project led to an increase of female labor in milk production. They conclude that for all landholding classes total employment of male and female labor in milk production was greater in DCS villages in comparison to control villages. They further show that the Project did not have a significant impact on female household labor used in milk production. They conclude that female labor employment in milk production was inversely related to the size of landholding (though the relationship was weak).

Advocates provide examples to show the positive impact of ‘modern’ dairying on the status of women. Somjee & Somjee (1989, 50, 141) describe the achievements of one of the largest milk cooperatives in India. The authors remark, “Dudhsagar is perhaps the only cooperative which has made an official policy, and not merely a strategy to involve more and more women in its village level operations”. Consequently, there is increasing presence of women in dairy related matters in the village where there was none earlier and women’s views, though to a large extent still expressed through their menfolk, are no longer ignored in the community. Linda Mayoux (1995, 211) drawing attention to the viewpoints of Dixon20 and Sunder21 in her work says “ Producer cooperatives, where women work together in a cooperative workshed outside the home, have been seen as having particular benefits because they challenge the norms of female seclusion and the unequal household division of labor”. The author elaborates that women empowerment could be an important objective for the cooperatives.

So large is the benefit which women are perceived to receive from participation in producer cooperatives that Marty Chen and others (1986, Chapter 7) recommend that as a matter of policy, 10 percent of all new dairy cooperatives should be women’s producer cooperatives. They also recommend that at least one-third of total members in existing primary cooperatives should be women and wherever possible there should be a sustained policy of transferring membership of cooperatives from men to women.
Constraints faced by Women

The literature also draws attention to the social and cultural constraints which hinder active participation by women in modern dairying. Bennett (1993, 4) notes, “Evidence is overwhelming that access—who gets what—is closely related to gender in Indian society”. The “inside/outside dichotomy” (Bennett 1993, 4) constrains their economic productivity while simultaneously limiting their access to education, health and other services like extension and training. The patrilineal transmission of land limits their access to financial services as land is the main form of collateral. “Though the intensity of the inside-outside dichotomy varies, on the whole barriers to women’s access to resources and markets are greater in the northern part of India than in the south” (Bennett 1993, 7). Mitra (1986, 18) argues that “Extension services provided by the dairy do not often reach the women due to sociological constraints and a lack of focus on women’s activities.”

Many of the problems which poor women face with respect to their involvement in dairying activities are not very different from those faced by marginal and landless farmers in general. These are constraints with respect to access to land, fodder and credit already discussed in the section on socioeconomic impact. These constraints may be more severe in the case of women because of the other gender related constraints they face.

6. IMPLEMENTATION OF THE ANAND MODEL

The NDDB’s relationship with the states and central government, and the nature of the cooperative organization it has helped build have been debated extensively in the literature. Critics argue that the NDDB enjoys too much autonomy in carrying out its operations and follows a “top down strategy” which is not in keeping with the spirit of the Anand pattern. Advocates on the other hand consider its mode of operation to be highly successful pointing out that the government looks favorably on the organization and has placed more primary commodities like edible oils, fruits and vegetables under its umbrella (A. Patel 1992, 50). Supporters also consider programs similar to OF, appropriate for dairy development in other Asian and African countries, where prevailing conditions in dairying today are comparable to those that were once found in India (Banerjee, 1994).

The Institutions

The NDDB and the Indian Dairy Corporation (IDC), created in 1965 and 1970 respectively, have the major responsibility for implementing OF. NDDB was created as a registered society and enjoys a parastatal status. IDC was set up under the Indian Companies Act of 1956 to handle the financial aspects of OF. Both the institutions are managed by technocrats and are under the final authority of the Central Government’s Ministry of Agriculture. Following the Jha Committee’s recommendations, the two were merged in August 1987 under the general umbrella of NDDB.

Though dairy development is a State subject under the constitution, the center and states exercise joint jurisdiction, with the central government laying down general guidelines within which the individual states design their dairy development policies. A significant shift in policy took place when the NDDB was established in 1965. Initially the organization functioned mainly as an advisory body, but it soon acquired the main responsibility for dairy development in the country. Critics argue that the OF program which involved the transfer of enormous amounts of dairy aid from the EEC, was responsible for this change. The Indo Dutch scholars argue “An institution (NDDB)
introduced as an *annex* to Central Government dairy development agencies evolved into being an usurper of those agencies* (S. George 1990, 90).

Mascarenhas (1988, 99-100) notes that since the state governments have the responsibility of actually implementing OF, NDDB promotes its dairy development policies through a process which involves considerable networking with the states. He describes,

“By adopting a strategy of persuasion, negotiation and bargaining with the implementing states, the NDDB has adopted a collaborative rather than a controlling role. Such collaboration takes several forms (and) is supported by a system of incentives to encourage state agencies to adopt new types of programs” (101).

S. George (1990, 87) notes that the state governments are reluctant to surrender authority in dairy development matters to the NDDB. She adds that the NDDB’s negotiation strategy involves temptations, bargains, compromises and provides the “NDDB with something of a tactical advantage, for delays and failures in the Operation Flood program can always be attributed to the dilatoriness or incompetence or hostility of various state governments.” George adds that NDDB’s relationship with all states is not the same. In Gujarat NDDB enjoys a sympathetic “insider” position, whereas in Maharashtra OF’s strategy of dairy development has been challenged by officials.

Doornbos and Gertsch (1994, 918) note that the NDDB enjoys considerable autonomy, because of its intermediary position between the donor agencies and Indian state governments, in addition to influencing dairy policy at the center. Gertsch (1990) observes that though the main task of NDDB was to replicate the Anand pattern, through providing relevant advise and technical guidance to the states, OF gave it an opportunity to become a corporatist25 partner of the state. “In its planning, policy making and program implementation, the NDDB often claims to perform these functions in the interests of the farmers and at times on behalf of State Dairy Federations and Unions....” (27).

**Replication of the Model**

The NDDB has been criticized for failing to successfully replicate the Anand pattern. Initially replication was to take place in Gujarat but when a large dairy surplus became available from World Food Program (WFP) and EC, expansion took off on a national scale. More than 70,000 Anand pattern cooperatives have been established since the NDDB came into being in 1965. The 1987 literature review refers to the problems inherent in attempts at replication. The Review of International Cooperation noted in 1992:

“While there have been many outstanding successes, there were also some symptoms that caused concern. In analyzing these, a common theme emerged: member participation and control was often less than necessary to ensure success. It was recognized that less than 20% of India’s cooperatives follow the Anand pattern.26 The cooperative environment is dominated by the other 80% cooperatives that often do not share a commitment to the fundamental principles and values of cooperation” (68).

Some critics argue that the original Anand model and the model which was sought to be replicated throughout the country were so different in origin, technology, and mode of operation that replication could not be achieved (S. George 1988, 394-420). George has distinguished between two kinds of Anand patterns: one which was found in the Anand milk tract of western India, the “real” Anand, and the other a “notional” Anand (395), and she attempts to bring out the claimed divergence between the two patterns by testing
some basic assumptions about the real Anand against evidence from the literature. On the basis of her analysis she states that

“If the original appearance of the Union in Kaira had been the result of official planning or deliberate intervention by public or private development agencies, the question of replication would be simpler as situational factors and catalytic inputs might be more easily identified. The spontaneous, non-governmental emergence of this dairy cooperative, however, makes the issue more complex and analysis more difficult” (414).

The earlier literature review (Alderman, Mergos and Slade 1987) made numerous references to authors who argue that replication of the Anand pattern was not possible because of special features associated with its origin and leadership. Patel (1990) highlights a number of factors specific to the original model, which were responsible for its success. In particular, she refers to the solidarity, skill and entrepreneurial capability of the land-holding *Patidar* caste, the political influence they exercised, the large agricultural surplus they put into dairying as a subsidiary activity, the support of the national movement for the cooperative ideology, the proximity of the Bombay market to the region, the age old dairy culture of the *Charotar* tract and the significant donations of foreign aid to the Kaira Union and Amul in the period prior to the inauguration of OF. Patel argues that these factors are not replicable. Patel concludes

“The NDBB technocrats, in order to sell their product, the Operation Flood scheme, marketed the myth of the Anand pattern as an organizational structure which, once put into operation, would be able to flood India with rivers of milk” (54).

Other critics question the idea of centralization inherent in the concept of replication. They argue that the approach of replicating the Anand pattern does not take into account the diverse features present in different parts of the country. Hence, the form of cooperation which emerges in various regions (because it is shaped by the local political, social and cultural background) is different. Mitra (1990, 154) observes that while in Kheda district in Anand, the milk producers came together spontaneously, in Bihar, because replication involved state initiative and supervision, caste and class relations had a profound effect on the nature of cooperation that emerged and largely succeeded in keeping the landless and the *Harijans* out of most of the cooperatives. Dairy cooperatives in the State at least in the short run added to the “process of polarization between different classes and caste groups”(155).

Critics have stressed decentralized approaches to dairy development as an alternative policy. As an example, Savara (1990, 278) shows how the SUMUL dairy because of its persistent development policy was able to create a milk production culture in a tribal population totally inexperienced in dairying. Savara notes that the tribal cooperatives deviated “substantially” in their functioning from the Anand pattern. Gertsch (1990, 49) argues that NDBB’s top down strategy eliminates the role of self motivation which was the driving spirit behind the ‘original’ Anand model. The NDBB’s method is to enter into negotiations with the State Government which leads to the formation of a State Dairy Development Corporation which propagates the cooperative structure to the district and village level.

Program advocates do not consider replication to be an impossible task. They argue that it can be brought about if an attempt is made to adapt program “essentials” to suit diverse conditions in different parts of the country. Mascarenhas (1988, 43) argues for a heuristic approach which would not be replication but a “Prototype being improved by local people, with the help of professionals, who share the value of the farmers.” Mascarenhas gives another reason why replication may not occur successfully. He draws attention to indigenous forms of cooperation, like the ‘*jajmani*’ system of reciprocity, that
have operated for centuries in the Indian society. He adds that building a successful dairy cooperative structure on the old existing indigenous one, basically involves the blending of the institutional (dairy cooperative) and indigenous form of cooperation. He quotes John Bennett:

“If we view indigenous cooperation as the soil in which formal, institutional cooperative organization must be planted, we shall find that the indigenous forms may either assist or obstruct the task. Indigenous cooperation may bring disparate groups together, thus helping to implement egalitarian cooperation, or it may divide groups and reinforce barriers between them, in which case it will impede the establishment of institutional cooperatives” (quoted in Mascarenhas 36).

NDDB was entrusted the task of creating ownership, participation and representation in states which have a vastly different sociocultural pattern in comparison to Gujarat. As Gertsch (1990) notes, “The NDDB utilizes various agents in implementing its programs that includes government officials (political leaders and bureaucrats), public institutions, international aid agencies, farmers’ cooperatives at various levels, spearhead teams to mobilize cooperative organization at the grassroots level along with their counterpart teams who sustain the impetus after the initial effort...” (44). Coordinating all these diverse actors to create the typical Anand pattern is not an easy task. The NDDB is aware that its efforts do not always result in the creation of a representative structure. It has set up a Cooperative Development Group to increase member participation and control (Review of International Cooperation 1992, 68). The management of NDDB is one with the critics on the issue that a fully effective operation depends vitally on farmer control at all three levels, lack of political/bureaucratic interference and employment of professional managers serving at the pleasure of the farmer controlled Board of Directors. However, they are faced with the operational question of how to persuade politicians and bureaucrats to relinquish control to farmers, especially, where the state has historically invested substantially in milk processing factories and other infra-structure.

7. SUSTAINABILITY

Background

OF sought to lay the foundation of a modern dairy industry in India. The program became possible when large amounts of dairy aid became available from a variety of international agencies, namely the World Food Program (WFP) of the United Nations’ Food and Agricultural Organization (FAO) and the European Economic Community (EEC). In addition, OF received bilateral assistance through the Government of India from several countries. Five loans from the World Bank provided additional funding.

Program funds were generated by selling donated commodities and were utilized for enhancing milk production, and building an infrastructure for milk processing and marketing. The table below gives quantities of skimmed milk powder (SMP) and butter oil (BO) and butter imported during various phases of the program.
Table 7.1: Total Imports of SMP, BO and Butter for India (1970-86) in metric tons

<table>
<thead>
<tr>
<th>Year</th>
<th>SMP</th>
<th>BO</th>
<th>Butter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-71</td>
<td>20,738</td>
<td>2,292</td>
<td></td>
</tr>
<tr>
<td>1971-72</td>
<td>29,357</td>
<td>2,457</td>
<td></td>
</tr>
<tr>
<td>1972-73</td>
<td>32,282</td>
<td>3,707</td>
<td></td>
</tr>
<tr>
<td>1973-74</td>
<td>21,242</td>
<td>4,281</td>
<td></td>
</tr>
<tr>
<td>1974-75</td>
<td>28,307</td>
<td>10,802</td>
<td>500</td>
</tr>
<tr>
<td>1975-76</td>
<td>27,626</td>
<td>7,165</td>
<td></td>
</tr>
<tr>
<td>1976-77</td>
<td>19,634</td>
<td>1,782</td>
<td></td>
</tr>
<tr>
<td>1977-78</td>
<td>11,821</td>
<td>7,679</td>
<td></td>
</tr>
<tr>
<td>1978-79</td>
<td>28,898</td>
<td>6,039</td>
<td></td>
</tr>
<tr>
<td>1979-80</td>
<td>31,146</td>
<td>12,291</td>
<td>1,282</td>
</tr>
<tr>
<td>1980-81</td>
<td>18,812</td>
<td>9,944</td>
<td>850</td>
</tr>
<tr>
<td>1981-82</td>
<td>77,467</td>
<td>14035</td>
<td>3,967</td>
</tr>
<tr>
<td>1982-83</td>
<td>37,573</td>
<td>9,331</td>
<td>3,457</td>
</tr>
<tr>
<td>1983-84</td>
<td>7,700</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>1984-85</td>
<td>105,480*</td>
<td>15,860</td>
<td>6,420</td>
</tr>
<tr>
<td>1985-86</td>
<td>9,590</td>
<td>2,810</td>
<td>3,490</td>
</tr>
</tbody>
</table>

* This surprising jump is not confirmed by other authors (Gulati and Bhide Table A3.12 1997).

Source: Doornbos and others (1990, 128-129)

Doornbos and Gertsch (1994, 935) discuss the reason why donors and recipients are interested in foreign aid. They observe that donors consider aid to be either an investment, a means of disposing of their surplus, or an instrument of development. They explain that the European Community, initially, thought of OF as a means of disposing its surplus and promoting its exports. In 1980s the EEC came to look upon aid as an instrument of development. India saw aid as a means of strengthening and achieving self sufficiency for its dairy sector and improving its balance of payments situation. S Patel (1990, 54) comments that “International linkages of Amul were forged only after it had succeeded in making milk production into a successful venture and had organized milk cooperatives around its production base. International aid was invited only for the processing of surplus milk and not, it is important to emphasize, for the organization of milk production itself.”

The Dependency Debate

A key issue which has been the subject of much debate in the literature is whether OF has built dependency into the system. Dr. Kurien32 (1992, 26) argues that OF is an example of successful utilization of food aid as an investment. He observes, “The overriding objective of all aid should be to eliminate the need for aid, and that the use of food aid as an investment would seem to be the most likely way to achieve that objective.” A Banerjee (1994, 9) adds,

“The successful Indian dairy development program OF has shown how food aid can be used as an investment in building the type of institutional infrastructure that can bring about national dairy development. Programs like OF, with similar policy orientations, may prove to be appropriate to dairy development in other Asian as well as African countries ....”

Critics argue that the program is unsustainable as large quantities of commodity aid and grants from a variety of international agencies made it possible. Doornbos and others...
(1990, 138) explain that aid served to establish the National Milk Grid System (NMGS) which provides facilities for transport of milk over long distances. They argue:

“The strong regional and seasonal variations in procurement combined with the high rate of milk utilization for manufacturing products in surplus areas would lead to unacceptably low levels of milk availability, especially in the urban and metropolitan areas outside the western region, if no foreign commodities were available to bridge the gap.”

Doornbos and Gertsch (1994, 935) note that even though NDDB has made self financing a statutory requirement, there is no strict adherence to this principle and subsidized capital is constantly used for capital investment and operating capital loans. “The constant need for fresh money constitutes one of the most pressing reasons for continuation of aid” (935-936). Doornbos and others (1990) refer to two kinds of subsidization: input subsidization and investment subsidization. They argue that withdrawal of these subsidies would put the sustainability of the whole infrastructure in the doldrums. J George (1988, 15) notes that though milk processing capacity in the country increased phenomenally under OF, procurement did not correspondingly increase. George explains, “As most of the capacity expansion programs have been on account of aid induced investment, an unused capacity is evidence of the aid’s inefficiency”.

Shanti George (1987) argues that the very policy decision which made OF dependent for funds on the sale of imported dairy commodities was faulty because such funding by its very nature creates a “dangerous substratum of subsidies.” George (1987, 1654) has provided an example of what she considers an alternative model for the dairy sector in India called “Operation Counter Flood.” This model emphasizes phasing out of dairy imports. Doornbos and Gertsch (1994, 938) argue that “easy access to enormous amounts of dairy aid has also obscured the precarious economic viability of this type of processing and marketing system”. Doornbos and others (1990, 148) admit that surplus milk powder from domestic sources could substitute for imports, but since this might involve raising prices they are doubtful if municipalities and consumer lobbies would find the solution acceptable. They state,

“In principle the transfer of surplus skim milk powder from Indian origin could substitute for imports. However, the guaranteed price at which the IDC buys such domestically produced SMP might have to be raised to create an attractive alternative for those dairies that are now operating on profitable markets. Simultaneously, the transfer price for which this SMP and BO will be passed on to the metropolitan and urban dairies may have to be raised. The question then is: how far will consumer lobbies and municipal authorities allow this to take place?”

Critics admit that the issue of how far NDDB’s policy influence has led to a sectoral dependency by incorporating India’s dairy sector into the world market for dairy products needs further careful examination (Doornbos and Gertsch 1994).

Gertsch (1990) argues that the dependency argument with respect to foreign aid arises because of the pricing policy of milk. Gertsch notes that NDDB sells the dairy commodity aid that it receives from the EEC to various dairies at a ‘transfer price’ lower than the indigenous cost of production of dairy commodities. Since this subsidy is then passed down, the real cost of dairy production for the whole sector gets obscured (61). Doornbos and others (1990, 293) support this argument when they say “Over the period 1970-1985 a continuous stream of aid commodities has tended to blur the effective cost of such supply, partly as a result of the price policy which has been followed for many years.”
Dilip Shah (1993, 373) on the other hand argues that there is little truth in the dependency argument since overtime, as a result of OF, India has developed skilled manpower, dairy technology and the capacity to manufacture dairy equipment and produce a diverse range of milk products. Chatterjee and Acharya (1992, 21) provide statistics to show that there has been a dramatic decline in dependence on imported skimmed milk powder and butter oil. They show that imported skimmed milk powder and butter oil utilized as a percentage of total milk throughput in the organized sector was 54 percent in 1961, 17 percent in 1971 and has dropped to 2 percent in 1989. Mascarenhas (1988, 130-131) notes that even prior to OF donated commodities and commercial imports of milk were coming into India and he argues that “By adopting the strategy ‘aid for development’ OF I and II convert such commodities into funds which are then invested in developing the infrastructure for dairy development”.

Advocates point to the large physical capacity that has been built in the dairy sector as a result of aid. Sahni (1993, 507) claims that the “World’s largest infrastructure for procurement, processing and marketing of rurally produced milk has been established in the country.” Khanna (1994, 159) refers to the tremendous capacity which has been built in the dairy equipment manufacture industry when he states that in 1970 almost 90 percent of the equipment and instruments for the dairy industry were imported whereas now 90 percent is manufactured in the country. Aneja (1994, 16) describes how under OF I “Skim milk powder and butter oil were made available to the metro cities at prices equivalent to producer prices for milk in India. The program generated over 1000 million rupees which financed the setting up of additional milk marketing dairies in the metro cities and setting up of eighteen Anand Pattern district dairy cooperatives which were linked through a network of rail/road milk transportation system...... Imported milk powder was thus used to set up milk power plants in India eliminating the need to import.” Fulton and Bhargava (1994, 45) argue “International funds provided the NDDB with the flexibility of working outside the state and national bureaucracies to plan and implement dairy development on a scale that would not have been possible otherwise.”

8. CONCLUSION

OF has generated a large and controversial literature. This literature review, dealing primarily with literature in the post 1987 period, has attempted to highlight the main arguments of the key players in the field on production, socioeconomic and gender impact of OF. The controversy regarding OF implementation and sustainability has also been visited. As noted in the previous literature review (Alderman, Mergos and Slade 1987, 70), lack of empirical data and scientific rigor continues to be a serious limitation of the available evidence on program effect. A lot of evidence on OF is either anecdotal or is based on area specific case studies.

Absence of longitudinal studies makes it difficult to assess the precise production impact of OF. Critics have even doubted the accuracy of official estimates of milk production. But sufficient evidence exists to show that there has been substantial growth in the dairy sector. The tremendous change in the dairy economy, the immense marketing network, the increased per capita availability of milk despite the tremendous increase in population are sufficient pointers of this growth. Directly or indirectly, OF has played a major role in this growth. A program as large as OF is bound to be criticized. Though some critics have totally repudiated the usefulness of OF, they have been noticeably silent on a plausible alternative for dairy policy in India. Their few suggestions are modest and not very convincing.

Evidence exists to show that OF has had a positive impact on income levels in rural India. Critics claim that OF has not benefited the poorest, but available evidence gives a mixed picture. Advocates argue that where the fodder and credit constraints have been
tackled the poorest have benefited tremendously. Numerous NGOs and socially concerned individuals have been undertaking active steps to integrate the poorest in the dairy development efforts of the community. There is need for more information and rigorous study to determine if better policies could overcome the fundamental fodder constraints faced by the landless, thereby extending the developmental impact of OF.

Advocates claim that OF is a boon for Indian rural women. They feel it provides them an opportunity to improve their social and economic status. Critics however point to an increased work burden for women. Whilst some women have certainly benefited, further empirical research is needed to conclude whether women on the whole have gained or lost.

The Anand pattern has not been replicated uniformly. What has emerged all over the country is adaptations and variations on the Anand pattern. This fact is well recognized even by program administrators who, given the political and administrative set up in the country, find it difficult to ensure farmer control and adherence to cooperative principles. At the time of this writing, farmer control is still the subject of a nationwide political struggle, though more intense in some places than others. The serious contention by critics that OF has made India’s dairy sector vulnerable to external pressures, does not seem to have an empirical basis.

**Endnotes**

1. The accuracy of these figures has been challenged (Doornbos and other 1990; Mishra and Sharma 1990).
2. In any case, the growth in production is several fold larger than the growth in OF milk procurement.
3. Following the recommendations of the Jha Committee, the two were merged in August 1987 under the general umbrella of NDDB.
4. A three tiered cooperative structure, owned and managed by the producer members. The cooperatives at the village level represented the primary producers. These in turn formed the district level unions which in turn formed the state level federation.
5. The districts of Sawai Madhopur and Tonk.
6. When production exceeds the demand for milk.
7. Cows and buffaloes primarily for milk production.
8. Shah mentions that there is a substantial ‘slack’ offered by the village agricultural and social system that can be used to increase milk production in the village at little incremental cost.
9. The authors also point out that milk income constitutes about one-third of total income, and in a society where level of economic development is low and poverty high this is a substantial amount.
10. This is the pessimistic conclusion. Optimists would use the same data to report that some landless did indeed benefit.
11. Scheduled caste and scheduled tribe.
12. Landless and marginal of intermediate castes.
13. This is a comment about animal production in general and not OF in particular. Also it comes from a National Commission not from apologists for OF.
14. However, milch animals are only one of the necessary inputs for dairy production (para 4.9 to 4.12).
15. Chairman of NDDB.
tribals.
i.e., Women’s.
Districts of Baroda and Ahmedabad in Gujarat and Udaipur in Rajasthan.
“Part of the cultural definition of the female in India is her association with the inside, the home and courtyard where the family is cared for. This is in contrast to males who belong outside in the fields and the bazaar where livelihoods are earned and economic and political power is transacted.” (Bennett 1993, 3).
Some critics who favor privatization of economic activity wherever possible, nevertheless manage to deplore the lack of active Government direction of NDDB.
OF was to replicate the ‘Anand’ pattern, a three tiered cooperative structure, owned and managed by the member producers, all over the country. The cooperatives at the village level were to represent the primary producers. These in turn were to form the district level unions which control the facilities for the procurement, processing and distribution of milk. The district unions in turn were to form the State Federation. There was an extension to a fourth tier in 1986, the National Cooperative Dairy Federation of India (NCDFI), to coordinate the activities of the state federations and manage the dairy grid to balance supply despite seasonal fluctuations.
Refers to interest group behavior.
Total cooperatives dairy and non dairy.
This is a salutary distinction for any centrally planned (c.f. Bank) project designed to be participatory. OF met the challenge by the organization of “spearhead teams” to alert villages as to the possibility and advantages of organizing a village DCS. However, the decision to actually form (“adopt” in the extension lexicon) a DCS was left to the villagers themselves.
The heartland of Patidar is locally known as Charotar. It consists of the regions covered by the Anand, Nadiad, and Petlad talukas (sub-districts).
Unlike Amul, the fat content of the milk is not tested daily and the producers are paid every month.
Underlying principles.
Chairman of NDDB
“The degree of input subsidization may be defined as the percentage increase in the costs of inputs if the IDC were forced to stop supplying the various milk schemes of the National Milk Grid System with subsidized commodities” (Doornbos and others 1990 pg. 139).
“The degree of investment subsidization refers to the subsidy element which the IDC allows in the investment activities under OF”. (Doornbos and others 1990 pg. 139).
This is another example of the strawman method of critical analysis. Having assumed “sectoral dependency”, the critics go on to examine how this developed and its implications. Whilst in the real world, concessional inputs of dairy products have ceased and with it, presumably, the postulated “sectoral dependency.”

Whilst new developments can always undermine existing institutions, the cooperative sector developed under OF is currently self financed without either subsidies from the central government or donors.

9. REFERENCES


