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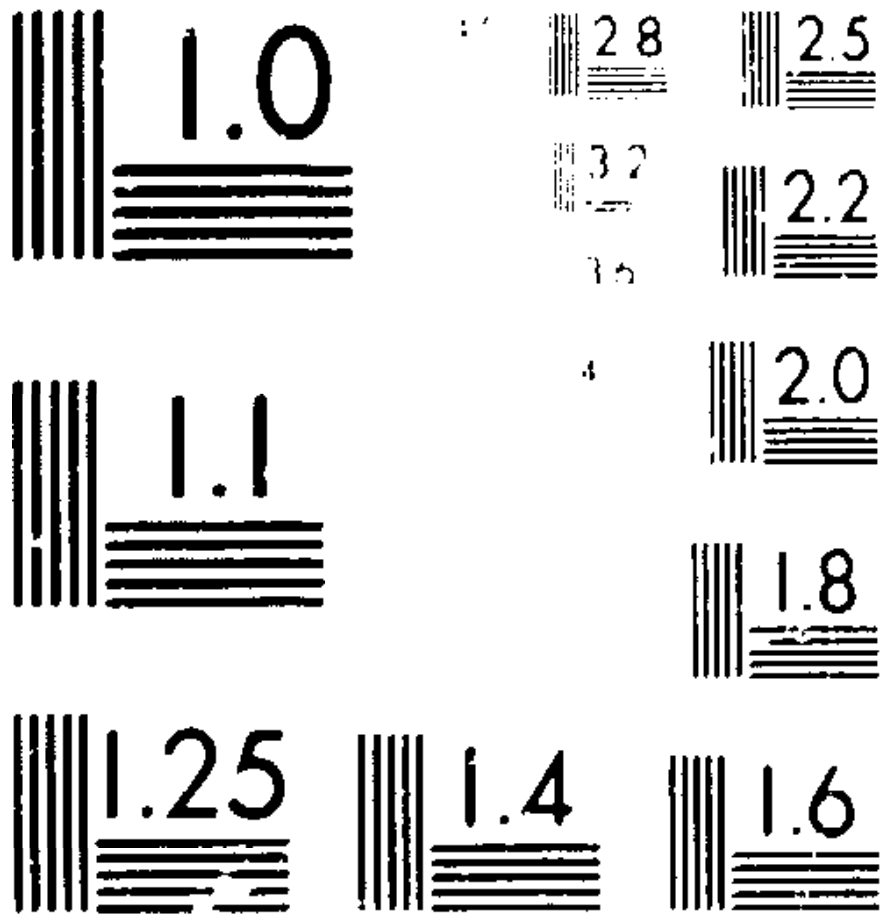
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ROLE OF CO-OPERATIVES IN FOOD PRODUCTION, PROCESSING AND MARKETING IN INDIA: A CASE STUDY*

by

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Explanatory notes

The following abbreviations of organizations are used in this report:

DCB	District Co-operative Bank
DCF	District Co-operative Consumers Federation
IFFCO	Indian Farmers Fertilizer Co-operative
NAFED	National Agricultural Co-operative Marketing Federation of India
NCCF	National Co-operative Consumer Federation
NCDC	National Co-operative Development Corporation
NCUI	National Co-operative Union of India
PACS	Primary Agricultural Credit Society
PLDB	Primary Land Development Bank
PMS	Primary Marketing Society
RCMS	Regional State Co-operative Marketing Society
RCS	Registrar of Co-operative Societies
SCB	State Co-operative Bank
SCCF	State Co-operative Consumer Federation
SCMF	State Co-operative Marketing Federation
SCU	State Co-operative Union
SLDB	State Land Development Bank
TDCC	Tribal Development Co-operative Corporation

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The aim of this study is to help clarify the role of co-operative organizations in the development of an intergrated food-processing system in India. It is not an attempt to illustrate the effectiveness of administrative decisions by the organizations concerned. The study describes the organization, role and integration of food production, processing and marketing co-operatives in India and highlights the role of the National Co-operative Development Corporation (NCDC) in the development of the food sector of the co-operative agri-business system. It is seen in the light of ideological preferences of the Government of India policies which favour co-operatives. An attempt is also made to present in greater detail two successful models of co-operative development in the largest subsectors of the co-operative food sector, the Kaira District Co-operative Milk Producers' Union Ltd in the dairy subsector, and the Warana Sahakari Sakhar Karkhana Ltd in the sugar subsector.

Agricultural co-operatives in India - an overview

Indian agricultural co-operatives have today outgrown their early reputation of being failures - inept, vague and inefficient - and have emerged as a major competitive force in certain sectors of the Indian agri-business system. They are recognized as a special managerial institution and as a distinct type of enterprise working for their farmer-owners, very much an integral part of the economic system and receiving an ever-increasing role from the government in planning for rural development. The vast network of rural co-operatives has up to 80 million members, 60 million of whom belong to farming families. More than 90% of co-operatives are strategically placed at rural and semiurban locations, thus emphasizing their eligibility to be developed as focal organizations for rural development.

Co-operatives play an important role in the multiple stages of the agri-business system, from production through delivery to terminal market points. In the food sector of the agri-business system, their share has been an increasingly important one.

Accounting for more than 40% of agricultural lending in the country, co-operatives play an important supportive role in food production and related activities by rendering agri-services. Their share in the distribution of farm inputs, mainly fertilizers, farm chemicals and seed, is around 45%. The Indian Farmers Fertilizer Cooperative Ltd. (IFFCO) is today the single largest manufacturer of fertilizer in the country - recording a capacity utilization in 1979/80 of 83.7% and 107.8% in 1978/79 as against the national average of nitrogenous units of 66.2% and 71.2%.

In the food-processing sector, sugar and dairy co-operatives have commanded an ever-widening share of their respective markets. With an investment of Rs 10 billion, the sugar industry is the second largest industry in the country. Co-operatives own 51% of manufacturing capacity and contribute 52% of total sugar produced. A total of 24,500 dairy co-operatives, with 2 million producer members account for more than 60% of the organized sector market share. AMUL - a co-operative venture, has achieved worldwide acclaim; its annual turnover of milk products is of the order of Rs 580 million.

Marketing of food produce by co-operatives has also increased. Of a total value of Rs 17.83 billion of agricultural produce marketed by co-operatives in 1978/79, food products accounted for well over 50%. Export of food products through co-operatives has also increased with the entry of National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) in this activity; in 1979/80, export of food products amounted to Rs 555 million. Various State marketing federations have also undertaken the export of food products.

Organizational structure of co-operatives

The co-operative complex in India deals with several areas. The or-organization dealing with each functional area is shown in table 1.

TABLE 1. FUNCTIONAL AREAS OF CO-OPERATIVE COMPLEX IN INDIA

Major functional area	Controlling organization at various levels *			
	National	State	District	Village
Finance	NCDCa	SCB(S+MTb) PLDB (LT)c	DCB/SCB/ PLDB	PACS PLDB/ branches
Marketing	NAFED	SCMF/TDCC/ Special CF	RCMS/ PMS	PACS
Consumer Distribution	NCCF	SCCF	DCF/PMS	PACS (Lead and link)
Training	NCUI	SCUI	-	-
Administration control and policies	Depart-ment of co-operation GOI	Depart-ment of co-operation GOS/RCS	Deputy RCS/ Assistant RCS	Co-operative inspector

* See Explanatory notes on page 2.

a For marketing, processing and storage credit (exclusive of production credit).

b S+MT = Short and medium-term loans.

c LT = Long-term loans.

Co-operative credit structure. At the national level, the NCDC is the leading body for term and block finance for all agricultural co-operatives for marketing, processing and storage activities. At the state level, the short- and medium-term financial structure is a pyramid of three-tier with the State Co-operative Bank (SCB) as the top credit institution and the District Co-operative Bank (DCB) at the district level and the Primary Agricultural Credit Society (PACS) at the village level. Long-term finance is undertaken by the State Land Development Bank (SLDB) through its primaries.

Co-operative marketing structure. NAFED is the national level co-operative organization for the marketing of agricultural produce as well as certain processed food products. It is a federation of marketing societies at the state, regional, mandi[1/] levels. Its aim is to promote organized marketing

1/ Primary market and trading centre.

of agricultural commodities, both in interstate as well as in international trade. The NAFED function is to streamline marketing, to process and supply agricultural commodities, machinery requisites, inputs etc., through the co-operative marketing system.

At the state level, the structure of the agricultural co-operative system concerned with input distribution and marketing and processing of agricultural produce is generally two-tiered. The State Co-operative Marketing Federation (SCMF) is the leading marketing society, with the Regional State Co-operative Marketing Society (RCMS) at the block level and the Primary Marketing Society (PMS) at the mandi level as the second tier. The SCMF formulates and distributes inputs to primary societies, purchases agricultural produce for members, stores and transports it on their behalf, processes members' produce, and functions as sole selling or procurement agent of the state government. The co-operative marketing structure is broad enough to encompass secondary and terminal markets in the country. At the primary markets, the structure functions through the PACS, which are members of the PMS. Generally there is one PACS for every four or five villages.

Where large tribal populations exist in various states, special Tribal Development Co-operative Corporations (TDCC) have been created to organize and co-ordinate credit and marketing functions.

Special commodity marketing federations have also been set up in some states where the co-operatives have a major share in the concerned commodity, e.g. areca nut, tea, rubber and coir.

Co-operative processing structure. A separate structure has not been created for agricultural processing co-operatives. Processing units are owned and set up by PMS, SCMF and NAFED. Separate processing societies are also formed depending on geographical agricultural specialization; such units have invariably well-established backward linkages with PMS and PACS and forward linkages with the SCMF.

Consumer co-operative structure. The National Cooperative Consumer Federation Ltd. (NCCF) is the national organization of consumer co-operatives in the country. Its role is closely linked with the role of the consumer co-operatives

in retailing and wholesaling, both in urban as well as rural areas. NCCF operates through its branch and zone offices. Its trading operations include (a) pulses, spices, food-grains, tea and other agricultural commodities, (b) controlled cloth,[2/] (c) non-controlled textiles, (d) general merchandise, (e) goods confiscated by Indian customs authorities. At the state level, the State Consumer Co-operative Marketing Federation (SCCF) is engaged in the distribution of agricultural and food products as well as essential non-agricultural products. The SCCF operates through regional centres and branches and sells consumer goods through co-operative stores in urban areas and PACS in rural areas.

Co-operative training structure. The National Cooperative Union of India (NCUI) is the leading body for training of co-operative personnel at the state level; the State Co-operative Union (SCU) identifies training needs and co-ordinates training of various co-operative staff in the states.

Co-operative administration control and policies. Formulation of co-operative policies is made at the government level by the concerned ministry dealing with co-operation. At the state level, administration of co-operative policies and planning is the responsibility of the Department of Co-operation. The Registrar of Co-operative Societies (RCS) reports to the Secretary and is the executive head. He is also the friend, philosopher and guide of the co-operatives in the state.

Integration of different co-operatives in the production and market aspects of the food-chain

While different co-operative organizations are independent entities, with their own sphere of well-defined activities and responsibility, they form an integral part of an otherwise well-knit chain into which they fit and within which they act and interact. The linkages and forms of integration are many and varied - the various functional specializations form one organization at the base, i.e. the village level PACS which integrates within it a range of activities covering credit, input supply, procurement, marketing, storage, transport and consumer distribution.

2/ Low-cost cloth produced by textile mills according to government directions.

Food processing units, like all other agricultural commodity processing units are owned and operated by NAFED, SCMF/TDCC/Special Commodity Federations, PMS, and specially constituted units. Funds for block purposes as well as short-term capital are channelled through the state co-operative credit structure. Management and technical consultancy is often provided by the SCMF, which maintain consultancy cells for this purpose. Training needs of personnel are identified and catered for by the ACU. Backward and forward linkages with other co-operatives are maintained for the supply of raw material on the one hand and market outlets on the other. Processing of commodities is done both on its own account or on a custom basis for other co-operatives. Linkages are also established through vertical integration of an industry to achieve economies through by product utilization or to provide the necessary inputs - several such instances are to be found in the Indian co-operative sector.

The role of co-operatives in the food sector in India

The role of co-operatives in the food sector of the Indian agri-business system is important. The food sector is composed of several subsectors - sugar, food-grains, oilseeds, dairy, fruit and vegetables, poultry and fisheries, plantation crops, and consumer goods. The role played by co-operatives in production, processing and marketing in each of these sub-sectors may be seen from the figure 1. Of the various subsectors, sugar and dairy are prominent, with more than 50% of the organized market share to their credit.

The role of co-operatives in integrating raw material production and processing, marketing, processing, storage and distribution, wherever possible on a subsector basis, has been elaborated below.

Integration between raw material production and processing

Village PACS collect and supply the raw material of its producer members to the processing units. Processing units are owned either by PMS, by specially constituted processing units, the SCMF or by national organizations. These organizations often use PACS as their procurement agents. When the processing units are owned by the SCMF or NAFED, the entire co-operative marketing network may be used for the integration of raw material supplies. Where processing is on a custom basis for the SCMF or the NAFED, the Federations generally supply raw material to the processor.

ROLE OF CO-OPERATIVES IN FOOD SECTOR

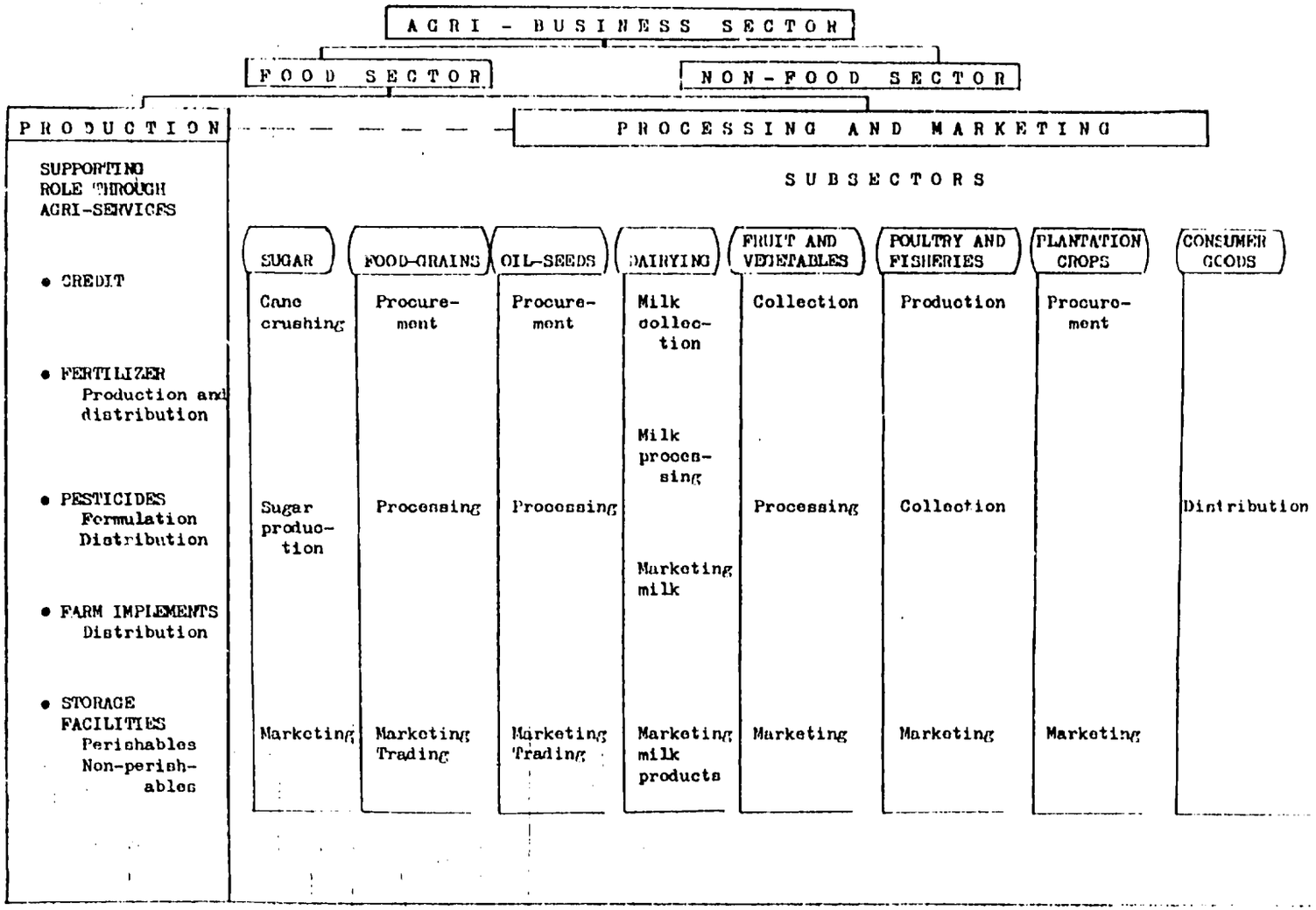

Figure 1. Role of co-operatives in the food sector in India

Marketing. The value of agricultural produce marketed by co-operatives increased to Rs 17.83 billion in 1978/79 in comparison with Rs 11 billion in 1973/74. On a commodity basis, business handled by co-operative marketing societies is shown in table 2.

TABLE 2. AGRICULTURAL PRODUCE MARKETED BY CO-OPERATIVES 1978/79

Item	Rs billion
Food-grains	4.28
Sugar-cane	6.01
Oilseeds	0.59
Plantation crops	1.03
Fruits and vegetables	0.13
Others	1.17
Total[a]	17.83

a Total figures correspond to both food and non-food sector. However, it would be seen that more than 90% of total value is accrued out of the commodities handled in food sector.

Co-operative marketing societies are assigned an important role in procurement of food-grains. In 1979/80, marketing co-operatives handled 2.4 million tonnes of wheat (32% of total procurement) and 291,000 tonnes of paddy. The co-operative sector accounted for the marketing of 50% of sugar-cane in the country. Co-operative marketing of oil-seeds was Rs 583.1 million in 1978/79 as compared to Rs 325.2 million in 1977/78. NAFED continued to be the procurement agency for price support operations of oil-seeds (ground-nuts, sunflower and soyabean). Co-operatives also registered an increase in their turnover in the marketing of cashew nuts, coconuts, cardamom etc. The value of plantation crops marketed by co-operatives in 1978/79 was Rs 1.08 billion, and fruit and vegetables Rs 132 million. NAFED is the national body dealing with the marketing of fruit and vegetables such as apples, potatoes, onions etc. It also undertakes such marketing on behalf of co-operative societies. During 1979/80, it marketed apples worth

Rs 12 million. The export of fruit and vegetables is also done by NAFED - potato exports in 1979/80 was valued at Rs 9.7 million. In the fishery and poultry subsector, the share of co-operatives in marketing has so far been minimal. A beginning, however, was made with the marketing of eggs by NAFED and SCMFs. During the co-operative year 1979/80 (July-June) NAFED total exports of agricultural commodities amounted to Rs 550 million.

Processing. 2,033 co-operative processing units are presently engaged in agricultural processing in the country, 75% of these units are directly concerned with the food-processing sector.

The sugar and dairy subsectors are the major ones involved in processing. Co-operative sugar factories, totalling 142, account for 51% of manufacturing capacity; and in the last season contributed about 52% of the total sugar production in the country. 54 co-operative sugar factories exceeded full capacity utilization, while 84 achieved a capacity utilization of over 80%. Average recovery rate of sugar from co-operatives was 10.3% compared with the industry average of 9.8%. The sugar factory at Warananagar in Maharashtra had a record sugar recovery of 12.5%. 139 co-operative sugar units crushed 19.5 million tonnes of sugar by 15 June 1980. An interesting feature of sugar co-operatives is that a large number of them are located in industrially backward areas. In the processing of food-grains and oilseeds, co-operatives presently command only a minor share. There are 720 rice mills with an installed capacity of 2.02 million tonnes of paddy per annum, and there are 61 pulse mills with an annual capacity of 120,000 tonnes. Efforts are presently being made to odernize co-operative rice mills. At present, there are 58 modern rice mills and another 255 are at various stages of modernization. Efforts are also in progress to diversify products through the setting up of bakeries etc.

Oilseed processing co-operative units in the country total around 250, and include ground-nut decorticators, oil mills, solvent extraction plants, vegetable oil r fineries, vanaspati units, and feed-mix units. A number of large integrated oil complexes have also been set up.

In the dairy subsector, with more than 10,000 village level dairy co-operative societies, co-operatives undertake procurement and milk chilling operations to benefit around 1.5 million milk producer members. 10% of raw

milk in the country is processed and approximately 50% of this is processed by co-operatives. During 1979/80 of a total daily milk production of 71.9 million litres, 7.9 million litres was processed daily, 3.2 million litres of this in the co-operative sector. The co-operative sector today has 90 milk-processing units with an installed capacity of 6 million litres of milk per day.

Co-operatives also play an important role in fruit and vegetable processing. Presently, 28 co-operative fruit and vegetable processing units, with an estimated annual processing capacity of 20,000 tonnes of finished products are involved in dehydration, juice making, pickle making, and canning. In 1978/79, co-operative sector processed fruit and vegetables was valued at Rs 11.2 million. Processing of plantation crops in the co-operative sector is carried out by 58 processing units. Crops processed are areca nut, coconut, cashew nut, cardamom, black pepper, coffee and tea. A large quantity of spices is exported. For instance, 50% of the total export of black pepper in the country is exported by the Kerala SCMF.

Storage. Co-operative storage facilities have been created at three different levels

- Rural godowns at the level of primary village societies
- Marketing godowns at mandi and secondary market levels
- Large godowns at SCMF headquarters or at potentially large business centres

Co-operatively owned storage capacity is presently around 4.7 million tonnes, with 37,019 rural godowns and 6,375 marketing godowns. Co-operative storage projects with International Development Agency (IDA) and European Economic Community (EEC) assistance are under way in five states and assistance to an additional five states over the next five years has tentatively been agreed to by IDA. The concept of rural storage has undergone a radical change; village societies are being developed as rural growth centres and focal points for rural change. The new storage concept would work by providing under one roof an integrated activity-mix, i.e. disbursement of credit, distribution of agricultural inputs, storage of agricultural output and distribution of consumer articles.

Co-operatives also cater for perishable commodities through cold-storage facilities. So far, 125 cold stores with a total capacity of 210,000 tonnes have been set up in the co-operative sector, mainly for potatoes and fruit and vegetables, depending on location. A project to create an additional 253 cold stores with a total capacity of 1.01 million tonnes over a period of five years, with financial assistance from IDA, has recently been agreed to. The project aims at filling 50% of the storage gap through the creation of cold-storage capacity in the co-operative sector, and will be operational in 1981/82.

Distribution. Co-operatives constitute the single largest institutional agency for the distribution of agricultural inputs such as fertilizers, seeds, pesticides etc. In 1978/79, co-operatives distributed inputs worth Rs 8.84 billion. Fertilizer alone accounted for as much as Rs 8.04 billion. Co-operative distribution of fertilizers in 1979/80 was estimated at 2.35 million tonnes of fertilizer (nutrients) worth Rs 9 billion. On an average, co-operatives presently account for 45% of fertilizer distribution through 51,000 retail outlets.

Rural consumer distribution through co-operatives has increased from Rs 5.46 billion in 1976/77 to an estimated Rs 6.5 billion in 1979/80. 2,220 PMS, 45,241 PACS and 679 tribal and other co-operatives are presently engaged in the distribution of consumer articles in rural areas. The average turnover of a village society which was Rs 50,000 in 1975/76 increased to Rs 65,000 in 1978/79, while in some states the average annual turnover exceeded Rs 100,000.

The role of the Government in Indian co-operation

After 75 years, the Indian co-operative movement is today the largest in the world. Co-operation is a familiar concept to India - traditional village life was based on the implicitly accepted and explicitly expressed principle of co-operation, with families getting together to help each other in various farm operations and social functions, as well as in meeting social obligations. The Co-operative Societies Act of 1904 first gave a formal shape to the co-operative movement. With successive refinements, what was initially started as a credit movement, has today evolved into a multi-functional integrated system.

Early government thinking on co-operation was expressed in the first plan document which said "the emphasis of the plan is in augmenting agricultural production. In this sphere, co-operation has a very significant contribution to make. Co-operatives can help to increase the effectiveness of extension work. Other services which a cultivator needs for efficient utilization of his land can also be made available through co-operative agencies. In fact, in the field of agriculture, co-operatives undertake almost every activity that is meant by the term 'agricultural organization'. It is the best medium for promoting a progressive agriculture".

The emphasis shifted from mere production credit to an integrated approach to co-operative development with the All India Rural Credit Survey Committee's Report (1954) which identified the problem as one not of "rural-minded credit" alone. The Committee recommended the development of an integrated approach to credit, marketing, processing and storage in the rural sector. One result was the recommendation of the establishment in 1962 by Parliamentof the NCDC. More recently, the National Cooperative Policy Resolution has recognized the importance of building up the co-operative network for the purpose of agricultural production, processing, procurement and public distribution.

The Government has directly participated in co-operative development through special programmes such as the Central Sector and Centrally Sponsored Schemes. A total of Rs 297.6 million was spent on this project in 1979/80. At the state level, state governments also provide financial support to various co-operative units.

Co-operatives are being increasingly used by the government for procurement, price support operations and consumer distribution. The scope of using the PACS with their close links with farmers as well as agricultural extension services, as focal organizations for rural development is being increasingly recognized. With a view to strengthening the societies, a major reorganization of societies into viable units has already been effected in a large number of states in accordance with the recommendations of a study team on Agricultural Credit Institutions.

The National Co-operative Development Corporation

The All India Rural Credit Survey Committee Report recommended that production finance should be the sphere of the Reserve Bank of India and that a separate institution should be set up to foster the activities of co-operatives in marketing, processing, storage and allied economic activities. The emphasis thus shifted from production credit alone to the need to develop an integrated system of agro-processing, storage and marketing to enable the producer to secure an increased share of value added. The NCDC was accordingly established by the Government of India in 1962 for the planning and promotion of various programmes for co-operative marketing, processing, distribution of inputs as well as warehousing of agricultural produce. With a further modification of its charter to accommodate a larger role for the NCDC, the NCDC is now planning, promoting and financing co-operative development programmes for (a) production, marketing, processing, storage, export and import of agricultural produce, foodstuffs including fish and dairy products, cattle and poultry feed and other specific commodities such as fertilizers, insecticides, agricultural machinery etc., and (b) collection, processing, marketing, storage and export of minor forest produce which is largely dealt with by the tribals in the country.

Organizational structure. The NCDC is governed by the 51 member General Council and the board of management of 12 members. The General Council is broad-based and provides representation to both officials and non-officials connected with co-operative development - representatives of states, economic ministries of the central Government and organizations involved in the development of agricultural co-operatives such as NAFED, SCMF, All India Federations of Co-operative Sugar Factories and Spinning Mills etc. The board is a cross-section of the General Council. The Union Minister for Agriculture and Co-operation is the President of the General Council and the Minister of State is its Vice President as well as the Chairman of the board of management. The Secretary of the Ministry of Agriculture and Co-operation, Government of India, is the Vice-Chairman of the board. NCDC's day-to-day working and organization is carried on by the Managing Director who, as Chief Executive, has sufficient financial and other powers to carry out tasks effectively. NCDC's organizational structure is indicated in figure 2.

Sources of funds and lending operations. While essentially a promotional and developmental organization, NCDC also provides funds to co-operative societies for a wide range of activities as outlined in its charter. As an organization

providing both promotional and financial support for evolving an efficient co-operative agricultural, marketing and processing infrastructure, NCDC is possibly unique in South-East Asia.

The NCDC Act does not provide for share capital. NCDC derives its funds from (a) budgetary support from the central Government for special government schemes meant for co-operatively underdeveloped areas, (b) market borrowings, (c) internal accruals to the NCDC fund, and (d) aid from international agencies such as the World Bank and EEC, routed to it through the central Government.

Though NCDC provides block finance for a variety of co-operative projects, it does not envisage financing the entire requirements of agricultural co-operatives. The approach has been to encourage co-operatives to borrow from other term-lending institutions wherever possible. To enable co-operatives to raise working capital from commercial lending institutions, NCDC also provides margin money and share capital assistance to societies to provide them with the requisite margin of security. NCDC has so far provided assistance totalling Rs.3.34 billion to co-operatives, of which Rs 2.03 billion has been for marketing, processing and storage of agricultural produce. The types of assistance provided by the NCDC on a subsector basis is described in annex 1.

In addition to providing the above funds, NCDC also acts as a financial co-ordinator vis-à-vis other financial institutions to fund co-operative programmes. For example, the establishment of a sugar factory costs about Rs 70 million which can be contributed by society members, NCDC, state governments, financial institutions such as the Industrial Finance Corporation of India, Industrial Development Bank of India etc. NCDC helps put together the entire package of funds so that the unit is assured of sufficient finance.

NCDC's financial programme has increased dramatically from an initial outlay of Rs 26.3 million in 1962/63, to Rs 547.1 million during 1979/80. During 1980/81, NCDC plans to spend Rs 659.5 million.

Role in the food sector

Establishment of food-processing units

NCDC has played a vital role in the establishment of co-operative food-processing units in the country and in the storage and marketing of their products. With NCDC's assistance, the number of food-processing units has increased considerably between 1962/63 (when NCDC came into being) to 1979/80, as shown in table 3.

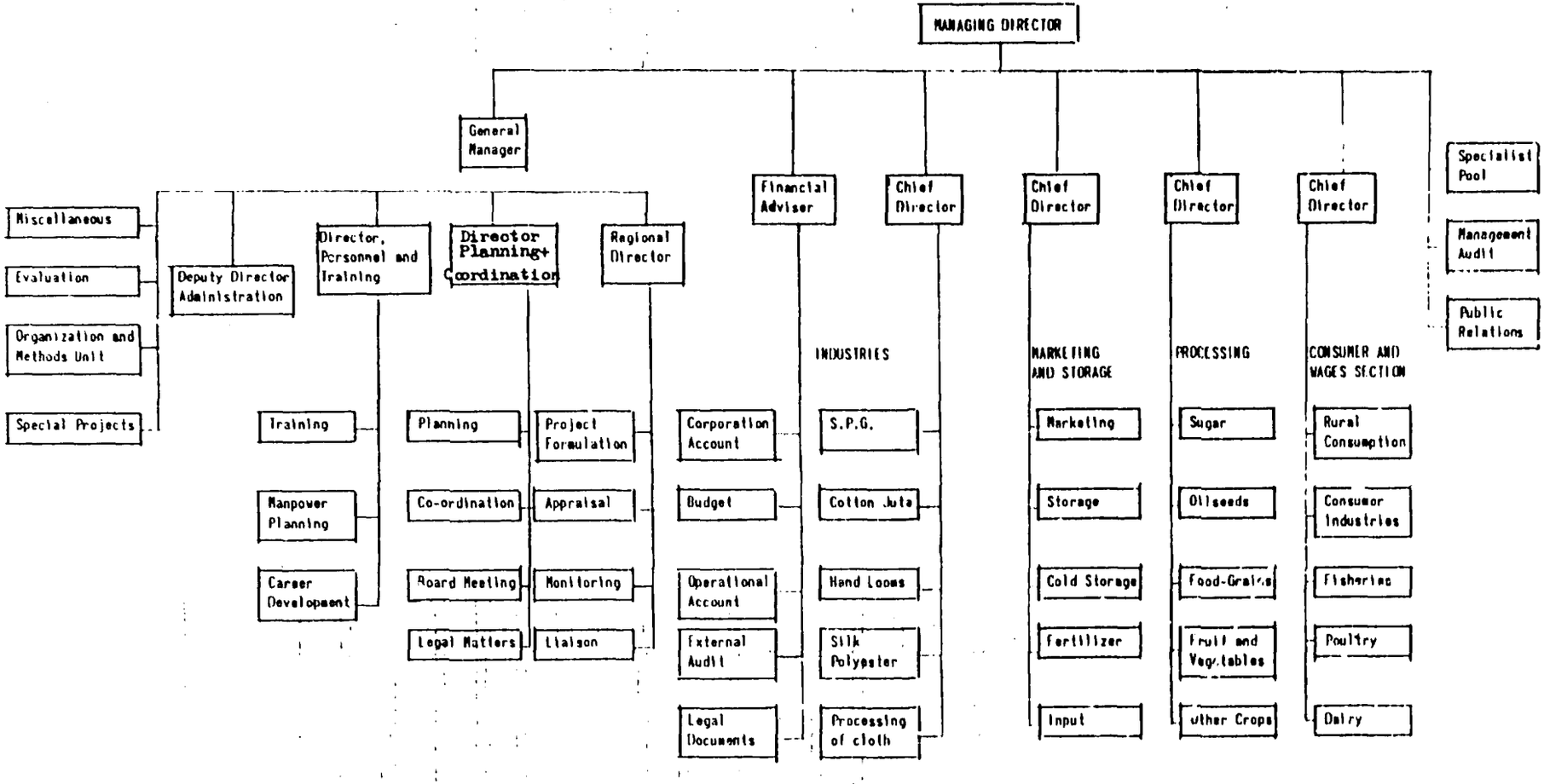

Figure 2 - Organizational set-up of National Co-operative Development Corporation

TABLE 3. NCDC ROLE IN ESTABLISHMENT OF CO-OPERATIVE FOOD-PROCESSING UNITS

Subsector	Number of co-operative units			
	1962/63	1968/69	1973/74	1979/80
Food-grains				
(a) Rice mills	32	612	798	720
(b) Dal mills	-	21	32	61
Sugar and by-products				
(a) Sugar factories	41	60	91	142
(b) Open pan	-	17	17	17
(c) By-products	-	1	11	22
Fruit and vegetables	4	21	27	28
Oil milling				
(a) Oil mills	2	133	145	154
(b) Rice bran	-	1	4	8
(c) Solvent extraction	-	4	6	25
(d) Vanaspati	-	1	2	6
(e) Ground-nut decorticators	-	47	57	58
Other (Cold storage, dairy, plantation, co-operative cattle, poultry feed, bakeries and miscellaneous units)	23	49	151	239

During the sixth five-year plan, NCDC proposes to assist 232 new co-operative processing units, 50% of which are in the food-processing sector. In addition, modernization of several other food-processing units is also envisaged.

NCDC has funded co-operative storage projects with World Bank and EEC assistance in five states. Two projects, one for storage godowns in an additional five states with a total outlay of Rs 1.1 billion and a potato storage-cum-marketing project in six states with a total outlay of Rs 1.2 billion, have been recently appraised by the World Bank and given a go-ahead. Five soya bean processing plants in two states involving Rs 270 million have already been approved in principle by the EEC.

Selection of programmes. Selection of programmes is by and large the responsibility of the concerned societies in the states as well as the state co-operative departments. However, NCDC maintains a team of professionals who appraise projects and advise societies on suitable production lines, choice of technology, specifications for equipment etc. NCDC also performs a promotional role by undertaking the responsibility for drawing up the national plan for the co-operative sector, by introducing pilot ventures in new fields and preparing blueprints and guidelines in respect of various schemes.

Manpower and manpower training. NCDC provides assistance for the appointment of experts in the technical and promotional cells created at the national and SCMF level. With a view to upgrading the managerial competence of the staff of various co-operative societies, NCDC funds the entire cost of training such personnel in specialized programmes, conducted by reputed management institutions. NCDC has also financed special programmes tailored to the specific needs of various food-processing units in collaboration with the Management Institutes, the National Council for Co-operative Training, the Co-operative League of the USA, ILO etc.

Export promotion. NCDC provides margin money to various co-operatives engaged in the export of food and food products to enable them to raise working capital. It also provides finance for setting up export-oriented processing units particularly for fishery co-operatives. Recently it has helped a number of co-operatives to undertake the export of raw fruits and vegetables to neighbouring countries.

Kaira District Co-operative Milk Producers' Milk Union Ltd

The Union, popularly known as AMUL, has demonstrated how successful a co-operative organization can be in achieving socio-economic betterment of vast under-privileged rural masses. Today, 259,000 producer members are beneficiaries of AMUL. Through 856 milk producers' co-operative societies, the Union collects 159.3 million kg of milk annually, processes and markets milk and milk products to a value of Rs 580 million and employs 2,400 persons.

AMUL - the genesis

Kaira, a district in Gujarat with a pattern of milk production typical of rural India consists of 1,000 villages covering 2,500 square miles. Agriculture is the mainstay of more than 80% of the population. Landholdings are small, 53% of small farmers have holdings of 0.1 to 2.0 hectares and about 22% are landless farmers. The farmers of Kaira have traditionally supplemented their income from farming by keeping milch animals. Milk yields were low, cost of milk production high and returns poor. Scientific practices in animal husbandry were unknown. A popular way of warding off cattle disease was to tie black thread to the horns of the animal or to dose it heavily with oil.

Farmers of the Kaira District had long supplied milk to a private dairy, which converted most of it into butter. As an alternative, they supplied milk through private contractors to the Bombay Dairy Scheme, run by the Government. Milk prices received by the producers were as low as 12 paise[3/] per litre. In 1946, under the leadership of Vallabhai Patel (later Deputy Prime Minister of India), the milk producers became better organized and ceased the supply of milk to the city of Bombay for two weeks as a protest against low milk prices. The successful strike ultimately brought about a change in the entire milk economy, with an overall increase in milk prices. Encouraged by the success, on 14 December 1946 a co-operative society was established in Anand, a small town with a population of 15,000, 427 km from Bombay. The first meeting of the co-operative - the Kaira District Co-operative Milk Producers' Union Ltd - was presided over by Morarji Desai, later Prime Minister of India.

Success induces confidence

The Union, which started with two village Milk Producers' Societies and covered 30 villages, began in June 1948 to pasteurize milk for supply to the Bombay Milk Scheme. Tribhuvan Das Patel, who was elected Chairman of the Union, provided the right leadership. These societies only handled 250 kg of milk daily but the economic betterment of producer members of these

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3/ 100 paise = Rs 1; Rs 8 = $1.

co-operatives led to the organization of more and more societies at an accelerated pace. At this stage, Dr. Verghese Kurien, who joined the Government Research Creamery at Anand, provided a helping hand to Tribhuvan Das Patel, by offering to repair the Union's pasteurizing plant when needed. In 1949, he resigned his post to join the co-operative organization. In 1950, he became the Manager of AMUL and introduced the concept of scientific dairy farming. Emphasis was placed in the use of qualified veterinarians, cross-breeding of milch cattle, scientific balanced feeding and appropriate cattle management practices. Under Kurien's management the Union grew rapidly. He concentrated on the procurement of more milk from members and the creation of plant facilities for handling fluid milk. The number of milk producers' societies rose from 64 in 1955 to 846 in 1979/80. Significant growth was recorded in share capital, milk procurement, coverage of producer members and turnover of milk and milk products (see tables 4 and 5). These achievements were possible with the help of the right kind of staff employed by Dr. Kurien. They brought about a major breakthrough by increasing milk yield from 3 litres to 4.5 litres a day per milch cattle, by shortening the time between the pregnancies and subsequent lactations, which increased the number of available milkers. But success produced problems. Buffaloes calve after the monsoon and twice as much milk is produced in winter as in summer. The Bombay Milk Scheme was unable to handle these seasonal gluts and refused to accept milk from the Union for a number of weeks. Kurien, therefore, decided to convert milk into powder. He received good support from UNICEF and the New Zealand Government to whom he had gone for help, but sceptics believed that when heat was applied to buffalo milk it would curdle. However, Kurien set up a make-shift arrangement to produce a jar of buffalo milk powder, and this silenced his critics. In October 1955, a Rs 5 million project to manufacture milk powder was established with assistance from UNICEF and the Government of New Zealand. The chronological development of AMUL is described in annex II.

Establishment and organization

Today the membership of Kaira District Co-operative Milk Producers' Union Ltd consists of 846 Milk Producers' Co-operatives which collect on an average 400,000 litres of milk per day from its 310,000 farmer members. It employs 2,400 persons, of which 300 are professionals. Its dairy complex is spread over 45 acres of land.

TABLE 4. AMUL AT 31 MARCH 1979

	Particulars	1978/79
1.	Milk Producers' Co-operative Societies	856
2.	Members	295,000
3.	Milk collected from societies (million kg)	159.3
4.	Number of milk routes	79
5.	Average rate for 1 kg fat (in Rs)	27.80
6.	Milk collection centres owned by societies	495
7.	Artificial insemination centres	734
8.	Artificial inseminations performed (in Rs)	255,000
9.	Pregnancy diagnosis (in Rs)	139,000
10.	Mobile veterinary dispensaries	21
11.	Cases treated by mobile dispensaries (in Rs)	135,000
12.	Veterinary first-aid cases treated (in Rs)	167,000
13.	Special veterinary visits (in millions)	6.6
14.	Members participating in milk-yield competition	773
15.	Cattle feed sale (AMUL Dan) (in tonnes)	77,800
16.	Total turnover (Rs in millions)	581.1
17.	Paid-up share capital (Rs in millions)	6.9
18.	Reserve fund (Rs in millions)	23.5
19.	Other funds (Rs in millions)	45.9
20.	Permanent assets (Rs in millions)	116.0
21.	Staff salaries and wages (Rs in millions)	17.8
22.	Net profit (Rs in millions)	1.5

TABLE 5. GROWTH OF AMUL

Year	No. of societies	No. of farmer members (in thousands)	Share capital (Rs in millions)	Quantity[a] of milk collected (million kg)	Income from the sales of milk and milk products (Rs in millions)
1955/56	64	23	0.03	10.1	7.4
1956/57	107	27	0.36	10.4	8.9
1957/58	130	29	0.39	20.1	10.34
1958/59	138	33	0.47	20.7	20.11
1959/60	167	38	0.57	20.3	10.82
1960/61	195	40	0.74	20.4	10.98
1961/62	219	46	0.75	30.5	30.15
1962/63	254	58	0.81	50.0	40.56
1966/67	567	120	1.65	70.16	110.7
1971/72	744	215	3.85	130.32	330.6
1972/73	783	225	4.15	140.78	390.2
1973/74	794	235	4.32	110.20	310.6
1974/75	844	245	4.42	130.1	440.6
1975/76	829	250	5.29	120.9	440.5
1976/77	831	255	6.86	120.7	440.2
1977/78	831	275	6.87	140.12	560.5
1978/79	846	290	6.89	150.93	580.1

a Milk collection has increased from 30,000 litres per day in 1955/56 to 400,000 litres per day in 1979/80.

The Board of Directors is elected by farmers from the villages and it governs the Union. Day-to-day operations are looked after by competert professionals.

The AMUL pattern of milk co-operatives may be seen from figure 3. This pattern, in practice throughout Gujarat and now being repeated throughout India through Operation Flood I and II, consists of a two-tiered structure of village Milk Producers' Co-operative Societies at the village level and a District Milk Producers' Co-operative Union at the District level which owns a dairy. The milk societies in the villages collect surplus milk from milk producers twice each day and make payments for it every 12 hours or as decided by the producers. The milk collected at each society is transported to the dairy by private contractors who are engaged by the milk union. At the dairy, it is pasteurized and most of it is sold as liquid milk. The remaining milk is converted into milk products.

Besides milk collection and twice-daily payments to milk producers on the basis of quantity and quality (fat and solids not fat), the milk co-operatives also have an intensive system to provide them with the essential technical inputs and services they need in the villages through the same organization engaged in milk procurement. When a new milk society is started in any village, the milk union provides financial assistance, mostly in the form of free milk testing equipment and other necessities. A Union supervisor helps the new milk society for a few days to organize its day-to-day business. Thereafter, the Union guides, supervises, rectifies and controls the activities of each milk society so that it runs efficiently and remains strong and viable. There is a continuous and concurrent audit of all the co-operatives on a quarterly basis to ensure an efficient milk business.

The Union through each of the milk societies provides a number of technical inputs to the villagers for milk production enhancement. The most important of these are artificial insemination services through use of semen from high pedigree or proven sires, veterinary first-aid treatment, weekly veterinary visits and health cover service, routine extension work, supply of quality seeds and root slips for production of green fodder and supply of balanced cattle feed. All these services are provided on a "no-profit no-loss basis" to the farmers in every village covered by the milk co-operatives. Details of these inputs are described in annex III.

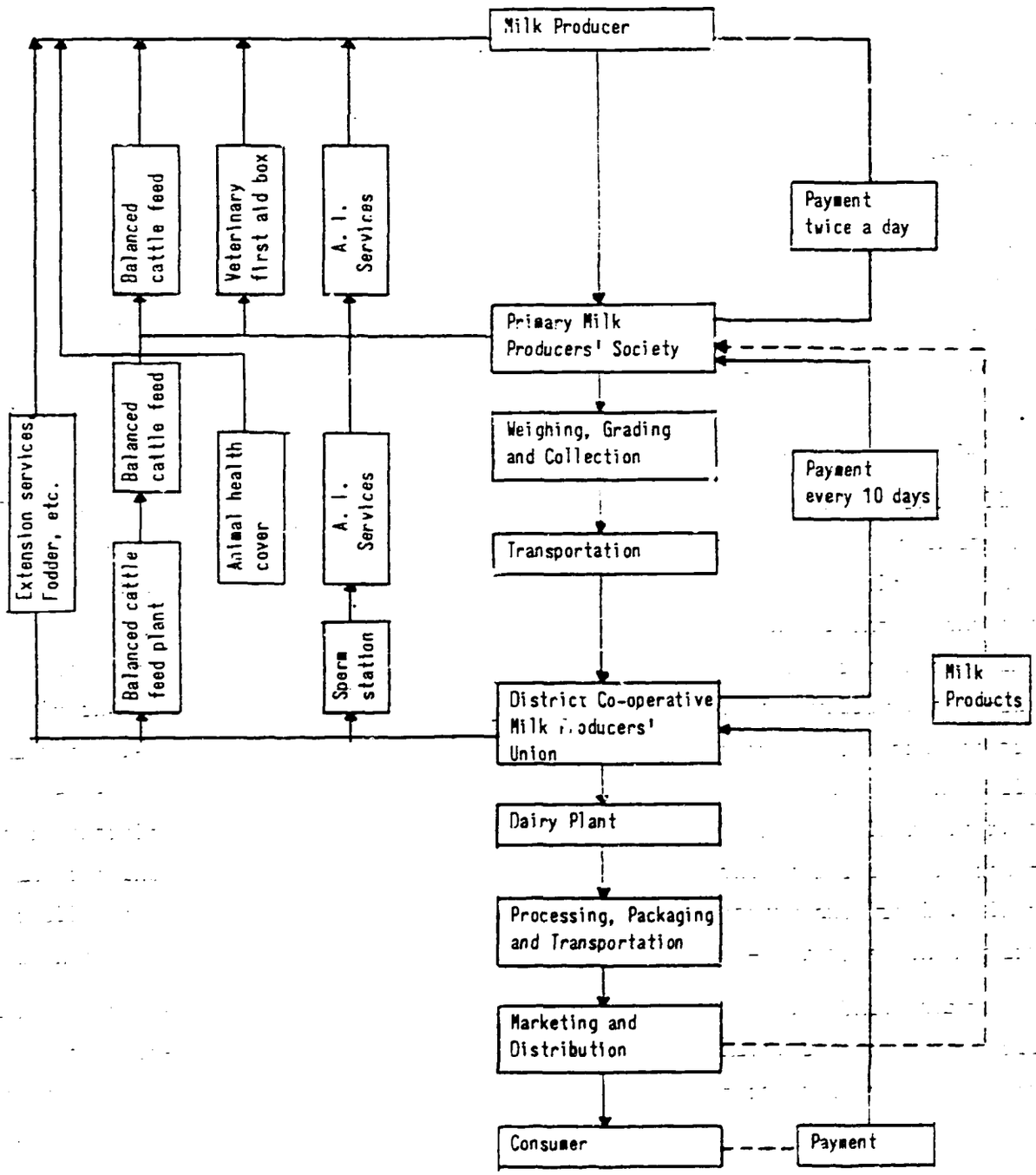

Figure 3 - Organisation of Milk Producers Co-operatives, AMUL

With a part of their annual savings, the milk co-operatives - unions as well as societies, have built up an extensive system to provide various rural development services. They assist in cattle development, co-operative propaganda and education, establishment of schools, libraries, health centres, youth clubs, construction of roads and provision of water supplies and electricity connections in the villages. The producers are paid dividends on their shares. A part of the net savings is also used to pay a bonus to the producers in relation to the contribution they make towards the business of the society, a bonus to the staff of co-operatives and to build reserve funds to ensure the financial stability of the co-operatives. The reserve funds can also be used for building up the assets of the society such as milk collection centres, telephone facilities, store rooms etc., and to help the co-operatives to function efficiently.

Integration

The success of AMUL can be attributed to its integrated approach.

A technological break-through in the increase in milk yield per milch cattle was an integrated function of several inputs, i.e. artificial insemination, veterinary first aid treatment, balanced cattle feeding and scientific cattle management practices.

Commercial success was achieved by effectively integrating milk procurement, processing and marketing activities. It also permitted the producer members ot receive their genuine share in value added gains.

Role of Kaira Cooperative Union in supplying the market with dairy products

The Union's dairies and plants today produce milk, butter, cheese of various flavours, milk chocolate and malted milk food, and market them under the brand name "AMUL" which means "priceless". It has undertaken a dynamic sales promotion programme and has almost monopolized the market in India for butter and cheese. It has fared exceedingly well in the sale of milk chocolate in competition with a transnational company.

AMUL today

AMUL provides a steady and remunerative year-round market for whatever milk is produced by its members. This in turn has provided an incentive for

farmers to adopt scientific practices of animal husbandry tc produce more milk at a lower cost, thereby optimizing their returns. Kaira Union is now implementing a seven-year plan for doubling milk production, this envisages a comprehensive programme of animal breeding, animal nutrition, animal health and hygiene, livestock and extension work on scientific lines. In addition to milk and milk products, Kaira Union has also encouraged the cultivation of cccoa beans, these are finding favour with the farmers. To help its members, some of whom produce lime, it has also set up a lime juice plant. To encourage the paddy growers amongst its members, a modern rice mill has been set up by the Union.

The Kaira District Union has also helped in erecting a dairy in Ahmedabad, and it has also been appointed as technical consultants to the dairy at Rajkot. The staffof the Union also serve as technical consultants to UNICEF, state governments as well as to the Government of India.

The miracle man of Kaira, Dr. Kurien, is today the Chairman of the National Dairy Development Board (NDDB), which through its two large projects, Operation Flood I costing Rs 3 billion and Operation Flood II now starting and will cost Rs 5 billion, would finally establish what is being termed as the "White Revolution" in the country. But the successful evolution of AMUL continues.

AMUL not only has helped to raise milk production and to improve economic conditions, especially of the rural poor, by providing them with effective and needed facilities, employment and daily cash income, but this pattern of milk co-operatives has also in it the seeds of an entire rural revolution. It demonstrates how a dynamic democratic body can envolop the entire population of an area and influence intimately its daily life in all its aspects - economic, social and educational. The late Lal Bahadur Shastri, as Prime Minister of India, said, "If we can transplant the spirit of Anand in many other places, it will also result in rapidly transforming the socio-economic conditions of the rural areas and in our achieving the objective of a socialistic pattern of society."

Shri Warana Sahakari Sakhar Karkhana Ltd., Warananagar, District Kolhapur, Maharashtra

Shri Warana Sahakari Sakhar Karkhana Ltd provides an example in yet another subsector of how a co-operative enterprise can benefit producer members

and also help bring about socio-economic development of rural areas. Today, the Warana Sugar Factory which crushes 3,000 tonnes of cane per day with well over 100% capacity utilization, has set records by achieving the highest sugar recovery (12.5%) among sugar factories in India. This brief case history is an attempt to highlight some of the achievements of this co-operative sugar factory.

The beginning

In the early 1950s, small and marginal sugar-cane farmers of the Warana area in Maharashtra strove hard to secure a remunerative price for their produce. A progressive farmer, V.A. Kore, foresaw the need to set up a sugar factory as he realized that increases in productivity and production of sugar-cane in the area alone would benefit the producers. To help producers become the owners of a factory, he provided the right kind of organizational leadership. The capital cost of a sugar factory at that time was around Rs 10 million. To register a co-operative society formally, and to secure financial help from the Government, it was necessary to arrange initial share capital of about Rs 1 million from the growers. This was in itself a formidable task. Mr. Kore was however undeterred, and a few dedicated supporters went around from house to house and village to village talking to and convincing farmers about the long-run benefits of such a co-operative factory. Share capital began to pour in with many cases of small farmers contributing their mite by selling ornaments, livestock and household goods. With the raising of the requisite share capital, the society was registered in 1955 with an area of operation involving 66 villages. The state government provided a counterpart contribution of Rs 1 million. This share capital enabled the society to borrow the necessary extra finance from term-lending institutions and to commission the factory in 1959.

Warana marches ahead

Over the years, membership and share capital of the society has substantially increased. Presently, the society has a share capital of Rs 8.44 million contributed by 6,632 members, as can be seen from table 6.

TABLE 6. MEMBERS AND SHARE CAPITAL OF WARANA CO-OPERATIVE SOCIETY

Type of membership	Number of members	Paid up share capital (Rs in millions)
Producer members	6,552	8.30
Co-operative institutions	63	0.12
Nominal members	17	0.01
State government	-	-
Total	6,632	8.44

5% of producer members are small farmers with less than five acres of land. The par value of a share is Rs 1,000. The Society further strengthens the share capital base of members by collecting non-refundable deposits deducted from the cane price paid to producers.

The factory started with an initial capacity of 1,016 tcd (tonnes of cane per day). It has successfully expanded its capacity in a phased manner to reach its present capacity of 3,000 tcd.

Operating results

The factory has operated on a basis of more than 100% capacity. Reduced losses and higher sugar percentage recoveries indicate its excellent technical performance. Details of the working results of the factory are shown in table 7.

TABLE 7. WARANA SUGAR FACTORY - WORKING RESULTS

	1979/80 [a]	1978/79	1977/78	1976/77
Season days worked	180	195	191	171
Cane crushed (kg millions)	399.4	406.0	405.4	359.9
Sugar production (kg millions)	4.66	5.09	5.02	4.44
Recovery percentage cane (%)	11.97	12.53	12.38	12.35
Crushing capacity utilized per season day	108.15	104.10	101.85	105.25

a 1979/80 was an exceptional year with low sugar production in the country.

	1979/80 [a]	1978/79	1977/78	1976/77
Total losses of sugar in processing (%)	1.99	1.94	2.05	2.07
Reduced overall recovery (%)	80.42	86.92	85.59	86.19

a 1979/80 was an exceptional year with low sugar production in the country.

Management

Warana's present Board has 17 elected directors, five nominated directors and one director co-opted as a representative of the workers. The Board functions through an executive committee and sub-committees which hold periodical meetings on various issues, but work along lines laid down by the general body of members which meets once a year.

Cane procurement and payment

To receive cane supplies from producers, the factory's sugar-cane department keeps plot records of fields, conducts maturity surveys and draws detailed harvesting plans. Farmers receive advance notice before these plots are harvested. The factory arranges harvesting labour and transportation from field to factory. Trucks and tractors are bought by the factory and provided to its members under a hire-purchase scheme. This permits small farmers to pool transport facilities which they could otherwise not afford. Such a system provides the factory with an assured supply of cane as well as benefiting the producers who receive ex-field instead of ex-factory prices.

The cane price is paid in two instalments - the price advances on cane delivery and the final price at the year's end, depending upon the financial results of the factory. The prices received by cane producers have always been much higher than the statutory minimum prices fixed by the Government.

Sugar-cane development

In the initial stages, sugar-cane productivity in the Warana area was poor due to lack of irrigation facilities and proper scientific agronomic practices. The management of the sugar factory has now taken various steps to help improve cane productivity and to extend the area under cane cultivation.

The factory has propagated the use of scientific practices and is educating farmers in the latest technological developments through publicity campaigns. The factory provides extension services, quality seeds, fertilizers, pesticides and other inputs to its members on credit terms. To solve the water supply problem of the area in order to increase agricultural production, the factory has constructed a jackwell, bunds and a dam from its own funds. The factory provides surety for the farmers who want to avail themselves of credit facilities for buying electric motors and pumps etc. for energizing the wells to pump out water. The factory also invests in development of other infrastructural activities needed for cane development. With these concerted measures, the productivity and cane area increased considerably in its area of operation. The increase in cane production finally led to the capacity of the factory being expanded.

Efforts toward integrated rural development

The management views the factory as a nucleus for creating agro-industrial, social, educational and cultural development of the area. The society has an account entitled "Area Development Fund" in which the proceeds deducted from members' cane bills are credited. Different socio-economic facilities are financed through this fund. The factory has enabled the rural people to organize various enterprises such as a Mahila Grah Udyog manufacturing papad, flour mills, spice powdering unit, poultry and dairy society, consumers and workers welfare society, a dispensary and a hospital with maternity home, a farmer's bank, a primary and public school and a college. The factory also owns a printing press. It has also started a thriving bank with headquarters in the small village of Warananagar, and branches in the nearby town of Kolhapur. These rural development activities are described in detail in annex IV.

Annex I

ASSISTANCE PROVIDED BY NCDC FOR MARKETING, PROCESSING AND STORAGE OF FOOD PRODUCTS

Marketing

Margin money assistance is given to state, regional, central and primary level marketing co-operatives for the expansion and diversification of their marketing and distribution activities of food products. Assistance is also provided for revitalization of selected primary marketing societies identified as potentially viable marketing and processing societies. Co-operatively under-developed states and union territories are given financial assistance for the purchase of transport vehicles.

Processing

Assistance is provided for the establishment of processing units in the food sector, these include, large-sized oil complexes and small- and medium-sized units for processing food-grains, plantation and horticultural crops. Bankable projects for the utilization of by-products particularly in regard to the sugar industry are also assisted.

Sugar

In the sugar subsector, NCDC gives assistance to state governments to enable them to participate in the share capital of sugar factories.

Dairy

Assistance is given for organizing medium- and small-sized dairy processing plants and milk-chilling centres, for the purchase of milk cans and cones, vehicles, bulk coolers and ice factories.

Fruit and vegetables

Financial assistance is given for the development of marketing, processing and storage of fruit and vegetables as well as for the purchase of vehicles.

Fish and poultry

Assistance is given to fishery co-operatives for the development of inland and marine fisheries and infrastructure facilities. This assistance

helps meet the share capital requirements of fishery co-operatives for their marketing, supply and distribution activities. Assistance is also given for the purchase of vehicles, including refrigerated vans, development of fish tanks, ice plants, oil extraction units, canning units and various inputs required by the fishery co-operatives.

The NCDC provides share capital assistance to poultry co-operatives, and assistance for various infrastructural facilities such as incubators, manufacturing of egg trays etc.

Storage

NCDC gives assistance to setting up rural and marketing godowns at primary and secondary markets. Large godowns needed for commercial operations of marketing federations are also financed by NCDC.

In addition NCDC assists in setting up cold stores for the storage of perishable food products.

Transportation

Assistance is provided to enable various processing units, dairy and sugar factories and marketing societies to buy the necessary vehicles.

Annex II

DEVELOPMENT OF AMUL

Phase I (1949)

New pasteurization plant bought.

Phase II (October 1955)

A dairy project costing Rs 5 million with a handling capacity of 160,000 litres of milk per day was inaugurated when a milk powder plant was set up with assistance from UNICEF and the Government of New Zealand. This was the first milk powder plant in the country. The project was completed in 11½ months.

Phase III (1960)

Dairy factory expanded at a cost of Rs 1.5 million to manufacture baby food and cheese. Kaira Union was the first to produce condensed milk food in India.

Phase IV (1962)

A lime juice plant was set up in 1962 to provide farmers with a better economic price for their products which were grown in the Kaira District.

Phase V (1964)

At a total outlay of Rs 3.1 million, a cattle-feed mixing plant was established in 1964 which was inaugurated by Lal Bahadur Shastri, the then Prime Minister of India. At the inauguration, Shastri asked Kurien "why can't we build co-operatives like this all over India?" Kurien replied, "absolutely no reason at all". From this brief exchange came the National Dairy Development Board (NDDB) with its headquarters at Anand, and not at New Delhi as is normal for national organizations. Today, NDDB through Operation Flood I and II, is effectively bringing what is called a "White Revolution" in the country.

Phase VI (1970 onwards)

Since 1970 the Union has further expanded and diversified its products; it now manufactures milk chocolate, weaning food, and malted milk food.

Annex III

KEY INGREDIENTS OF AMUL

A. Milk producers' co-operatives

Depending upon the size of each village, 300 to 400 farmers, each with one or two buffaloes, form a co-operative society by purchasing a share of Rs 5/- or Rs 10/- each and by paying an entrance fee of Rs 1/- each. The members elect an honorary management committee consisting of between - and 13 members and elect their own chairman. When the new society is registered, the Union's supervisor visits the area of procurement to assess the availability of milk and the quality of milch cattle in the area. He trains the secretary and sometimes the other office bearers of the society in the testing of milk and maintenance of records. The milk co-operative is given free of charge a hand-operated fat testing machine by the Kaira Milk Producers' Milk Union Ltd. After some years, many societies buy electrically operated machines. Chemicals used for testing are given free to all societies whether new or old, at a fixed quantity per year. The Union keeps a constant eye on the societies and its supervisor visits each village society every six weeks until it is sound both technically and financially. He checks the accounts of the society to make sure that there are no unwarranted items of expenditure.

B. Milk collection

Milk is picked up at the society's collection centre twice each day. The milk is graded for fat and the Union supplies charts to help the society in calculating the price of milk. For the milk delivered in the morning, the producer gets payment in cash in the evening, and for the milk brought in by him in the evening, he gets payment the next morning. Each society employs three to six paid staff, depending on the quantity of milk handled. The employees include a secretary, someone to measure the amount of milk received from the farmers, a clerk and a man to test the samples. Each member is given a pass book in which a daily account is kept of (a) quantity of milk supplied, (b) percentage of fat, (c) quality, and (d) amount paid. Each milk sample is given a code number to test its fat percentage. The allocation of

different sample numbers is determined according to their position in the line of producers when the milk is delivered by them to the society. This helps in achieving an unbiassed evaluation of the milk at the society level.

While milk is accepted from members on a volume basis, it is delivered to the Union on a weight basis. The weight-volume difference credit goes to the milk producer; 1 litre of milk weighs 1.032 kg. The milk is transported in Union trucks to their dairy at Anand. The Union provides transportation since it found from experience that this was the most efficient means. It was more costly and inefficient to have one's own fleet of trucks.

The contractor is responsible for shortages, delays and spillage during transportation. Milk unloaded from trucks is weighed immediately and is graded into sour and good milk. Generally, 4% of milk is sour and is used to make casein and clarified butter (ghee). The society is paid by the Union for the quantity of fat received in its milk. Sour milk or milk graded below fixed standards is paid Rs 1.50 less per kg of fat. 448 societies have built their own collection centres. The Union gives Rs 10,000 as a contribution to each centre and the societies spend about another Rs 15,000 out of their profits.

C. Supply inputs

The Kaira District Co-operative Milk Producers' Milk Union Ltd has its own cattle feed plant which manufactures 300 tonnes of cattle feed per day. This is being expanded by another 300 tonnes per day. Farmers purchase feed in the store adjoining the milk collection centre at a subsidized rate of Rs 1.05 per kg. They also can purchase other supplies such as salt, tea, sugar, matches etc.

D. Veterinary first-aid treatment

One of the key services provided by the Kaira District Co-operative Milk Producers' Milk Union Ltd is a team of 23 doctors which cover 82 routes weekly. Between them they visit all the villages in the area each week. Each doctor heads a fully-equipped mobile veterinary dispensary. Free veterinary treatment is given to all cattle in villages during their weekly visits. A number of doctors is also employed around the clock for emergency visits. Most societies new have telephones and as soon as a message is received, a completely

fitted mobile veterinary dispensary is on the way. Regardless of the distance, the charge for emergency visits is Rs 15/- plus the charge for medicine which is supplied at cost. This facility is for members only; non-members must pay Rs 40/- for each emergency visit. A first-aid box is also kept by the society and the trained secretary is able to take care of small ailments.

E. Artificial insemination

For scientific breeding, the Kaira District Cooperative Milk Producers' Milk Union Ltd has established an artificial insemination centre at its headquarters, with 80 breeding buffalo calves. The system established is unique in India. All secretaries of milk societies are trained for inseminating buffaloes. Diluted and preserved semen is sent from Anand to all village artificial insemination sub-centres in the milk trucks which visit the villages twice daily to collect milk. The supervisory stockman and veterinary staff of the Union check artificial insemination work periodically. If a buffalo fails to calve after artificial insemination, it is brought to the veterinary hospital and insemination is performed by experts. The usual charges are Rs 5/- per animal. If the buffalo does not conceive, the fees charged are refunded.

F. Fodder production

Societies are encouraged to develop common grazing lands in the form of fodder farms. The Union acquires common grazing land from the village panchayat[a/] on a lease for a minimum period of seven years. Fodder and silage production are carried out in such a way that the maximum benefit is provided with the least expenditure. As soon as a fodder farm breaks even, it is handed over to the society.

a/ Local civic body.

Annex IV

EFFORTS TOWARD INTEGRATED RURAL DEVELOPMENT

A. Women and welfare and economic development

Shri Warana Bhagini Mandal, an organization for creating social awakening among women had a humble beginning in 1959. It now runs Mahila Grih Udyog, manufacturers of "Lijjat Papad", a flour mill and spice-powdering unit. This institution has developed to such an extent that Lijjat Papads are sold in the country and are exported. The membership of this Mandal is about 3,600, with an annual turnover of more than Rs 10 million.

B. Educational facilities

In 1964, Shri Warana Vibhag Shikshan Mandal was sponsored for developing educational facilities. This Mandal now runs a college, high school, primary school, Shishu Vihar (a pre-primary unit) and a printing press. It also runs Montessori classes in some surrounding villages and helps in creating further educational facilities in the area. The music section of the primary school has won international fame. A team of children within 5 to 15 years of age has been trained in music and has formed an orchestra whose reputation has also travelled to some foreign countries. The factory also provides financial support for running Balwadis in villages, expanding existing schools in its area and for setting up libraries etc.

C. Farmers' bank

The Shri Warana Sahakari Bank Ltd - a bank for farmers - was floated in February 1966. The initial share capital of Rs 143,000 was collected within four days. This bank has introduced a number of loan and savings schemes for the benefit of small farmers and landless people.

D. Technical guidance for socio-economic development

The "Sat Karya Samwardhak Mandal" was established in 1968, and provides guidance and supervision for individual and collective efforts towards financial, educational and industrial development. Farmers receive guidance for procedural formalities, preparation of plans and estimates, survey reports and development of cultural and educational facilities.

E. Poultry

The factory also sponsored two poultry farms for ameliorating the financial position of the people in the area - particularly the landless labourers. The poultry farm at Aarana created a record in collecting an initial share capital of Rs 260,000 within 36 hours. These farms have popularized the poultry business among the villagers. The poultry farms provide technical advice, training, birds, cages, feed, supervision and also assistance in marketing.

F. Dairy

An important feather in the cap of the Warana complex was added with the establishment of a dairy complex by the Warana Cooperative Milk Producers Processing Society. With a capital cost of Rs 2.85 million, this project was commissioned in October 1976. The plant has a capacity for processing 70,000 litres of milk in two shifts and converting 55,000 tonnes of milk into different milk products. The necessary loan for purchase of milch animals by the farmers was arranged by the factory from banks. The dairy also maintains a team of veterinary surgeons, livestock supervisors and extension officers equipped with proper facilities for taking care of milch cattle development.

G. Consumers' and workers' welfare

The co-operative complex at Warananagar has not lagged behind in extending services and facilities to consumers and its workers. A consumer society has operated a department store with a variety of articles to service the consumers. A society has been sponsored to provide better facilities and an additional source of income to the workers in addition to their normal salary and housing facilities. The society also operates a general store, a cloth store and a flour mill. There is also a "Kalyan Mandal" for workers. The workers are also associated with the dairy and poultry schemes.

H. Medical facilities

The factory has also established a dispensary and a hospital with a maternity home which provides timely medical facilities in the rural area. Care is also given for the physical development of members by the establishment of gymnasiums and Akharas.

The efforts made by this co-operative sugar factory towards integrated rural development are appreciated by visitors, and the achievements of the Warananagar co-operative complex deserve to be known and emulated widely.