

**DAIRY CO-OPERATIVE AND RURAL DEVELOPMENT
(WITH SPECIAL REFERENCE TO COMPARATIVE STUDY BETWEEN
THE KAIRA DISTRICT CO-OPERATIVE MILK PRODUCERS' UNION
LIMITED AND THE HIMALAYAN CO-OPERATIVE MILK
PRODUCERS' UNION LIMITED)**

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DEPARTMENT OF COMMERCE
RAJA RAMMOHUNPUR, DARJEELING

**MANOB KANTI BANDYOPADHYAY,
M. COM. ; B. Ed. ; L. L. B.
DEPARTMENT OF COMMERCE
UNIVERSITY OF NORTH BENGAL
RAJA RAMMOHUNPUR, DARJEELING
WEST BENGAL
I N D I A**

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Forwarded to my parents –

*(Shri Bimal Kanti Bandyopadhyay
and Smt. Gayatri Bandyopadhyay)*

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The 12th December, 1990.

(MANOB KANTI BANDYOPADHYAY.)

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Chapter- I

Introduction

India is a thickly populated village based country. "The Village system is the foundation rock of Indian economy"¹. The Indian village is claimed to be "the most compact and adequate social, political and economic machinery for working out in daily practice, the great basic ideals of "Plain living and high thinking", striking the happiest combination between work for self-sufficiency and services rather than for gain, and leisure for the higher things of life"².

Thus "One of India's most crucial needs is agricultural development, an extremely thorny and perplexing problem, for it involves as host of highly complex and difficult social

and economic changes. To effect such changes is, indeed, a delicate and frustrating task, particularly in the social, cultural and political context of Indian Society. But for the future welfare of India these changes must take place and the goals of agricultural development must be achieved"³.

The economic development of our country has been initiated through economic plan. In this context co-operatives have been assigned a specific role. At their initial stages, economic plans have emphasised only on credit aspect of co-operatives. But with the passage of time functional areas like Dairy, Piggery, Fishery, Marketing, Housing etc. have received their importance. The agro-based village level societies in India are economically weak, but it could be observed that new avenues of rural income and employment could be created by emphasising on increasing production of milk also.

In India, landless labourers account for 21 percent of all rural household. So they do not have any share in the total land-holding. However they own 12 percent of the milch animals and produce 16 percent of all rurally produced milk. It stands to reason that dairying is a paying proposition for these poor rural people⁴. "Dairying is being envisaged as an important means of reinforcing the income for economically weaker section of the society

constituted by landless and small farmers"⁵. In this context it may be noted that in our country, the urban people make 7 percent expenditure for milk and milk products out of their total expenditure⁶.

India has about one-fifth of the cattle and about half of the buffaloes of the world i.e. largest in the world. There were 54 million breedable cows and 29 million breedable buffaloes in India in the year 1972⁷. But India's share is only about 5 percent in the world milk production (Table 1.1). This is quite insufficient to meet the demand of the country as the man and milch animal ratio depicts a very poor condition (1000:134)⁸.

Table 1.1

Milk Production in India and World (In '000 tonnes/annum)

Sl.No.	Types of animal	Milk Production	
		India	World
1.	Buffalo	11240	20267
2.	Cow	9550	367117
3.	Goat	570	6554
4.	Sheep	-	6348
Total		21360	400322

Source : United Nations year Book, 1971. The given figures pertain to 1970. Secondary source : M.S.Bedi, Dairy Development Marketing and Economic Growth. New Delhi:Deep & Deep Publication 1987, p.11.

Livestock census of India 1972 revealed that the growth rates of cow and buffalo population was 0.2 percent and 1.4 percent per annum respectively. The overall growth rate per annum was 1.6 percent. On the other hand to human population had grown in the same time by 2.5 percent per annum⁹. That means the growth rate of human population is faster than the growth rate of cattle population. In our country, the trend in per capita availability of milk showed a steady decline from 156 grams per day in 1940 to 139 grams per day in 1950, to subsequently, 108 grams per day in 1970¹⁰. In 1985 it is 144 grams only (Annexure 13).

"The Low production of milk in India is due to extremely low genetic potential of our cows and buffaloes as milk producers completed with malnutrition and poor health care. The average annual milk yield per cow in India is estimated at 157 kg. and per buffalo at 504 kg., whereas the average productivity of cows in dairy developed countries like Denmark, New Zealand, U.K. and U.S.A. is twenty times and in respect of buffaloes, it is seven times that of India. The U.S.A. for example, with only 14.5 millions cows produces more than 53 million tonnes of milk every year"¹¹. But Domestication of milch animals especially buffaloes and cows in India for the production of milk was started before 4000 years ago. So milch animals and milk become an important part of the Indian way of life even before our written history began. But dairying in India is

not sufficiently modernized like many other countries in the World¹².

The National Commission on Agriculture (1972) in their Interim Report on milk production recommended that benefits of increasing demand of milk in large cities, towns and industrial areas should go to small and marginal farmers and landless labourers. Efforts should be made to promote as much milk production possible through this section of rural population. The Commission suggested an integrated rural development approach based on a system of "Kaira District Cooperative Milk Producers' Union Limited," commonly known as 'AMUL in ANAND' of Gujrat¹³

"Thus in view of many positive points in favour of Co-operative sector and practical results shown by milk Cooperatives, in Gujrat, it was finally decided by the Government of India to extend institutional support to industrialize and organize dairy efforts in entire rural India, through co-operatives"¹⁴. In 1965, the National Dairy Development Board (NDDB) was set-up in India. And it drew up a Programme known as "Operation Flood", to replicate the ANAND Pattern Dairy Cooperative in 18 areas of the country in 1970. The original pattern was a two-tier one, but subsequently ANAND Pattern was adopted with three-tier system viz;

- i) Village Society,
- ii) The Union of the Village societies and
- iii) The State Milk Marketing Federation.

Objectives of Study :

The creation of more "ANANDS" was recommended also under World Bank Projects in Karnataka, Madhya Pradesh and Rajasthan. The ANAND pattern cooperative dairying is now being replicated in almost all the states and Union Territories of India and two "Operation Flood" programmes (Operation Flood I and Operation Flood II) had already been completed by 31st March, 1984¹⁵.

Under the 'Operation Flood I', Programme, "The Himalayan Cooperative Milk Producers' Union Limited", commonly known as HIMUL was set up in 1973, in Darjeeling District of West Bengal. It was first of its kind in West Bengal.

West Bengal is relatively backward with respect to milk production and its productivity (Table 1.2 and 1.3). There are enough scope to bring changes for the success of the Operation Flood in West Bengal. West Bengal has sufficient milch animals, but her milk output is low compared to other states in India (Table 1.2).

Table 1.2
Milk Production in Different States

State	Milk Production 1977-78 (000 Tonns)	State	Milk Production 1977-78 (000 Tonns)
West Bengal	1,128	Mizoram	2.4
Bihar	1,860	Punjab	2,730
Orissa	212	Rajasthan	3,100
Tripura	14	Gujrat	2,025
Manipur	53	Haryana	1,620
Meghalaya	50	Uttar Pradesh	5,326
Nagaland	2.8	Madhya Pradesh	2,000
Assam	419	Maharashtra	1,344
Arunachal	30		

Source : Ministry of Agriculture & Irrigation, Govt. of India Publication, April, 1979.

The phase of Operation Flood covered 18 areas. These formed the "Catchment areas" from which milk was drawn into four metro Towns, viz : Calcutta, Delhi, Bombay and Madras. Operation Flood II is extended to organised marketing of milk to 147 towns, which involves development work in 150 milk sheds. Progress in this respect has been rapid during the last five years¹⁶.

Operation Flood seeks to place the instruments of progress in the hands of the farmers themselves. Milk

Table 1.3
Statewise Productivity of Cows and Buffeloes

State	Average yield in kg.	
	Cow	Buffelo
West Bengal	0.65	2.40
Bihar	1.49	2.61
Orissa	0.80	1.65
Tripura	0.50	1.57
Assam & Manipur	0.45	N.A.
Punjab	2.40	4.00
Gujrat	1.76	2.80
Rajasthan	1.92	2.86

Source : Journal on Agricultural Situation in India, September, 1967.

Producers' Cooperatives are organised in villages towards this end. There has been a sharp increase in their numbers since 1980.

The AMUL is the pioneer and largest of milk cooperatives in Gujrat, HIMUL is the largest milk producers' cooperative in West Bengal and also Second Largest in the Eastern region of India (Annexure 11).

The quantity of production and organisation of number of Village Milk Producers' Cooperatives have been increasing rapidly. But in Himul, the number of Village Milk Producers' Cooperatives and the quantity of milk production are not

uniform throughout. On the other hand in Amul, the organisation of number of Village Milk Producers' Co-operatives and the quantity of Production show a steady increase during the last ten years (Table 1.4 and 1.5).

Table 1.4

The Progress Made by the 'Amul' and 'Himul' from 1975-76 to 1984-85

Year	No. of Societies		Quantity of milk collected		No. of Farmer members of the societies	
	Amul	Himul	Amul (kg)	Himul (kg)	Amul	Himul
1975-76	829	88	129041218	3212000	250000	2215
1976-77	831	133	127017040	5339950	255000	4068
1977-78	831	227	141197710	7139400	275000	5722
1978-79	856	254	159262615	3932767	995000	6597
1979-80	895	272	169376542	5436574	308000	6916
1980-81	895	280	189576969	4699681	327000	7044
1981-82	894	296	160018395	5478022	339000	7449
1982-83	895	314	183820076	7411783	352000	8225
1983-84	870	350	193220249	6465428	359000	18370
1984-85	870	350	193220249	6465428	359000	15145

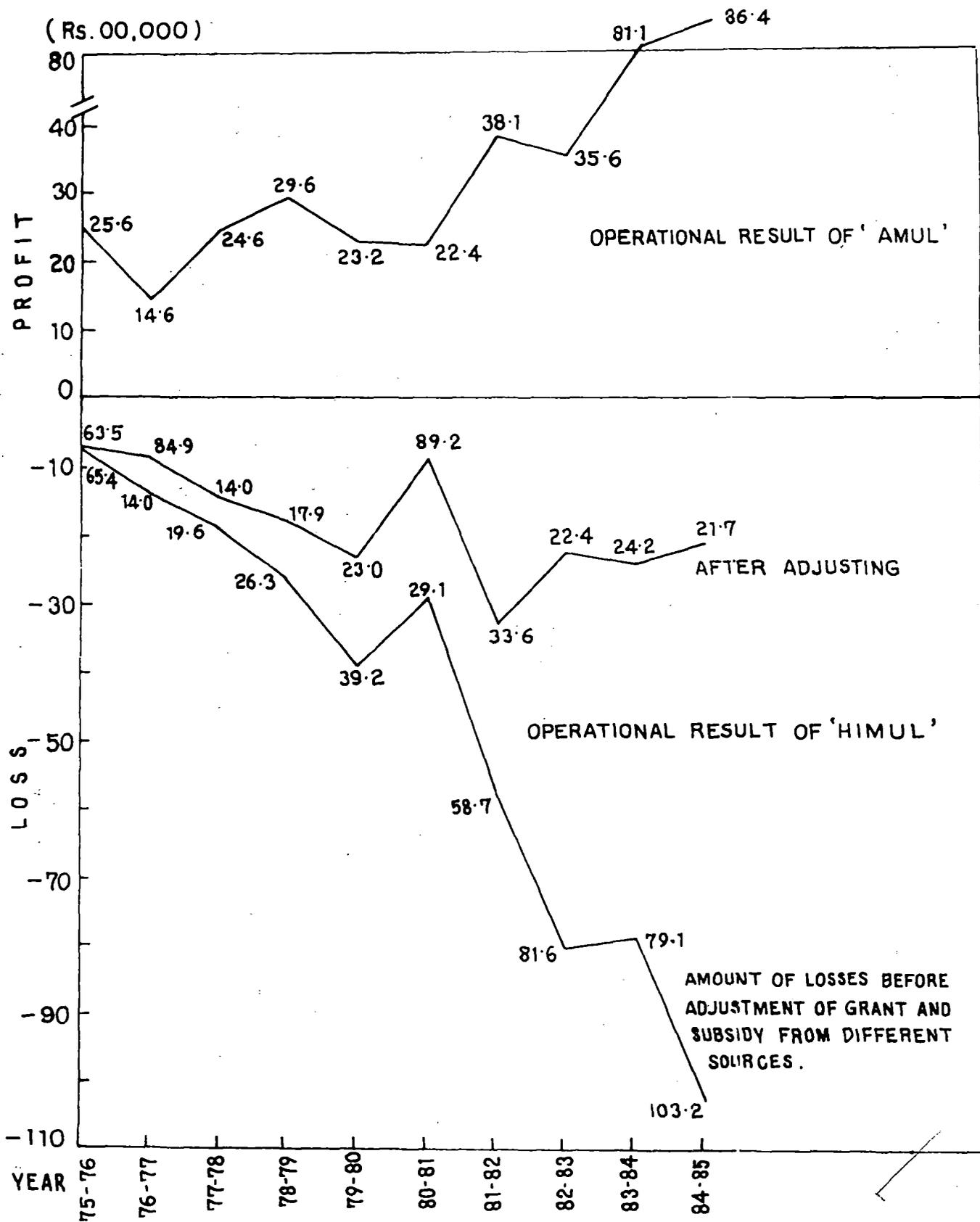
Himul could not achieve its targets since its inception in respect of production; and even was not in a position to achieve a 'Break-even Point' which was fixed at 35000 litres per day. Himul had targets to organise 500 village milk

producer's Societies of which 200 would be in the hills and another 300 in the plains within the first five years. In the hills Himul could achieve the target but in the plains it failed miserably. Though the number of organised village -Milk Producers' Societies in the hills is sufficient yet in respect of functioning, its working was not satisfactory. However, Amul could make steady progress in the same period (Table 1.5).

Moreover Himul had been suffering loss since inception. And this financial loss increased at an alarming rate. Though Himul is getting 'Grant and Subsidies' from the Government, Himul could not attain profit in its whole working life, whereas Amul has always earned profit. Himul has failed as a Commercial enterprise (Graph 1.1).

The objective of the present study is to explore the problem of Rural Development with special reference to Operation Flood. It is well known that rural development implies mainly agricultural development. But as land is in short supply attention has been given to allied activities of the primary sector. Dairy farming is one of such activities and 'Operation Flood' is a special Programme aimed at this dairy development. It is expected that Operation Flood in different areas of India will improve the standard of living of the rural people. Given this goal we have chosen the Kaira District Co-operative Milk

OPERATIONAL RESULTS OF AMUL AND HIMUL



GRAPH - 1.1

Table 1.5

Annual Organisational Progress (Performance) Report of the Societies of Himul

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
Total number of societies organised	88	133	227	254	272	280	296	314	332	350
Total No. of Functioning Society	88	133	363	159	175	184	196	215	215	233
Total No. of Society organised in Hill	88	97	187	210	225	233	241	254	272	285
Total No. of Society organised in Plain	-	36	40	44	47	47	55	60	60	65
Total No. of Society functioning in Hill	88	97	124	137	154	163	168	175	175	188
Total No. of society functioning in Plain	-	36	39	22	21	21	28	40	40	45

Producers' Union Limited popularly known as Amul of Gujrat and the Himalayan Co-operative Milk Producers' Union Limited (Himul) of West Bengal to evaluate critically their successes, failures, problems and impediments.

Related Research :

There had been previous attempts to assess the problem of Dairy Co-operative in Kaira District by several institutions, viz. Institute of Rural Management, ANAND; Sardar Patel University; Amul Dairy; National Dairy Development Board, Anand; Institute of Co-operative Management, Ahmedabad etc. and individually by Homer Hogle¹⁵, Dilip R. Shah¹⁶, Narendra J. Shah¹⁷, Saraswati Prasad Singh¹⁸, and various Indian and Foreign Journalists. But no such attempt has so far been made to study the problem of dairy development for the district of Darjeeling in West Bengal. Our special emphasis would be to assess, why Amul could be a successful venture while Himul could not be, even though structurally both of them are basically the same.

Area of the Present Study :

The geographical location of Amul and Himul and their respective hinterlands viz. Kaira District of Gujrat and

Darjeeling District, Sadar Sub-Division of Jalpaiguri District and Islampur Sub-Division of West Dinajpur District of West Bengal have been considered for the purpose of the present investigation.

The Research Design and Methodology :

The present problem is approached essentially from three directions. First, an attempt has been made to assess the comparative growth and performance of the two Projects - Amul and Himul, as this two have identical objectives and structure of management. It pertains to organisational growth, milk procurement and technoeconomic performance.

Secondly, another attempt has been made to study the financial performance of the two projects. It includes a comparative study of the operational results of Amul and Himul as based on data collected from primary and secondary sources.

Lastly, the most difficult task is to find out the economic impact of the projects on rural development. In this respect we have studied villages of Darjeeling District, Sadar Sub-Division of Jalpaiguri District and Islampur Sub-Division of West Dinajpur District of West Bengal and compared these results with the studies done earlier on the Kaira District of Gujrat.

Our method of study is very similar to the study of S.M. Patel and M.K.Pandey of the Institute of Co-operative Management, Ahmedabad¹⁹. We have compared to two studies to come to a particular conclusion. Since in this part of our study our main objective is to compare the relative performance of Amul and Himul, we have adopted a similar technique of sampling. The methodology used by Patel and Pandey was to study certain sample Villages in some districts of Gujrat. They followed the design of stratified random sampling. The same method has been adopted by us to make our study comparable to the study of Patel and Pandey. The steps that we followed are the following :

1) We have classified the villages into two categories and chosen 6 dairy-villages and 2 non-dairy villages for our study.

2) The choice of villages have been done by following the method of random sampling so that variability in the errors of observations can be minimum. It is to be noted that geographically the area of Himul has been divided into two regions : the hills and the plains. There are six sub-divisions in the area of Himul viz. (1) Darjeeling Sadar (2) Kurseong (3) Kalimpong (4) Siliguri (5) Jalpaiguri Sadar and (6) Islampur, of which first three sub-divisions of Darjeeling district are situated in the hills and another three are in the plains. At the time of sample designing

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for Himul 3 dairy and 1 non-dairy villages have been taken from each of the region (Vide Annexure 32).

3) Having selected the eight villages, the next-step has been to select randomly sample of 150 households of the Himul area (out of which 100 from 6 dairy and another 50 from 2 non-dairy villages). At the time of taking personal interview of the households through a structured questionnaire (Annexure 26) in the villages or at their homes, special care has been taken to explain the questions clearly to all the respondents. And therefore local language was used with the help of local language knowing (Nepali) experts, while conducting our interview.

Collection of data :

Information used for the present study have been collected from two sources :

- i) Primary information through field survey and
- ii) Secondary information through records and reports prepared by several institutions or individuals and discussions with the related people as well as with the concerned institutions and agencies. For Amul in particular we relied mainly on this source. Personal visits at Amul and its catchment areas on several occasions facilitated collection of further information. This study has considered

only the period of 10 years (i.e. from 1975-76 to 1984-85).

Plan of Analysis : For analysing the collected data, several designs of analysis have been followed viz. Tabulations, Charting, Graphical representation and Financial ratio analysis etc. Besides these, some statistical analysis have also been undertaken for the present study, such as Co-efficient of Variation, Rank correlation in the triangular matrix form (t-matrix) etc.

Limitation of the Study :

All information and data to be found in the analysis are collected personally, through interviews and investigations. Precaution has been taken to maintain objectivity, to keep the study free from any bias. For this, an equal emphasis has been given on asking the questions and recording the answers. However, inspite of the best of efforts made, some limitations could not be avoided.

In a big country like India where large number of co-operative Milk Producers' Unions are running it is not so easy as to study in depth the problems of all the Dairy Cooperatives at a time. So only two such Unions - Amul and Himul have been selected for a detailed investigation.

Another problem is the non-availability of necessary information and this has impelled me to give greater importance on verbal interviews. Limited cooperation of enterprise officials in supplying records as well as limited scope of having interviews with them rendered occasional difficulties.

The third limitation of the study is time frame. The time frame of our study is different from that of Patel and Pandey. However, We have made certain adjustments of the income data of their study by taking the trend values in consideration.

Scheme of Chapters :

The study has been divided into eight chapters. The first chapter i.e. the present introductory chapter includes rationale of the study, objective of the thesis, related research, methodology and limitation and scope of the study.

Chapter II deals with the discussion about the history of dairy cooperatives in India.

Chapter III describes the progress of 'Operation Flood Programme' launched by the Government of India to invigourate Dairy industry.

Chapter IV contains a brief discussion relating to background of Amul and Himul.

Chapter V examines the comparative growth of the two Unions Amul and Himul. It includes discussions on organisational growth, milk procurement and techno-economic performance.

Chapter VI examines the financial performance of the two projects. It includes a comparative study of operational results of Amul and Himul.

Chapter VII identifies the economic impact of the projects on rural development.

Chapter VIII or the last chapter contains summary and conclusions of the entire study.

Notes & Reference

1. E.M.Hough, The Cooperative Movement in India. Bombay: Oxford University Press, 1959, p.8.
2. K.S.Venkataramani, My Ashram Plan for Rural Uplift. Madras : Mylapore, 1947. Secondary Source E.M.Hough, op.cit., p.8.
3. John P.Lewis, Quiet Crisis in India : Economic Development and American Policy. Garden City, New York Anchor Books, 1962, p.148.
4. M.S.Bedi, Dairy Development Marketing and Economic Growth. New Delhi : Deep & Deep Publications, 1987, p.10.
5. Compatible with recommendation of National Commission on Agriculture, on Milk Production in its Interim Report 1971. Secondary Source, Ibid., p.10.
6. National Sample Survey (N.S.S.) (28th round) 1973-74.
7. Dr. P.K.Das "Dairying in India: Constraints and Prospects" /Kalyani: National Dairy Research Institute, Kalyani, West Bengal, p.1.
8. Ibid., p.1.
9. M.S.Bedi, op.cit., p.11.
10. V.Kurian, Annual Report of NDDB, 1979.
11. Dr. P.K.Das, op.cit., p.2.
12. Ibid., p.1.
13. M.M.Jain, "Dairy Development through Cooperatives - A Study of Rajasthan" 'Indian Dairyman', Vol.31, p.195.
14. M.S.Bedi, op.cit., p.13.

15. Homer Hogle. The Influence of Agricultural Extension In Selected Villages of Kaira District (Gujrat, India). Michigan, USA : The University of Michigan School of Education, 1972.
16. Dilip R. Shah. An Economic Analysis of Co-operative Dairy In Gujrat Industry. Bombay:Somaiya Publications Pvt. Ltd.; Employment and Income Generation by Amul Dairy - A paper reprinted in the volume on Employment, Poverty and Public Policy edited by Lakawala D.T. New Delhi:Allied Publishers.
17. Narendra J. Shah. A Study of the Kaira District Co-operative Milk Producers Union Ltd. (Unpublished Master's thesis). Boroda:M.S.University of Boroda, Department of Economics, 1962.
18. Saraswati Prasad Singh. The Kaira District Co-Operative Milk Producers' Union Limited and It's Role in Rural Development (Unpublished Ph.D. dissertation). Manhattan, Kansas, USA:Kansas State University, Department of Economics, 1968.

Chapter - II

History of Dairy Co-operative In India

Dairying has been a part and parcel of Indian culture and civilisation from ancient times and remains so even today. Our ancestors had recognised the importance of cattle in economic well-being of the people. They, therefore, elevated the cow to the level of mother and incorporated the protection of cow as an integral part of their religion and culture¹. This sentiment continues to be shared by the Indian masses even today. Portrayal of 'Kamadhenu' as a cow indicates the importance Indian sages attached to the cattle. Reverence for the cow, the use of milk and milk-products in religious rites, rituals and festivals are important parts of our life since times immemorial². Moreover, it is universally recognised that

in our country dairying is next only to agriculture in importance as a source of income to the rural folks³.

HISTORY OF THE ENACTMENT OF CO-OPERATIVE SOCIETIES ACT :

In 1875, there were agitations organised by the farmers in the Deccan. After a Government enquiry, it was found that the cause of these agitations was poverty and farmers' debts. The Commission recommended action to reduce the burden of debts⁴.

In 1882, Sir William Bedburn recommended that agricultural bank cash-credit facilities be provided to the farmers to reduce their dependence on money-lenders. But his recommendation was not approved. In 1883, the Land Reform Cash-Credit Act was drafted. Under this act, farmers were given loans on the surety of their land. The land labourers were not benefited by this Act. The Madras State Government was the first to implement the co-operative system with a view to solve the economic problems of the farmers⁵.

On the basis of recommendation of Sri Fredric Nicholson Institutions were established on the lines of 'European Bank' having joint and unlimited liability, restricted area of operation, allocation of certain portion of profit to a indivisible reserve funds,

limitation of loans to members, the issue of loans on personal security and administration of societies by honorary office bearers⁶.

Registration of the societies at that time was done under the companies Act 1882 or Societies Registration Act 1860. Indian Famine Commission (1880) recommended the necessity of the agricultural Bank on the line of the Mutual Credit Association in Europe. In 1901 the then Viceroy, Lord Curzon took a decision and a committee was formed under the Chairmanship of Sir Edward Low to study the existing pioneer societies and to suggest a better line. Mr. Nicholson was also a member of that Committee. On the recommendation of this committee, Co-operative Credit Societies Act was passed in 1904⁷.

The Co-operative Credit Societies Act of 1904 the first one in India had such features as simplicity and elasticity, classification of societies as rural and urban, unlimited liability for rural societies, (Urban Societies can give credit to members on personal security of landed property) exemption from stamp registration, wide powers for the Registrar of Co-operative Societies⁸.

On the basis of this Act various Provincial Government appointed Registrars to initiate expansion of co-operative ideologies specially to the rural people for starting the Co-operative Credit Societies⁹.

Subsequently, through amendments the Co-operative Societies Act of 1912 came into being with the objective to promote the Co-operative Societies for the promotion of thrift and self-help amongst the agriculturists, artisans and persons of limited means. The new Act (1912) contained the provisions for the registration of all types of societies and provided that all the Societies had to declare dividend on shares after creating a reserve of 25% of the net profit and a portion of the profit had to be expended for educational and charitable purposes.

The effect of the new Act was that there was increase in the number of the societies, its membership and in working capital. To examine the growth of Co-operative movement and to suggest the financial implication in it, Government appointed "Maclagan Committee" which published its reports in 1915. It made the classification of the Co-operative Societies into four categories : (1) Primary Societies, meant for individuals, (2) Union Federation of Societies for supervision having no banking business, (3) Central Bank Federal Institutions which were doing banking business and (4) Provincial Bank meant to lead the Central Banks.

After the World War-I (1918-19), provincial Co-operative Societies Act was passed in Bombay in 1925 followed by Madras and Bihar in 1932 and 1935 respectively. During

this period Cooperative Societies Act had been passed by the several provincial governments¹⁰.

The period from 1938-45 saw another Great War. In that period the development of Co-operative Societies took place considerably and many consumer Societies like Milk Supply Societies, Cane Growers Societies, Fruit Growers' Societies and Weavers' Societies etc. were organised.

In 1945, the Government of India appointed a twelve man Committee which recommended (1946) for more financial assistance to different types of Co-operative Societies and more involvement of the village people in the Co-operative movement; and stressed that Co-operative movement should be spread over in different types of activities, viz. marketing, processing, insurance, housing, animal husbandry and in different types of factories¹¹.

Subsequently, the Acts were reviewed by the Committee on Co-operative law appointed by the Government of India in 1956. A model bill was prepared. On the basis of this model eleven State Governments passed Co-operative Societies Act¹².

In the several Five Year Plans emphasis was laid on the successful development of the Co-operative Sector.

Table 2.1

Development of the Cooperative Sector in India

Particulars	1950-51	1955-56	1960-61	1965-66	1968-69	1970-71	1971-72	1972-73
No. of societies (Lakhs)	1.8	2.4	3.3	3.3	3.3	3.2	3.2	3.3
Membership of Primary Societies (Lakhs)	137	176	342	500	585	591	614	678
Share capital (In crores)	45	77	222	405	663	851	994	1051
Working capital (Rs. in crores)	276	409	1312	2794	4473	6810	7695	8575

Source : Indian Economics (A Development Oriented Study)
By Kewel Krishna Dewett and J.D. Varma.

It could be seen that between 1950-51 and 1972-73, the membership of Primary Societies increased more than four times, whereas the share capital increased more than 23 times and the working capital by more than 31 times (Table 2.1).

On the whole, the period from 1912 to 1935 proved to be one of advancement in the field of Co-operation side by side with livestock and dairy development. The Indian Co-operative societies Act of 1912 enabled the co-operatives to be divided into credit and non credit types and again as urban or rural in character. Co-operative Banks started under the style of Urban Credit Societies at district level Central Banks. These Banking institutions have contributed greatly to the promotion of Co-operative dairying. As a subsequent stage co-operatives have been classified into 'unlimited liability' and 'Limited Liability' societies. Dairy co-operatives organised and registered with the objectives of cattle breeding and milk production and supply were classified as non-credit societies with limited liability to safe-guard the interest of the share-holders¹³.

DEVELOPMENT OF DAIRY CO-OPERATIVE IN PREINDEPENDENCE PERIOD :

In 1919, an organised dairy enterprise was registered at Calcutta. And, it was in the Co-operative sector. It

was a pioneer venture in this line not only in the eastern region but also in all the regions. Behind its formation, there were the blessings and keen desires of a great National Leader Deshbandhu Chittaranjan Das¹⁴.

Milk trade in Calcutta was then, controlled by two agencies viz. (1) Big "Khatalwallas" who were primarily traders in milch cows and buffaloes; (2) Traditional milk-men of the villages who were not many in number. But the combined total volume, though very large, was quite inadequate for the total requirements of the institutional or individual consumers of the city. Naturally, the milk trade came to be controlled by some corrupt men, and adulteration of milk became the order.

Deshbandhu observed that milk supplied by such traders to the cities open market and to the hospital attached to the Medical College (run by the 'National Education Board', set up by the then National Leaders of Bengal in protest against the education system and discriminatory treatment meted out to the Indian Patients at Government hospitals run by the British Government) was not at all safe for patients or children. With the hope of putting an end to the business of corrupt milk-traders Deshbandhu took the initiative to organise Dairy Cooperative Society in Calcutta.

In the villages one or two cows used to be kept at each household mainly for the purpose of agriculture. Production of milk by these cows was not so much that their owners could make good business with it.

Deshbandhu proposed that small quantities of milk produced at each village home, were to be collected by the co-operative organisation to meet the demands of the hospital of the National Education Board, the maternity Homes of Calcutta Corporation and also of the low-income group people of the city.

On this back-ground, primary Milk Producers' Co-operative Societies were organised with farmers of the villages of 24 Parganas, Howrah, Nadia, Hooghly, Burdwan, Midnapore, Khulna and Jessore districts as its members. These districts were situated within a reasonable distance from Calcutta and were connected with the city by road and rails. Milk Union was organised by the Federal unit of those primaries. The Union appointed a Manager at every Primary Milk Producers' Co-operative Society for collecting milk from individual society members and for delivering of milk so collected to the milk Union through the visiting milk collectors. The Union paid commission on the basis of quantity of milk supplied to the Managers of Primary Milk Producers' Co-operative Societies.

The Union took initiative to pasteurise and also of tonning milk to the required standard as well as of proper canning and bottling the milk under hygenic condition. The Union opened retail outlets at the Municipal and other private markets of the city. Thus, scientific handling of milk and milk products was first initiated at this city of Calcutta during the early "twenties" of this century¹⁵.

With the passage of time, more and more farmers became interested in joining village primary Co-operative societies to sell their small quantities of milk. Collection of milk by the Unions gradually increased to nearly 180 Mds. through 140 primary milk co-operative societies¹⁶.

After partition of Bengal the area of operation of the Milk Union was bifurcated into two parts, viz. India and Pakistan. The instant impact over the union was that, its daily collection fell down to about 40-50 Mds. a day and the liability was of Rs. 94,617/-¹⁷. A large number of primary milk cooperative societies were rendered dormant. The Union had to depend on the Managers of the remaining primary societies for maintaining the then existing milk market. The Managers took opportunity to seize upon the Union's discomfoting predicament. They began to dictate terms and conditions to the Union, and insisted upon induction of their chosen candidates to the staff of the Union. The candidates were neither qualified nor skilled.

Thus, the entire administration of the Union was virtually overtaken by the corrupt Managers. They did not however, succeed to increase supplies of milk from the villages by any appreciable volume. Quality control of milk began to lose ground. Good customers, also, by and by, turned about. Several attempts had been made by the West Bengal Govt. to revive, the Union as an active Union but to no effect.

Calcutta Co-operative Milk Union was born too early for our country, and had passed away, making no mark in the history of Indian Dairying.

FRAMING OF BYE LAWS OF PRIMARY COOPERATIVE MILK SOCIETIES AND COOPERATIVE MILK SUPPLY UNIONS :

With the change in outlook consistent with dairying co-operators started framing 'Bye-laws' for various types of co-operatives, which included milk societies, milk supply Union, cattle breeding societies etc. The co-operative in Madras province received technical advice and guidance from William Smith, Imperial Dairy Expert in framing suitable bye-laws. The Imperial Dairy Expert had also organised and conducted short course training at the Imperial Institute of Animal Husbandry and Dairying Bangalore (Present NDRI) to educate the co-operative personnel.

"The provincial government of Madras decided that urban milk supply to Madras city and other district headquarters should be organised and handled by Co-operative milk supply Unions; serving as marketing organisations for the primary producers. The milk producers in rural and urban areas are to be organised into Primary Co-operative Milk Producers' Societies and get affiliated to a Milk Union.

The Model Bye-Laws, drawn for the Primary Co-operative Milk Societies and Co-operative Milk Supply Unions, were primarily based on the Indian Co-operative Societies Act of 1912, as amended in 1932. These Model Bye-laws have served as guide lines for the formulation of Bye-laws in other provinces"¹⁸.

MODEL BYE LAWS :

PRIMARY SOCIETIES :

The model bye-laws contained specific guide lines/provisions for both the primary societies and the milk union : (1) Provision of common milk yards/sheds for animals; (ii) use of sanitary milking pails; (iii) correct weighment of milk using proper spring balances and stamped measures to ensure equitable payment for milk;

(iv) introduction of fat test using certified apparatus; efficient cleaning and sterilization of milk utensils, maintenance of necessary account books; (v) provision of veterinary aid and service; (vi) maintenance of approved bulls for breeding; (vii) supply of balanced cattle feeds at reasonable cost; (viii) arrangement of credit to the member producers for purchase of animals and undertaking of distribution milk in the absence of the Union¹⁹.

COOPERATIVE MILK UNION :

(i) Undertaking all the above functions of a society where primary societies do not exist; (ii) installation of plant and machinery for processing milk and manufacture of products; (iii) marketing of milk and milk products procured from the primary societies and member producers; (iv) supply of cattle feeds and other requisites to primary societies; (v) maintenance of grazing lands and breeding bulls for the benefit of the member producers; (vi) arrangements for salvage of dry animals; (vii) raising cattle mortality fund to cover the risk of members in the purchase of animals; (viii) undertaking field publicity and extension work to promote hygienic milk production and (ix) other improved practices and maintenance of proper records²⁰.

DEVELOPMENT OF DAIRY CO-OPERATIVE IN POST INDEPENDENCE PERIOD :

MILK COLONY :

After independence the attention of the Government was first drawn by the consumers in big cities to an adequate supply of cheap, hygienic and unadulterated milk. During 50 's the Government started organising milk marketing infrastructure in big cities by establishing city milk supply schemes. Some foreign companies were permitted to manufacture milk products like baby foods, condensed milk, malted milk etc. Moreover, steps were taken to shift the city kept cattle to the areas outside the cities and thus to form cattle colonies like those at Aarey in Bombay, Haringhata in Calcutta and Madhavaram in Madras²¹. But these schemes proved to be very expensive establishments for milk production and they failed to prevent the widening gap between supply and demand for milk in the urban centres.

To increase the supply of milk in Bombay an experiment was made by the Government. Government imported, Skim milk powder and mixed it with the locally produced milk to make 'Toned Milk', which contains less fat than whole milk, but which has the same quantity of non-fat solids. This toned milk was cheaper as well as more nutritious than the whole-milk. But this could not be

the permanent solution because of scarcity of foreign exchange and increasing price of Skim milk powder in the world markets. This also delayed initiatives on other programmes for stimulating local milk production.

KEY VILLAGE SCHEME :

During First Five Year Plan (1951-52 to 1955-56) One hundred fortysix Key village blocks were set up in different States, each with 2000 breedable cows and buffaloes for improving productivity of milch animals and technical inputs viz., artificial insemination work, health coverage etc. The schemes could achieve only a limited success because of the lack of market facility for the increased milk production.

INTENSIVE CATTLE DEVELOPMENT PROJECT :

It was realised that the production of milk could not be increased without an integrated programme of technical inputs and an efficient milk marketing system. For this reason about 40 Intensive Cattle Development Projects (ICDP) in the milk sheds of existing milk plant were set up in mid 60s. The Projects took up the integrated package of inputs for cattle improvement viz. breeding,

health cover, feeding extension and marketing. Each project had 1,00,000 breedable cows and buffaloes. Many semen collection centres and artificial insemination centres were also established.

But the situation did not improve much due to lack of co-ordination between the procuring agency and the technical inputs services agency. The personnel in most Intensive Cattle Development Projects (ICDP) were accountable neither to the producers nor to the consumers and had no sense of purpose of commitment. In addition to this, lack of safe-guards against the exploitation of the producers by "gowalla" (local milk man) or other middlemen who were the procurement agents in most of the milk plants could not be stopped. And the main beneficiaries of the projects were no other than the middlemen.

THE EMERGENCE OF ANAND MODEL :

The milk producers in the Kaira district of Gujrat had revolted against the exploitation by middlemen just before Independence. They organised Milk Producers' Co-operative Societies in the village level for the marketing of milk produced by them and also for improving the productivity of the cow applying technical inputs programme viz. artificial insemination, health cover,

extension service etc. One dairy plant had also been established to manufacture milk products from surplus milk. And the milk processing facilities were expanded time to time as the organisation and strength of co-operatives went up.

This organisational set up has proved most successful in increasing milk production as well as improving the socio-economic status of the milk producers. This system known as the "ANAND MODEL", has been adopted by the government of India as the proper one for dairy development work throughout the country (Annexure I).

MILK CO-OPERATIVES IN MADRAS :

The Madras City Co-Operative Milk Supply Union Ltd., Madras was the first to install a Pasteuriser plant with a bottling unit to market pasteurised milk, both in cans and bottles in Madras. For installation of this plant, it received the help of Dairy Institute, Bangalore. During ~~fourth~~ Five Year Plan periods, modern dairies with pasteurization plant had been installed in 5 places, viz. Coimbatore, Madurai, Madras, Trichirapally and Tanjore. In 1970-71, Madras had 23 Co-operative milk unions with 9,524 members and 2,566 Primary Co-operative Milk Societies consisting of 2,83,575 members²².

MILK CO-OPERATIVES IN UTTARPRADESH :

With the impetus given under the Grow More Food Campaign, Co-operative milk supply unions were organised and started in Lucknow, Allahabad, Kanpur and Varanasi,

The Imperial Dairy Departments gave the necessary technical advice and guidance to these Co-operatives. Their objectives and functions were similar to those of the dairy cooperatives in Madras. But unlike the Madras Milk Cooperatives which had common milking yards, they adopted the system of centralized collection of milk at rural centres²³.

MILK CO-OPERATIVES IN GUJRAT :

Co-operative dairying has developed very rapidly in Gujrat ever since the days of independence. The first co-operative Milk Union in Gujrat was setup in 1946, and in the 1970-71, Gujrat State had 11 Co-operative Milk Union with 3,079 members and 1,736 Primary producers' societies with 3.3 lakh members²⁴. Of the several Co-operative Milk Unions the top most were the following :

1) Kaira Co-operative Milk Producers' Union Limited :

This union started functioning in June, 1948, with two villages producing just 250 litres of milk a day. By 1970-71 the union had 706 affiliated societies with 1,80,000 farmer members. The quantity of milk collected during 1969-70 was 1,24,000 tonnes and the farmers were paid Rs. 19.39 crores. The average daily collection of milk was about 3.40 lakh litres and in the flush season it was a little over 4 lakh litres.

During 1970-71 the amount of milk supplied by Amul every day to Bombay milk Scheme was 2 lakh litres and to Anand and neighbouring towns about 50,000 litres. The balance was converted into various milk products. The total turnover was Rs. 28.0 crores²⁵.

ii) Mehsana District Co-operative Milk Producers' Union Limited :

The Mehsana Co-operative Milk Union Limited established the 'Didsagar Dairy' in 1960-61 with 11 primary producers' societies and an annual collection of 2.2 lakh litres of milk. By 1971-72 it had 370 affiliated producers' societies and the annual milk collection came to 630 lakh litres. After distribution of 20,000 litres per day to Ahmedabad Municipal Corporation Dairy, the rest was converted into various milk products²⁶.

MILK CO-OPERATIVES IN MAHARASTRA STATE :

With the advent of the greater Bombay milk scheme, milk Co-operative have come into existence in Maharashtra. In 1970-71 there were 45 co-operative milk unions with 9,396 members; and 2,021 primary co-operative milk societies with 1,26,320 members in this State²⁷. The Dhulia Co-operative Milk Producers' Union Ltd., Dhulia, had set up a modern dairy plant which could pasteurise with 20,000 litres of milk per day. This Union had introduced centralized milking, at all centres of milk collection. This system was being extended to other co-operative milk unions in the State.

The following Statement indicates the overall development in co-operative dairying during the first 18 years after independence of India.

TABLE 2.2
Primary Co-operative Milk Societies

Year	Number	Membership	Value Rs. in crores
1953-54	1354	1,17,510	3.0
1961-62	3728	2,75,953	9.6
1969-70	10831	9,18,889	40.5
1970-71	11909	10,23,330	49.3

Source : Compiled from Reserve Bank of India Bulletines.

TABLE 2.3
Co-operative Milk Unions

Year	Number	Membership	Value Rs. in crores
1953-54	56	5,589	2.0
1961-62	96	16,715	6.4
1969-70	144	29,171	46.1
1970-71	150	31,659	58.8

Source : Compiled from Reserve Bank of India
Bulletines

WEST BENGAL :

In Bengal during pre-independence period, Dairy Co-operatives were limited in Calcutta area only. In the post-independence period the dairy Co-operatives were practically nil and its existence could be felt during the **fourth** five year, period (1970-75) with the establishment of HIMUL in Darjeeling district.

SUMMARY :

The Co-operative movement started in India in the last decade of the 19th Century with two objects in view, i.e. to protect the farmers from the hands of the private money lenders and to improve their economic condition. Madras province was the birth-place of this movement. With the setting up of Agricultural Co-operative Banks there the movement took root in our Land and slowly gained strength. However, the growth of co-operative movement in India during British rule was a very slow and haphazard one. In most of the cases, the provincial governments took the lead. The foreign ruler had only made some committees or framed a few rules and regulations. But they did not take any wide-ranging programme to spread the movement all over the country. In spite of this official indifference, co-operative organisations had been formed at that time. Banking society, consumers' society, fruit growers' society, milk supply society, cane growers' society and the like came into being in dependent India.

The golden era of co-operative movement began after India won freedom. Within two decades of independence the membership of primary societies had increased four times while the share capital and working capital increased 23 and 31 times respectively.

The history of Dairy Development Movement in India is a new one. During the pre-independence period this movement was limited to a few pockets of Calcutta, Madras, Bangalore and Gujrat. The most notable of this venture was Kaira District Co-operative Milk Producers' Union Limited of Anand, Gujrat. But after independence the national Government took great initiative in setting up new Dairy Co-operatives in many parts of the country. The National Dairy Development Board was set up to make the ambitious project a success. Besides this the Operation Flood Project was taken up to balance the demand and supply of milk throughout the country and to help the rural people in making additional income.

Notes & Reference

1. A Brief review of Dairying in India (Study note), National Dairy Research Institute, Kalyani, West Bengal, p.1.
2. Dr. Jagjit Sing Punjrath, "Reaching Milk to the City consumers". 'Dairying in Eastern India - 1980' Calcutta : Published by Indian Dairy Association (East Zone), 1980, p.58.
3. Shri J.P.Pal, "some constrains of Milk Supply Management in West Bengal - with Special Reference to greater Calcutta Milk Supply Scheme under the Directorate of Dairy Development, West Bengal". 'Dairying in Eastern India - 1980', Calcutta : Published by Indian Dairy Association (East Zone), 1980, p.52.
4. History of Co-operative Legislation in India (Study note). National Dairy Research Institute, Kalyani, West Bengal, p.1.

5. Ibid., p.1.
6. Prof. K.R.Kulkarni, Theory & Practice of Co-operative in India and Abroad, Vol.III. Bombay : Bombay Co-operatives' Book Depot, 1958, pp.5 & 6.
7. History of Co-Operative Legislation in India. Op.Cit, p.1.
8. Ibid., p.1.
9. "During 1906-07 the number of societies were 843 with memberships of 90.8 the thousands and a working capital of Rs. 32.71 lakhs and these figures increased to 17,327 numbers, 824.4 thousands and Rs. 896.6 lakhs respectively at the end of the year 1914-15". Prof. K.R.Kulkarni, op.cit., pp.7 & 8.
10. "For example, the Mysore Co-operative Societies Act, 1918 as amended upto 1927, Hyderabad Co-operative Societies Act of 1923, The Gwalior Co-operative Societies Act of 1934 and the West Bengal Co-operative societies Act of 1940 respectively. Ibid., p.13.
11. Ibid., p.41.
12. "The Mysore Co-operative Societies Act, of 1959 (as amended in 1964).
The Maharashtra State Co-operative Societies Act of 1960;
The Jammu and Kashmir Co-operative Societies Act of 1960;
The Madhya Pradesh Co-operative Societies Act of 1960;

The Punjab Co-operative Societies Act of 1961;
The Gujrat Co-operative Societies Act of 1961;
The Madras Co-operative Societies Act of 1961;
The Orissa Co-operative Societies Act of 1962;
The Andhra Pradesh Co-operative Societies Act of
1964;

The Rajasthan Co-operative Societies Act of 1965;
The Uttar Pradesh State Co-operative Societies Act
of 1965".

History of co-operative legislation in India, op.cit.,
p.2.

13. R.Gopalan, Dairy Co-operatives in India (Study note),
National Dairy Research Institute, Kalyani, W.B., p.1.
14. Dr. Barun Mitra, "Why Co-operative Milk Union of
Calcutta, had failed", 'Dairying in Eastern India
- 1980'. Calcutta : Published by Indian Dairy Asso-
ciation (East Zone), 1980, p.63.
15. Ibid., p.64.
16. Ibid., p.65.
17. Ibid., p.65.
18. R.Gopalan, op.cit., p.2;
19. Ibid., p.2.
20. R.Gopalan, op.cit., p.3.
21. A Brief Review of Dairying in India, op.cit., p.4.
22. R.Gopalan, op.cit., p.3.
23. Ibid., p.3.

24. Ibid., p.4.

25. Ibid., p.4.

26. Ibid., p.4.

Chapter - III

Progress of Operation Flood

"Operation Flood, the largest dairy development programme ever undertaken in the world, was initiated closely on the heels of the 'Green Revolution' in this country, against the backdrop of a huge surplus of milk products in the highly developed milk producing countries in the west"¹.

Operation Flood is the expression, describing the generalised application, on a national scale, of the experience gained from the establishment and successful operation of the Co-operative dairying venture known as Amul, at Anand in the Kaira district of Gujrat.

The general principles underlying the programme are basically simple; their specific application to the dairy sector involving the progressive establishment on a nationwide basis, of vertically integrated milk producers' Co-operatives of the Amul variety².

Broadly, the objectives of the programme are as follows³ :

- 1) to facilitate a progressively increasing level of milk consumption and dairy products in the country at large, and the urban areas in particular, at a price that ensures a fair return to the primary producer that is not simultaneously at the expense of the final consumer;
- 2) to initiate and implement measures aimed at raising the output of the dairy sector by both encouraging organised dairying and improving productivity so that higher national consumption can be achieved on the basis of domestic production of the dairy and related sectors and not imports; and,
- 3) to effectively integrate the short and medium term aspects of the programme with the long run goal of modernising the dairy sector in all its aspects, establishing basic infrastructure, and laying a permanent basis for future productivity gains.

Our national economy is predominantly agricultural. And agriculture does not provide full time employment throughout the year. The rural population has considerably increased and there is pressure on land. For the above reasons, the rural households have to look out for some subsidiary occupation which would provide them incremental or subsistence income. Therefore, dairy farming has become a predominant occupation in the rural areas in our country.

Though the predominantly vegetarian population of India derived the bulk of its animal protein requirements, traditionally, from milk, the supply of milk increasingly fall short of demand whereby availability per capita declined from 132 grams in 1951 to some 107 gms. (1970)⁴. The ever expanding urbanisation, a genetically depleted bovine stock characterised by low-yields and seasonality in production, inability of the urban milk supply schemes to provide adequate incentives to rural producers to produce and market more—all these factors contributed to the creation of a situation wherein the government found it self in an unenviable role of a commercial importer of milk powder from abroad to satisfy the needs of its urban population, although at a high rate of subsidy⁵.

In the early stages of town and city developments, animals could be kept next to living areas and fodder

could be had from the nearby farm. As the city life became more complex, there were not enough land left for the human beings and it became uneconomical to keep animals near the city homes. Not only feeding of the animals regularly on fresh green fodder became difficult and expensive, there was also the problem of pollution of environment. The tending and rearing of animals passed on to a group of people who could apparently do this job more efficiently. The animals were also moved to less -hospitable areas which slowly took the form of "City Khatalas".

Again, with the rapid increase in population, the per capita availability showed decreasing trend and cost of the milk started increasing at a rapid rate. To meet the demand, in absence of any increase in the production, the middlemen and 'Doodhwallas' started adulterating milk; and anything white in colour started being marketed as milk. This became really a serious problem in big cities such as Bombay, Calcutta, Delhi and Madras which, over a period of time, started becoming remote from rural production areas.

Official programmes notwithstanding viz. "Cattle colony" - at Bombay, Calcutta and Madras, intensive cattle development projects, the milk situation deteriorated into

a situation of near famine in the cities. That was the position since independence, until the early 1970s⁶. (It is to note that the late Prime Minister of India, Sri Lalbahadur Shastri during his visit to Anand in 1964 was greatly impressed by economic progress brought about by the dairy co-operative movement and desired the AMUL pattern to be replicated all over the country).

The National Commission on Agriculture in their Interim Report on Milk Production recommended that benefits of increasing demand for milk in large cities, towns and industrial areas should go to small and marginal farmers, and landless labourers. Every effort should be made to promote as much milk production possible through this section of rural population. The Commission suggested an integrated rural development approach based on a system of producer's Co-operatives as developed in Kaira district of Gujrat⁷. As a result, the National Dairy Development Board was set up in 1965 with Dr. V.Kurian as the Chairman. It was an autonomous technical consultant to the Government of India in matters relating to animal husbandry and dairying.

"Four years later when European milk producers decided to off-load their excess stocks of milk products by gifting them to other countries including India, Kurien decided to accept this gift and channelise it to

boost indigenous production which would initially fulfil the needs of four metropolitan cities, Bombay, Calcutta, Madras and Delhi and subsequently the entire country. Thus began "Operation Flood" - I. A vast chain of milk processing centres were set up in all parts of the country. Not only requirements of our large cities were met substantially but many by-products such as butter, cheese, ghee, baby-food, chocolate and powdered-milk on which multi-nationals had fattened came to be produced in India"⁸.

Subsequently, Indian Dairy Corporation was established in 1970 to provide the finance and to attend administrative aspects of the operation flood programme; the National Dairy Development Board provided technical and consultancy services. For proper co-ordination Kurien was appointed Chairman of the IDC as well.

CONCEPT OF ANAND PATTERN :

The core concept behind the operation flood programme was, the "Anand pattern"⁹. Under the Anand Pattern, a Primary Co-operative Society is formed in the village on the bye-laws which insulate the society from the undue interference of people who are not directly connected or concerned with the development of the society or milk producers, but are mainly interested in dominating the

society to further their own ends. This has been possible because of the provisions in the bye-laws : that only the farmers keeping milch animals can become members; and even among the members, only those who participate regularly in the business of the society can be elected to the Managing Committee of the Society. No person either connected with or doing business in milk can become a member of the society.

The members of the society elect their Managing Committee who appoints the paid employees of the society. The salary of the employees is paid out of the co-operative's earnings.

The co-operative buys milk from the producers in the village who wish to sell to it. The milk is measured and the quantity recorded in the pass Book kept with the milk producers. While accepting the milk, the society also draws a small sample for quality tests. The payment for the milk procured by the society in the morning is made in the same evening and for the evening milk, the payment is made the next morning. This enables the producer to know the price he or she is receiving for the milk. The quality based payment also gives incentive to sell better quality milk.

The milk from each society is transported to the Union's Dairy plants or chilling plants where it is received

after grading and weighment. The milk so received is processed, according to the requirements and commitments of the Union, as fluid milk or converted into milk products.

Overall responsibility of the functioning of the Union is vested in the Board of Directors elected by the Chairmen of the primary Societies. The Board in turn appoints a high calibre professional Manager. Under the Manager, specialists in field like Dairy Technology, Engineering, Animal Husbandry & Veterinary, Agriculture etc. are recruited not only to process and market the milk procured by the Union but also to provide inputs to the rural milk producers in order to increase the milk production. The inputs like Veterinary First-aid, Artificial Insemination, Cattle Feed etc. are marketed by the Union through the primary societies for the benefit of the producers at their door step. Recently, to reap marketing benefits of the milk and milk products, one more tier has been added to the "Anand pattern", that is the Federation of the District Unions. Usually, the Federation of the District unions co-ordinates the overall milk marketing activities of the member unions.

Thus, in short, "Anand Pattern" has evolved a three-tier structure of Dairy co-operatives - primary societies at the base, their District unions at the middle level

and at the apex, a Federation of the District unions with elected representatives of producers setting each institution's policies at the level of each 'tier' (Annexure-2).

The system has enabled the milk producers to derive maximum benefits from the cooperative, which functions under the guidance of an elected Board. The producers have freedom to place their grievances before the village Managing Committee and, if necessary, before the Unions' Administration for proper and timely action.

The payment to the milk producers from milk is strictly on the basis of quality as determined by the 'Fat test'. The society, in turn is paid on the basis of Fat & solids Non-Fat. The Dairy plant owned and operated by the union helps the society to procure and accept the milk in the flush and lean season, thereby providing an assured year-round remunerative market for the milk.

With a view to help the milk producers to increase milk production, the society or Union provides technical inputs like veterinary First-Aid, Artificial insemination and Balanced cattle Feed on a no-profit-no loss basis. Balanced Cattle Feed is sold to the milk producers through the village co-operatives at 20 to 30 per cent less than the market prices of conventional cattle Feeds. The dissemination of the knowledge and education of improved

Animal husbandry practices are provided through a strong extension network (Annexure-3).

Besides, the concurrent and continuous auditing of the primary societies and the union is one of the major factors of the success of the system. The constant watch on the working of the co-operative functioning, either through the union's supervisory staff or by the departmental audit team, helps to instil confidence in the mind of producers that the funds of their organisation are properly utilised.

The whole functioning of the 'Anand model' may be schematically represented by the Chart 3.1.

OPERATION FLOOD-I :

The progress of operation flood could be best measured when studied against the specific objectives with which the programme was achieved. Operation Flood-I Programme was taken up by the Government of India in 1970 deciding to accept from the World Food Programme (WFP), 1,26,000 tonnes of skim milk powder and 42,000 tonnes of butter oil from 1970 to 1975 as gift. The gift commodities were donated by the European Economic Community (E.E.C). Funds amounting to Rs. 116.40 crores would be generated through the sale of these gift to the four metropolitan city dairies (Calcutta, Delhi, Bombay and

SCHEMATIC DESIGN OF THE FUNCTIONING OF 'Amrut Model'

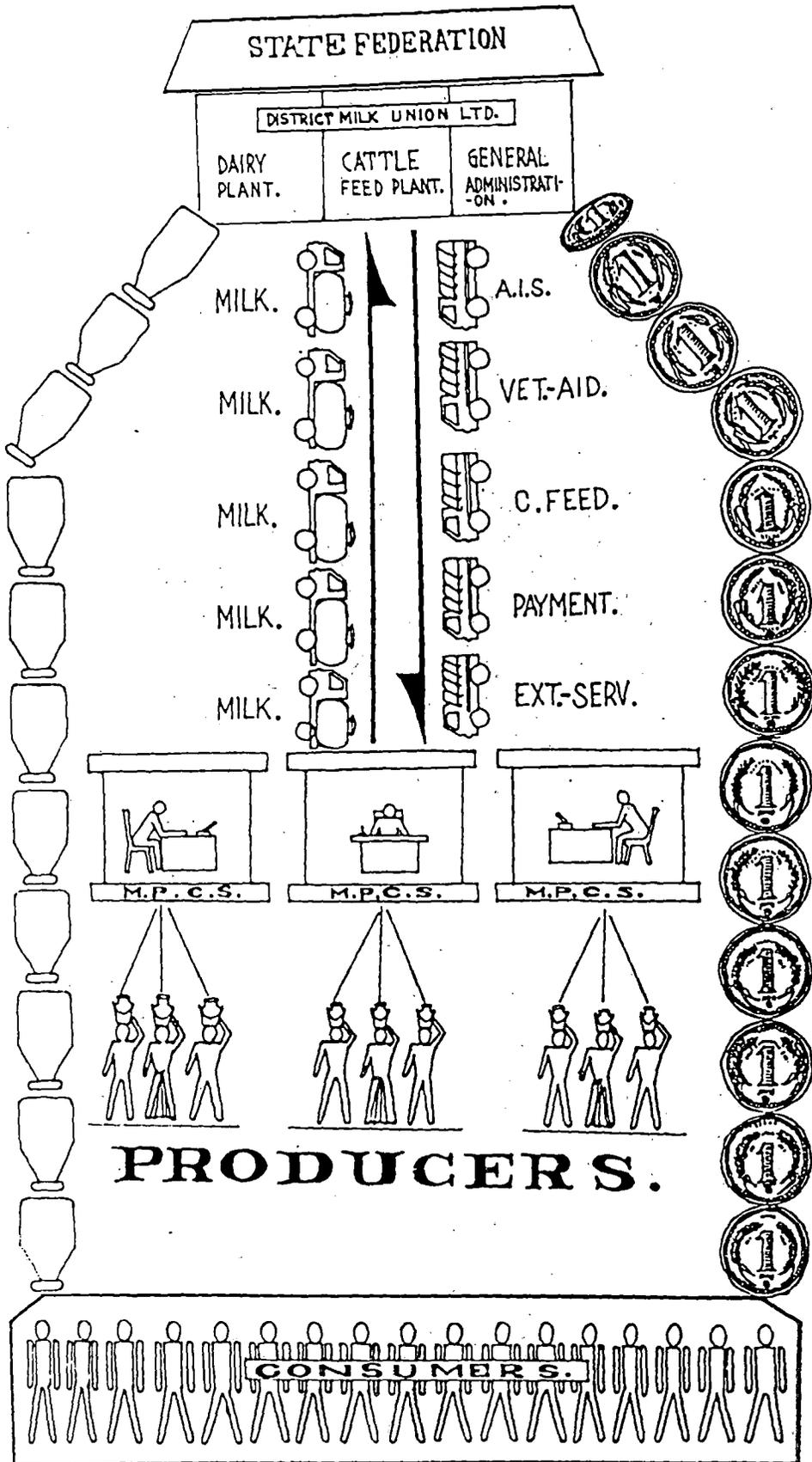


CHART 3.1

Madras)¹⁰. For increasing the processing facilities of the public sector dairies in those four metropolitan cities from 10 lakh litres per day to 27.50 lakh litres per day and for increasing milk production and procurement in the hinterland areas in ten States of Andhra Pradesh, Bihar, Haryana, Gujrat, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal and the Union Territory of Delhi, the generated funds were to be used (Annexure-4).

OPERATION FLOOD-II :

Government of India approved the Operation Flood-II Programme in October 1979 with a total outlay of Rs. 485.50 crores over a period of 7 years. (but it was launched in April 1981 as the Operation Flood-I Programme was extended upto March, 1981). This was to be funded by a soft loan of 150 million U.S. dollars from the World Bank, money generated from the dairy commodities gifted by the European Economic Community¹¹, and by the internal resources of the Indian Dairy Corporation.

The Operation Flood-II programme was intended to the following¹² :

- 1) to benefit 10 million farm families in 155

milkshed districts selected by the National Commission of Agriculture on the basis of their potentiality of milk to build a viable self sustaining dairy industry by mid 1985. (These milksheds would be linked with 147 cities each with a population of about a lakh or above, and they would be the chief consuming centres);

2) to cover a national milch herd of about 14 million cross-breed cows and upgraded buffaloes by mid 1985;

3) to increase the country's milk production from the present 68.7 million litres per day to 102.3 million litres per day in 1985;

4) to increase the consumption of milk per head from the present 120 grams per day to about 145 grams per day per head in 1985.

OPERATION FLOOD-III :

Operation Flood-III has been designed to bring the remaining major milk markets and milksheds of the country within 1989-90.

FUND ALLOCATION :

1) Operation Flood-I :

The provision of the fund allocation of Operation Flood-I was that the funds were provided under different heads of items (styled as Action Item) to create a Milk Union through the Project cell - W.F.P. (World Food Programme) - 618. Under a few heads of items 70% was given as loan and 30% as grant and the other a few items of amount was provided as 100% grant. The amount of loan was for a period of 20 years with a moratorium period of 5 years and the rate of interest charged 8½% compound interest. The respective state Government was to stand by as guarantor. The heads of items of grants were as follows :

- 1) Action item No.1.1, for dairy plant and chilling plant, 70 percent loan and 30 percent grant;
- 2) Action Item No.2.1, for capital expenditure of technical input programme, 70 percent loan and 30 percent grant;
- 3) Action Item No.2.2, for recurring expenditure of technical input programme, 70 percent loan and 30 percent grant;

- 4) Action Item No.3.0, for creating marketing facilities, 70 percent loan and 30 percent grant;
- 5) Action Item No.4, for supporting dairy co-operatives, 100 percent grant;
- 6) Action Item No.5, for salary (40 heads) of CSHT (Composite speare head team) for first two years, 100 percent grant;

ii) Operation Flood-II :

The allocation system of the fund of Operation Flood-II was the same as Operation Flood-I with the only exception that the fund would be given through the respective State Milk Federation.

iii) Operation Flood-III :

In Operation Flood-III, there is no provision for allocation of recurring expenditure for technical input programme. And the loan will be given to the milk union through respective State Milk Federation with a compound interest of $8\frac{1}{2}$ percent for a period of 15 years with 3 years moratorium for repayment.

A comparative position of the initial funds for different operation flood programmes may be observed from the table 3.1.

TABLE 3.1
Funds for Different Operation Flood Programmes

	Operation Flood-I	Operation Flood-II	Operation Flood-III
Duration	July 1970 - March 1981	April 1981 - March 1985	April 1985 - March 1990
Fund : Rs. (Crore)	116.40	485.50	681.30 (Proposed)

Sources : Compiled from (i) Operation Flood:
progress and potentials - B.K.
Ganguli (N.D.D.B) (Mimeographed)
(ii) Western Times, January 9, 1984.

Achievements of the Operation Flood (I and II) in India can be observed from Zonal progresses. Mainly operational areas can be divided into four Zones : North, South, East and West. The North Zone covered States of Haryana, Panjab, Uttar Pradesh, Rajasthan, Himachal Pradesh and Jammu & Kashmir; the South Zone covered States of Andhra Pradesh, Kerala, Karnataka, Tamilnadu and Pandicherry; the West Zone considered the States of Gujrat, Madhya Pradesh, Maharashtra and Goa, Daman & Diu; the Eastern Zone stretches the area of the States of West Bengal, Bihar, Orissa, Tripura, Assam, Sikkim and Andaman & Nicobar Islands

NORTH ZONE :Haryana :

By the end of 1985, a total of 2,383 milk producer's co-operatives covering 1,45,929 milk producers were organised and milk procurement reached the level of 2 lakh kg. per day during the flush season in 11 milksheds. The agency responsible for implementation of operation flood in the State was Haryana Dairy Development Co-operative Federation (HDDCF). 150 artificial insemination (AI) centres and only 12 veterinary routes were organised for providing technical inputs (Annexure 5). The technical inputs programme were not implemented in a smooth way. The National Dairy Development Board (NDDB) together with the Institute of Rural Management, Anand (IRMA) organised a programme for developing a management information system as a tool for better decision making at Union or Federation levels.

However it can be observed that the dynamicity of the progress in latter part was at a high level as a number of initiatives had been taken by HDDCF and NDDB for setting up a number of units (Annexure 6). The work of construction of a dairy at Sirsa with a capacity of 60,000 litres per day and the renovation of a experimental dairy at the National Dairy Research Institute, Karnal with a

capacity of 10,000 litres per day continued. The planning of expansion of dairies at Jind and Ambala was initiated in two phases by the HDDCF with the consultancy of NDDB from 50,000 litres to 1,00,000 litres per day and from 20,000 litres to 75,000 litres per day respectively. The Rahtak dairy with a capacity of 1,00,000 litres per day was also at a planning stage.

Punjab :

At the end of March 31, 1985, 3818 milk producers' co-operatives with 1,83,872 producer members were organised and milk procurement touched close to six lakh kg. per day during the flush season in 11 milk sheds, 697 of these village milk co-operative societies were providing artificial insemination services to their members and there were 63 mobile Veterinary Clinics to provide animal health services to the producer members (Annexure 5).

At the end of March 1985 the progress of Operation Flood was continuing in a smooth way. However work was continuing for the expansion of Dairies at Bhatinda, Hoshiarpur, Sangrur and Jalandhar from their combined per day capacity 1,50,000 litres to 5,25,000 litres. The work of construction of dairies at Gurdaspur, Patiala and Ferozpur with daily capacity of 1,50,000 litres, 1,00,000 litres and 50,000 litres respectively and two chilling

centres at Bhatinda and Sangrur with a capacity of 10,000 litres daily each continued, work was also continuing to expand the chilling centres at Jalandhar, Hoshiarpur, Ropar, Bhatinda and Faridkot and thereby to raise combined capacity from 75,000 litres to 1,40,000 litres daily. One dairy and one chilling centre at Faridkot (capacity 50,000 litres and 30,000 litres respectively per day) and expansion of a chilling centre at Ludhiana from 4000 to 30,000 litres daily were also at planning stage. Moreover work of a cattle feed plant with a capacity of 100 metric tonnes per day was also continuing (Annexure 6). All the above projects were being executed by the Punjab State Co-operative Milk Producers' Federation with the technical consultancy of National Dairy Development Board.

Uttar Pradesh :

At the end of Operation Flood-I and II 2503 milk producers' Co-operative Societies with near about 1,30,000 producer members were organised and milk procurement reached close to 3,00,000 Kilogram (kg.) daily during the flush season in 19 milksheds, 500 of these milk co-operative societies were providing Artificial insemination services to their members, and there were 48 Mobile Veterinary clinics to provide animal health services to producer members (Annexure 5). With the proposal of

Pradeshik Co-operative Dairy Federation (PCDF), the National Dairy Development Board together with the institute of Rural Management, Anand, Organised a programme for developing a management information system as a tool for better decision making at Union or Federation levels.

The dynamicity of operation flood was also continuing at the end of 1985. And it may be more clear from the following information.

The construction of dairy at Lucknow and Agra with a capacity of 2,00,000 Litres and 1,00,000 litres daily respectively and chilling plant of Muzaffarnagar, Bulandshahar, with a capacity of 60,000 litres daily each, Barabanki, Ballia, Etawah, Hapur, with capacity of 30,000 litres per day each and another at Barabanki (capacity of 10,000 litres per day) and expansion of dairy at Meerut from 1,00,000 litres to 3,50,000 litres per day with a Powder plant of 15 metric tone were at planning stage.

The work of dairy renovation at Kanpur (capacity of 50,000 litres per day), Meerut with a powder plant of 10 metric tone (capacity of 1,00,000 litres per day) and expansion of Dairy at Moradabad with a powder plant from 60,000 litres to 1,50,000 litres per day and chilling centre at Fatehpur from 10,000 litres to 30,000 litres

per day were also continuing (Annexure 6). All the above projects were being executed by the Pradeshik Co-operative Development Federation with National Dairy Development Board's Technical Consultancy.

Rajasthan :

At the end of March, 31, 1985, 2064 milk producers' co-operative with 1,23,050 producer member were organised and milk procurement reached 5,62,690 kg. per day during peak season in six milksheds. 346 Artificial Insemination centres and 36 veterinary routes were organised for providing technical inputs at the end of Operation Flood - I & II programme (Annexure 5).

However, it may be observed the dynamicity of the progress of operation flood in latter part as a number of initiatives had been taken and also continued (Annexure 6). It may be clear from the following.

The work was continuing on construction of dairy at Kata (capacity 25,000 litres) and on expansion of dairy at Jodhpur from 1,00,000 litres to 1,50,000 litres per day and also on construction of four chilling plants at Bikaner, and Jodhpur with combined capacity of 60,000 litres per day.

Himachal Pradesh :

At the end of March 31, 1985 altogether 78 co-operatives had been organised with 8,861 producer members in Simla and Mandi. Their total peak milk procurement reached 15,160 kg. per day (Annexure 5) and part of milk collected by Himachal Pradesh Dairy Federation was also supplied to the Punjab State Co-operative Milk Producer's Federation. Work of expansion of one chilling plant at Nihan was at planning stage at the end of 1985 (Annexure 6).

Jammu & Kashmir :

At the end of March 31, 1985, 86 producers' milk co-operative societies with near about 4,000 producer members were organised by the Kashmir Valley milk producers' co-operative federation in one milkshed (Annexure 5). And construction of a dairy at Srinagar (capacity 60,000 litres per day) was at planning stage at the end of March 1985, (Annexure 6).

SOUTH ZONE :Andhra Pradesh :

At the end of Operation Flood-I & II i.e. end of March of 1985, 2,518 milk producers' co-operatives with

2,14,415 producer members were organised and milk procurement touched close to 7.07 lakh kg. per day during the flush season, 121 of these milk producers' co-operatives were providing Artificial Insemination services and there were only 12 Mobile Veterinary Clinics to provide animal health coverage to the producer members (Annexure 7).

In the year 1984-85 work was continuing on expansion of dairy at Sangram from 2,50,000 litres to 3,50,000 litres per day and construction of "Aseptic" packaging station at Sangram with a capacity of 1,00,000 litres per day and steps were initiated to set up a cattle feed plant at Mydukur with a capacity of 100 metric tone daily (Annexure 8). From the above it may be concluded that the progress of operation flood was continuing in Andhra Pradesh at the end of March 1985.

Kerala :

At the end of March 31, 1985, 468 village milk producers' co-operative societies covering with 67,641 producer members had been organised and milk procurement reached 95,000 kg. per day in the flush season. There were 199 A.I. centres and 13 veterinary clinics in Kerala (Annexure 7).

However it may be observed that the dynamicity of the progress in latter part of 1985 was at a high level

as a number of initiatives had been taken and continued by the Kerala co-operative Milk Federation with NDDB's consultancy for setting up a number of units. More it may be clear from the following information (Annexure 8). The work of construction of four dairies at Quilon, Allepey, Trichur and Ernakulam with their combined capacity of 2,80,000 litres per day and two chilling plants at Mivatupuzha and Mannar with a capacity of 10,000 litres per day each continued during the year 1984-85. The Trivandam dairy with a capacity of 1,00,000 litres per day was also at planning stage at the end of March 1985.

Karnataka :

At the year end of March 1985, 2,289 village Milk Producers' Co-operative societies covering 3,74,374 producer members were organised by the Karnataka Co-operative Milk Producers' Federation and milk procurement reached to five lakh kg. per day during the flush season. 798 Artificial insemination centres and 53 mobile veterinary clinics were organised for providing technical input services and animal health services respectively (Annexure 7).

Tamil Nadu :

At the end of March 31, 1985, 4,249 milk producers' co-operative societies had been organised covering 5,72,341 milk producer members and total milk procurement reached to near about seven lakh kg. per day. All the village milk co-operative societies were providing Artificial insemination services and animal health services to their producer members through 1319 Artificial Centres and 80 mobile veterinary clinics (Annexure 7).

At the end of the year 1984-85 the progress of operation flood was continuing in a smooth way. However, construction work was on progress of two dairies at Coimbatore and Karaikudy with a combined capacity of 1,50,000 litres daily and on expansion of dairy at Erode from 1,50,000 litres to 3,00,000 litres daily and Salem from 1,00,000 litres to 2,00,000 litres daily at the end of the year 1984-85. Dairy expansion at Madurai from 1,50,000 litres to 2,50,000 litres per day and a cattle feed plant with a capacity of 100 metric tone at Madurai was also at planning stage (Annexure 8).

Pondicherry :

Fifty three village milk producers' co-operative societies covering 8,798 producer members had been

organised at the end of March 31, 1985. During the flush season they procure nearly 19,000 kg. of milk per day (Annexure 7). Work was in progress for the expansion of Pondicherry dairy from 10,000 litres to 30,000 litres daily (Annexure 8). There were only 15 and 1 Artificial insemination centres and vaterinary clinic respectively under Pondicherry Milk Producers ' Co-operative Unions for providing technical and animal health services to their producer members. Information depict that the progress of operation flood was going on.

WEST ZONE :

Gujrat :

The dairy development programmes under Operation Flood in Gujrat continued to gain momentum in all the 16 milksheds. 7,973 village milk producers ' co-operative societies had been organised covering 11,49,433 producer members and milk procurement reached to nearly 19.44 lakh kg. per day. Technical input services such as Artificial insemination, cattle feed, animal health care, minikits for fodder development etc. continued to be provided by the village milk producers ' co-operative societies to their producer members (Annexure-9). From

the following information it may be more clear that the progress as well as dynamicity of operation flood was at high level at the end of two Operation Flood programmes in Gujrat as there number of initiatives had been taken and also the many projects were in planning stage as well as continued.

The work continued on dairy (with drying facility) expansion at Anand from 8,00,000 litres to 9,50,000 litres (with 75 metric tone powder plant) per day, at Junagadh from 30,000 litres to 80,000 litres (with 10 metric tone powder plant) per day and at Godhra from 30,000 litres to 80,000 litres (with 10 metric tone powder plant) per day. In the year 1984-85 the work was also undertaken by the National Dairy Development Board on expansion of dairy at Surat, Boroda, Rajkot, Surendranagar and valsad from their total capacity of 3,55,000 litres to 7,20,000 litres per day and on expansion of three chilling plants at Rajkot and Bhavnagar from their total capacity of 14,000 litres to 50,000 litres per day and expansion of a cattle feed plant at Surat from 100 metric tones to 200 metric tons, daily. The work also continued to set-up a "Aspetic Packaging Station" at Boroda with a capacity of 14,000 litres per day, ten chilling plants at Ahmedabad, Junagadh, Bhavnagar, Bhuj, Rajkot and Valsad with a combined capacity of 1,80,000

litres daily and dairy at Bhavnagar with a capacity of 60,000 litres per day. At the end of the year 1985 the expansion of a cattle feed plant at Rajkot from 100 metric tones to 200 metric tones was at planning stage (Annexure 10).

Under the programme of Operation Flood, the Indian Dairy corporation set up the Hindustan Dairy Packaging Company to produce packaging materials and the Indian Dairy Machinery Company to fabricate road-milk tanker, milk storage tank, milk reconstitution equipment, ghee boiler, Artificial insemination gun and other dairy equipments etc. in Gujrat.

Madhya Pradesh :

At the end of March 31, 1985 (i.e. end of Operation Flood-I & II), 1,685 milk producers' co-operatives covering 76,926 milk producers were organised and milk procurement reached to 2,12,260 kg. per day during the flush season in seven milksheds. 823 Artificial insemination centres and 39 veterinary routes organised for providing technical inputs and animal health coverage (Annexure 9).

At the end of 31 March, 1985, work was under way of construction of a Feeder balancing dairy with a capacity of 2,00,000 litres per day, with a 10 metric tone daily

drying facility, three dairies at Sagar, Raipur and Jabalpur with their combined capacity of 2,30,000 litres per day, eight chilling plants at Gwalior, Bhopal, Sagar, Raipur and Jabalpur with their combined capacity of 1,30,000 litres daily and on expansion of chilling plant and Bhopal from 20,000 litres to 30,000 litres per day as well as one powder plant at Indore from 10 metric tone to 20 metric tone per day. Expansion works of three chilling plants at Indore and Ujjain with their combined capacity from 40,000 litres to 70,000 litres per day were at planning stage (Annexure 10).

From the above it may be concluded that the dynamicity of operation flood was continuing at the end of two programmes.

Maharashtra :

At the end of the year 1984-85 1,950 milk producers' co-operative societies with 4,84,483 producer members were organised and milk procurement touched close to 11.87 lakh kg. per day during the flush season, 214 and 1137 of these milk producer's co-operative societies were providing artificial insemination services and animal health care services respectively to their producer members (annexure 9). At the end of March 1985, work was continuing on construction of feeder balancing

dairy with a capacity of 2,00,000 litres per day with 10 metric tonne powder plant at Kolhapur (Annexure 10).

These information prove the progress of operation flood was also continuing in Maharashtra at the latter part of two programmes.

Goa, Daman & Diu :

At the end of operation flood-I & II, 66 milk producers' co-operative societies were organised and procured 16,500 kg. of milk per day in the flush season. There were 11 artificial insemination centres and 2 veterinary clinics for providing technical inputs programme and animal health coverage to the producer members (Annexure 9) work continued on expansion of a cattle feed plant with a capacity of 50 metric tonne at Uргаon at the end of March, 1985 (Annexure 10).

EAST ZONE :

West Bengal :

At the end of 31 March, 1985, 978 village milk co-operative societies with 49,479 milk producer members were organised and milk procurement touched close to 49,000 kg. per day during the flush season in six milksheds,

424 of these village milk co-operative societies were providing artificial insemination services to their producer members and there were 29 veterinary clinics for providing animal health services to the producer members (Annexure 11).

From the following it may be observed that the progress of operation flood was also going on after the end of two programmes as one dairy with a capacity of 60,000 litres per day at Berhampore was commissioned and at the same place one cattle feed plant construction was continued (Annexure 12).

Bihar :

Bihar State Co-operative Milk producers' Federation was organised at the end of 31, March, 1985, 765 village milk producer co-operative societies covering 15,827 producer members and succeeded in procuring 34,000 kg. of milk per day in the flush season. There were only 61 artificial insemination centres in Bihar (Annexure 11).

However, it may be observed from the following that the dynamicity of the progress of operation flood was at a high level as a number of initiatives had been taken in Bihar for creating the number of projects. The establishment of five dairies at Dhanbad, Gaya, Jamshedpur, Moonghyr and Ranchi with their combined capacity of

3,00,000 litres per day, expansion of two dairies at Bokaro and Patna from 25,000 litres to 50,000 litres per day and from 1,00,000 litres to 1,50,000 litres per day respectively, establishment of 12 chilling plants at Hazipur, Arah, Buxer, Gaya, Saran, Est Champaran, Biharsharif, Saharsa and Rohtas with their combined capacity of 2,20,000 litres daily and expansion of one chilling plant at Darbhanga from 10,000 litres to 20,000 litres per day were at planning stage (Annexure 12).

Orissa :

At the end of March 31, 1985, 285 village milk producers' co-operative societies covering 11,223 producer members were organised and milk procurement achieved a target of only 8000 kg. per day during the flush season in four milksheds. There were 133 artificial insemination centres and 4 veterinary clinics for providing technical input services and animal health care services to the producer members of 133 and 137 villages respectively (Annexure 11).

The work of establishment of two dairies at Bhubaneswar and Rourkella with the capacity of 60,000 litres and 30,000 litres per day respectively and of a cattle feed plant of Cuttack with the capacity of 100 metric tone continued (Annexure 12). From the above it may be concluded that the progress of Operation Flood

in Orissa was also continuing at the end of March 1985.

Tripura :

Sixty one village milk producers' co-operative societies covering 3,184 producer members had been organised at the end of March, 31, 1985. During the flush season they procured nearly 2,000 kg. of milk per day. In Tripura there were two veterinary routes (Annexure 11).

Assam :

At the end of the year 1984-85 only 124 village milk producers' co-operative societies covering 5,925 producer members were organised. And they procured only 4000 kg. daily in the flush season. There were only six artificial insemination centres and one veterinary clinic in Assam (Annexure 11). The works of establishment of one dairy and one cattle feed plant with a capacity of 60,000 litres and 100 metric tone respectively at Guahati continued at the end of March 1985 (Annexure 12).

Sikkim :

At the end of March 31, 1985, 107 village milk producers' co-operative societies covering 5357 producer

members organised. They procured only 4,180 kg. during the flush season. Eighty of these societies were covered in the animal health programme (Annexure 11).

Andaman & Nicobar Islands :

Only 20 village milk producers' co-operative societies with 1,000 producer members were organised by the South Andaman Co-operative Milk Producers' union, six artificial insemination centres for providing technical input services to the producer members started functioning (Annexure 11). Planning was initiated to establish a dairy at port Blair with a capacity of 5,000 litres per day (Annexure 12).

TABLE 3.2

Achievement of Dairy Co-operatives in Four Zones in India Upto March 1985

Zones	Milk-sheds	Anand pattern co-operatives	Producer members ('000)	Milk Procurement '000 kg.		Technical Inputs	
				peak month	Annual Average	A.I centres	Vety routes
NORTH	50	10932	597	1732	1017	693	159
SOUTH	28	9577	1238	2044	1403	2452	159
WEST	40	11674	1718	4543	3296	2734	214
EAST	18	2340	91	103	69	664	39

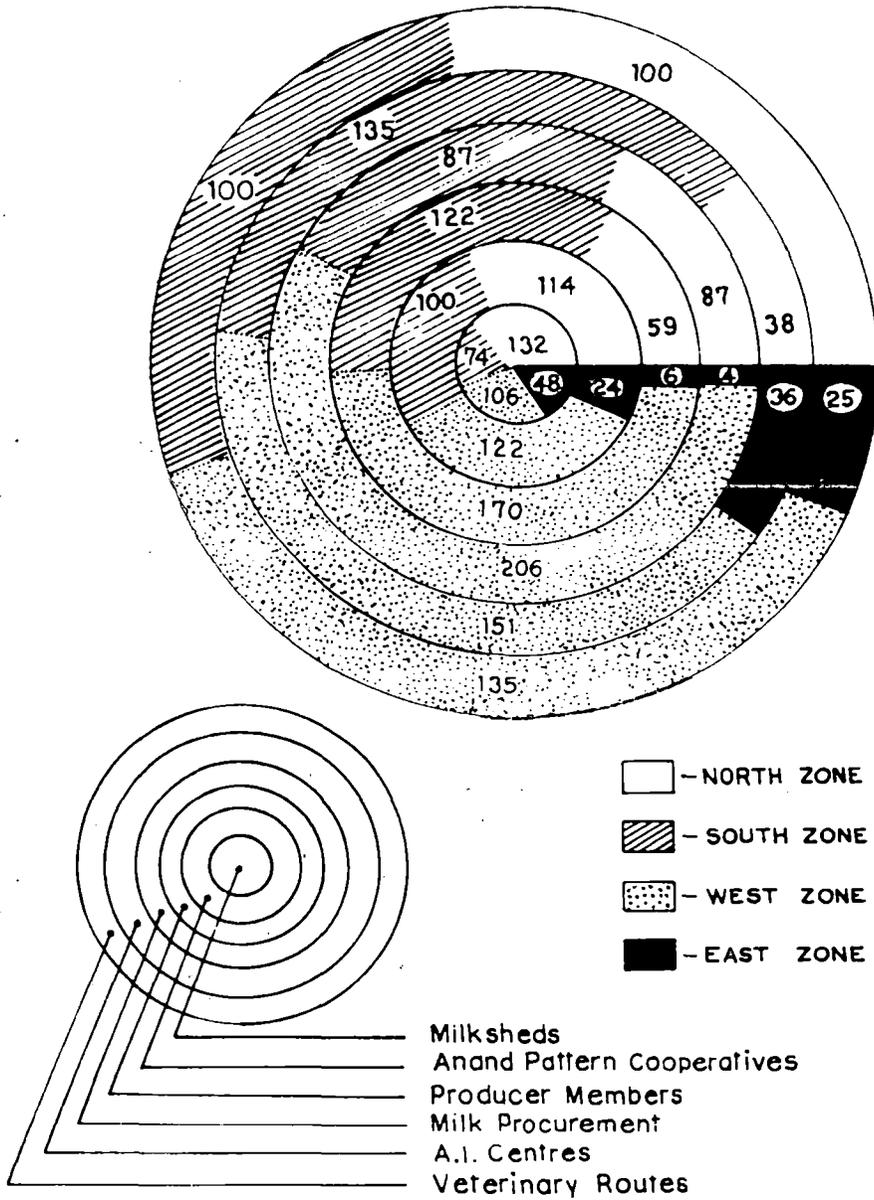
Source : Compiled from N.D.D.B Annual Report of 1984-85.

An overall analysis in relation to comparative position of different zones (Table 3.2) discloses that the West Zone in India is far ahead of other Zones specially with respect to organisation of village milk Co-operative societies, number of producer members, annual average milk procurement and technical input programmes etc. At the same time it cannot be denied that, so far as the milkshed is concerned, the frequency of North Zone is highest. The progress in all respect was worst in East Zone. There is only 6.8%, 2.5% and 1.2% of the Anand pattern Co-operatives, number of producer members and annual average procurement respectively. Whereas in West Zone the percentage of the same is 33.8%, 47.1% and 57% the Anand pattern Co-operatives, number of producer members and annual average milk procurement respectively.

However, with respect to the overall position in India the development of dairy Co-operative after the commencement of operation flood programme is notable (Chart 3.1). Milk production and an increase in per capita milk consumption from an average of 21.62 million metric tonnes to 41.0 million metric tonnes per year and 109.5 grams to 147 grams per day respectively (Annexure 13).

The progress of the Milkshed coverage is much slower for the period of 1970-71 to 1980-81 (on an

CHART - 3.1
 Percentage of Achievement of Dairy Cooperatives
 in four zones in India (vide Table 3.2)



average 3.4 approximately per year). However it gains momentum from 1980-81 onwards till 1985-86. The average growth rate is 22.2 per year (Annexure 14).

The effect of the formation of Anand pattern village milk producers' Co-operative is a much remarkable one. Though in the first six years (1970-71 to 1975-76) the number of village milk producers' co-operative increased by less than 3 times but the progress of fifteen years (1970-71 to 1985-86) disclose a growth of more than 25 times of what it was in 1970-71 (Annexure 15).

The average rural milk procurement has increased from 0.65 million kg. per day in peak months (i.e. in winter) and 0.52 million kg. per day annual average to 9.30 million kg. per day in peak months and 6.50 million kg. per day annual average respectively (Annexure 16).

Post Operation Flood efforts for production of balanced cattle feed, promotion of fodder production, promotion of technical input programmes and extension of education amongst farmers for use of the balanced cattle feed, green fodder and input programmes, have helped in the gradual increase of milch animal productivity (Annexure 17).

However the Operation Flood has been a remarkable departure from the traditional practices. As a result

there has been an increase in per animal average milk yield from 700 grams in 1970 to almost a kilogram by 1983¹³ (Annexure 17).

The effect of Operation Flood may also be felt in the matter of import of milk powder which declined after Operation Flood (the only exception being in the year 1981-82)¹⁴. Commercial imports of milk powder stopped in 1976; the imports since then have been in the form of gifts¹⁵. Indigenous milk production has also shown a rising trend since 1970-71 (Annexure 18 & 19).

The milk marketed in smaller towns and in four cities (viz. Delhi, Calcutta, Madras and Bombay) have been increased. In the former areas the increase is by about 2.21 million litres (i.e. more than 24 times) (Annexure 20) and in the latter areas it is by 2.19 million litres from 0.91 litre in 1970-71 (i.e. about 3.41 times) (Annexure 21).

On the whole Operation Flood has revolutionised the infrastructure base of the Indian dairy sub-sector. To cope up with seasonal and regional milk supplies long distance transportation of liquid milk, have been made possible by the introduction of road or rail milk tankers (as for example, milk to the city of Calcutta from as distant a place as Anand, some 2000 k.m.). The automatic

bulk-vending booths have ensured round the clock milk availability in the cities. The marketing system has been modernised with the introduction of the modern technology like "long-shelf life tetra-pack milk laminated paper" - a machine produced indigenously. "As a matter of fact, except a few highly specialised equipments, the country has now built up the necessary know-how and manufacturing facilities for major dairy processing and cattle feed equipments, by creating demand for them"¹⁶.

SUMMARY :

The Operation Flood Programme was undertaken after the National Dairy Development Board had been formed in 1965. The programme aimed at bringing the shortage of milk supply in the four Metropolitan cities of Calcutta, Bombay, Madras and Delhi into agreement with the abundance of milk production in the adjoining villages of the cities. Simply speaking, it tried to achieve a two-fold objective — increasing the production of milk and making equilibrium of supply and demand in the milk market. It was then decided that the Milk Co-operatives formed on Anand Pattern in all over the country should be reorganised, the excess milk would be procured at a fair price and be supplied to the cities. The Anand pattern had been accepted as the model because the Kaira Dist. Milk Producers' Co-operative Union Limited (AMUL) was then recognised as the only ideal Milk Union of the country. In the initial stages of the programme India received a huge amount of butter, oil and milk powder as gift from the European Economic Community (EEC). This assistance from the EEC provided our country with the necessary impetus to carry on the programme into its desired goal.

The progress of the Operation Flood Programme all over India has been quite commendable. Before the implementation of the programme both the production of

milk as well as the per capita milk consumption was too low. The position at present, has undergone a distinctive change. Apart from the increase of milk production and its per capita consumption a great number of Village Milk Co-operative Societies have come up. The trend of keeping milch animals in a scientific method has registered a increase too. As a result, import of milk powder from foreign countries substantially dropped and after 1976 its import on a commercial basis stopped totally. However the country got little amounts of milk produce after that as gift. This testified to the fact that, with the inception of the Operation Flood Programme, the Dairy Development Movement in India and also the Dairy industry has made remarkable progress.

Despite that, the rate of progress has not been the same in different zones. While the Eastern zone is lagging far behind the other zones in this respect, the Western Zone has gone far ahead of others. The Kaira District Milk Producers' Co-operative Union Limited (AMUL) of Guzarat which has established itself as a model of what an ideal Milk Union should be is located in the Western Zone. The Himalayan Milk Producers' Co-operative Union Limited (HIMUL) of West Bengal has been founded as a part of the Operation Flood Programme. Naturally, questions arise

about the performance and achievements of the two. In order to find answer to these, let us have a look at a detailed and comparative study of the two Milk Unions.

Notes & Reference

1. B.K.Ganguli, "Operation Flood Progress and Potentials".
(Mimeographed), Capital, Annual Vol.2. Anand :
Published by National Dairy Development Board, p.69.
2. Economic Times, December, 29, 1983.
3. Economic Times, op.cit.
4. Operation Flood - A Progress Report, Boroda : Published
by I.D.C. p.1.
5. B.K.Ganguli, op.cit., p.69.
6. Ibid., p.1.
7. M.M.Jain, "Dairy Development through Co-operatives - A
Study of Rajasthan". 'Indian Dairyman', Vol.31, p.195.
8. Khushwant Singh, "Kurian - The Nation's Doodhwala",
Sunday Observer, December, 18, 1983.
9. S.P.Mittal, "The True Anand Pattern". Dairing in
Eastern India - 1980. Calcutta : Published by Indian
Dairy Association (East Zone), p.82-A.

10. Western Times, January 1, 1984.
11. "During the Operation Flood II Programme the European Economic Community (EEC) had agreed to donate 1,86,000 tonnes of Skim milk powder and 76,200 tonnes of butter oil and butter" - Western Times, January 9, 1984.
12. L.P.Mehta, "Relevance of Cattle Insurance in Dairy Development". 'Dairying in Eastern Indian 1980'. Calcutta : Published by Indian Dairy Association (Eastern Zone), p.81.
13. Operation Flood : A reality. Baroda : Published by Indian Dairy Corporation, 1983, p.34.
14. "We did import more milk powder in 1981-82 to overcome unusually low procurement due to distortions in the market. We did so by drawing on unutilised EEC commitments from the previous years" - Dr. V.Kurien, A black lie. Anand : Published by Anand Press, 1983, p.17.
15. "These clearly show that commercial imports of Milk powder touched their peak in 1963-64 (53,000 tonnes) and that there have been no commercial imports since 1975-76" - Dr. V.Kurien, Ibid., p.16.
16. B.K.Ganguli, op.cit., p.71.

Chapter - IV

Back Ground of 'AMUL and HIMUL'

AMUL :

"Kaira district has had a long tradition of dairying, dating back to 1892. By the early 1900's, the district was exporting an impressive quantity of milk products, particularly ghee, to the towns and cities of the neighbouring districts. Kaira is particularly noted for its ghee or clarified butter¹.

The Kaira District Co-operative Milk Producer's Union Limited (AMUL) is situated at Anand in Kaira District, Gujrat. Eastern Gujrat is remarkable for both its crops and milk production and Kaira District is one

of them. This district is linked with other parts of India by major transportation routes, bordered on two sides by the Mahi river on the south-east and the Sabarmati on the north-West and situated in the area of deepest penetration by the Gulf of Cambay. This district has been visited, for many centuries, by traders, warriors and migratory people. Thus, it bears an ancient cultural and historical heritage².

TABLE 4.1

Agro-Climatic and Other Features : Kaira District

	Unit	
1. Total geographical area (1981 Census)	Sq. Km.	7194
2. Total Population (1981 Census)	Nos.	30,07,194
a) Urban	"	6,05,325
b) Rural	"	24,01,869
3. Density of Population	Per Sq. Km.	418
4. Total No. of Households (1971 Census)	"	146
a) Urban	"	1,051
b) Rural	"	120
5. Percentage of cultivable area	%	N.A.
6. Total No. of workers (1981 Census)	Nos.	9,36,146

contd...

Table 4.1 contd...

7. Percentage of workers of Population	%	31
8. Total No. of Cultivators (1981 Census)	Nos.	6,81,007
9. Percentage of cultivators of workers	%	40.7
10. Total No. of agricultural Labourers (1981 Census)	Nos.	2,49,680
11. Percentage of agri. labourers of workers	%	26.6
12. Total No. of workers in Livestock, fishing, Forestry etc. (1971 Census)	Nos.	4,415
13. Rate of literacy (1981 Census)	%	49.2
14. Density of milch animal	100 sq.km.	N.A.
15. Annual rainfall	m.m.	60-100
16. Principal crops		Rice, Bajra, Jowar, Wheat, cotton etc.

Source : i) High lights from the 1981 Census.

Pub : Hindusthan Thompson Associates Ltd.

ii) Dept. Statistics and Full Count Census Table (KHEDA District-1971.

iii) Provisional population Totals Census-1981 series-5-R.S.Chhaya, Director of census operations, Gujrat.

iv) Census of India-1971 Administrative - C.C.Doctor, Director of census operations, Gujrat.

Kaira district, as a whole, resembles the rural India. Most of the people lives in villages and most of

them are dependent upon agriculture. 31% of the total population are workers (i.e. 9,36,046 according to 1981 census) out of which 40.70% and 26.67% of the total workers are cultivators and agricultural labourers respectively but landholdings are small in size and all are used for agriculture purpose. In Kaira, farmers mainly grew bajra, kodra, rice, jowar, wheat, cotton and tobacco.

Generally most of the farmers' family maintained one or two milch animals particularly buffaloes and utilise the by-products of the farm, seasonal grass and the available surplus labour of farmer's family. Before dairy cooperatives' era, the farmer used cotton-seeds as a main feed for their milch animals, which was not only a wasteful way of feeding but also unscientific and there was no improvised shelter for their milch animals in many cases³.

Milk production in Kaira district is an important cottage industry. Generally house-wives and children look after the milch animals. Before the co-operatives' era there was no organised marketing facilities of the milk or the milk products. At that time Milk marketing was controlled by the middlemen and contractors and for that reason, the farmers were compelled to sell their milk or milk products at a lower price.

The farmers of Kaira district, though not sufficiently educated, however could feel that it was not a fair system under which they were compelled to sell their milk or milk products to the middlemen at a low price (and the middlemen also were making huge profits by these goods).

In 1945 for a better marketing system the Government of Bombay started the Bombay Milk Scheme for the consumer of Bombay Metropolitan city, by transporting Milk from Anand to Bombay (427 kilometres). After preliminary trials the Government of Bombay made an agreement with M/s Polsons Limited for supplying milk from Anand to Bombay on a regular basis. By this agreement, the farmers of Kaira district were not satisfied mainly in respect of price. M/s Polsons Limited earned maximum profit from this supply than did the farmers. Thus the farmers of Kaira district were in the same position in which they had been in the past. They had to sell their milk to the contractors at a price which was fixed by the contractors. The grievances accumulated. The farmers went to the then National Leader Late Sardar Vallabhbhai Patel on a deputation in this regards. Late Sardar Vallabhabhai Patel listened their grievances and advised them to form a co-operative society with a pasteurization plant for marketing their milk through that co-operative society. And for that reason, they would demand for setting up

such co-operative society and if their demand was not fulfilled, they should refuse to sell their milk to the milk contractors. In addition to that he pointed out that in that situation "there would be some losses to the farmers as they would not be able to sell their milk for some times. If they were prepared to put up with the loss, he was prepared to lead them"⁴. The farmers accepted the proposal.

Then Mr. Patel sent Mr. Morarji Desai to Kaira district for organising a Co-operative society. In 1946, Mr. Morarji Desai Organised the farmers, under the leadership of Mr. Desai farmers resolved that the milk producer's co-operative societies be organised for collecting milk from the farmer members in the village. And all the milk collected be accumulated by the 'Union' which would be formed with its own milk processing facilities, by the milk producers' co-operative societies.

Farmer's Co-operatives urged that government should undertake the responsibilities of purchasing all the pasteurised milk from the Union. If this was not done by the Government the farmers would refuse to sell their milk to the milk contractors. The Government rejected farmers' demand. A 'milk strike' was called by the farmers of Kaira district and it lasted for 15 days. Not a drop of milk reached from Anand to Bombay milk

scheme. The farmer's demand was accepted by the Government after an on the spot study and assesment of the situation by the then Milk Commissioner of Bombay and his Deputy Secretary⁵.

In December, 14, 1946 the 'Kaira district Co-operative Milk Producers' Union Limited' was formally registered with a view to provide proper marketing facilities to the milk producers of the Kaira district. The Union started with two Village milk producers' societies and commenced pasteurising milk for the Bombay milk scheme in June, 1948. Initially about 250 litres of milk was being handled⁶. At the end of 1948, the number of farmer members had increased by 432 and the quality of milk procured had also increased by 5,000 litres of milk⁷.

The milk Co-operative movement of Kaira district became very much popular among the farmers and the number of organisations increased. The growth rate was so fast that by 1953, it was found that the Bombay Milk Scheme was unable to purchase all the collected milk of the Kaira district Co-operative Milk Producers' Union Limited especially in winter season (as in that season buffaloes yielded an average of 250% of their summer yield). It was necessary to set up a new plant for processing the extra milk into products like butter and milk

powder. As the farmers were bound to sell their surplus milk at low rates. On the representation of the farmers the government of Bombay and the Government of India accepted the proposal to set up a new plant for processing the extra milk into milk products. The government of India helped the Union to get financial assistance from UNICEF (United Nations International Children's Emergency Fund), and from the Government of New-Zealand under the Colombo Plan and technical assistance from FAO (Food and Agriculture Organisation).

On November, 15, 1954, the then President of India Late Dr. Rajendra Prasad laid foundation stone of a new Dairy Plant for processing milk powder and butter. After 11½ months the Dairy plant was completed and it was inaugurated by the then Prime Minister Late Pandit Jawaharlal Nehru on October, 31, 1955.

As a result of opening up the new Dairy Plant, the Kaira District Co-operative Milk Producers' Union Limited (AMUL) was able to organise more and more village milk producers' co-operative societies and handled more milk. The AMUL Dairy was further expanded in 1958 (at a cost of Rs. 15 lakhs) to manufacture condensed milk. After two years another new plant was installed for manufacturing 2500 tones of roller-dried baby food and 600 tones of cheese. The baby food project was implemented in collaboration with the Central Food Technological Research

Institute, Mysore. In October, 1964, a Cattle Feed Plant was donated by OXFAM under the Freedom from Hunger Campaign of FAO.

In April, 1965, a new Dairy plant with the capacity of producing 40 tones of milk powder and 20 tones of butter was opened by the then Union Minister Mr. Morarji Desai to meet the requirements of the defence services for milk powder. "The Anand Dairy Complex could now handle 5,00,000 litres of a day"⁸. In 1974 the dairy's milk handling capacity was raised to 7,50,000 litres a day. In the same year Kaira Milk Union set up a plant for making chocolate, weaning food as well as molted milk food.

Thus AMUL worked as a technical adviser in respect of Dairy industry in India and trained several personnel for various milk schemes in this country⁹.

The historical summary as depicted in the Annexure 22 shows the progress of Kaira District Co-operative Milk Producers' Union Limited. The union has grown from only two village societies to 870 village societies with 3,59,000 producer members. By 1984-85 procurement of milk has gone up from 250 litres to 7,00,000 litres per day with total turnover of Rs. 122 crores in 1984-85.

Besides, Amul has solved some of the problems

regarding rural poverty. It may be clear from the following conclusion made by Dr. S.M. Patel and Sri M.K. Pandey in their study. "The Milk Co-operatives have not only created certain positive impacts on the economy of the milk producers but also have made them realize such impacts to a larger extent. The milk co-operatives are not viewed by milk producers nearly as milk collection centres where they go for disposing off their surplus milk, but they are regarded as institutions which play a vital role in uplifting the rural economy in general and what of the milk producers in particular"¹⁰.

HIMUL :

It is situated in the Darjeeling district of West Bengal in the Eastern India. The area of operation of The Himalayan Co-operative Milk Producers' Union Limited (HIMUL) is Darjeeling District, Sadar Sub-Division of Jalpaiguri District and Islampur Sub-division of West Dinajpur District. This hinterland is situated in the extreme north of West Bengal. This area is linked with other parts of the country by major transportation routes. There are three international borders; on the south-east, on the north-east and on the north-west side (i.e. Bangladesh, Bhutan and Nepal respectively); and

two State borders on the south-west side and on the extreme north i.e. Bihar and Sikkim respectively and on the East Jalpaiguri district of West Bengal other than Sadar Sub-Division of that district and on the extreme North West Dinajpur district of West Bengal other than Islampur Sub-division of that district, in this area. This area has been passed over for many centuries by traders, migratory people etc. Thus it bears also an ancient culture and historical heritage^{11,12 & 13}.

TABLE 4.2

Agro-Climatic and Other Features; Operational Area of HIMUL

Unit	Darjeeling District	Islampur Sub-division (West Dinajpur)	Sadar Sub-Division (Jalpaiguri)	
1. Total Geographical area (1981 Census)	sq.km.	3075	1751.8	3373.7
2. Total population (1981 census)	Nos.	1024269	755002	1296022
a) Urban	"	280372	33754	218615
b) Rural	"	743897	721248	1077407
3. Density of population	Per sq.km.	325	431	384
4. Total No. of households (1971 census)	Nos.	139529	104784	196269
a) Urban	"	33861	3824	20650
b) Rural	"	105668	100960	1755619

Table 4.2 contd ...

5. Percentage of cultivable area	%	26.93	N.A.	N.A.
6. Total No. of workers (1981 census)	Nos.	366931	228662	413590
7. Percentage of workers of population	%	30.02	30.28	32
8. Total No. of cultivators (1981 census)	Nos.	94635	109822	136335
9. Percentage of cultivators of workers	%	25.79	48.02	33
10. Total No. of agricultural labourers (1981 census)	Nos.	30848	88696	66985
11. Percentage of agri. labourers of workers	%	8.4	38.78	16.19
12. Total No. of workers in live-stock, fishing, forestry etc. (1971 census)	Nos.	76172	1017	12134
13. Rate of literacy (1981 census)	%	42.52	16.24	29.28

contd ...

Table 4.2 contd...

14. Density of Milch animals	100 sq.km.	N.A.	N.A.	N.A.
15. Annual rainfall	mm.	211.24	261.58	N.A.
16. Principal crops		Ginger, Potato, Maize, Orange, Tea & Cincho-na etc.	Paddy, Jute, Tea & Pine-apples etc.	Paddy, Jute, Tea & Pine-apples etc.

- Source : (1) Census 1971, Series-22 West Bengal Part X-A & B; District census hand book, West Dinajpur.
- (2) Census 1971, Series-22, West Bengal, Part X-C; District census handbook, Jalpaiguri.
- (3) Census 1971, Series-22, West Bengal, Part X-A & B; District census hand book, Darjeeling district.
- (4) Census 1971, Series-22, West Bengal, Part X-C; district census handbook Darjeeling.
- (5) Gurkhaland agitation-Government of West Bengal Publication.

Geographically the hinterland of HIMUL may be divided into two parts viz. hills and plains. In hills there are mainly three sub-divisions viz. Darjeeling, Kurseong and Kalimpong of Darjeeling district. There are other three sub-divisions viz. Siliguri of Darjeeling district, Sadar Sub-division of Jalpaiguri district and Islampur of West Dinajpur district in the plains.

The three hill sub-divisions of Himalayan region of West Bengal, are largely known for their tea gardens and scenic beauty and their major tourist attraction in the country. Tea, Tourism and Timber, the three T's form the backbone of the hill economy. The topography in the hills does not favour the development of a highly productive agriculture, though the hardworking local farmers try to make the most from the difficult terrain through horticulture and animal husbandry. The area is also known for a wide range of medicinal plants, which are exported. As for animal husbandry, the hill area of the Himalayan region has the largest proportion of high-breed cattle in the state of West Bengal. This can provide an important source of livelihood to a large section of the rural population in the hills. The forests, as elsewhere in the country, are suffering from a high rate of depletion giving rise to serious ecological problems, in addition to reducing the stock of one of the Principal natural resources in this region. Besides, in this area the hill farmers grow Maiza, Potato, Ginger and the plantation crops like organge etc.

✓ About 54 per cent is covered by forests another 14 per cent is devoted to agriculture while tea and cinchona plantations account for 6.62 and 10.75 per cent of land respectively of the hills. Approximately 35.33 percent of the total population are workers out of which one third

are engaged in agriculture , about one third are engaged in activities connected with plantations, orchards, forestry and livestock, another 8 per cent are engaged as agricultural labourers, while the rest of the workers are involved with manufacturing construction, mining, trading and various service activities¹⁴.

The people of three plain subdivisions viz. Siliguri, Islampur and Sadar of Jalpaiguri, depend mainly upon the agriculture and the people have migrated, mainly from East Pakistan (Now Bangladesh), Nepal and Chhotonagpur of Bihar. In addition to that there are some permanent inhabitants like polia, Raj Banshi etc.

In these areas farmers grow mainly paddy, jute and the plantation crops like Tea, and Pine-apple etc. But major portion of the agricultural land are possessed by a few farmers. However, most of village people are marginal farmers, landless labours and bargadars. In addition to that, there is the problem of unemployment. Many of the farmers and agricultural labourers have idle time for about eight months in a year. In that period they do not get job. Besides, there are inadequate market facilities for their agricultural products, limitation of land and non availability of irrigation facilities.

Generally most of the village people of hills and plains own some milch animals, specially cows and

buffaloes. But milk output (productivity) of the cows and buffaloes is very low, mainly in plains as most of the cows in the hills are high breedable cow (Table 4.3).

"The cattle-stock now found in the hill area (specially in its higher altitudes) are generally up graded crossbreeds of the local stock with one or more of the foreign strains. Historically, the improvement of the cattle-stock in the hill area is largely due to the efforts of European Tea-Planters and christian Missionaries who imported different varieties like Ayrshire, British, Triesian Jersey and other short-horn animals from similar climatic condition in the West Bengal. This was the origin of the up-graded stock particularly around those area, where activities of the foreigners concentrated. Thus, the cattle in Darjeeling and uphill areas of Kurseong and Kalimpong sub-divisions are generally of better varieties than those in the lower parts of Kurseong and Kalimpong including the entire Garubathan Block"¹⁵. But actually output of the cows in hills is not appreciable due to scarcity of balanced cattle feed.

However, before the establishment of HIMUL the village people of Darjeeling district, especially in hilly regions, were not interested in rearing cows and

buffaloes, as they were forced to sell milk at .40 paise per litre to the local purchaser or local middlemen in milk business¹⁶.

TABLE 4.3

Percentage of Ordinary and Jersey in the Plains & Hills -
A Comparative Study

Plain				Hill			
Ordinary		Jersey		Ordinary		Jersey	
Milch	90.0	Milch	10.0	Milch	36.3	Milch	63.7
Preg- nent	95.0	Preg- nent	4.5	Preg- nent	20.0	Preg- nent	80.0
Culf	91.7	Culf	8.3	Culf	25.0	Culf	75.0
Total	91.8	Total	8.2	Total	28.6	Total	71.4

Source : Compiled on the basis of sample survey on producers of plain and hill areas relating to HIMUL's hinterland.

Originally, West Bengal State's "Operation Flood-I" milkshed areas consisted of the districts of Darjeeling, West Dinajpur, Malda, Murshidabad, Nadia, Burdwan, Bankura, Hooghly, Howrah, 24-Parganas and Midnapur. In 1973, studies were conducted by the National Dairy Development Board in all these areas to compare the several parts of the milkshed for their potential. The project report for Darjeeling milkshed, jointly prepared

by the government of West Bengal and the National Dairy Development Board and approved by the Indian Dairy Corporation (IDC), outlined following main actions for the milkshed under Operation Flood I¹⁷.

- 1) Establishment of a 60,000 litres per day Dairy plant with 10 metric ton per day milk drying capacity of Matigara.
- 2) Installation of six chilling centres each with a capacity varying from 2000-4000 litres per day, totalling to 15,000-20,000 litres per day.
- 3) Setting up a 100 metric ton daily capacity cattle feed plant at Siliguri.
- 4) Organisation of 500 village milk producers' co-operatives, to be affiliated to the district co-operative Milk producers' Union.
- 5) A Technical Input Programme to be implemented by the Union through the village cooperatives, comprising animal health cover, artificial insemination services, balanced cattle feed, fodder seeds and dairy extension services to the milk producers, in order to enhance milk production in the milkshed. About 1,50,000 milch animals were envisaged as being brought within

the cooperative ambit.

- 6) Creation of a suitable milk procurement and marketing infrastructure.
- 7) Recruitment and training of the personnel required for the project.

HIMUL was registered in the year of 1973 (13.1.73) and it was modelled on the pattern of Indian Dairy Corporation in June, 1974. The Himalayan Co-operative Milk Producers' Union Limited, Darjeeling, West Bengal (HIMUL) is under Action Item No.7 of Operation Flood.

This project has been jointly organised by the world food programme (WFP) through the National Dairy Development Board (NDDB) consisted by the Government of India, Government of New-Zealand and Government of West Bengal. Indian Dairy Corporation agreed to finance the 'HIMUL' to develop the milk cooperatives on the pattern of 'ANAND' Co-operative Milk Producers' Union Limited (AMUL), Gujrat.

This project started functioning only with its pasteurisation Unit with effect from 5th January, 1976, with a capacity to handle 60,000 litres per day with a 10 metric tones milk drying plant and adequate storage facilities to handle 1,00,000 litres per day.

Before starting the functioning of 'HIMUL' project itself there were two chilling plants, one at Ghoom and another at Kurseong having 2,000 litres per day capacity, each owned by the West Bengal Dairy & Poultry Development Corporation. In addition to that only one milk collection centre was in Mirik. Moreover, there was a small dairy plant at Mallaguri (Siliguri) of Darjeeling district run by the West Bengal Dairy & Poultry Development Corporation through the six non Anand Pattern milk cooperatives with a capacity of 5,000 litres per day. The milk collected was directly sold in Siliguri. Later, the procured milk was marketed by the 'HIMUL'.

Before the starting of HIMUL. "There were two stud Farms - one run by the Directorate of Animal Husband^{and}dry with 6 Jersey Bulls at Kalimpong and the other at Siliguri under the project cell of the State Government with 12 Jersey bulls"¹⁸.

On completion of 'HIMUL' Dairy plant the functions of West Bengal Dairy & Poultry Development Corporation at Ghoom, Kurseong, Mirik and Mallaguri were absorbed by the 'HIMUL' in 1976. In December, 1980 a cattle feed plant of 100 metric tones daily production capacity is commissioned. The project has also been designed to manufacture 2.5 metric tones of butter and 0.6 metric tone of ghee daily. Now the 'HIMUL' has already organised seven chilling

centres located at Sukhia Pokhari, Kalimpong, Rambh, Ghoom, Kurseong, Bijanbari and Mal and 350 village milk cooperative societies with 15,145 producer members by 1984-85. Procurement of milk has gone up from 5,000 litres to 17,985 litres per day with total turnover of Rs. 2.76 crores in 1984-85.

But Himul could not achieve its target in spite of all efforts. It aimed at organising 500 village milk societies within 5 years, but it could not manage to organise more than 350 during the last ten years. Of them only 233 societies are functioning. The most surprising fact is that Himul could achieve only 45 percent of its milk procurement target.

SUMMARY :

Both Amul and Himul have a historical heritage. The density of population, percentage of literacy, agricultural products, economic status, geographical area, milk production in both the areas where Amul and Himul are located have something common in them. Nevertheless, the dissimilarities between the two are more glaring.

The establishment of Amul has back-ground of long struggle and movements. But Himul was totally a Government enterprise. Amul Co-operative has the blessings of the national leaders of pre-independence days. The strong determination and indomitable courage of the local milk producers were its main support. The people of the area have realised through experience what a co-operative actually stands for and how the people and above all, the nation may be benefited by it. This cannot be said of Himul. It was as if imposed on the people of Darjeeling district and sadar subdivision of Jalpaiguri district and of Islampur sub-division of West Dinajpur district. People were main force behind Amul, whereas in case of Himul the government was the entrepreneur - Himul is the foster-child of the Government while Amul is of the masses.

Amul has now reached the peak of success. It has become the perfect model of India's Dairy cooperative movement. Himul is lagging far behind it in every respect. It has not yet crossed its infancy.

Notes & Reference

1. Homer Hogle, The influence of Agricultural Extension In Selected Villages of Kaira District (Gujrat, India). Michigan, USA : The University of Michigan, School of Education, 1972, p.5.
2. The Rajputs ruled the lands of Kaira from 746 to 1290 A.D. Kaira passed to the Muslim rulers of Ahmedabad at the end of the fourteenth century and, finally in 1573, it was transferred to the Muguls. From 1720, the struggle between the Marathas and Muslim rulers of this district started and in 1752, Kaira came ^{under} the Maratha rulers. Ahmedabad region was then shared by the Gackwad of Boroda and the Peshwa. In December, 31, 1802 Peshwa handed over some villages to the British under the terms of a Treaty. In 1803, for maintaining troops supplied by the British Government, the Geckwad of Boroda handed

over a portion of the region to the British. Again in 1817, another portion of Kaira districts was ceded by the Geckwad of Boroda. In January, 1818 the territory to the north of the Mahi River was divided into two districts, - Ahmedabad and Kaira. Later Kaira was subdivided into the seven talukas, (those talukas remain intact even today), Anand, Kapadvanj Borsad, Matar, Mehmedabad, Naidad and Thasra by the then British Government for their administration.

Another three talukas (Balasinor, cambay and Petlad) were added to Kaira district in between 1941 to 1951 and it was under the undivided Bombay State upto May 1, 1960. When the Bombay State was bifurcated by the Government of India into two States i.e. Maharashtra and Gujrat, Kaira became a district of the newly-formed State of Gujrat.

- Sources :
- (a) Ibid., pp.1-10.
 - (b) The imperial Gazetteer of India, Vol.XIV, Government of India.
 - (c) Gazetteer of Bombay presidency, Vol.III-B, Vol.VI-B, Bombay:Government Central Press, 1926 and 1914.
 - (d) Census of India-1961, 1971, 1981, Published by The Government of India.
 - (e) Gujrat District Census Hand Book No.12, Kaira District. Ahmedabad:State Government Publications, 1966.
 - (f) District Statistical Abstract Kaira 1960-61, Govt. of India.
 - (g) Deptt. of statistics and full count census table (Kheda district), 1971, Government of India.

3. Amul. Anand:Published by Amul 1980, p.1.
4. The Amul story - a sage of cooperative effort. Anand: Published by Amul, 1985, p.3.
5. Ibid., p.4.
6. Ibid, p.5.
7. Ibid., p.5.
8. Ibid., p.7.
9. Homer Hogle, op.cit., pp.44-45.
10. S.M.Patel and M.K.Pandey, Economic impacts of Kaira district co-operative Milk producers' Union (Amul Dairy) in Rural Areas of Kaira district (Gujrat State), Ahmedabad:Published by Institute of Cooperative Management, 1976, p.32.
11. Darjeeling District :

There was a time when some particular hill caves were believed to be the living place of Gods and Goddesses. The hills would echo the mantras and hymns sung by the Buddhist monks. The holiness of the region would attract 'Sadhus' and 'Sanyasis' from far and wide. Once upon a time Atish Dipankar a Bengali Bhikshu, launched his journey on foot towards Tibet through one of the hillway in this area carrying with him the lamp of knowledge.

It is known mostly that the Buddhist monks belonged to the 'Doharj' community. It is believed that the living place of the Doharj communities was subsequently transformed

into the name of Dorj-ling or Darjeeling. History says that to oppose the invention of the Dravidians one Meha King built a mount or 'Garh' near pankhabari from which came the name of Siliguri.

The historical record proves that the Tarai area of Siliguri was a part of ancient Gour during the Pala Sena and Sultani period. Being far away from the capital, this area remained backward.

During the early 16th century the Kamta-Coochbehar State was formed and the whole of Tarai area of Darjeeling came into that newly formed State.

After a long time in the early 18th century Sikkim captured that region. But at the end of the 18th Century, Nepal snatched away the Tarai areas from his neighbouring State Sikkim. Still the area remained as backward as it had been in the past. All the hilly areas of the present Darjeeling district were under the possession of Sikkim.

In 1706, Bhutan captured the present Kalimpong sub-division of Darjeeling district. In 1814 an event happened in the history of Darjeeling. The English attacked Nepal taking advantage of the weakness of Nepal and inflicted a crushing defeat on it. Nepal agreed to conclude a treaty with the British. According to the terms of the treaty all the Tarai areas from Western bank of the river Mechi

became a vassal of British Raj.

After that in 1817, during Sikkim - Nepal war the British joined in favour of Sikkim and won victory. In 1833, the British received a small village named Darjeeling from Sikkim as a tribute. After having that village they crowded in Darjeeling in a large number, as they found some atmospheric similarity in Darjeeling with that of England.

Later, in 1850, the British taking the possession of some Tarai and hill areas and in 1864 (During Aung-Bhutan war) taking the possession of Kalimpong, included this greater part with the small village Darjeeling in 1866.

In this way the present Darjeeling district came into being.

- Sources :
- a) A. Mitra, Census - 1951.
 - b) W.W. Hunter, A Statistical Account of Bengal, Vol. VII.
 - c) Biswanath Das, Uttarbanga Purakritty (Bengali scripts).
 - d) Abid Ali Khan, Memories of Gour and Pandua.
 - e) Nihar Ranjan Roy, Bangaleer Itihas, Adi Parba (Bengali scripts).
 - f) Dr. Atul Sur, Bangla-O-Bangaleer Bibaran (Bengali Scripts).
 - g) Gorkhaland Agitation Govt. of West Bengal.
 - h) Sadhan Sarkar, Gorkhaland Sansodhanbadider Atanka (Bengali Scripts).

12. Jalpaiguri Subdivision :

In the age of the Mahabharata this land was situated in

Prag-Jyotishpur. Bhagadatta was its ruler at that time. Later, it came under the domain of the state of Kamrup. It is assumed that Jalpesh, the king of pragjyotishpur built the famous Jalpesh temple and this place came to be known as Jalpaiguri since that time. Later another famous king named Prithu dominated this kingdom. Then it was under the rule of the state of Coochbehar. During the 17th century the people of Baikunthapur situated in this area, suffered a lot as the Mughals tyrannized over them. Ibrahim Khan, the Subedar of Dacca invaded Baikunthapur after the death of Bhujangadeb, the ruler of Baikunthapur. The Himalayas in the North, the Teesta in the east and the river Mahananda in the West surrounded Baikunthapur. From 1765 to 1772 the Bhutias spread their dominion over the whole of Coochbehar. In 1774 the Bhutias entered into a treaty with the English as a result of which their domain from the Teesta to the Sankoch was kept intact. In 1765 the English began to rule over Rangpur (now in Bangladesh) which they snatched away from the state of Coochbehar ruled by the Mughal emperor Shah Alam. In 1865 the English captured the vast areas from the east of the Teesta to the river Manas of Assam. Upto the year 1868 Baikunthapur and its neighbouring areas were under Rangpur. Later in 1869 the district of Jalpaiguri came into being.

Sources : a) West Bengal Gazetteers - Jalpaiguri.
 b) A. Mitra, District Census Hand Book - Jalpaiguri.
 c) W.W.Hunter, op.cit., Vol.X.

13. On November 2, 1956, Islampur thana which had been within Krishanganj subdivision of Purnea district, Bihar, was included in West Dinajpur district of West Bengal^a. During the reign of Mughal Emperor Akbar, Islampur was under Surjapur Pargana in Sarkar Tajpur. Prof. Partha Sen refers to Bucanin when he makes the same claim. Mr. Sen writes; "... the large estate was Surjapur Pargana which included the Divisions of Haveli, Dulalganj, Krishanganj and Urdhrail besides a little area in Dinajpur. In the year 1945 when Humaun got back his empire, Syed Khan Dastur was deputed to Pargana Surjapur which was at the time under the Bhutias. By the assistance of Syed Khan, these mountaineers (Bhutias) were driven out. Syed Khan married his friend's daughter and succeeded to his estate. He obtained the title Raja and was made Register (Qanungo) as well as Zaminder of the newly acquired territory"^b.

When Jahangir succeeded Akbar he deputed Islam Khan as Subedar of Bengal. Islam Khan was put in charge of giving a crushing defeat to the formidable 'Bhuinas' of Bengal. In the 17th century a part of Surjapur came to be known as Islampur after the name of Subedar Islam Khan^c.

- Sources :
- a) J.C.Sengupta, West Bengal District Gazetteers - West Dinajpur, Govt. of India.
 - b) B.N.Mukherjee & P.K.Bhattacharyya, Early Historical Perspective of North Bengal, H.B.U., Raja Rammohunpur:p.182, Article - Land Revenue Settlement of Islampur From the Period of Akbar to the Early 19th century - Partha Sen.
 - c) M.A.Rahim, Banglar Samajik O Sanskritik Itihas Bangla Academy, Dacca.

- 14. Gorkhaland Agitation. op.cit., p.1.
- 15. M.Dasgupta, Occasional Paper of the Dept. of Economics. North Bengal University, p.181.
- 16. "It is a matter of satisfaction to know that with the advent of HIMUL the producer-farmer is not forced to sell milk at 40 p. per litre and now gets Rs. 1.25p. per litre in close proximity to his home, about 6500 producer-members have been directly benefited and a large number of non-member producers have also been benefited". Message, Amritendu Mukherjee, Minister of Animal & Husbandry and Veterinary Services Department, Government of West Bengal, published in Annual Report of Himul, 1977-78.
- 17. Operation Flood I. Impact series Digest-4; Darjeeling. Rural Milkshed: Development of milk production and cooperative milk marketing, March-1981, Published by N.D.D.B., p.3.
- 18. Ibid., p.2.

Chapter - V

Growth of Amul & Himul during the period

The procurement, processing and marketing of the rurally produced milk is the primary function of a Producers' Cooperative Union. "Procurement of milk involves the basic responsibility of providing technical inputs; and therefore, the Union would act as the channel for technical inputs. The growth and progressive development of any Cooperative Milk Union can reasonably be projected over a period of 3 to 4 years assuming ^{that} the cross-bred cows would come into production from the fourth year onwards and would completely replace the foundation cows and buffaloes in first six years, while the percent of production procured rises from

50% in the first year to some 75% in the 5th year (after each primary society's formation)"¹.

On the above context a comparative growth and performance of the two projects Amul and Himul has been assessed. The assessment includes (i) organisational growth (i.e. organisation of cooperative Societies), (ii) techno-economic performance (i.e. veterinary aid or Animal health coverage), (iii) Breed improvement Programme, (iv) Fodder development programme and (v) Milk Procurement.

i. ORGANISATIONAL GROWTH :

Table 5.1

Annual Organisational Progress In Respect Of Societies

Year	No. of Societies		% of Growth (1975-76 = 100)	
	A	H	A	H
1975-76	829	88	100.00	100.00
1976-77	831	133	100.24	105.14
1977-78	831	227	100.24	257.95
1978-79	856	254	103.26	288.64
1979-80	895	272	107.96	309.09
1980-81	895	280	107.96	318.18
1981-82	894	296	107.84	336.36
1982-83	895	314	107.96	353.41
1983-84	880	332	106.15	377.27
1984-85	870	350	104.95	397.73

A - Amul

H - Himul

Table 5.1 depicts the organisational progress of Amul and Himul in respect of their society organisation. In case of Amul the maximum growth rate during the period of 10 years is only 7.96% whereas in Himul it is 297.73%. Percentage of growth in Amul increases at a lower rate, the exception being 1981-82, 1983-84 and 1984-85, when it has decreased by 0.1% in 1981-82, 1.8% in 1983-84 and 3% in 1984-85. The growth rate of Himul increases rapidly during the last ten years i.e. since its inception. The maximum number of societies are 870 and 350 in Amul and Himul respectively in 1984-85 financial year and in 1975-76 these are 829 and 88 respectively. The number of organised societies in Amul has been 9.42 times of Himul but the same has fallen to 2.49 times during the period under study.

But this does not indicate that the Himul's performance is better than that of Amul in this respect. The 1975-76 is the beginning year of Himul whereas it is the 30th year of Amul. Amul organised only two societies in her incorporation year (i.e. 1946-47) and 64 societies in her 10th year (i.e. 1955-56 - annexure 23); but before 1955-56 there were no such facilities as are available now to Amul to organise more and more societies². Amul organised 421 societies in her 19th year (1964-65) i.e. after 10 years of installation of an extra milk processing unit like butter and milk powder. However, Himul could not organise 421 societies in ten years though it had those facilities.

In achieving the target of society organisation, Himul discloses a different picture (Table 5.2).

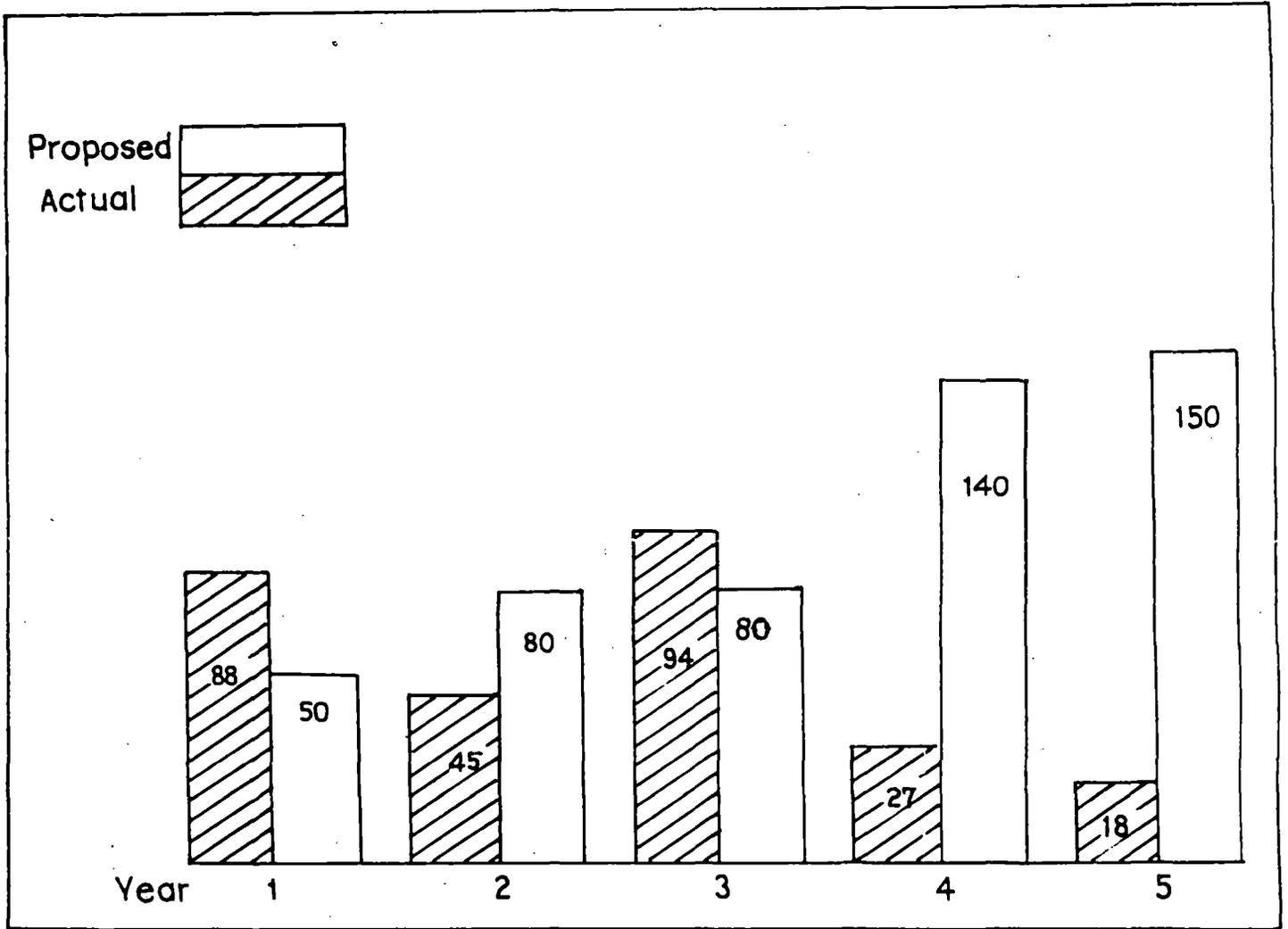
Table 5.2
Yearwise Proposed Growth of The Primary Cooperative Societies (Himul)

Year	Societies proposed to be organised in the year	Total number of societies proposed to be in operation	% of proposed growth (1st year 100)	% of Growth achieved, vide Table 5.1
1st	50	50	100	176
2nd	80	130	160	90
3rd	80	210	160	188
4th	140	350	280	54
5th	150	500	300	36

Source : Compiled from Annual report of Himul, 1976-77, p.32, Published by Himul.

It can be observed that Himul cannot achieve her target to organise 500 societies within the first five years. This number is now only 350 in 1984-85, i.e. after ten years. In first year Himul fulfils more than 76% of her target. In second year it comes down to 70%. But in the third year Himul achieves her target of growth rate above 29%. The percentage of growth is very poor in fourth and fifth year i.e. 54% and 36%, but it would be 280% and 300% respectively. Except the first and the third year, organisation of primary cooperative societies of Himul is very poor considering her

Proposed and actual growth of the primary cooperative societies (Himul).



Graph - 5.1

target of first five years. However, in second year this picture is remarkable (Graph 5.1).

It is also to be noted that all organised societies do not function all the time (Table 5.3).

Table 5.3

Number Of Societies Functioning And Closing Etc. Of Himul

Year	Total No. of societies organised	Total No. of societies functioning	Total No. of societies started	Total No. of societies organised but not started	Total No. of societies started but closed	Total No. of societies closed	Total No. of societies closed but started further
1	2	3/-(2-7) 8/	4 (3+5) -8	5	6	7(5+6)	8
1975-76	88	88	88	-	-	-	-
1976-77	133	133	133	-	-	-	-
1977-78	227	163	206	21	43	64	-
1978-79	254	159	223	31	64	95	-
1979-80	272	175	231	41	65	106	9
1980-81	280	184	231	49	65	114	18
1981-82	296	196	244	52	66	118	18
1982-83	314	215	254	60	67	127	28
1983-84	332	215	254	78	67	145	28
1984-85	350	233	272	78	57	145	28

Himul organises a total number of 350 societies upto 1984-85 of which 272 start functioning. But due to closure of a number of societies, the present strength (1984-85) of operating societies is only 233. However, a number of societies exist in paper only and, because of lack of followup activities, they never start operations.

During ten years, the number of functioning societies increases continuously with the exception of fourth year. In first two years not a single unit is closed. In third, fourth, fifth, seventh and eighth years there are the existence of closing societies that started earlier. Lastly, in both the fifth and the sixth years nine societies and in the eighth year ten societies, once closed, started functioning again.

It may be concluded that the first two years (i.e. 1975-76 and 1976-77) and last six years (i.e. 1979-80 to 1984-85) progress of extension is, on an average, better than the third and the fourth year (i.e. 1977-78 and 1978-79). Though in third year (1977-78) the number of functioning society has increased by 30, but 64 societies have been closed during the same period, of which 43 have been running societies.

Table 5.4Progress of Society Organisation In Plain And Hill Of Himul

Year	Total number of society organised		% of Growth (1975-76-100)	
	Plain	Hill	Plain	Hill
1975-76	-	88	-	100.00
1976-77	36	97	100.00	110.22
1977-78	40	187	111.11	212.50
1978-79	44	210	122.22	238.63
1979-80	47	223	130.55	253.40
1980-81	47	235	130.55	267.04
1981-82	55	241	152.77	273.86
1982-83	60	254	166.66	288.63
1983-84	60	272	166.66	309.09
1984-85	65	285	180.55	323.86

A look at the performance of primary societies in plain and hill areas (Table 5.4 and Table 5.5) discloses that in first year the Hill areas have "organised societies" and all of them are operating, but in the plains there is no existence of any such society. Comparative position of 'Society Organised' in the Hill areas and in the Plains gives a different picture. With respect to number of societies organised, functioning and closed, the hill areas surpass the plains.

Table 5.5
 Number of Society Functioning And Closing ^{Etc.} In Plain & Hill
 of Himul

1 Year	2		3 $\sqrt{(2-(5+6))} + 7$		4 (3+6)-8		5		6		7	
	Total No. of societies organised		Total No. of societies functioning		Total No. of societies started		Total No. of societies organised but not started		Total No. of societies started but closed		Total No. of societies closed but started further	
	Plain	Hill	Plain	Hill	Plain	Hill	Plain	Hill	Plain	Hill	Plain	Hill
1975-76	-	88	-	88	-	88	-	-	-	-	-	-
1976-77	36	97	36	97	36	97	-	-	-	-	-	-
1977-78	40	187	39	124	40	166	-	21	1	42	-	-
1978-79	44	210	22	137	44	179	-	31	22	42	-	-
1979-80	47	225	21	154	44	187	3	38	23	42	-	9
1980-81	47	233	21	163	44	187	3	46	23	42	-	18
1981-82	55	241	28	168	51	193	4	48	23	43	-	18
1982-83	60	254	40	175	60	194	4	56	23	44	7	21
1983-84	60	272	40	175	60	194	4	74	23	44	7	21
1984-85	65	285	45	188	65	207	4	74	23	44	7	21

It may be observed (Table 5.4) that the rate of increase in primary societies in Hills is much higher than that of the Plains. During the ten years the maximum growth is only 80% in plain areas where as in Hill areas it is to the extent of 224%. In plains the extension of primary society in first six years (i.e. upto 1980-81) is at a decreasing rate but in the later period this shows an opposite direction (except 1983-84).

Number of starting society in each year in Hills and Plains is increasing at a lower rate upto 1979-80. The growth of starting society is zero in 1980-81 and 1983-84 in both areas. In hills number of functioning primary society increases at a rapid rate upto 1979-80 then again it increases but at a decreasing rate, whereas in the Plains the statistics shows the opposite one. In 1983-84 the growth of functioning society is also zero in both areas. Only 18 societies are organised in Hills but no new society starts functioning in 1983-84 (Table No.5.5). The position of closing society in Plains (Table 5.5) is better than that of Hills, especially in last three years no society has been closed anew.

On the whole, in Himul, the development of primary society in Plains is very poor compared to the Hills and the total number is much lower than what the programme for first five years indicate.

The comparative positions clearly disclose that in Hills the position is better only with respect to the relative position of organised one versus the starting one. But in plains the position of the two i.e. organised versus starting and functioning is comparatively much better than that of the Hill areas.

Table 5.6
Primary Societies

Society	Hill areas	Plain areas	Total
Organised:Starting	1.4:1.0	1.0:1.0	1.3:1.0
Organised:Functioning	1.5:1.0	1.4:1.0	1.5:1.0
Organised:Closed	2.4:1.0	2.4:1.0	2.4:1.0
Closed:Re-started	5.6:1.0	3.8:1.0	5.1:1.0

The given target of Himul is to organise 300 societies in the Plains of which 65 have been organised and only 45 of them are functioning. But in Hills having a target of 200 societies, Himul has organised 285 societies, of which 188 are functioning(1984-85). The position in Hills is much better than that of the Plains itself.

The organisational progress of Amul and Himul in respect of their farmer-members of the societies can be observed from the table below (Table 5.7).

Table 5.7

Annual Organisational Progress In Respect Of Farmer Members Of The Society

Year	No. of farmer members of the society (000)		Average No. of farmer members per society		% of Growth (1975-76 = 100) (Average member per society)	
	A	H	A	H	A	H
1975-76	250	2.21	301.5	25.1	100.00	100.00
1976-77	255	4.06	306.8	30.5	101.75	121.51
1977-78	275	5.72	330.9	25.1	109.75	100.00
1978-79	295	6.50	344.6	25.5	114.29	101.59
1979-80	308	6.92	344.1	25.4	114.12	101.19
1980-81	327	7.04	365.3	25.1	121.16	100.00
1981-82	339	7.45	379.1	25.1	125.73	100.00
1982-83	352	8.17	393.2	26.2	130.41	104.38
1983-84	359	8.58	407.9	35.8	135.29	102.78
1984-85	359	15.14	412.6	43.2	136.84	172.11

In both Amul and Himul, growth of farmer-members of the societies has increased during the ten years (1975-76 to 1984-85) but there is rapid increase only in Amul.

Average number of farmer members per society in both Amul and Himul has gone up. The increase in case of Amul is always smooth with the exception of 1979-80 which is quite negligible but it is not so in case of Himul.

During the ten years range the total growth in Amul is 36.8% but in Himul it is 72.1% (about it is double in comparison with the Amul).

However, during the ten years barring two years (1976-77 and 1984-85) the growth of average number of farmer-members of each society is only 4.3 in Himul. But in 1976-77 and 1984-85, the total number of farmer-members of the society of Himul has been nearly doubled in relation to previous year. Actually in this year new Manager of procurement and Input Services of Himul took initiative to make the non-member as a member of the village milk society through making a survey among the farmers related to the village milk society.

ii. TECHNO ECONOMIC PERFORMANCE :

VETERINARY AID OR ANIMAL HEALTH COVERAGE :

The basic paper of the "Operation Flood" provides that "depending on the logistic of the area, one mobile veterinary unit can be expected to cover the milch animal populations in 50 commanding villages (Primary cooperatives), by Organising visit route for calling on each of them at least once a week. Therefore, assuming 250 milch animals to be covered in each village the total animal coverage per mobile unit will be $250 \times 50 = 12500$ milch animals. The total number of mobile units for the union

covering 1.25 lakh milch animals will be ten by the 5th year"³.

Table 5.8

Progress of Veterinary Works of Amul And Himul

Year	No. of Mobile veterinary Unit		No. of Animal treated		Average No. of treated (animal) per unit		% of Growth of animal treated (1975-76 = 100)	
	A	H	A	H	A	H	A	H
1975-76	23	4	315634	2615	13723	654	100.00	100.00
1976-77	23	5	326419	2091	14192	418	103.41	79.96
1977-78	21	7	335566	4137	15979	591	106.31	158.20
1978-79	21	7	368393	5343	17542	763	116.71	204.32
1979-80	23	7	393041	2967	17088	424	124.52	113.46
1980-81	23	7	423618	4851	18418	693	134.21	185.50
1981-82	23	7	436732	5366	18988	766	138.36	205.20
1982-83	18	7	436551	7072	24252	1010	138.30	270.43
1983-84	18	7	432297	8373	24016	1196	136.96	320.19
1984-85	18	7	459632	15024	25534	2146	145.62	574.53

An examination of the progress of veterinary services of Amul and Himul(T-5.8) shows that Amul has organised 23 Mobile veterinary units in 1975-76 but in 1984-85 only 18 such units are seen running. Himul has organised 7 Mobile veterinary units within first five years but the objective is to have a minimum of 10 units. According to the given proportion between Mobile veterinary units and primary

cooperatives, the position is a better one than the Amul as compared to the objective having 50:1.

In Amul during ten years under study the percentage of animal treated has increased by 45.6% whereas in Himul it is 474.5% i.e. more than ten times. Percentage of animal treated in Amul increases at a slower rate during last ten years but only exception in 1982-83 and 1983-84, when it has dropped by 0.1% and 1.4% respectively. In Himul the growth rate in this respect increases at an increasing rate exception being 1976-77, 1979-80 and 1980-81 when it drops by 20%, 90.8% and 18.8% respectively. However, a remarkable change is shown in respect of number of animal treated in 1984-85 due to the survey made by the Union.

Here it may not be concluded that Amul is not better than Himul as because the growth rate of animal treated in Himul is higher than that of Amul. It is to note that Himul is quite a new organisation. Whereas Amul has completed 30 years in 1984-85. After twelve years (i.e. in 1966-67) of installation of an extra milk processing unit, it treated 116865 cases of animals (Annexure 24), whereas Himul has treated only 15024 cases of animals in that period of ten years but the objective is to have a minimum of 1.25 lakh cases of treated animals.

Again, the average number of cases of animal treated per Mobile veterinary Unit increases except two years

(1979-80 and 1983-84) in Amul and in 1976-77 and 1979-80 in Himul it has dropped by some numbers. But it is to be noted, where Amul treats 25534 cases of animals per Mobile veterinary unit in 1984-85, Himul treats only 2146 cases of animals per Mobile veterinary Unit in that period. In fact, Himul fails to achieve her objective of covering animal health.

iii. BREED IMPROVEMENT PROGRAMME

"Improved regularity of calving and increased fecundity, in addition to broad-casting of superior germplasm, can most readily be prompted for a large population of animals through artificial insemination. The union will cover, in all its 500 primary cooperatives, some 70000 milch cows and 55000 milch buffaloes. The breeding facilities and genetic improvement of these animals will be arranged through artificial insemination centres in each of the 500 milk societies. One functionary of each primary society in the villages covered will be trained inseminators. The union will establish a central semen laboratory and a stud-farm with upto 30 exotic bulls and upto 20 buffalo bulls"⁴.

Table 5.9

Progress of Artificial Insemination Work of Amul and Himul

Year	No. of A.I. Centres		No. of A.I. cases		Average No. of A.I. cases of per A.I. Centres		% of Growth of A.I. cases (1975-76 = 100)	
	A	H	A	H	A	H	A	H
	1975-76	665	26	207674	538	312	21	100.00
1976-77	678	71	223218	734	329	10	107.48	136.43
1977-78	711	120	248263	3358	349	28	119.54	624.16
1978-79	734	NA	255011	NA	347	NA	122.79	NA
1979-80	739	65	268792	NA	364	NA	129.42	NA
1980-81	735	79	285073	3019	389	38	137.26	561.15
1981-82	731	83	325886	5862	446	71	156.92	1089.59
1982-83	704	98	353152	7698	502	78	170.05	1430.85
1983-84	722	112	354744	5996	491	53	170.81	1114.49
1984-85	736	135	422876	7743	574	57	203.62	1439.21

N.A = Not available

Amul has arranged 736 Artificial Insemination (A.I) Centres and this arrangement works smoothly till 1979-80 whereas it should have arranged 870 A.I. Centres to keep pace and parity with her number of societies. On the other, Himul has arranged only 135 A.I. centres upto 1984-85. In the first three years this number has increased at a high rate, but after that it drops to 65 numbers in 1979-80 though it increases again. But in terms of society strength the number should have been at least 233.

In Amul, the number of A.I. cases increases in each year, but in Himul, this number goes up at an increasing rate upto 1977-78 and after that it has dropped in 1980-81. Again the number rises up in 1984-85 with the exception of the year 1983-84.

Due to fluctuation of Budget for A.I. Programme in Himul the number of A.I. cases fluctuates ^{from} year to year.

Table 5.9 depicts that, in Amul the range of percentage of growth of A.I. cases during ten years is only 103.6% whereas in Himul this is 1339.2% i.e. ten times more than that of Amul. The percentage of growth in Amul increases in each year except in 1983-84. On the other hand, in Himul, this rate of percentage increases except in 1980-81 and 1983-84 where the percentage drops.

Here it should not be concluded that the Himul is better than that of Amul in respect of number of A.I. cases done, because 1975-76 is the beginning year of Himul whereas it is 30th year of Amul. Amul did 3854 A.I. cases in 1955-56 and 31582 A.I. cases in her 19th year i.e. 1964-65 (Annexure 25) (i.e. after 10 years of new installation of an extra milk processing unit). In fact here indeed, Himul can not achieve its target of covering 31582 A.I. cases in her last ten years. Actually here the people are not interested to take the advantage of A.I. due to some

religious beliefs cherished by them. And it is seen specially in the plains of Himul.

Again, table 5.9 shows that in both Amul and Himul, the average number of A.I. cases done per A.I. Centre increases every year except in 1978-79 and 1983-84 in Amul and in 1976-77, 1983-84 and 1984-85 in Himul, where it has dropped by some numbers. But it may be noted that where Amul has done 574 A.I. cases in 1984-85, Himul had done only 57 average number of A.I. cases per A.I. Centre in the same time i.e. it is less than 10 times of Amul. In fact, Himul fails to achieve her target which should have in that period except only to open a stud farm in Mallaguri⁵. Moreover, a comparative position in hills and in the plains indicate that this activity is much popular in hill areas (Table 3.2).

iv. FODDER DEVELOPMENT PROGRAMME

There are only 201 societies under the Fodder Development Programme and 22 Fodder demonstration farms covering an area of 93 hectares of land. But the target is to cover every society gradually. Amul undertakes this programme in almost all the societies covering total area under fodder cultivation by farmers of 59185 acres of land. Besides, Amul creates 'Gaucher land' (Pasture land) in 22 societies

uptill 1983-84 for the milch animals of those societies.

As a major effort in this direction, over 550 acres of Government owned 'Gaucher land' in 22 villages has been developed to cultivate green fodder for the milch animals of those villages⁶. Here it may be concluded that Himul is not better than that of Amul in respect of Fodder development Programme.

Table 5.10

V. MILK PROCUREMENT

Table 5.10

Progress of Milk Procurement of Amul and Himul (In lakh kgs.)

Year	Quantity of Milk Collected (00,000 tons)		Average milk procurement per society (00,000 tons)		% of growth of average milk procurement per society (1975-76 = 100)	
	A	H	A	H	A	H
1975-76	1290.4	32.1	1.56	.36	100.00	100.00
1976-77	1270.2	53.3	1.53	.40	98.07	111.11
1977-78	1412.0	71.3	1.70	.44	108.97	122.22
1978-79	1592.6	39.3	1.86	.25	119.23	69.44
1979-80	1693.8	54.3	1.90	.31	121.79	86.11
1980-81	1895.8	51.9	2.12	.28	135.89	77.77
1981-82	1600.2	54.7	1.79	.28	114.74	77.77
1982-83	1838.2	74.1	2.05	.34	131.41	94.44
1983-84	1820.2	76.8	2.07	.36	132.69	100.00
1984-85	1932.2	65.6	2.22	.28	142.30	77.77

The Comparative Picture (Table 5.10) of the progress of milk procurement of Amul and Himul discloses that during the ten years under study, milk collection of Amul normally increases with the exceptions of 1976-77, 1981-82 and 1983-84. But in case of Himul it is a fluctuating one. The procurement of Amul is increased by 14.4 times compared to Himul during the ten years under study. In Amul, average milk procurement per society in 1976-77 and 1981-82 decreases. But in 1983-84 it increases though quantity of milk collection decreases due to closure of 15 societies.

In 1976-77 and 1981-82 the quantity of milk collection, average milk procurement per society and the growth of average milk procurement per society fall, the growth of average farmer members of the society, the growth of total number of A.I. cases, the growth of total number of animals treated i.e. veterinary works increase even the growth of society organisation is almost the same. This variation can be ascribed to low milk procurement price compared to the available market price^{7,8}. Despite efforts of the management and even by increasing the procurement price, total procurement could not be improved because of shortage of milk and milk products in the market (in 1981-82)⁹. The increase in the milk-purchase price by Rs. 7.72 per kg. of fat-content could not solve the impasse as increase in the price had not fully satisfied the expectation of the milk producers¹⁰.

On the other hand, in Himul, average milk procurement per society is adversely affected in 1978-79, 1980-81, 1981-82 and 1984-85 though the growth of society organisation, growth of average farmer-members, growth of number of animal treated and also the growth of total number of A.I. cases continue their progress in the same period. It is also strange that in 1980-81, 1981-82 and 1984-85 the average procurement of milk per society is the same though the total procurement of milk of the society varies. On the otherside, during the period of 1977-78, 1982-83 and 1983-84, the total milk procurement suddenly increases due to the organisation of new societies and the temporary closure of some societies which starts functioning again in 1982-83 and 1983-84 (Table 5.3).

However, the average quantum of milk procurement is low in Himul due to smaller number of societies and the reasons for fluctuations can be ascribed to different aspects. Firstly, during the period 1978 to 1985 price structure was revised in five stages (1978-79¹¹, 1980-81¹², 1981-82¹³, 1982-83¹⁴ and 1984-85¹⁵) but average procurement could not be improved due to market price prevalent locally. The price offered by Himul was comparatively lower than what had been offered by the local milk merchants. As a result, a major quantity of milk of producer-members had been channellised to local merchants. Secondly, the functioning of the producers'

cooperatives leave much to desire. Despite non-viability of a proposed milk co-operative, the management of Himul organised those as a entity only with the objective to fulfil their target-quota of organised society (i.e 500 societies). Thus it is evident that in Himul, the price is not the prime factor to improve the procurement of milk from its hinterland.

Table 5.11

Achievement of Daily Average Milk Procurement of Himul (in litres)

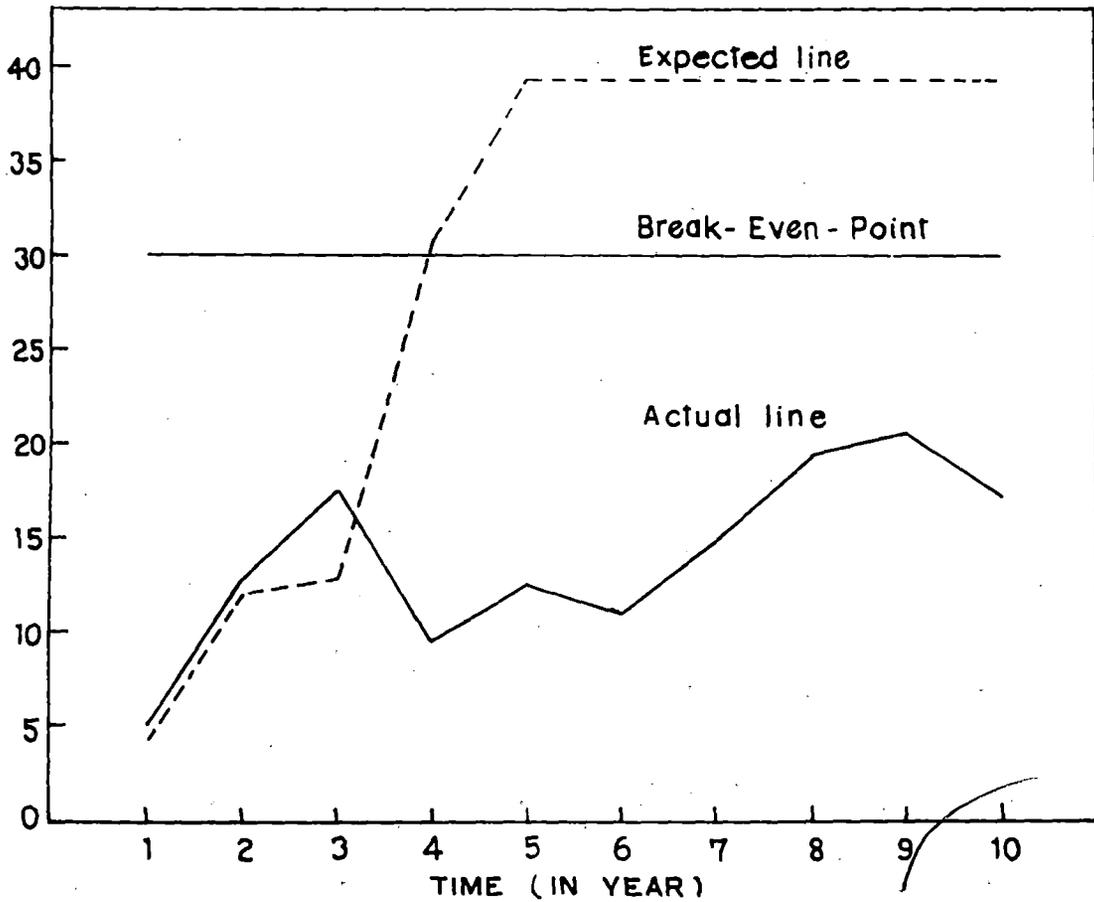
Year	Actual quantity	Targeted quantity	% of Achievement
1975-76	8,800	7,500	117.3
1976-77	14,630	14,000	104.5
1977-78	19,560	15,000	130.4
1978-79	10,775	30,000	36.0
1979-80	14,895	40,000	37.2
1980-81	14,219	40,000	35.5
1981-82	15,000	40,000	37.5
1982-83	20,306	40,000	50.8
1983-84	20,772	40,000	51.9
1984-85	17,984	40,000	45.0

Source : Annual Report : 1976-77, Page 32, Published by Himul.

It becomes evident (T-5.11 & G-5.2) that performance of Himul in actual procurement in the first 3 years is above

**GRAPHIC REPRESENTATION OF DAILY AVERAGE MILK
PROCUREMENT OF HIMUL (Vide Table- 5.11)**

Average Procurement
Litres (In thousand)



GRAPH - 5.2.

expectations. In first three years, Himul achieves more than it aims at, but from 4th year i.e. 1978-79 it fails to touch its target. It was quite unexpected as Himul achieves its target in any year except in first three years and also cannot achieve her project "Break even point" (30,000 Lt. per day). From 5th year (i.e. 1979-80) barring 1980-81, the trend of actual procurement increases upto 9th year (i.e. 1983-84) then it again starts to fall. The achievement comparatively is lowest in 1980-81 (Tabil 5.11) i.e. 35.5% of its target. However, the actual procurement is lowest in 4th year i.e. 1978-79 than the rest of years under study (Graph 5.2). Besides, there is negative corelationship ($r = -.36$) between expected line and Actual line of milk procurement.

In Himul, maximum quantity of milk is collected from the society of hill areas throughout the year (Table 5.12).

The backwardness of the plains in respect of milk procurement lies in the fact that only 65 village milk societies are organised out of 300 societies. Later, 20 societies ceased to exist. The hill areas present a some what different picture. Of the 200 societies 188 are on the run. The rate of percentage of growth of societies is also better in the hills than that in the plains (Table - 5.4). Besides, the cows in the plain areas have low productivity, while those in the hill areas have got high productivity.

Table 5.12

Sampling Table For Daily Procurement From January 1984 to December 1984 of Himul Dairy Plant (In Lit.)

Milk Routes	Month/Date											
	Jan. 20	Feb. 25	Mar. 30	Apr. 5	May 10	June 15	July 20	Aug. 25	Sep. 30	Oct. 5	Nov. 10	Dec. 15
1. Phansidewa	22	15.5	10.5	N.A	N.A	N.A	24.5	18	6	7	21	11
2. Nagrakata (Mal C.P.)	444	512.5	569.5	N.A	N.A	N.A	761	598	329	326	362	255
3. Mirik	2287	2149.5	1803.5	N.A	N.A	N.A	1569.5	1380.5	1327.5	658	1624	1837
4. Bidhan Nagar	146.5	123.5	168	N.A	N.A	N.A	N.A	169.5	105	108	117	180
5. Rambhi (C.P)	2534.5	3063	2559	N.A	N.A	N.A	2401.5	2243	250	N.A	270	312.5
6. Kalimpong (C.P)	1431.5	1296	834.5	N.A	N.A	N.A	N.A	N.A	N.A	N.A	2449	N.A
7. Kurseong (C.P)	3083	2817	2005	N.A	N.A	N.A	2181	2079.5	N.A	1415.5	2181	2695
8. Ghoom (C.P)	6393.5	3248	3423	N.A	N.A	N.A	3881.5	3657	4875.5	3945	6315	6425
9. Sukhia (C.P)	4992	6452.5	2580.5	N.A	N.A	N.A	4391	4619	4062	3282	3991	4313.5

Note : C.P. - Chiling Plant.

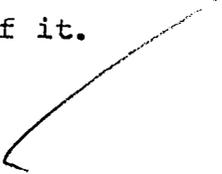
Source : Compiled from Procurement Register of HIMJL

This is because of the genetic improvement to be seen among the cows in the hills. Again, it happens sometime, especially in the plains that the price of milk fixed by the Himul is less than the existing market price. This is simply because quantity of milk produced is much less than the local demand.

SUMMARY

Ten years have passed since Himul started functioning. Still it has not recovered from teething trouble. Far from making the desired progress it could neither organise targeted number of society for fulfilling techno-economic programme like Breed Improvement Programme, Veterinary Aid, Fodder Development and so on. Only in the hill areas it could achieve some success. But the lapses and failures in other fields have overshadowed this achievement. It has also failed to involve large number of farmers in the Dairy Cooperative Movement. As a result, milk procurement per day could never reach even one third of the target. Moreover, one third of the village societies it had organised were either closed or did not start functioning. However, the major amount of milk procured per day comes from the societies located in the hill areas. The performance of the societies on the plains is deplorable. Of the 300 societies only 65 societies were formed. At present only 45 societies are functioning. Now, if we put both Amul & Himul side by side for a comparative study, the

failure of Himul appears to far more striking. While Amul has maintained the trend of improvement in every field, Himul has fallen far short of what was expected of it.



Notes & Reference

1. Operation Flood, published by Indian Dairy Corporation/
National Dairy Development Board, p.11.
2. "In the early stages, rapid growth brought in its wake serious problems. Their solution provided the stimulus for further growth. For example, as the Cooperative movement spread in the district, it was found that the Bombay Milk Scheme could not absorb the extra milk collected by the Union in winter, when buffaloes yielded an average of $2\frac{1}{2}$ times their summer yield. Thus by 1953, the farmer members had no regular market for the extra milk produced in winter. They were again forced to sell a large surplus at low rates to middle men.

The only remedy was to set up a plant to process the extra milk into products like butter and milk powder. The logic of this step was readily accepted by the Government of Bombay and the Government of India, except

for a new doubling Thomases. The Government of India helped the Union to get financial help from UNICEF and assistance from the Government of Newzealand under the colombo Plan. Technical aid was provided by FAO. A Rs. 50 lakh factory to process milk Powder and butter was blue printed. Its foundation stone was laid by the then President of India late Dr. Rajendra Prosad on November, 15, 1955, On which day the late Pandit Jawaharlal Nehru, the then Prime Minister of India, declared it open. The new dairy provided a further fillip to the cooperative movement among milk producers. The union was thus enabled to organise more village cooperative societies and to handle more and more milk each year" - The Amul story - a sage of cooperative effort, printed at Anand Press, Gamdi, Anand, pp.5-6.

3. Operation Flood, op.cit., p.26.
4. Ibid., p.24.
5. "Our Union has the only Frozen semen Station of its kind in the whole of North Eastern India. There are 23 bulls at present. Semen Collection is made regularly from 11 bulls while 12 numbers are under rearing. The total number of semen doses produced since inception is 226320. Number of doses supplied free of charges to the milk producers of this union is 708877. All the milk unions of West Bengal and North Eastern India

also purchase frozen semen from us. The total number of semen doses produced in 1984-85 and 1985-86 (till April '86) are respectively 56,674 and 54300".

Nineth Annual Report - 1983-84, published by Himul, p.17.

6. 38th Annual Report - 1983-84, published by Amul, p.3.
7. "The year began with lower milk collection by about 15% than the previous year. This trend of low milk collection continued upto Dewali. Thus for nearly half a year our product plants were running under capacity due to shortage of milk and also due to more demand for liquid milk from the consumer market". 31st Annual Report - 1976-77 published by Amul, p.1.
8. "However, the approval for restoration did not come during the year which adversely affected our capacity to pay a better price for milk". 31st Annual Report, op.cit., p.2.
9. "Low milk procurement created serious problems in meeting market requirements for milk and milk products. The total procurement of milk particularly during the lean season dropped considerably. In spite of paying higher prices, we had to face stiff competition from private merchants due to shortage of milk and milk products in the market. We made continuous efforts to improve our realisation during the year under report to meet this unusual situation and tried our very best to

pay higher prices to the extent possible to meet increased cost of production under the inflationary trend through which our country has been passing. Even after putting all these efforts, our milk procurement could only reach a figure of 16 crores kgs. which is lower by 5.6% over the preceeding year". Annual Reports & Accounts - 1981-82, published by Amul, p.2.

10. "During the year under report, milk purchase price increased by Rs. 7.72 per kg. fat on an average compared to an increase of Rs. 2/- per kg. fat last year. However, this increase in the price may not fully satisfy the expectations of the milk producers". Ibid., p.4.
11. Fourth Annual Report - 1977-78, published by Himul, p.16.
12. Fifth Annual Report - 1978-79, published by Himul, p.7.
13. Sixth Annual Report - 1980-81, published by Himul, p.10.
14. Seventh Annual Report - 1983 published by Himul, p.1.
15. Nineth Annual Report. op.cit., p.15.

Chapter- vi

Financial Performance of **'AMUL' & 'HIMUL'**

The financial strength and weakness of any enterprise can be assessed from the financial statements prepared by it. These financial statements are prepared at the end of a period of time through financial accounting techniques. These statements are store of information condensed into figures. The establishment of proper relationships between different items that are shown in the financial statements discloses the concealed and camouflaged facts under the abstract figures of financial statements. Through the analysis of financial statements it is possible to ascertain the inherent structural and functional charges, which are ultimate result of policies and decisions of the management over a given period of

time. To resolve this issue there are number of techniques. However, ratio analysis is now one of the well recognised techniques commonly accepted. In our present study, comprising analysis of the financial performance of the two enterprises, the Himul and the Amul, we have adopted this technique.

A comparison between the financial health of Amul and that of Himul is being done in this chapter to depict a comparative financial condition and performance of both the firms Amul and Himul.

Efficiency of any enterprise managed by professionals is dependent on the managerial performance through their decision-making and the resultant effect is being reflected in quantitative terms through financial data. Analysis and interpretation of various financial ratios provide a better understanding of the financial condition and performance of the enterprise which could be obtained from analysis of the financial data alone. Availability of some norms help in evaluating the performance of the management itself. Both the Amul and the Himul are registered societies and hence norms that are available in and applicable to corporate bodies are of no use here. However after taking into consideration the age factors of these two Unions an attempt has been made to make a comparative analysis of their financial health through

ratio technique.

The ratio technique helps "to describe significant relationship which exists between figures shown on a Balance sheet, in a Profit & loss account, in a Budgetory control system or in any part of the accounting Organisation"¹. Besides, "the ratio analysis provides guides and clues specially in spotting trends towards better or poor performance and in finding out significant deviation. However, the ratios are guides in the analysis of financial statements, and are not conclusive in themselves"². However "as a ratio indicates a quantitative relationship, it can be used to make a qualitative judgement"³.

"Although the number of financial ratios that might be computed increases geometrically with the amount of financial data"⁴, in this study, stress has been laid only on the more important ratios.

Keeping in mind the limitations of ratio analysis that "No one ratio gives us sufficient information by which to judge the financial condition and performance of the firm. Only when we analyse a group of ratios we are able to make reasonable judgements"⁵. Besides "it is difficult to evaluate the differences in the factors that effect one company's performance in a particular year as

compared with that of another year and that of another company. This task becomes more difficult when comparison is made of one company with different size, age etc.⁶. Accordingly, for our purposes, the financial ratios of both the enterprises have been classified into five groups : (i) structural (ii) liquidity (iii) profitability (iv) turnover and (v) Miscellaneous. The objective of this classification is to judge, amongst other things, the financial condition and operating results from the view point of (1) Solvency (2) Liquidity (3) Profitability (4) Efficiency and (5) Earning capacity. The first group of ratios have been computed from the balance sheets. The second and third groups of ratios have been computed from income statements; and the last two groups computed from both the income statements and balance sheets.

The ratio grouping with their components are as follows :

Group name of the ratio	Components ratios
1. Structural Group	: i) Funded Debt to Total Capitalisation; ii) Debt to Equity; iii) Debt to Equity (considering grant & subsidies);

-
- iv) Equity to Net Fixed Assets;
 - v) Net Fixed Assets to Funded debt;
 - vi) Funded Debt (long term) to Net Working Capital;
 - vii) Long Term Debt to Equity;
2. Liquidity group : i) Current ratio;
- ii) Acid-Test ratio;
3. Profitability group : i) Operating ratio;
- ii) Operating Profit to Sales;
 - iii) Net Profit to Sales;
 - iv) Net Profit to Sales (considering grant & subsidies);
 - v) Coverage of Interest Payment;
 - vi) Return on Investment;
4. Turnover group : i) Assets Turnover;
- ii) Net Working Capital Turnover;
 - iii) Receivable Turnover;
 - iv) Inventory Turnover;
5. Miscellaneous group : i) Net Operating Profit to total assets;
- ii) Total Debt to Total Assets;

The ratios are snapshots of the picture at one point in time, but there may be trends in motion that are in the process of rapidly eroding a relatively good present position. Conversely, an analysis of the ratios over the past few years may suggest that a relatively weak position is being improved at a rapid rate⁷. For this the method of time-series analysis has been adopted to incorporate the time dimension in the study.

When we observe the values of a variable at different points of time, the series so formed is known as time series. The technique of graphic presentation is extremely helpful in analysing changes at different points of time⁸. On the X-axis and Y-axis time and the value of the ratios are plotted respectively. Time-series analysis help us to disclose the nature of change of the parameter under study with the change of time. However, if comparison between two series is required, graphic representation of two series does not help much and it depends on the subjective judgement of the researcher. Therefore, for the comparison of two series, we require an objective measure i.e. coefficient of variation. Since we intend to compare between the different level of performance of Amul and Himul, we take the help of coefficient of variation*.

* Coefficient of variation stands for the percentage which the value of standard deviation is to the

Again, even after measuring the variability objectively by Coefficient of variation we still have another problem to generalize the observations. Time series or coefficient of variation analyse the features of a particular ratio with respect to time-dimension and extent of dispersion respectively. But both the measures fail to co-ordinate the results obtained from different ratios. As for example, time-series analysis of two ratios of structural group shows the change over time but the direction of change may not be understood properly. Precisely for this reason we would use Rank Correlation* between different ratios of the same group. When we represent these Rank Correlation in the matrix form, it

value of the mean.

In otherwards if standard deviation is divided by the mean and multiplied by 100 we get the coefficient of variation⁹. The measure of relative variation is termed the coefficient of variation¹⁰ represented by the letter V. Thus,

$$V = \frac{S}{M} \times 100$$

* Rank Correlation may be defined as the correlation between ranks or orders of magnitude of pairs of observations. It is measured by Rank Correlation coefficient (R), given by

$$R = 1 - \frac{6 \sum d_i^2}{N(N^2-1)}$$

Where d_i -difference between the ranks of the individual in the two character; N = Number of pairs of observations. This formula is also known as Spearman's formula¹¹.

will be a t-matrix^{10-A}. Thus, five separate t-matrices will be obtained for Amul as well as Himul.

STRUCTURAL GROUP :

Ratios of the Structural Group show the composition of assets and liabilities of a firm. These also indicate the relationships between various sources of funds and their utilization patterns¹².

TABLE 6.1
Summary of the Structural Group Ratios

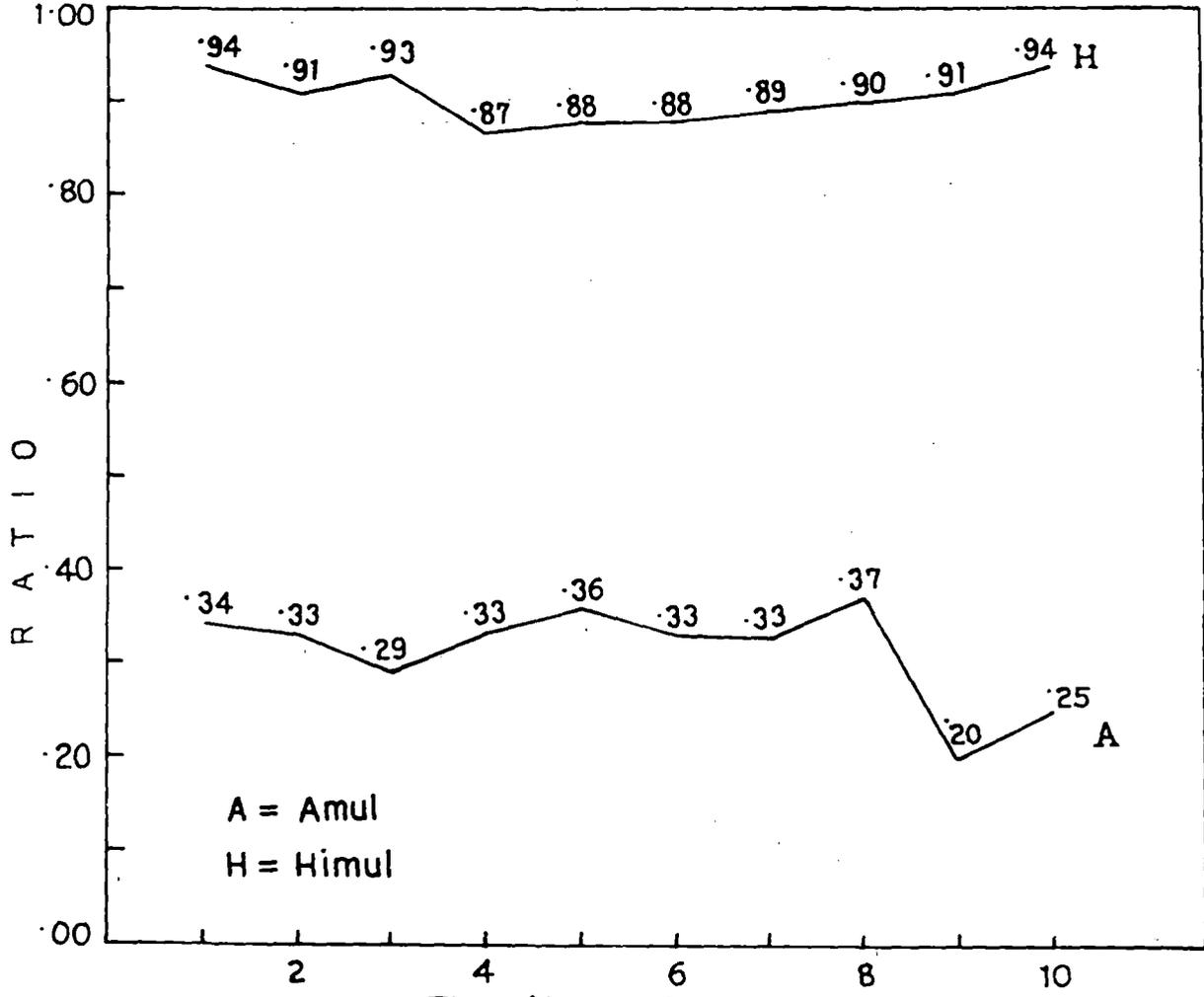
Sl. No.	Ratios	Formulae of Calculation
i.	Funded Debt to total Capitalisation	$\frac{\text{Funded Debt (Long term Loans)}}{\text{Total Capitalisation}}$
ii.	Debt to Equity	$\frac{\text{Debt}}{\text{Equity}}$
iii.	Debt to Equity (Considering Grant & Subsidies)	$\frac{\text{Debt (Considering Grant \& Subsidies)}}{\text{Equity}}$
iv.	Equity to Net Fixed Assets	$\frac{\text{Equity}}{\text{Net Fixed Assets}}$
v.	Net Fixed Assets to Funded Debt.	$\frac{\text{Net Fixed Assets}}{\text{Funded Debt}}$
vi.	Funded Debt to Net working Capital.	$\frac{\text{Funded Debt}}{\text{Net Working Capital}}$
vii.	Loan Term Debt to Equity	$\frac{\text{Long Term Debt}}{\text{Equity}}$

In table 6.1, we summarise the actual calculation formulae of different ratios. Among these, two ratios, namely Debt to Equity (with and without Grant & Subsidies) deserve some explanation. Equity is neither an important component in the capital structure of both Amul & Himul, nor it plays the ideal role of Equity like in a corporate organisation. So far the Debt is concerned, it comprises mainly the longterm government loan. Moreover, Himul enjoys a large amount of Grant and Subsidies from several sources like Indian Dairy Corporation, Hill Development Authority, World Food Programme, S.F.D.A. and D.R.D.A, National Dairy Development Board etc. Himul used to show unutilised amount of Grant and Subsidies as liabilities in the Balance Sheet. Thus we calculate two Debt-Equity ratios for Himul and both of them will be compared with Debt-Equity ratio of Amul.

Funded Debt to Total Capitalisation* ratio of Himul has been found always higher than that of Amul (nearly three times; Graph 6.1). It indicates substantial debt burden of Himul over a large period of time. It is well known that a too heavy debt burden decreases the margin

* The 'total capitalisation' comprises long term debt, capital, stock and reserve & surplus. The funded debt denotes the long term loans obtained from National Dairy Development Board, World Food Programme, Animal Husbandry and Veterinary Service, Government of West Bengal,

Funded Debt To Total Capitalisation



A = Amul
H = Himul

Time (in year)
Graph - 6.1.

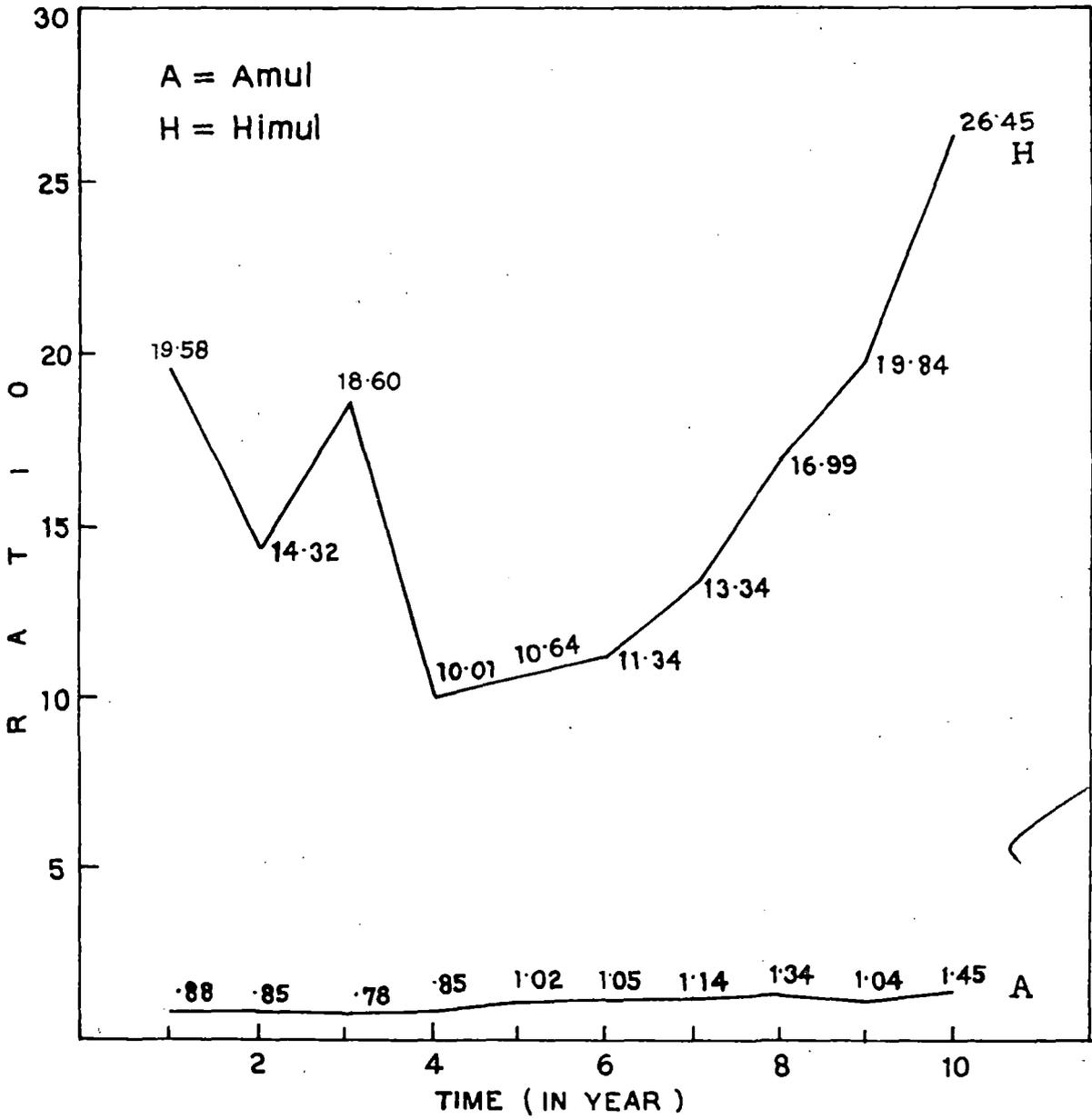
of safety for lenders, rises fixed charges upon earnings, reduces benefits of members of the Union. Moreover if the enterprise continues to earn zero profit or losses it may invite insolvency and force reorganisation¹³.

Debt* to Equity ratio¹⁴ curve of Amul is going upward slowly as well as smoothly (Graph 6.2). But this line of Himul is moving upward abruptly after 1978-79. The ratio values show that the debts of Himul are minimum 10 times and maximum 26.45 times of equity, whereas in case of Amul the debts are maximum 1.45 times of Equity. Again if the 'grant and subsidy' is considered as debt in Himul (Graph 6.3) the debts are minimum 12.58 times and maximum 33.13 times of the equity. What should be the reasonable amount of debt of a firm depends on various factors. Thus a financially desirable Debt-Equity ratio

Hill Development Authority, S.F.D.A., Darjeeling, Banks and Indian Dairy Corporation etc. However, some readjustments have to be made in ascertaining the capitalisation of Himul. The particular element 'grant and subsidy' shown as liability has not been included in the total capitalisation fund as this element has been adjusted, as and when it is utilised for techno-economic Programme, against profit and loss debit balance of every accounting year.

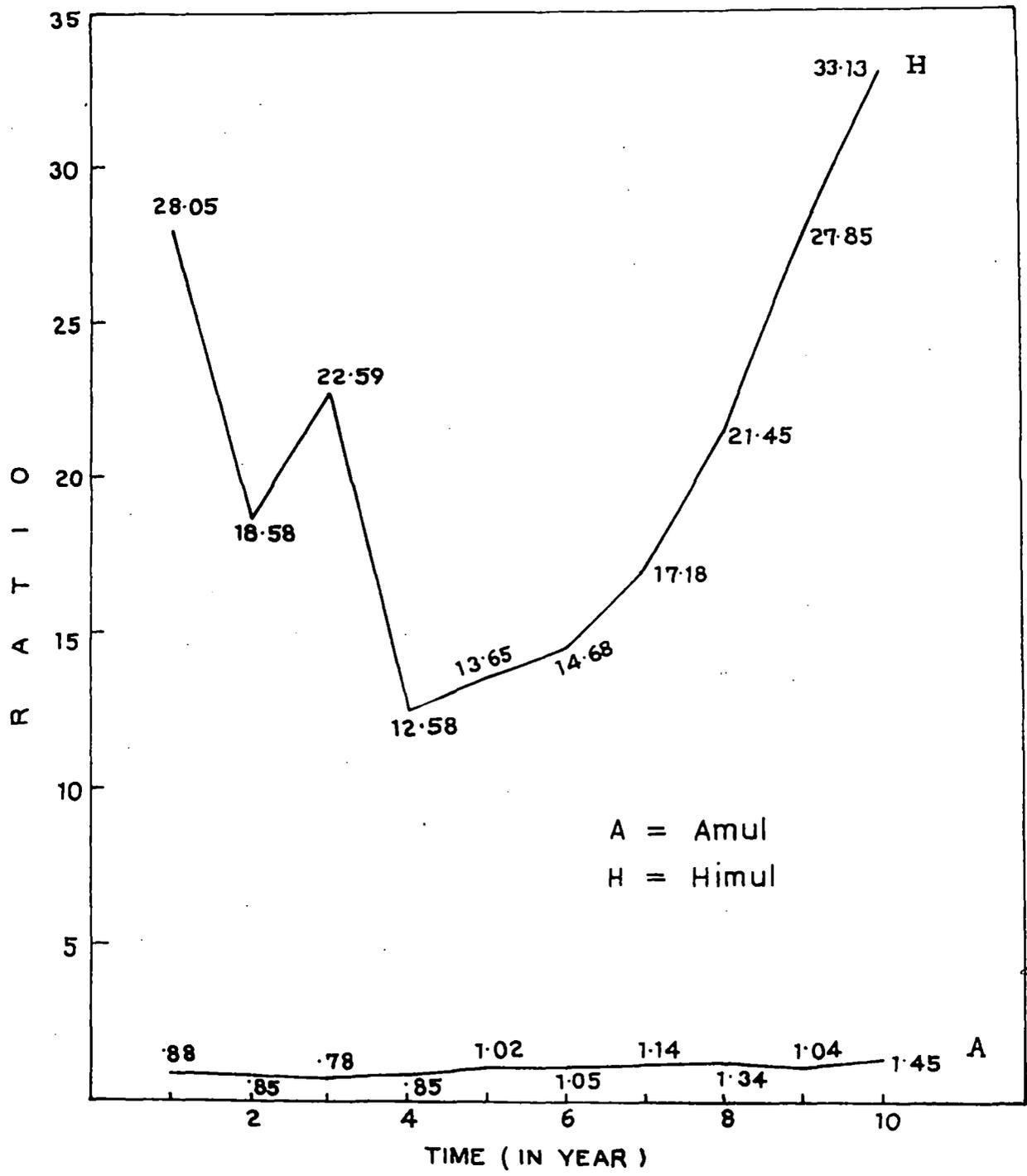
* Debt denotes summation of long term loans, short term loans, 12% Redeemable debentures, current liabilities & provisions and sundry creditors. And equity means only equity capital.

Debt To Equity



Graph - 6.2

Debt To Equity (Considering Grant & Subsidies)

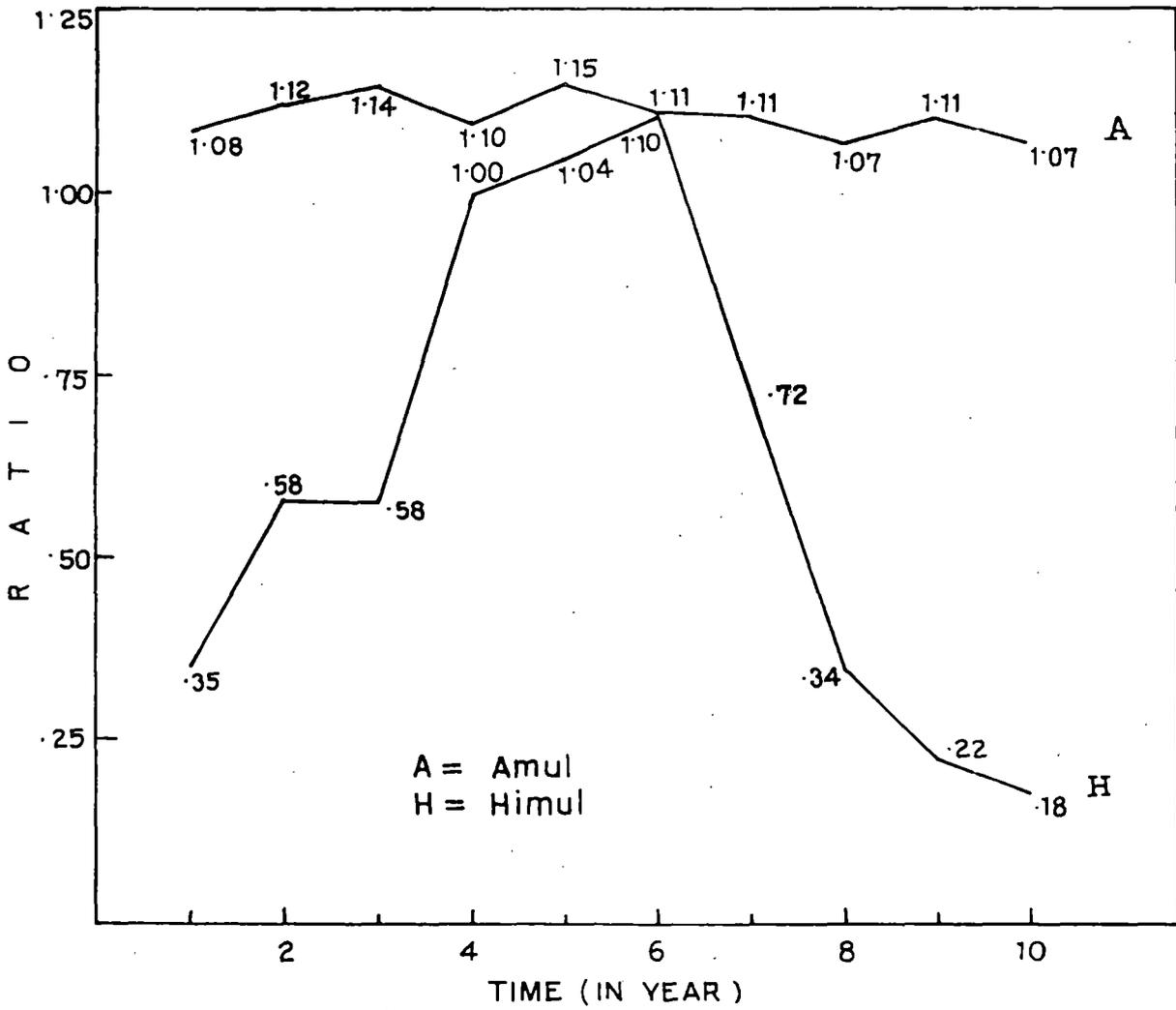


Graph - 6.3.

of public utility differs from a manufacturing firm. In this case though we do not ascertain precisely the sound ratio between Debt-Equity, but obviously can say that debt in Himul which varies from 12 times to 33 times of equity is not appreciable. It therefore seems that the debt to equity position of Himul is not desirable so far the creditors are concerned. Besides, if we compare the debt position of Himul with Amul, then it shows that Amul's position is far better than Himul. Amul's debt is of 1.45 times that of equity, signifies a much better financial control and management¹⁵.

The ratio of Equity to Net Fixed Assets¹⁶ of Amul (Graph 6.4) shows marginal ups and downs. Whereas the same of Himul is going upward upto 1980-81 then downwards abruptly till 1984-85. Except 1978-79 to 1980-81, the net fixed assets of Himul is larger than the net worth or equity. This is not a sound picture. It is well known that the more the shareholders' investment is tied up in fixed assets, the less is the amount available for contribution in current assets, i.e. the creditors have contributed towards large part of the net fixed assets. The higher this ratio the less the protection for creditors. Where net fixed assets exceed net worth, which should plan for an additional equity capital¹⁷. Besides, excessive reliance upon creditors implies weak financial structure¹⁸.

Equity To Net Fixed Assets



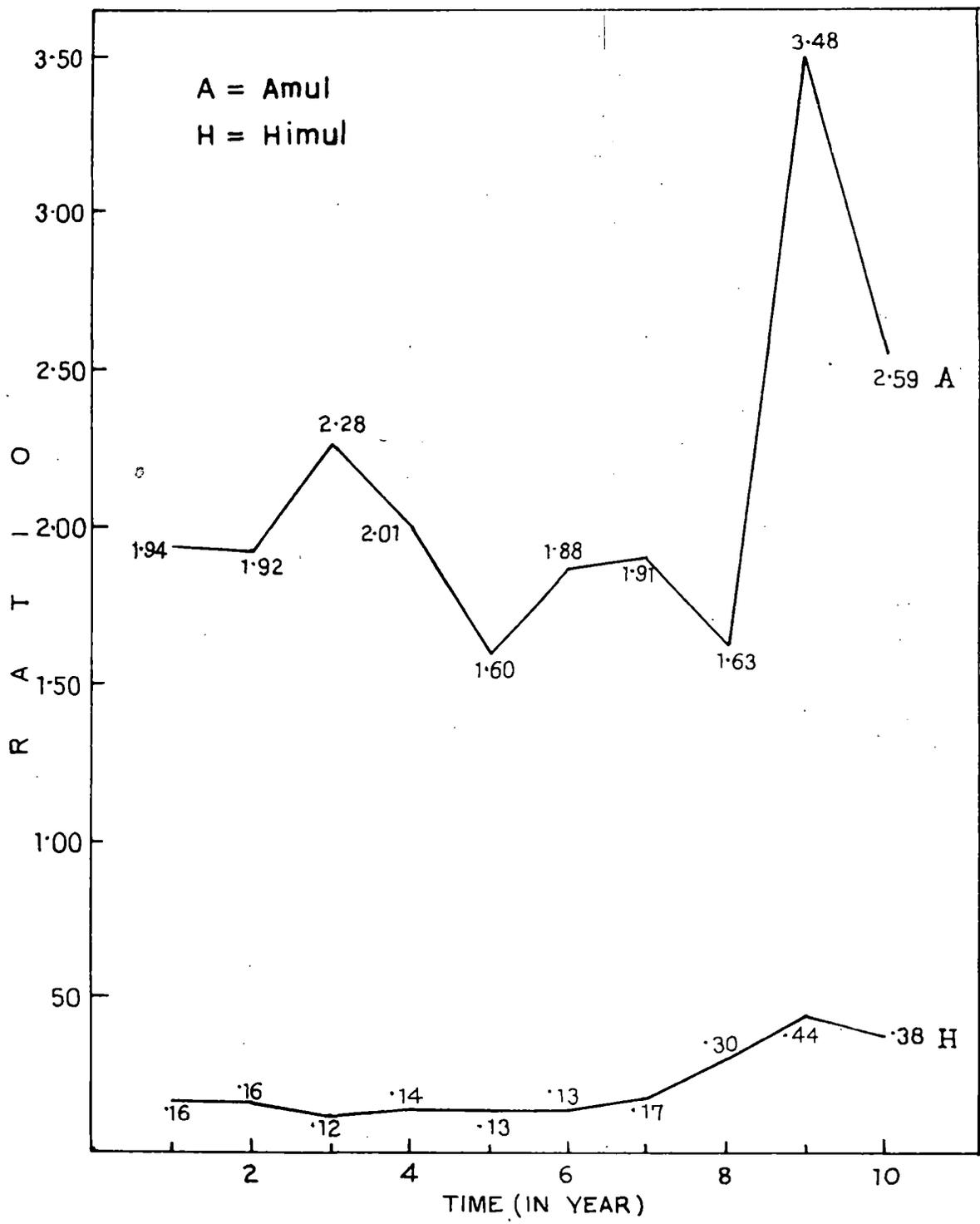
A = Amul
H = Himul

Graph - 6.4.

The Net Fixed Assets to Funded Debt ratio¹⁹ of Amul (Graph 6.5) fluctuates year to year and in 1983-84 it has reached its maximum level. On the other hand this ratio of Himul is almost stable upto 1981-82. It starts to increase from 1982 and reaches its maximum level in 1983-84 at .44 times of debt. It implies that the net assets is even less than the half of the total debt of the firm. The position of net fixed assets to funded debt ratio of Amul is better as the ratio has maintained always the minimum desirable level 2:1²⁰ and it crosses three in 1983-84.

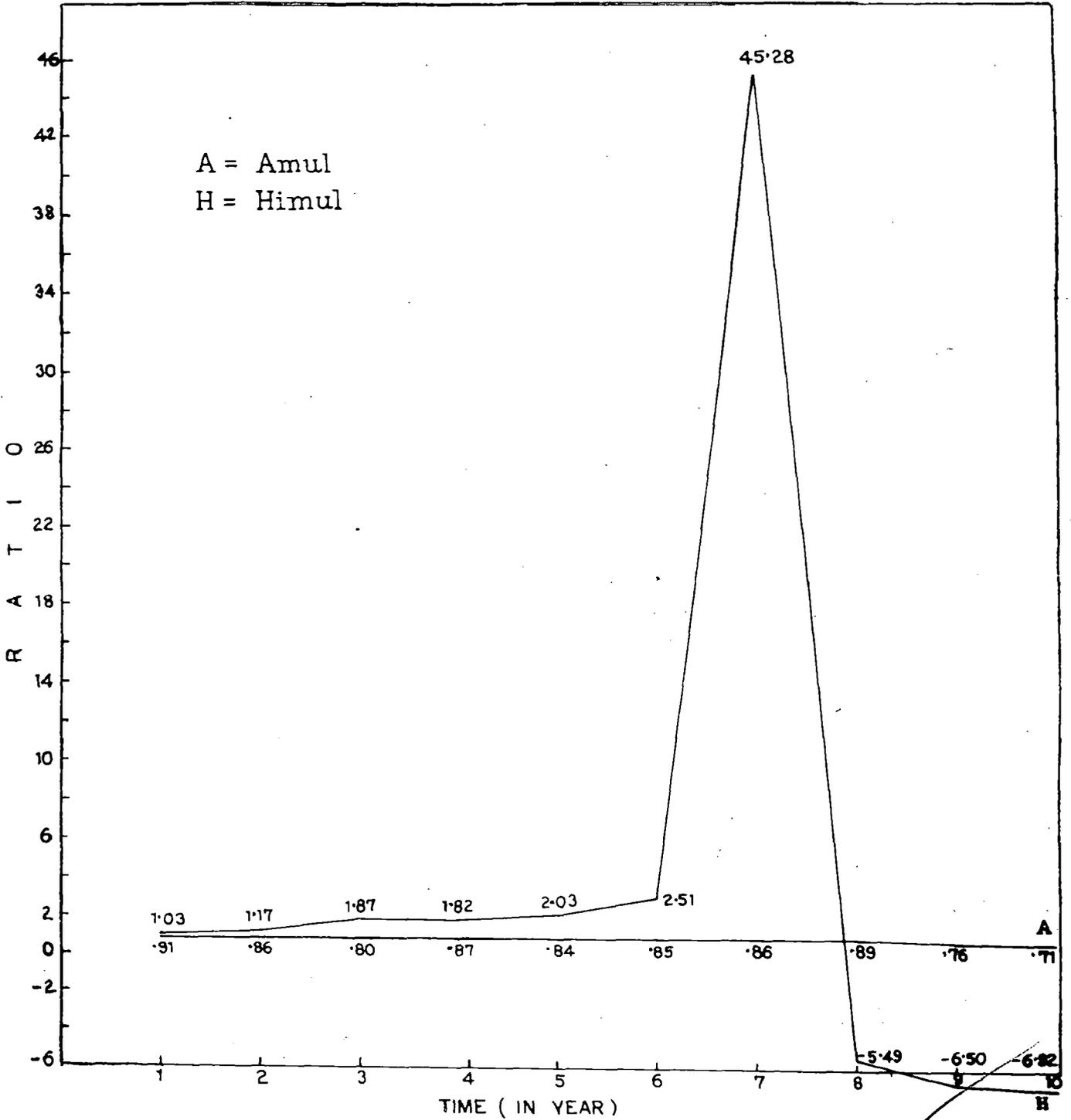
Funded Debt to net working capital ratio is used to assess the working capital position and is said that funded debt should not exceed working capital²¹. The graph obtained from the Funded debt to Net Working Capital ratio²² (Graph 6.6) of Himul has always exceeded the working capital and it is more remarkable in 1981-82 onwards. During the same period this ratio of Himul goes below the axis of the graph. Because in that period current assets are also lower than the current liabilities. Graph also shows the sound working capital position of the Amul which remains almost parallel to the X-axis over the whole period. On the otherhand, Himul is facing a financial obligation at present and in the long run, it will face a vigorous working capital crisis.

Net Fixed Assets To Funded Debt



Graph - 6.5 .

Funded Debt To Net working Capital.



Graph - 6.6

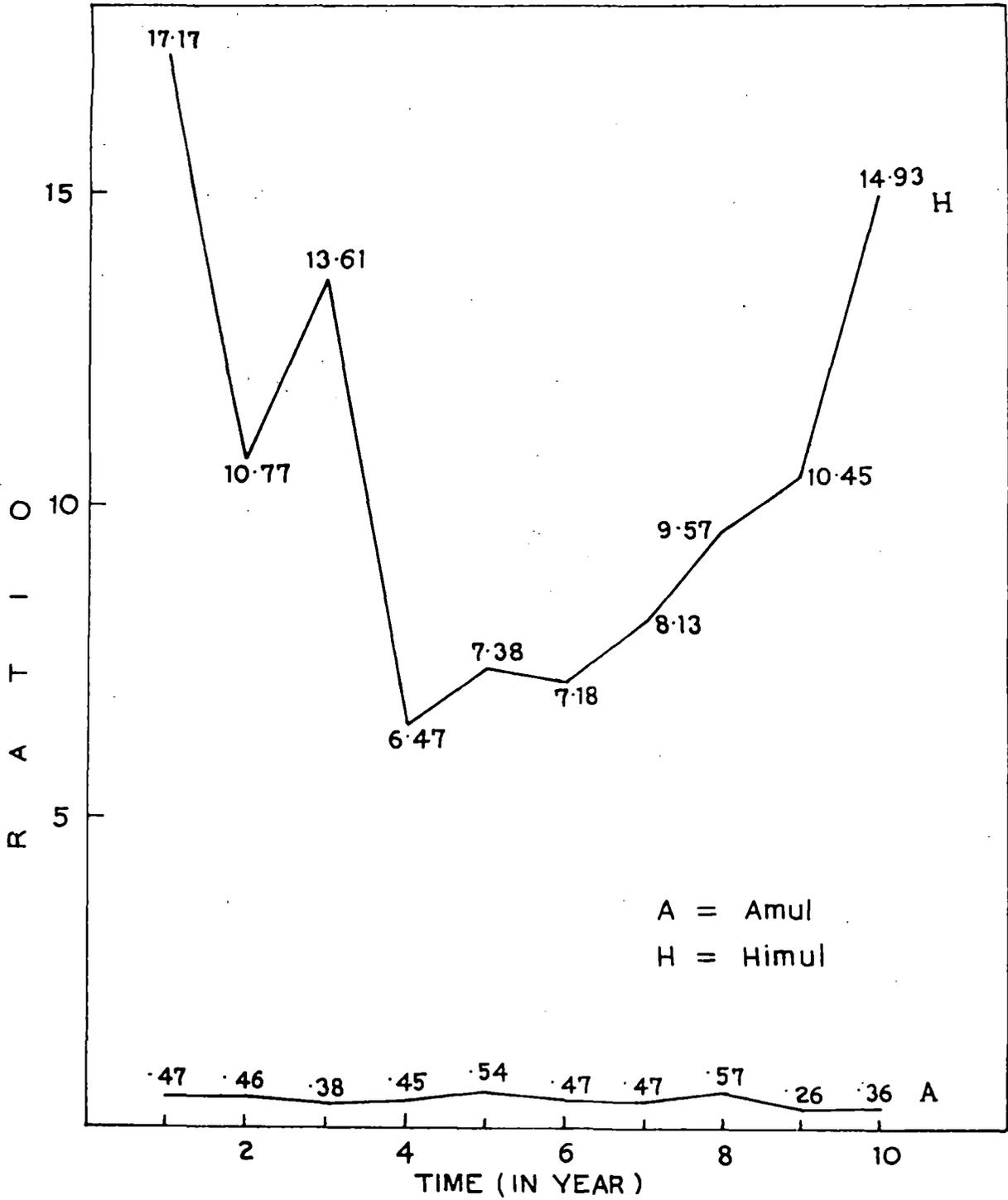
So far as the long term Debt to Equity ratio is concerned, it appears that the debt burden of Himul is too much heavier than Amul. Because the graph showing the Long Term Debt to Equity ratio (Graph 6.7) of Himul fluctuates year to year abruptly but this ratio of Amul fluctuates smoothly.

TABLE 6.2

Coefficient of Variation of Ratios of Structural Group of Amul and Himul

Sl. No.	Ratios	Mean		S.D.		Coefficient Variation	
		Amul	Himul	Amul	Himul	Amul	Himul
i.	Funded Debt to Total Capitalisation	.31	.90	.05	.02	16.707	2.817
ii.	Debt to Equity	1.04	16.11	.21	5.17	21.115	32.093
iii.	Debt to Equity (considering grant & subsidies)	1.04	20.97	.21	6.92	21.115	33.025
iv.	Equity to Net fixed assets	1.10	.61	.02	.34	2.456	56.393
v.	Net fixed assets to Funded Debt	2.12	.21	.55	.11	26.226	54.708
vi.	Funded Debt to Net working capital	.83	3.68	.06	15.11	7.345	410.60
vii.	Long Term Debt to Equity	.44	10.56	.08	3.61	20.248	34.167

Long Term Debt To Equity



A = Amul
H = Himul

Graph - 6.7 .

Here, in this sub-section, we intend to discuss the extend of variability of the time series analysis of different ratios of Amul and Himul. A series showing greater coefficient of variation is said to be more variable and the series having lesser coefficient of variation is said to be more consistent than the other. We also presume here that the standard deviation is the total variation in the mean.

Coefficient of variation of seven ratios (Table 6.2) of Amul indicates a consistent structural financial position as all the seven Coefficient of variations of Amul except the first one, are less than that of Himul. Only in the case of Funded Debt to Total Capitalisation ratio, Himul seems to have a better position so far dispersion from average position is concerned.

The working capital position of Himul is very acute. From the present table we find that the extent of variation in funded Debt to Net working Capital is as large as 410.00 as against only 7.345 of Amul. Similarly, the Coefficient of variation of the Equity to Net Assets of Amul is only 2.456 whereas the same for Himul comes out as 56.393.

This analysis which shows the large extent of variability of almost all the ratios of Himul, seems to

suggest that Himul does not follow any uniform pattern to manage its capital. It also may be said that the major decisions regarding capitalisation which supposed to be of long term basis are taken probably on ad-hoc basis and no serious thought has been given prior to decision making as a consequence, no uniformity has been found in the time-series analysis and wide degree of variation in coefficient of variation has been obtained.

Rank correlation between ratios of structural group are given below (Table 6.3 and Table 6.4) for Amul and Himul respectively.

TABLE 6.3

Rank Correlation Matrix of the Structural Group Ratio of Amul

	i	ii	iii	iv	v	vi	vii
i) Funded Debt to Total Capitalisation		.04	.04	-.16	-.84	.72	.91
ii) Debt to Equity			*	-.48	-.17	-.16	.49
iii) Debt to Equity (considering grant & subsidies)				-.48	-.17	-.16	.49
iv) Equity to Net fixed assets					-.25	-.47	-.07
v) Net fixed assets to Funded Debt						-.52	-.94
vi) Funded Debt to Net Working Capital							.62
vii) Long Term Debt to Equity							

*The values of Debt to Equity and Debt to Equity (considering grant & subsidies) ratio are the same as Amul is not getting any grant and subsidies from any source.

TABLE 6.4

Rank Correlation Matrix of the Structural Group Ratio of
Himul

	i	ii	iii	iv	v	vi	vii
i) Funded debt to Total Capitalisation	.81	.64	-.87	.22	-.70	.88	
ii) Debt to Equity		.96	-.91	.48	-.72	.87	
iii) Debt to Equity (considering grant & subsidies)			-.88	.51	-.72	.91	
iv) Equity to Net fixed Assets				-.99	.89	-.73	
v) Net fixed assets to Funded Debt					-.72	.27	
vi) Funded Debt to Net Working Capital						-.57	
vii) Long Term Debt to Equity							

We observe from matrix that in case of Amul, there is no relation between the Ranks of Funded Debt to Total Capitalisation and Debt to Equity (with or without grant & subsidies) but there is a high positive correlation with 'Funded Debt to Net Working Capital' and 'Long Term Debt to Equity'. 'Long Term Debt to Equity' has also moderate positive correlation with 'Debt to Equity' (with or without grant & subsidies) and 'Funded Debt to Net Working Capital'.

On the contrary, in case of Himul, 'Funded Debt to Total Capitalisation' has a significant positive

correlation with both 'Debt to Equity' ratios. Moreover in case of Himul, 'Equity to Net Fixed Assets' and 'Funded Debt to Net Working Capital' ratio negatively correlated with the rest. But other ratios are positively related with each other and that too is also high degree. It seems to imply that the direction of change obtained from different ratio measures are of consistent in case of Himul.

LIQUIDITY GROUP :

The liquidity group ratios indicate the ability of a firm to meet its short-term financial obligations. The ability of a firm to meet its current liabilities with a margin of safety is judged on the basis of two ratios, viz., the Current ratio and the Acid-test ratio²³.

Formulae of calculation of these two well known ratios are given below in Table 6.5.

TABLE 6.5
Summary of the Liquidity Group Ratios

Sl.No.	Ratios	Formulae of Calculation
i)	Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$
ii)	Acid-Test Ratio	$\frac{\text{Current Assets}-\text{Stock}}{\text{Current liabilities}}$

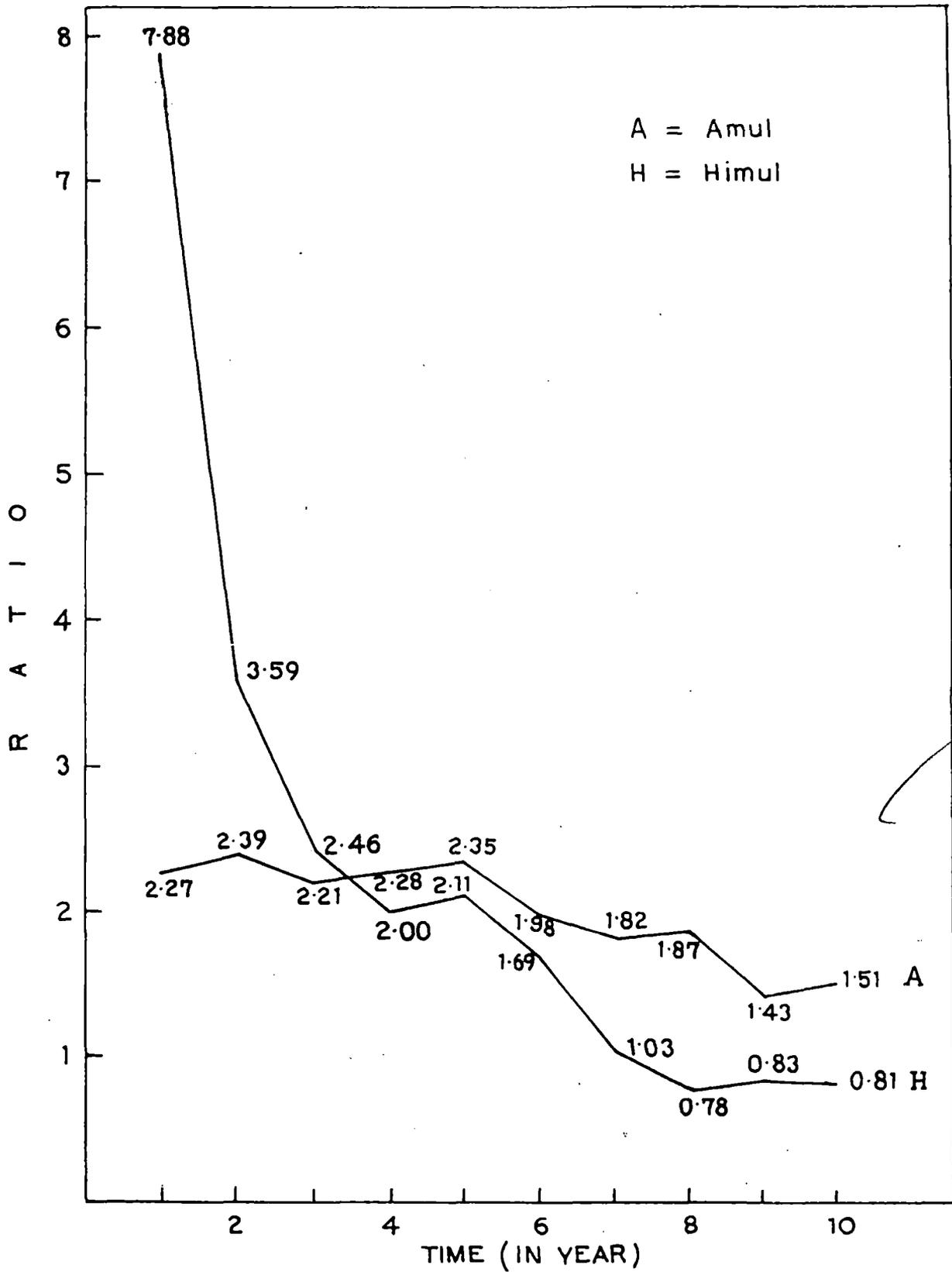
It is well known that an ideal current ratio²⁴ often suggested is 2:1. Generally low current ratio indicates that the firm may have some difficulty in meeting its debts. Again high Current ratio would suggest that funds are not being used economically in the firm²⁵.

The time-series graph of Current ratio* (Graph 6.8) of ten years of Amul is almost sound nature upto 1982-83. On the otherhand, this graph of Himul shows a critical condition of the organisation throughout the period of the study except three years (1977-78 to 1979-80).

Acid-Test ratio²⁶ (Graph 6.9) of Amul indicates a good working capital position. But this ratio of Himul shows monotonically declining nature and it settles down to 0.58 in 1984-85. As we know that the desirable ratio is 1:1 or 1.5:1, Himul does not show any comfortable position at any point of time. On the contrary, it starts

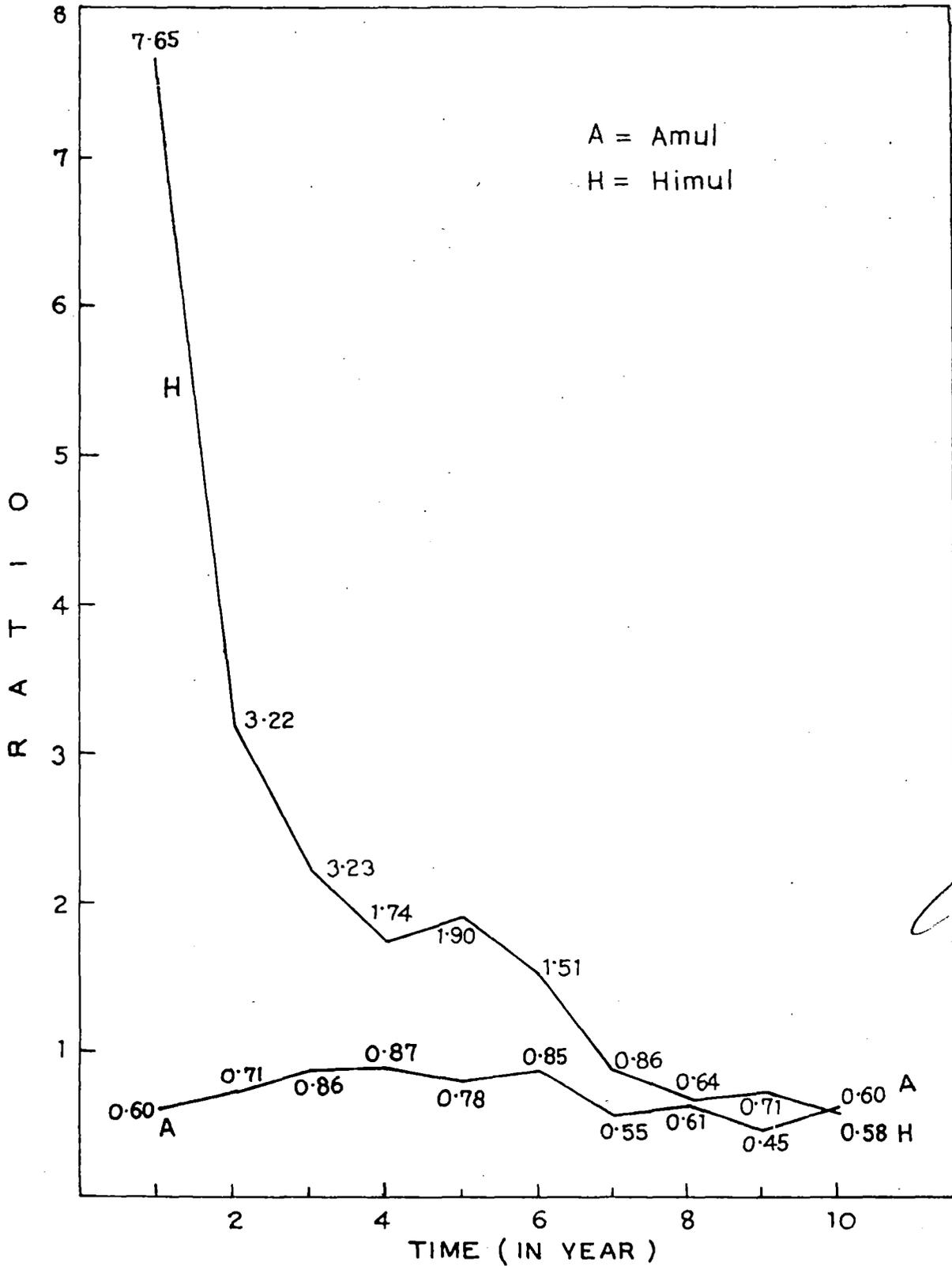
* Current ratio is computed by dividing current assets by the current liabilities. Current assets comprises stock, loans & advances, deposits, debtors, cash in hand, cash at bank, deferred revenue expenditure, cattle feed plant and other assets. And current liabilities comprises current liabilities & provisions, creditors, cattle feed plant and outstanding liabilities.

Current Ratio



Graph - 6.8 .

Acid - Test Ratio



Graph - 6.9.

with a position of unutilisation of current asset and comes down to a position which is far below the standard i.e., either 1 or 1.5. This trend of course indicates the future liquidity crisis.

TABLE 6.6

Coefficient of Variation of Ratios of Liquidity Group of Amul and Himul

Sl. No.	Ratios	Mean		S.D.		Coefficient of variation	
		Amul	Himul	Amul	Himul	Amul	Himul
i)	Current ratio	2.01	2.31	.34	2.15	17.254	92.778
ii)	Acid-Test ratio	.68	2.10	.14	2.12	21.404	100.83

In table 6.6 we represent the Coefficient of variation of ratios of liquidity group of Amul and Himul. Most uncomfortable extent of variation is revealed in case of Himul. Coefficient of variation of current ratio is 92.778 for Himul as against 17.254 for Amul. Similarly, the same measure is 100.83 for Himul as against 21.404 for Amul. This variation is obvious as the current ratio is as high as 7.88 in 1975-76 and it gradually comes down to only 0.81 in 1984-85. It implies that during the initial period of our study, current assets are not being utilised properly and in the later period the liquidity position of the organisation is at very dangerous level. It comes

down to a position when the organisation's current asset is much less than current liability which is supposed to be half of the current asset ideally. Moreover, Acid-Test ratio shows that current liability is double the current asset. It seems to imply an acute crisis of working capital as well as liquidity position of the organisation.

As against this mis-management or poor management of working capital of Himul, Amul maintains a very stable position of its working capital. It, of course, indicates an efficient working capital management of Amul. Amul maintains current ratio-uniformly almost at the level of 2 and Acid-Test ratio at the level of 1. It, therefore, may be said that neither there is unused current asset nor the shortage of working capital or the problems of liquidity in Amul.

In the following the rank Correlation between the ratios of liquidity group of Amul and Himul are given respectively.

TABLE 6.7

Rank Correlation Matrix of the Liquidity Group of Amul and Himul

Amul		Himul	
i	ii	i	ii
i) Current ratio	.64	i) Current ratio	.99
ii) Acid-Test ratio		ii) Acid-Test ratio	

In liquidity group we observe that both in case of Amul and Himul two ratios of this group give the ranking of same sequence since strong positive rank correlation of the order 0.99 in Himul and 0.64 in Amul has found.

PROFITABILITY GROUP :

The profitability group ratios indicate the overall performance of the firm measured in different ways²⁷.

There are many ratios for measuring profitability depending on the choice of the variables. Some common ratios we used are given in Table 6.8 below :-

TABLE 6.8

Summary of the Profitability Group Ratios

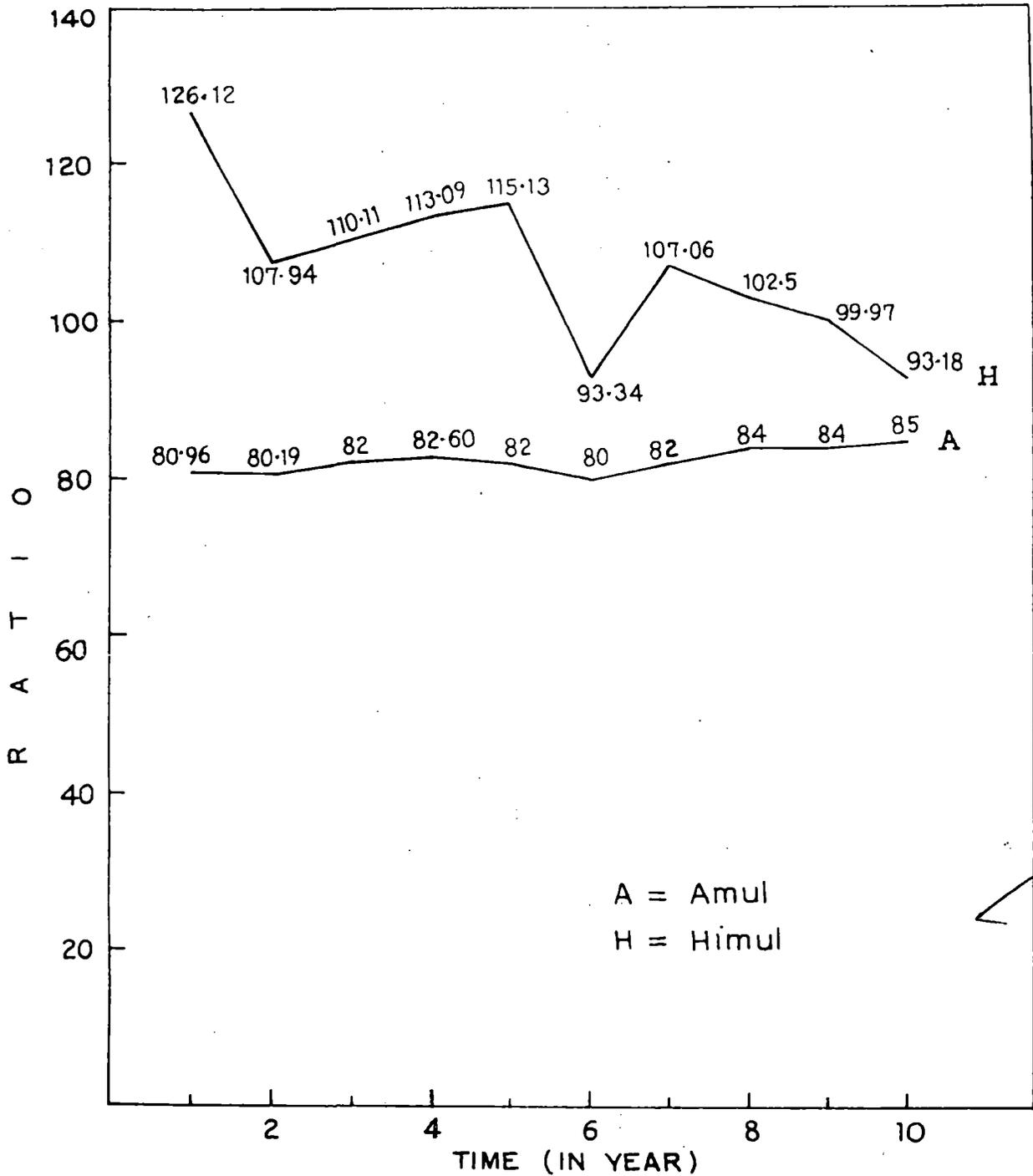
Sl. No.	Ratios	Formulae of Calculation
i)	Operating ratio	$\frac{\text{Total Operating Exp.}}{\text{Net Sales}} \times 100$
ii)	Operating profit to sales	$\frac{\text{Operating profit}}{\text{Net Sales}} \times 100$
iii)	Net Profit to Sales	$\frac{\text{Net Profit}}{\text{Net Sales}} \times 100$
iv)	Net Profit to Sales (considering grant subsidies)*	$\frac{\text{Net Profit (considering grant \& subsidies)}}{\text{Net Sales}} \times 100$
v)	Coverage of Interest payment	$\frac{\text{Earning before Int. \& Taxes}}{\text{Interest}}$
vi)	Return on Investment	$\frac{\text{Earning before Int. \& Taxes}}{\text{Capital employed}} \times 100$

*Net profit of Himul is calculated after deducting the grant & subsidies.

The graph of the operating ratio²⁸ (Graph 6.10) of ten years of Amul appears smooth. Eighty percent to eighty five percent operating expenditure provides the net margin of Amul within 15 percent to 20 percent. Whereas the same of Himul is fluctuating year to year between 93.18 percent to 126.12 percent.

It clearly explains why Himul is running with huge losses every year. Out of ten years, seven times this ratio comes out as higher than hundred which implies that total operating expenditure exceeds net sales. This is being the most important general measurement of operating efficiency and is important to management in judging its operations, the present position of this ratio in Himul identifies the extreme operational inefficiency on the part of the management. Though this financial ratio does not explain truly and fully the extent of responsibility of the management for this inefficient operation. It would never be correct to conclude that the degree of operating inefficiency revealed by this ratio have the scope of minimisation without considering the non-financial and other structural constraints of the management. Thus we have discussed some of these issues constrained upon management in our concluding chapter. Time-series curve of the operating profit to sales ratio²⁹ (Graph 6.11) of Amul except first year is uniform.

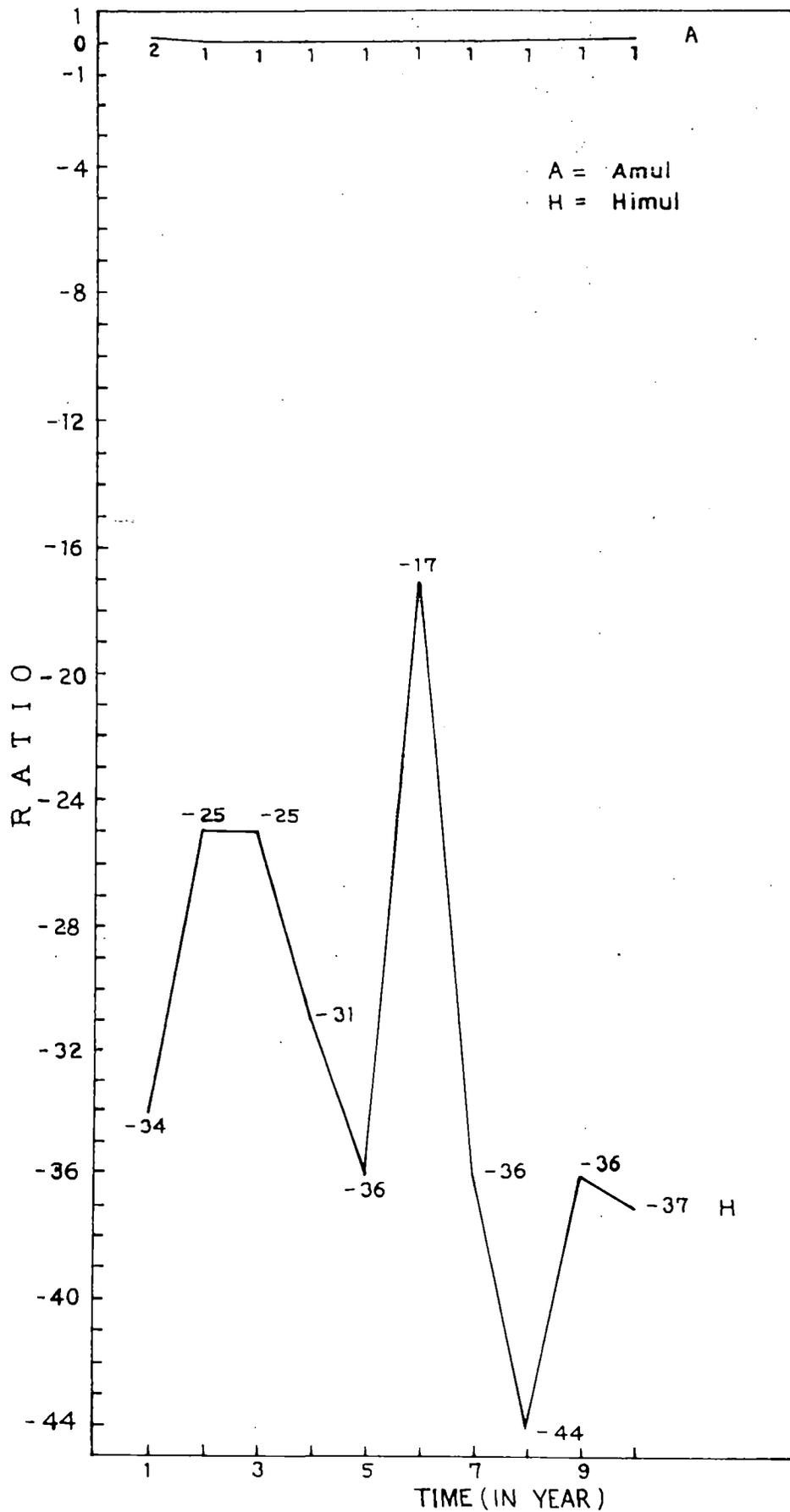
Operating Ratio



A = Amul
H = Himul

Graph - 6.10

Operating Profit To Sales



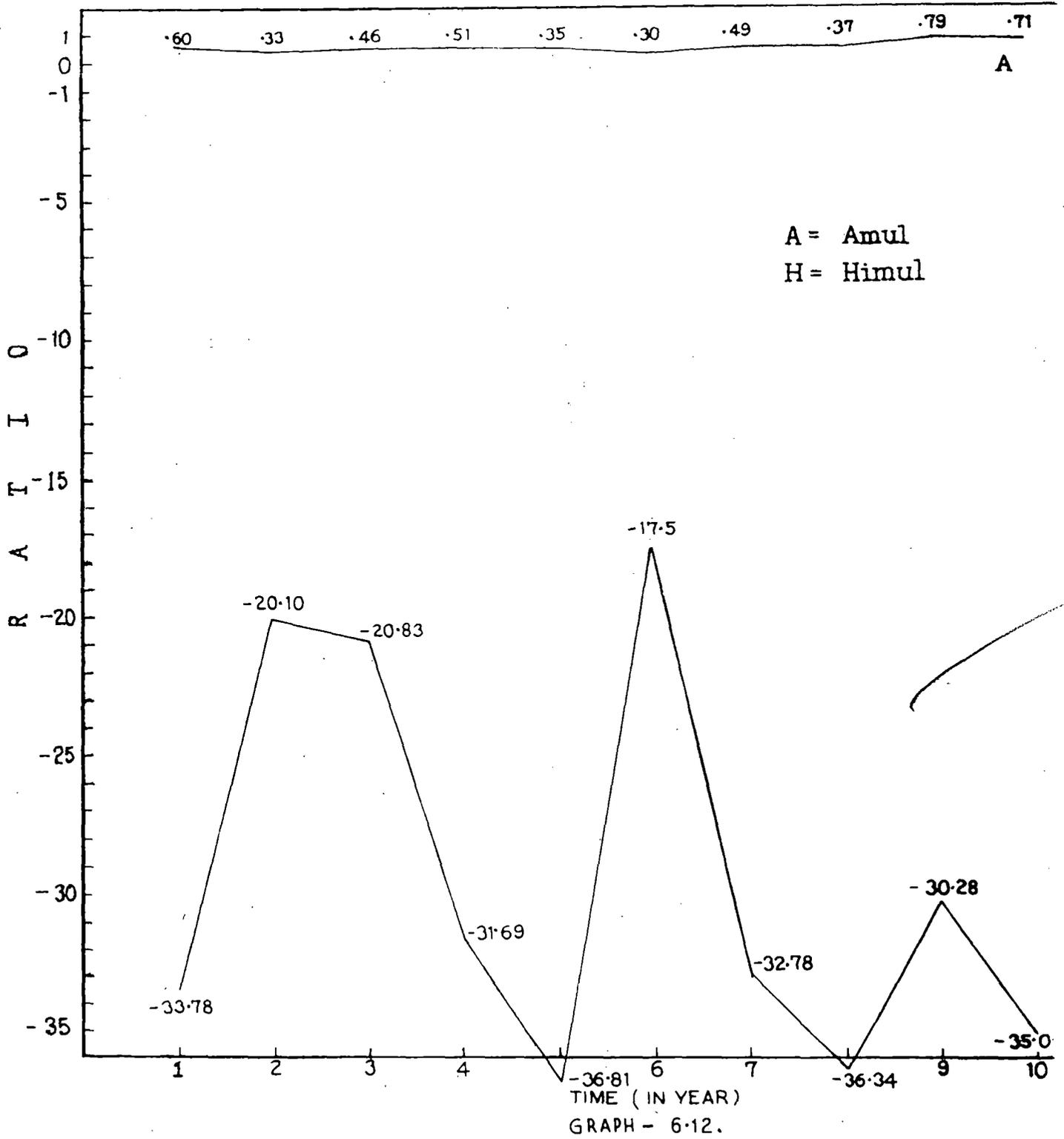
GRAPH - 6-11.

The implication of this ratio is that the lower the operating ratio, the higher is the margin of profit³⁰. In case of Amul, it declines to 0.01 in 1976-77 from 0.02 of 1975-76 and it maintains the same ratio throughout the whole period. Moreover, since the ratio is very small, Amul's margin of profit is high. On the otherhand, in case of Himul it not only fluctuates with sudden fall and rise in each year, profit being negative the curve lies always below the X-axis. Besides, higher negative ratio implies improper cost of production. It seems to indicate that the production management deserves to be scrutinized to identify the cost inefficient intermediate process if there is any. Since it requires a separate study and the details viability study of technical aspect of production process is beyond the scope of the present thesis, we do not comment precisely on this. We can only say in general that the time-series, analysis of this ratio reveals the undesired fluctuation of cost of production and at the same time cost of production is much higher than any economically viable level.

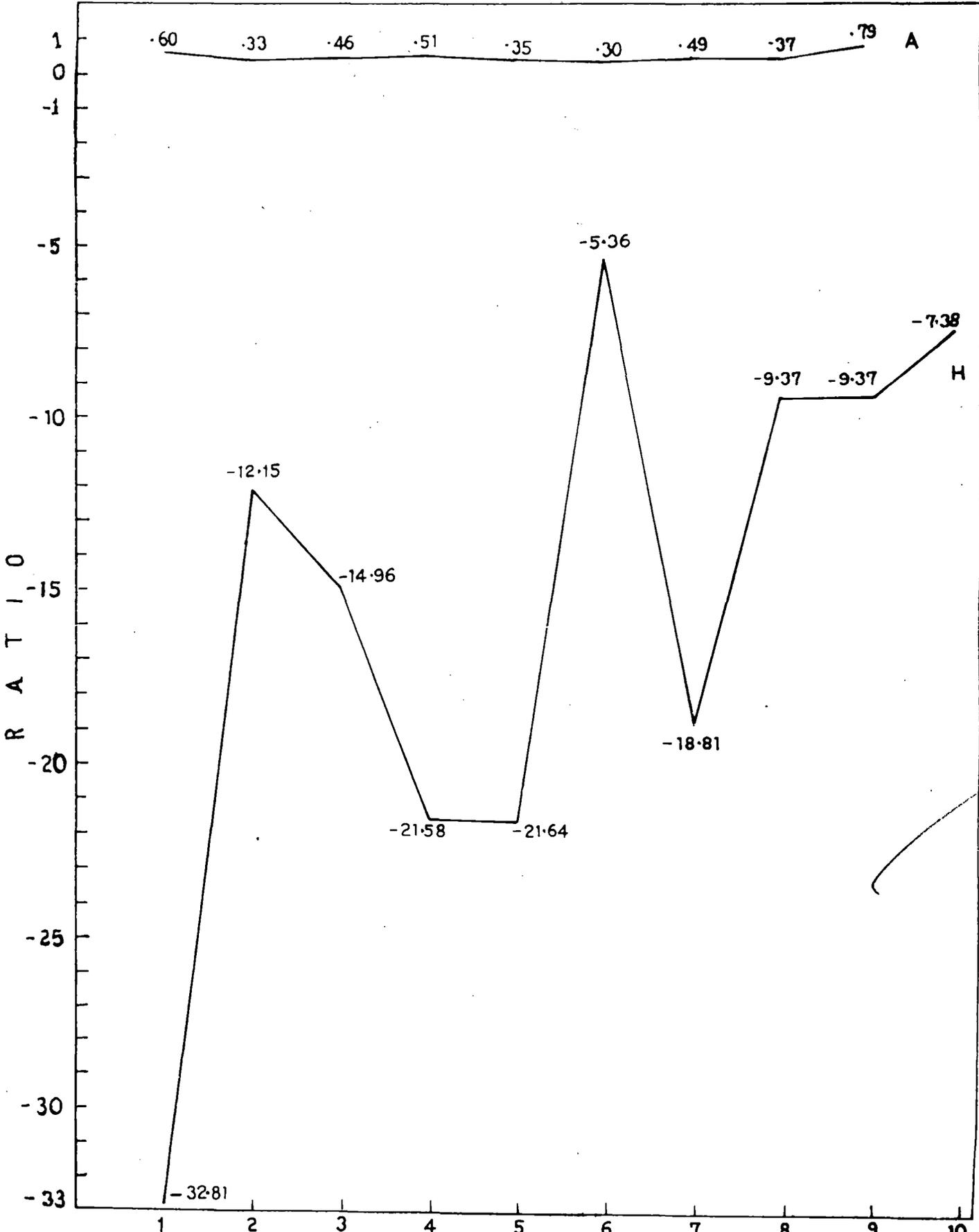
We have drawn two graphs of Net Profit to Sales ratio one with and other without grant and subsidies. The rational of two graphs has been given already.

Due to constant loss over the whole period, the Net Profit to Sales ratios³¹ (Graph 6.12 and 6.13) of Himul

Net Profit To Sales



Net Profit To Sales (Considering Grant & Subsidies)



TIME (IN YEAR)

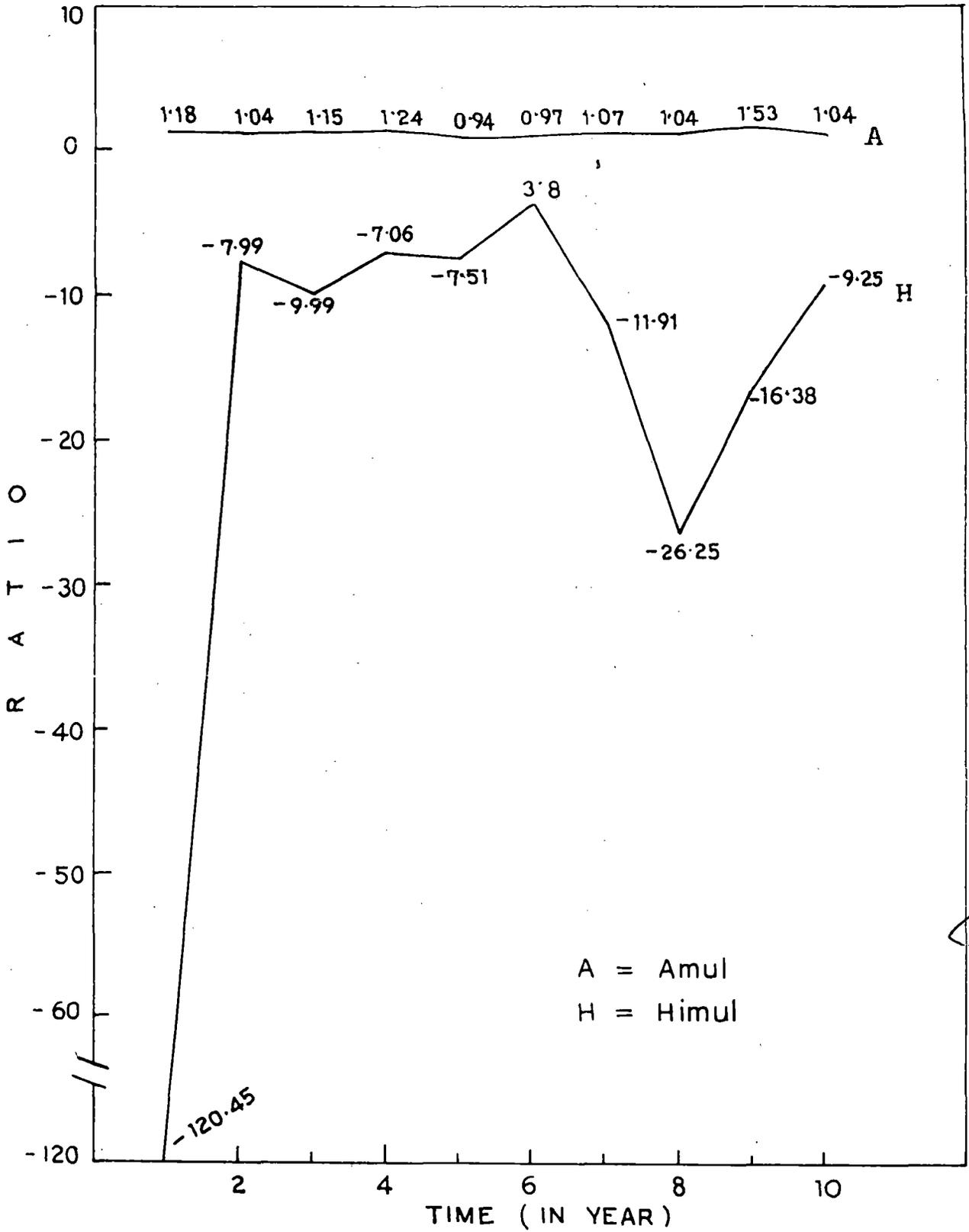
GRAPH- 6.13.

both have gone below the X-axis. And like previous one, these are also too much fluctuating. The range of this ratio of Himul is 19.31% whereas the range of the same ratio of Amul is only 49%. Again if the 'grant and subsidy' is not being considered as an income this ratio of Himul (Graph 6.13), especially of last three years shows a much adverse position.

The Coverage of Interest Payment ratio³² (Graph 6.14) of Amul is steady. Whereas this ratio of Himul is not steady one and below X-axis for obvious reason of negative profit. Usually a high ratio of coverage of interest payment indicates a low burden of borrowings of the business and lower utilisation of borrowing capacity³³. Therefore, the ratios show the constant existence of huge burden of borrowing in Himul and uniform and reasonable burden in case of Amul.

The Return on capital employed ratio³⁴ indicates the earning capacity of the capital employed of the business. Higher this ratio value indicates the better return on capital employed. On the otherhand, lower this ratio value indicates lower return on capital employed. Usually due to higher cost of production or lower selling price of the goods, the Return on capital employed ratio is lower³⁵. Here (Graph 6.15) this time-series ratio of Himul fluctuates year to year and has gone below the

Coverage of Interest Payment

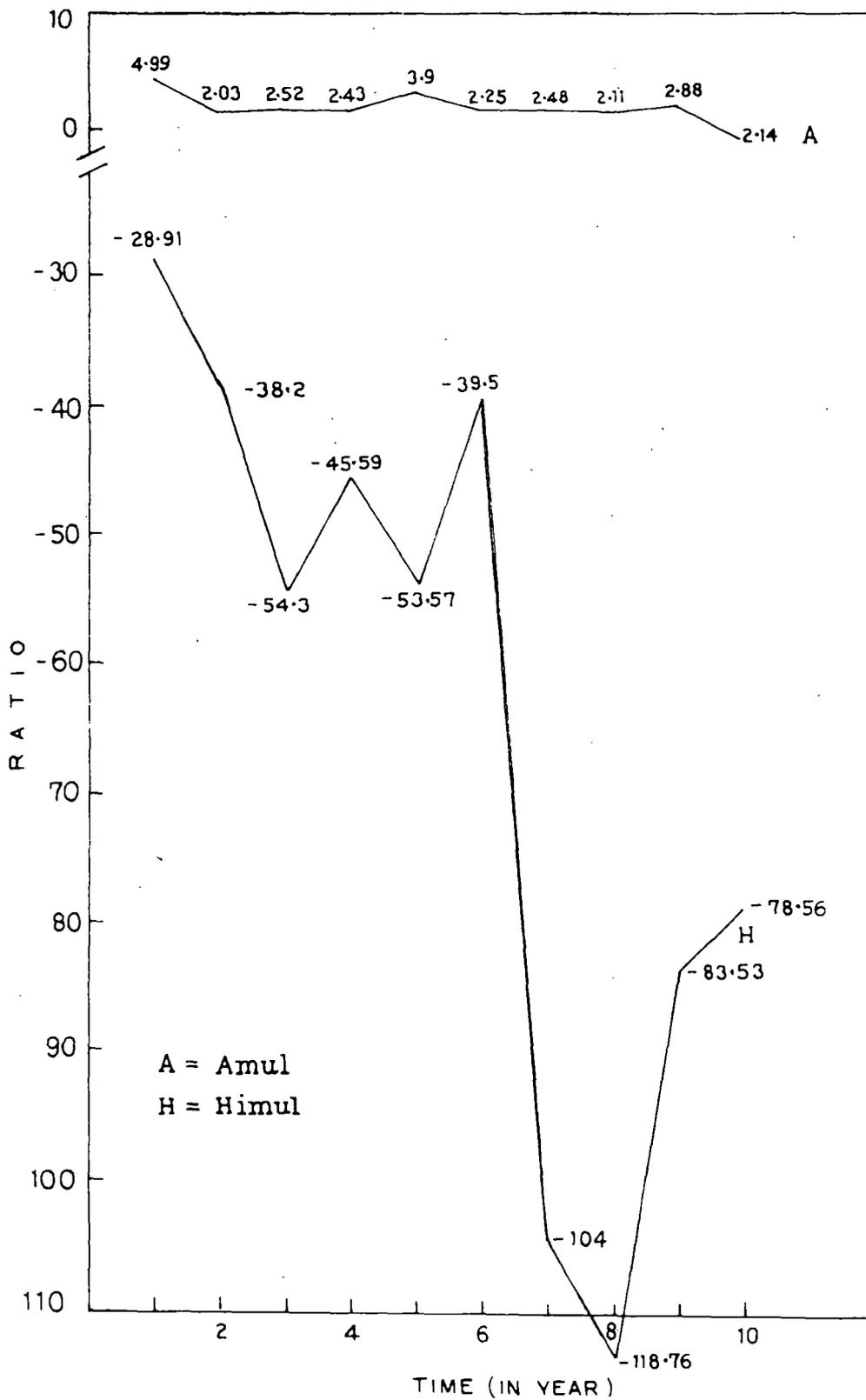


A = Amul

H = Himul

Group - 6.14.

Return on Investment



A = Amul
H = Himul

TIME (IN YEAR)
GRAPH - 6.15.

X-axis. But this ratio of Amul indicates a good Return on Investment situation.

TABLE 6.9
Coefficient of Variation of Ratios of Profitability Group
of Amul & Himul

Sl. No.	Ratios	Mean		S.D.		Coefficient of variation	
		Amul	Himul	Amul	Himul	Amul	Himul
i)	Operating ratio	82.27	106.84	1.57	9.62	1.920	9.008
ii)	Operating Profit to Sales	1.1	-32.1	.33	31.59	30.151	- 98.430
iii)	Net Profit to Sales	.49	-29.51	.15	6.87	32.04	- 23.3
iv)	Net Profit to Sales (considering Grant & subsidies)	.49	-15.33	.15	6.00	32.04	-191.44
v)	Coverage of Interest payment	1.12	-22.05	.16	33.33	14.498	-151.111
vi)	Return on Investment	2.77	-64.49	.90	28.68	32.515	- 44.479

Here we represent the Coefficient of variation of the time-series of both Amul and Himul to compare the degree of variability. The coefficient of variations of all the ratios (Table 6.9) of Himul indicate a wide range of fluctuation. Except 'Operating Ratio' all other ratios in

case of Himul indicate wider fluctuations compared to Amul. However, the positions of 'Net Profit to Sales (considering grant and subsidies)' and 'Coverage of Interest Payment' are the worst.

TABLE 6.10

Rank Correlation Matrix of the Profitability Group of Amul

	I	ii	iii	iv	v	vi
i) Operating Ratio		-.20	.61	.61	-.15	.12
ii) Operating Profit to Sales			.15	.15	-.27	.27
iii) Net Profit to Sales				*	-.51	.38
iv) Net profit to sales (considering grant & subsidies)					-.51	.38
v) Coverage of Interest Payment						-.28
vi) Return On Investment						

*The values of Debt to Equity and Debt to Equity (considering grant & subsidies) ratio are the same as Amul is not getting any grant & subsidies from any source.

TABLE 6.11

Rank Correlation Matrix of the Profitability Group of Himul

	i	ii	iii	iv	v	vi
i) Operating Ratio		.07	-.25	-.96	-.15	.43
ii) Operating Profit to Sales			.81	-.06	.47	.35
iii) Net Profit to Sales				.33	.43	.43
iv) Net Profit to Sales (considering Grant & Subsidies)					.20	-.31
v) Coverage of Interest Payment						.36
vi) Return on Investment						

In profitability group most of the rank Correlations of Himul are positive except insignificant correlation of 'Operating Profit to Sales' with 'Operating ratio' and 'Net Profit to Sales', whereas in case of Amul, there are many negative rank correlations among the ratios. Thus it implies that the conclusion regarding financial aspect of Himul made from each ratio is consistent with each other.

TURNOVER GROUP :

The turnover group ratio indicates the turnover of various classes of assets. More precisely, turnover ratios measure the efficiency of asset utilisation by the firm³⁶.

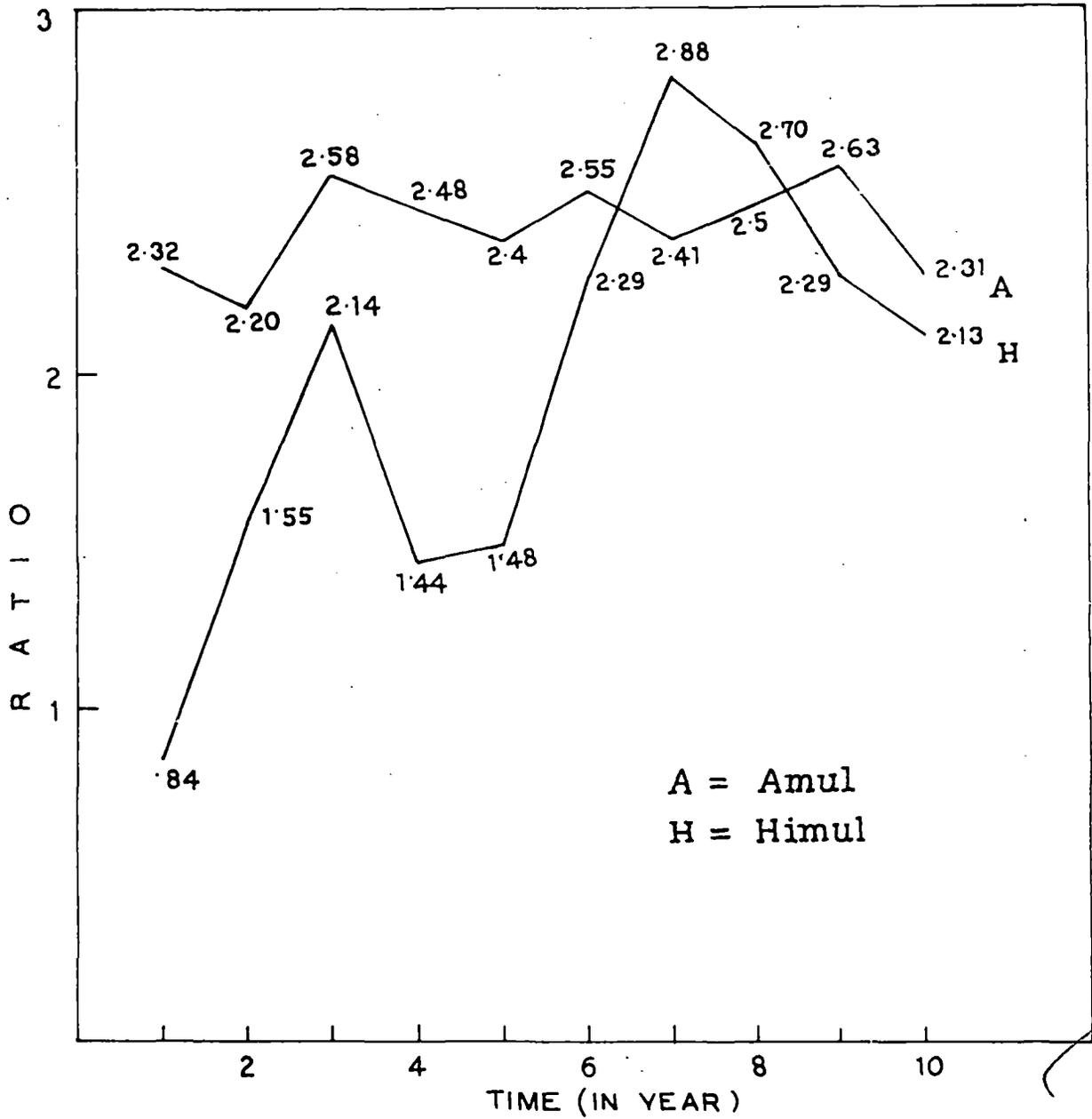
In the following Table 6.12 we have given the four turnover ratios. We have considered for our analysis along with their formulae.

TABLE 6.12
Summary of the Turnover Group Ratios

Sl. No.	Ratios	Formulae of Calculation
i)	Assets Turnover	$\frac{\text{Net Sales}}{\text{Net Fixed Assets}-\text{Current Assets}}$
ii)	Net working capital Turnover	$\frac{\text{Net sales}}{\text{Net working capital}}$
iii)	Receivable Turnover	$\frac{(\text{Opening} + \text{Closing Debtors}) \div 2}{\text{Net Sales}} \times 100$
iv)	Inventory Turnover	$\frac{\text{Cost of good sold}}{\text{Average Inventory}}$

Assets Turnover ratio³⁷ indicates the management's ability to make a good use of its tangible assets if the value of this ratio is higher, but a lower value of this ratio may mean large outlays for fixed assets³⁸. Here the ratio values (Graph 6.16) of Amul is steady than of Himul. Graph 6.16 indicates that Himul's effective use of fixed assets improves over time. It starts from 0.84 in 1975-76 but reaches at 2.88 in 1981-82 which is even higher than Amul's all time highest position. But Himul

Assets Turnover



A = Amul
H = Himul

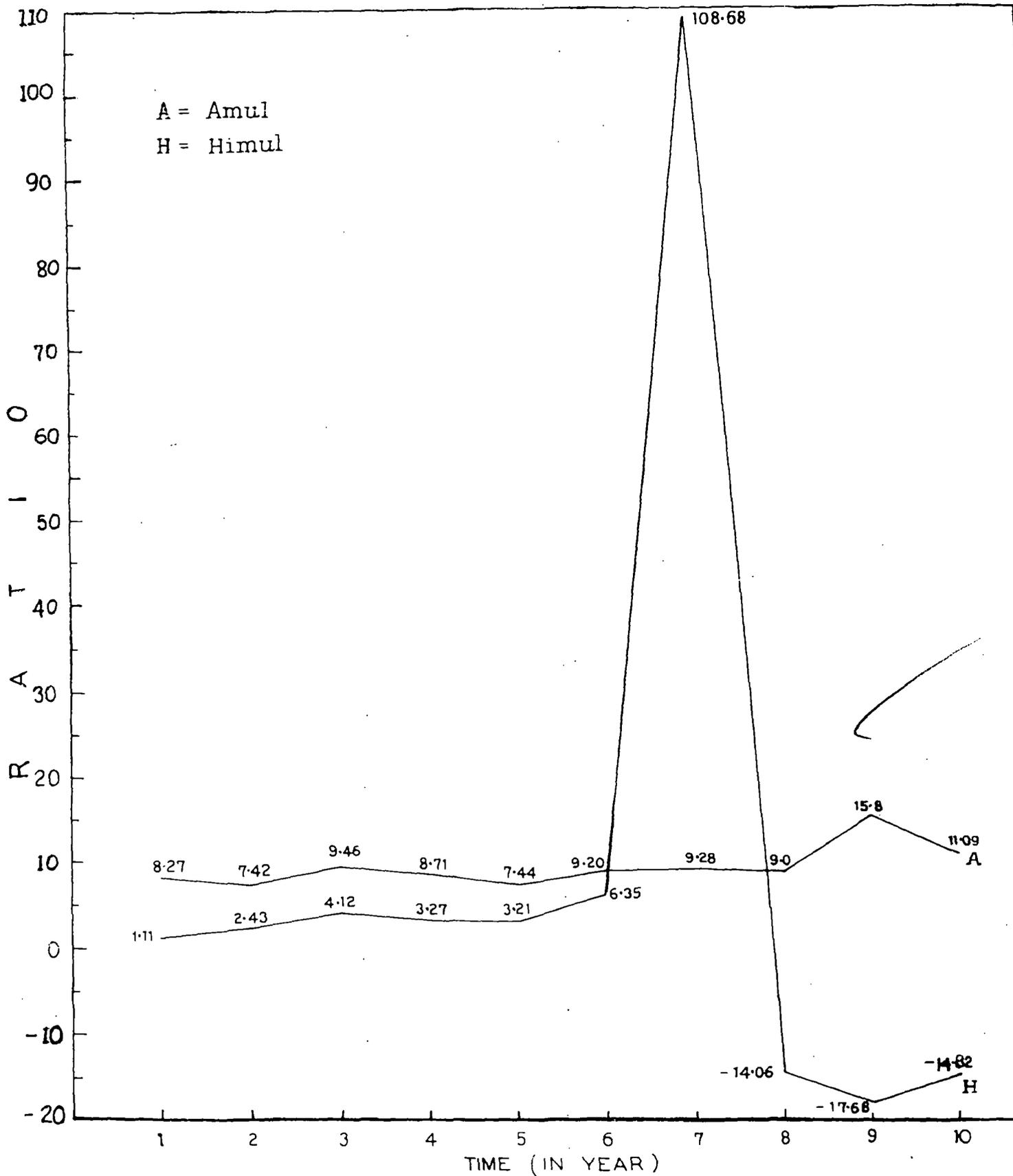
Graph - 6.16 .

fails to maintain this situation and gradually decreases to 2.13 in 1984-85.

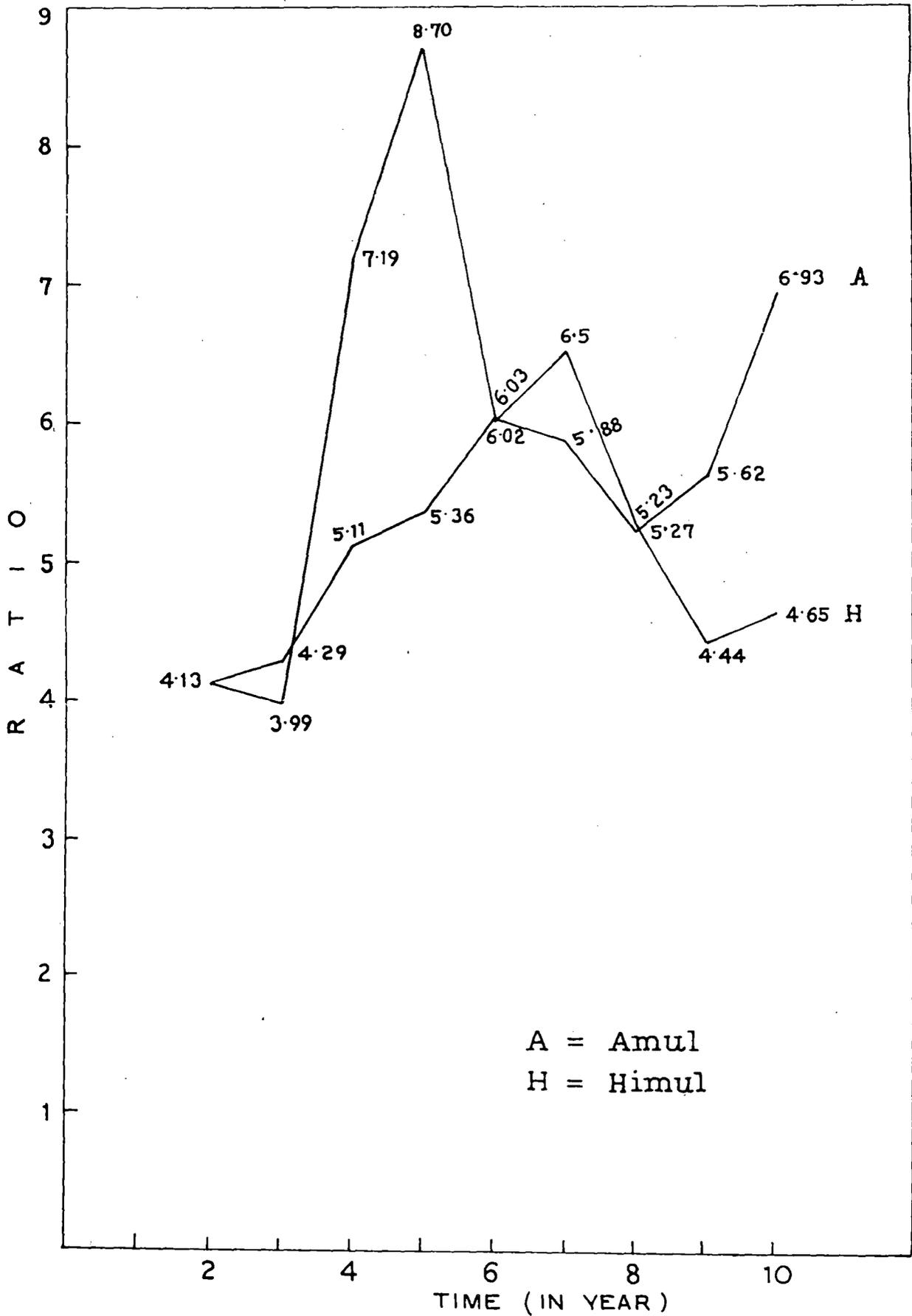
The ratio values of the second ratio of this group namely Net Working Capital Turnover ratio³⁹ shown in Graph 6.17 is almost identical to that of Funded Debt to Net Working Capital which we discussed in structural group. Since working capital is involved in both ratios, in this case also, the curve goes below the X-axis after it reaches its maximum in 1981-82. This also proves poor position of working Capital and inefficient management. However, sky high turnover of working Capital obtained in 1981-82 implies a sign of over trading and that may be the reason of worst position of Net Working Capital Turnover following 1981-82⁴⁰. Whereas Amul Maintains its uniformity throughout the period and a monotonic increasing trend is observed.

Receivable Turnover⁴¹ ratio values (Graph 6.18) of Himul starts to increase after a set back in the first year of our period of study. But it steadily declines to 4.44 in 1983-84 from 8.70 in 1979-80 which is the highest peak of the curve. On the contrary, Amul starts from the same point 4.13 but uniformly improves it to 6.93. However, the average collection period during the years of study is almost the same i.e. 20 days. This figure is very low. Much low an average collection period may be

Net Working Capital Turnover



Graph - 6.17.



A = Amul
H = Himul

Graph- 6.18 .

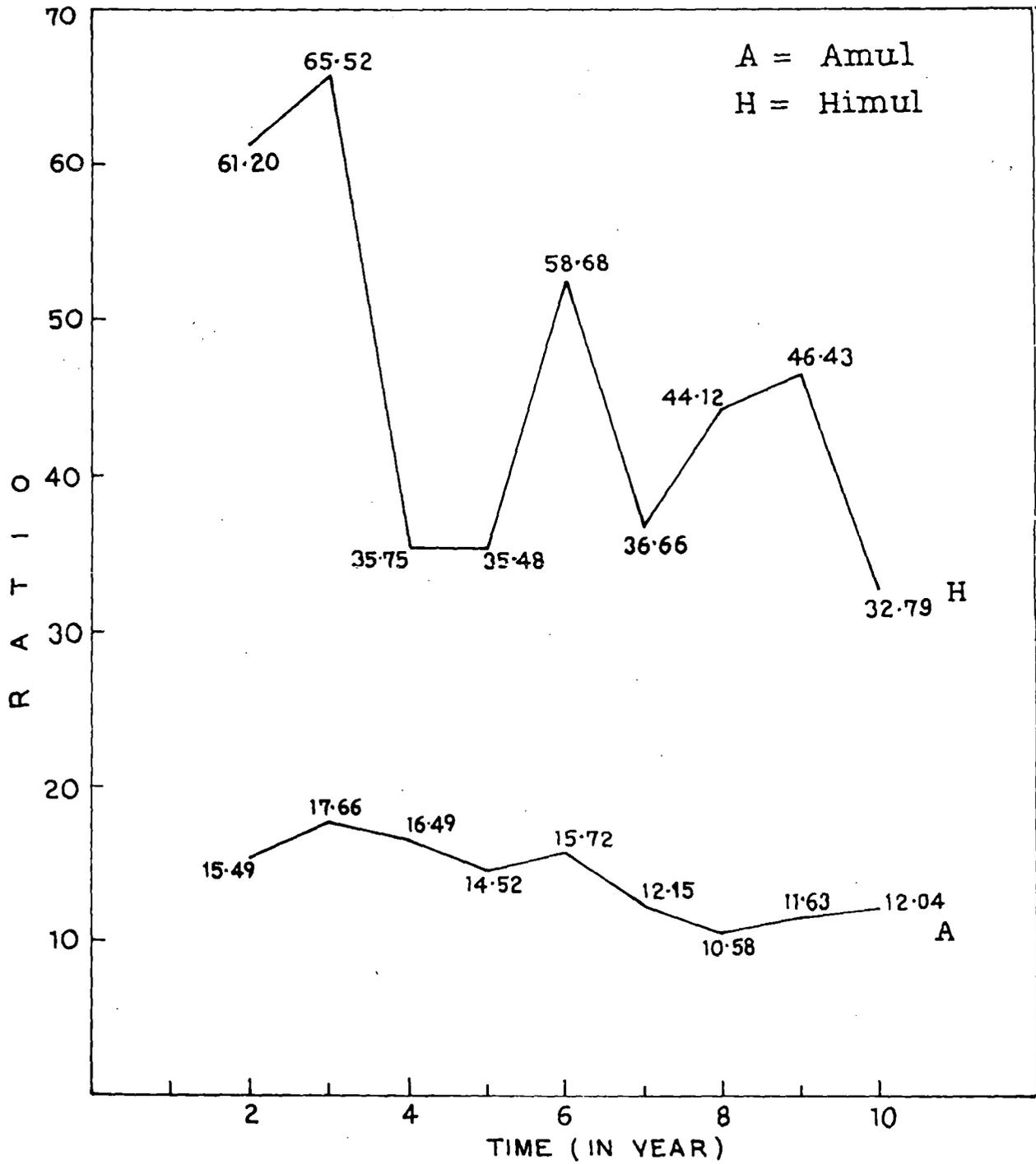
the result of much restrictive or tight credit policy⁴².

The Inventory Turnover ratio⁴³ varies between organisation to organisations due to the nature of operations. For a milk trading organisation which is marketing its products daily, this may be higher. The stock turnover ratio of Himul is much higher than the ratio of Amul (Graph 6.19). But the cause of lower ratio values of Amul is that the Amul is not only marketing the liquid milk, but also is marketing the Baby-food, Chocolate, Milk powder etc. which are more non perishable nature of product than liquid milk. Whereas the Himul is mainly marketing the liquid milk. However, the stock turnover ratio of Himul fluctuates year to year than that of Amul.

In this subsection we will discuss the Coefficient of variation of aforesaid ratios of the turnover group. In the following Table 6.13 we furnish the Coefficient of variation.

From the Table 6.13 it is much evident that between the time-series of each ratio of this group of Amul and Himul, latter one varies widely than the former. This also seems to imply, as before, existence of non-uniform policy adopted by Himul's management.

Inventory Turnover



Graph - 6.19 .

TABLE 6.13

Coefficient of Variation of Ratios of Turnover Group of Amul & Himul

Sl. No.	Ratios	Mean		S. D.		Coefficient of variation	
		Amul	Himul	Amul	Himul	Amul	Himul
i)	Assets Turnover	2.43	1.97	.13	.63	6.288	59.366
ii)	Net working capital Turnover	9.56	8.26	2.43	36.43	25.43	440.99
iii)	Receivable Turnover	5.39	5.65	.86	1.58	16.012	28.108
iv)	Inventory Turnover	14.03	44.51	2.49	13.25	17.749	29.769

TABLE 6.14

Rank Correlation Matrix of the Turnover Group of Amul and Himul

	Amul					Himul			
	i	ii	iii	iv		i	ii	iii	iv
i) Assets Turnover	.57	.03	.05		i) Assets Turnover	.16	-.17	.26	
ii) Net Working Capital Turnover		.55	-.28		ii) Net Working Capital Turnover		.33	.22	
iii) Receivable Turnover			-.42		iii) Receivable Turnover			-.68	
iv) Inventory Turnover					iv) Inventory Turnover				

t-matrices of turnover group reveal that ranking according to 'Net Working Capital' is positively related with the rankings according to both 'Assets Turnover' and 'Receivable Turnover' in case of Amul as well as Himul. But in Amul these are of high degree as against Himul where these are not that much of significant. This finding is of course very much consistent with our earlier discussion as Amul enjoys a very good position so far turnover is concerned. Frequent fluctuations of the position of each turnover ratio of Himul is apparent from the lower value of correlations.

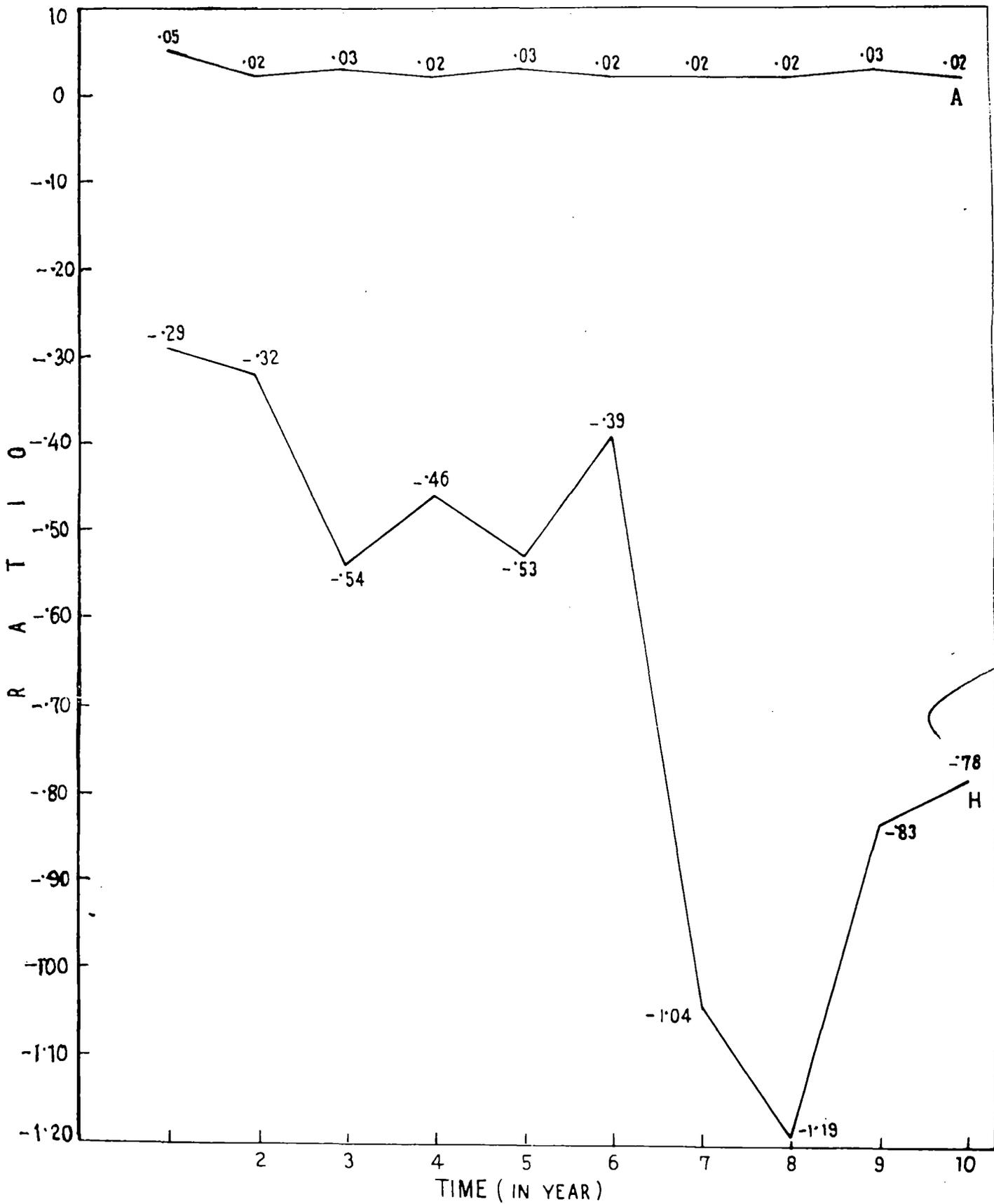
MISCELLANEOUS GROUP :

The last category of ratios is a general one in which all other important ratios which do not fall in any of the above categories are included.

We incorporate two of such ratios in our analysis and define them in Table 6.14 with their corresponding computing formulae.

The Net Operating Profit to total assets ratio⁴⁴ (Graph 6.20) of Himul is very much non-uniform than that of Amul. Due to Operating losses values of this ratio of Himul are negative.

Net Operating Profit To Total Assets



GRAPH - 6.20.

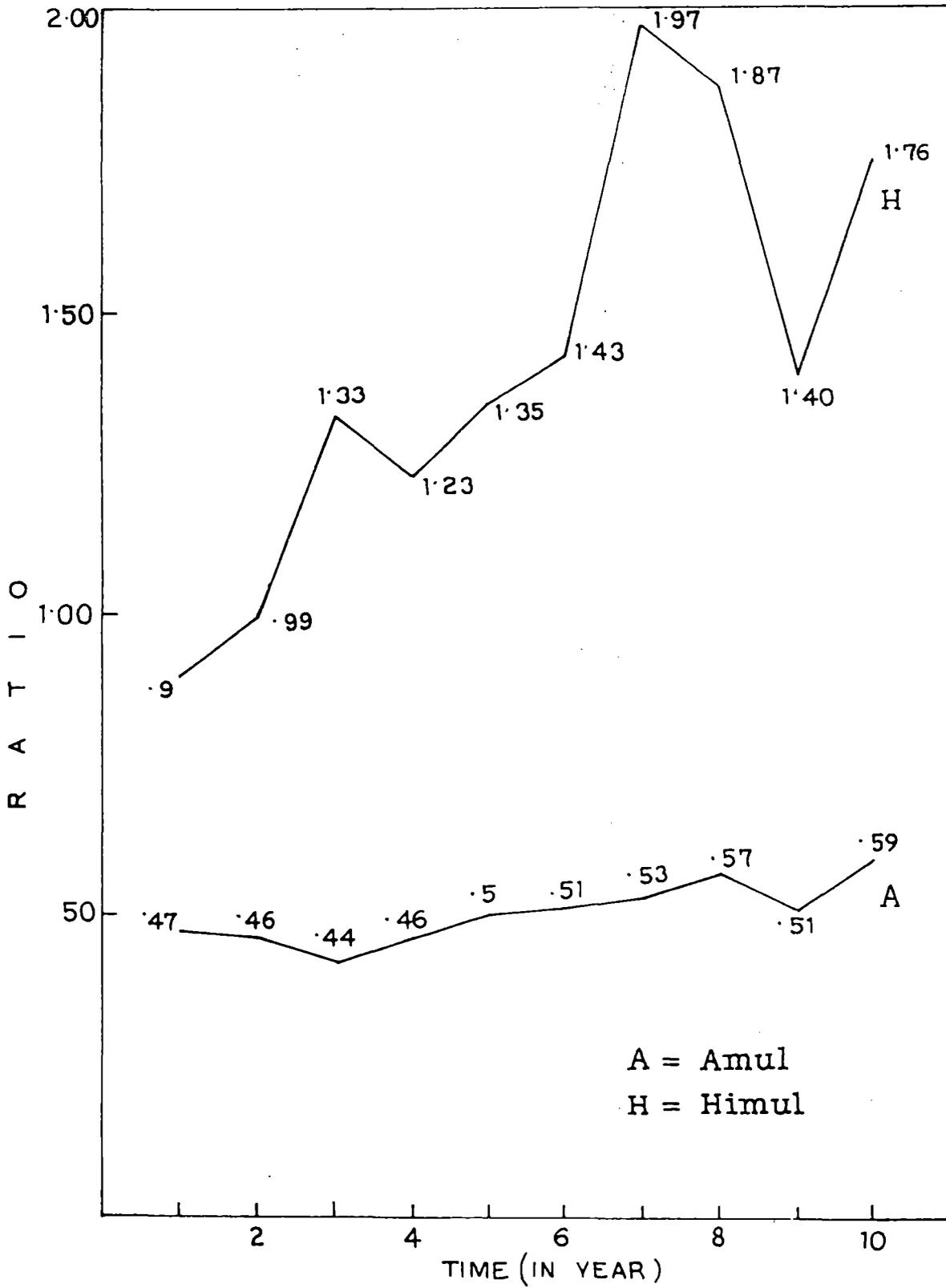
TABLE 6.15
Summary of the Miscellaneous Group Ratios

Sl. No.	Ratios	Formulae of Calculation
i)	Net Operating Profit to Total Assets	$\frac{\text{Net Operating Profit}}{\text{Total Assets}}$
ii)	Total Debt to Total Assets	$\frac{\text{Total Debt}}{\text{Total Assets}}$

Though the Total Debt to Total Assets⁴⁵ ratio (Graph 6.21) is fluctuating but the result of this ratio is significant in Himul. The cause behind it is that the Himul does not sell its product on credit. In case of Amul these ratios are lower than that of Himul. But it may not be sufficient to conclude that the creditors of Himul are more guaranteed than Amul, as it is well known that the lower this ratio, the greater is the caution against creditors' losses in the event of liquidation⁴⁶. But this can not be the only considerable factor to determine the power of solvency of a firm like Himul where loss is the constant companion.

Now coefficient of variations of these two aforesaid ratios of Amul and Himul are given in Table 6.16.

Total Debt To Total Assets



A = Amul
H = Himul

Graph - 6-21.

TABLE 6.16

Coefficient of Variation of Ratios of Miscellaneous Group
of Amul & Himul

Sl. No.	Ratios	Mean		S.D.		Coefficient of variation	
		Amul	Himul	Amul	Himul	Amul	Himul
i)	Net Operating Profit to Total Assets	.02	-.63	.009	.30	37.157	-48.528
ii)	Total Debt to Total Assets	.50	1.42	.04	.33	9.229	23.574

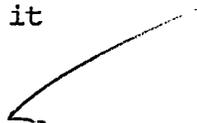
Here also Himul exhibits the high degree of variability as the coefficient of variation are much higher than Amul.

TABLE 6.17

Rank Correlation Matrix of the Miscellaneous Group of Amul
and Himul

	Amul		Y	Himul	
	i	ii		i	ii
i) Net Operating Profit to Total Assets				i) Net Operating Profit to Total Assets	
		-.5			-.83
ii) Total Debt to Total Assets				ii) Total Debt to Total Assets	

t-matrices of miscellaneous group expose that both in case of Amul and Himul rank of correlations are negative and of high degree. This is understandable as the first ratio depends on Net Operating Profit whereas the second one depends on total debt. Therefore, it suggests that rankings are of different order.



SUMMARY :

In this chapter we have computed different ratios in order to make an evaluation of the performance of both the organisations. For this purpose, a trend analysis of different ratios for ten years is made and interfirm comparison is also considered to get a clear picture.

During the course of our study it is found that there is virtually no financial control in Himul. In most of the cases different ratios of Himul depicted a very poor performance. This organisation has a negative net working capital. Also, it never earned surplus and return on capital employed is always negative. Again, this organisation has a very low current ratio indicating very poor state of current asset management.

In our analysis, we have considered Amul as an ideal organisation and the financial ratios of Himul are compared with the same ratios computed for Amul. It is found in our analysis that the financial position of Amul is much better than Himul. The dismal performance of Himul is reflected both in the trend analysis and comparative analysis. In most of the cases the rank correlation coefficients of different ratios are found to be very insignificant. Again, in some of the cases, we found a negative association between the two sets of ratios.

Notes & Reference

1. J.Batty, Management Accounting. Plymouth:Macdonald And Evans Ltd., 1976, p.374.
 2. S.Bhattacharyya, Financial Management in Tea Industry, Unpublished Ph.D. thesis, North Bengal University, 1984, p.29.
 3. Ibid., p.29.
 4. J.C.Van Horn, Financial Management and Policy. New Delhi:Prentice-Hall of India, 1975, p.655.
 5. Ibid., p.655.
 6. Kuchal, Financial Management - An Analytical and Conceptual Approach. Allahabad:Chaitanya Publishing House, 1980, p.66.
 7. J.Fred Weston, Eugene F.Brigham, Managerial Finance. New York:Holt, Rinehart & Weston, 1969, p.38.
 8. S.P.Gupta, Statistical Method. Delhi:Sultanchand & Sons, 1984, p.E-6.27.
 9. D.N.Elhance revised by Veona Elhance, Fundamental Statistics. Allahabad:Kitab Mahal, 1984, p.224.
 10. Frederick, C.Mills, Statistical Method. London:Sir Isaac Pitman & Sons, Ltd., 1955, p.124.
- 10-A. "A square $n \times n$ matrix is called an upper triangular matrix if all the entries below the diagonal are zeros. Similarly an $n \times n$ matrix is called a lower triangular matrix if all elements above the diagonal are zeros".

- S.Bazaraa and J.Jarvis, Linear Programming and Net Work Flows. New York:John Wiley & Sons, 1977, p.46.
11. N.G.Das, Statistical Methods. Calcutta:M.Das, 1973, p.345.
 12. R.R.Barthwal, Industrial Economics. New Delhi:Wiley Eastern, 1984, p.260.
 13. Kuchal, op.cit., p.57.
 14. "The Debt to equity ratio is an idea of the degree of protection the creditors of an enterprise have". P.K. Ghosh & G.S.Gupta, Fundamentals of Management Accountancy, Delhi:National Publishing House, 1979, p.143.
 15. J.Batty, op.cit., p.445.
 16. "This ratio gives an indication of the extent to which equity capital is invested in net fixed assets". Kuchal,op.cit., p.58.
 17. Ibid., p.58.
 18. J.Batty, op.cit., p.445.
 19. "This ratio acts as a supplementary measure to determine security for the lenders". Kuchal. op.cit., p.58.
 20. Ibid., p.58.
 21. Ibid., p.58.
 22. "This ratio is calculated by dividing the long term debt by the amount of the net working capital. It helps in examining creditors' contribution to the liquid assets of the Firm". Ibid., p.58.

23. R.R.Barthwal. op.cit., pp. 261,263.
24. "It is expressed as an integer and provides a rough measure of a firm's ability to meet its current obligations". P.K.Ghosh & G.S.Gupta, op.cit., p.141.
25. Ibid., p.141.
26. "The quick or liquid ratio shows the ability of a business to meet its immediate commitments. This ratio is also known as the acid-test ratio". J.Batty, op.cit., p.434.
27. R.R.Barthwal. op.cit., p.260.
28. "This ratio indicates what is the proportion of sales revenue that has gone into covering operating expenses". P.K.Ghosh & G.S.Gupta, op.cit., p.134.
29. "This ratio is very useful for purposes of internal analysis in detecting the areas of difficulty". Kuchal, op.cit., p.57.
30. "It is helpful in determining the ability of management in running the business". H.Chakraborty, Advance Accountancy. Calcutta;Oxford University Press, 1983, p.1472.
31. "Net profit to Sales ratio indicates how many paise of Net Profit is earned per rupee of turnover i.e. paisa per rupee left to proprietors after deducting costs etc. Although the ratio is not likely to be constant from year to year, it gives an idea as to the ultimate profitability of sales. It shows operational efficiency

i.e. efficiency regarding sales and cost control".

Ibid., p.1473.

32. "This measure is used to indicate time interest charge has been earned and how much safety margin is available to the share holders", R.M.Srivastava, Essentials of Business Finance. Delhi:Himalaya Publishing House, 1986, p.37.
33. Ibid., p.37.
34. "This ratio is an indicator of the earning capacity of the Capital employed in the business. By Capital employed, we mean not only the equity share capital and preference share capital, but also in addition to that the various fixed liabilities representing borrowed amount as also capital reserves, revenue reserves, undistributed profit as reduced by the fictitious assets. This ratio is considered to be the most important ratio because it reflects the overall efficiency with which capital used. This ratio is a helpful tool for making Capital budgeting decisions, a project yielding higher return is favoured". S.P.Jain & K.L.Narang, Advance Accountancy. Delhi:Kalyani Publishers, 1983, pp.12.6, 12.7.
35. Ibid., p.12.7.
36. R.R.Barthwal, op.cit., p.261.
37. "This ratio express relationship between the amount invested in the assets and the results accruing in

- terms of sales". R.M.Srivastava, op.cit., p.38.
38. Kuchal, op.cit., p.61.
39. "This ratio shows the number of times working capital is turned over in a stated period". S.P.Jain, op.cit., p.12.14.
40. Ibid., p.12.14.
41. "This ratio indicates the rate of which money is being received from credit sales. This ratio is sometimes reversed to show the average collection period". B.K. Bhar, op.cit., p.676.
42. P.K.Ghosh & G.S.Gupta, op.cit., p.140.
43. "This is an indication of the velocity of the movement of the goods during a period". B.K.Bhar, op.cit., p.676.
44. "Profit to Total Assets will indicate profit per Rupee of Assets". H.Chakraborty, op.cit., p.1473.
45. "This ratio exhibits the proportion of total assets created through debt including short term and long term liabilities. This ratio is computed by dividing total assets into total debt. This ratio is of considerable significance to the creditor in as much as it highlights the long-run solvency of the company". M.Srivastava, op.cit., p.36.
46. Ibid., p.36.

Chapter - VII

Economic Impact of 'AMUL' & 'HIMUL' On The Rural Development

Dairying is one of the most effective instrument of supplementing farmer's income and generating employment in the rural sector. Dairying requires one million Rupees to create an employment potential of 290 persons- years as against 120-200 persons- years for crop production¹.

"Dairy animals, comprising of cows and buffaloes, are the major livestock and hold a very important place in the national economy. Apart from their role in milk production, they contribute a huge quantity of organic manure, which is one of the major inputs in our agriculture.

Dairy farming is also very important subsidiary occupation.

It provides employment to millions of unemployed and

under-employed, and particularly to small farmers, marginal farmers and landless labourers in villages. In view of these benefits, and the facts that dairy animals being ruminants, can utilize rough ages, dairy farming should complement and supplement the production of food and fibre in the country and not compete with it"². To improve socio-economic conditions of village-based population in India, a sizeable portion of which is living below poverty line³. Dairying has been chosen by the Government of India as a compatible means. Besides, dairying is a labour intensive economic activity and has the potential of generating cash income for people in rural areas⁴. A question can be reasonably, asked at this juncture-what can Dairy Co-operative contribute in the Programme of Dairy Development ?

To review the impact of the dairy co-operatives of Amul & Himul on rural development in the area concerned, 150 households of different groups are taken from the 6 dairy villages and 2 non-dairy villages of the area of Himul by stratified Random Sampling⁵ and compare these results with the similar results of the area of Amul which was done earlier by S.M.Patel and M.K.Pandey of Institute of Co-operative Management, Ahmedabad, Gujrat. Of these, 3 dairy and 1 non-dairy villages are taken from each of the plains and the hills in Himul as the areas of Himul cover both the hills and plains. The technique of sampling used here has

been followed in the foots-steps of S.M.Patel and M.K. Panday. We have followed their technique of sampling simply to make a comparison between Himul and Amul.

LAND HOLDING :

TABLE 7.1

Land Holding Pattern of Sample Households of Amul & Himul

Holding Pattern	No. of households			
1. Weaker Section : 12 dairy vills 4 non-dairy vills.				
A. Landless households	A	H	A	H
	22	22	8	21
B. Small farmers (0.1 to 2.0 hec.)	53	55	16	25
2. Stronger Section :				
C. Medium farmers (2.1 to 4.0 hec.)	13	15	18	3
D. Big farmers (4.1 to above hec.)	12	8	8	1
Total	100	100	50	50

Note : A denotes Amul and H denotes Himul.

A sample analysis of land holding in hinterland of Amul and Himul discloses that in dairy villages a large

number of households belong to the weaker section. Percentage of medium farmers are almost the same in both areas of Amul and Himul. The difference is only of 2%. But the percentage of big farmers is higher in Amul against Himul. Whereas in non dairy villages the percentage of weaker section and stronger section is almost the same in Amul. But it is different in Himul. Here, a large number of households belong to the weaker section. Only 8% of the households belong to the stronger section.

TABLE 7.2

Land Holding Pattern of Sample Households of Plains & Hills of Himul

Holding Pattern	No. of Households			
	6 Dairy Villages		2 non-dairy vills.	
	P	M	P	M
1. Weaker Section :				
A. Landless households	6	16	9	12
B. Small farmers : (0.1 to 2.0 hec.)	27	28	14	11
2. Stronger Section:				
C. Medium farmers : (2.1 to 4.0 hec.)	10	5	2	1
D. Big farmers : (4.1 to above hec.)	7	1	0	1
Total	50	50	25	25

Note : P denotes plains and M denotes hills.

But when discussed in respect of the hills and plains of Himui, it becomes clear that a large number of households belong to the weaker section in all respects.

In dairy villages percentage of small farmers is almost the same. The difference is meagre (2 percent). A large number of sample households in hills in dairy villages have no land. In dairy villages the stronger section of the sample households in hills is far behind the plains. In non-dairy villages of the hills near about half of the sample households belong to the landless group. Again, in dairy and non-dairy villages comparatively the stronger section of non-dairy villages is lagging behind the stronger section of the dairy villages. However, it may be clear that in dairy and non-dairy villages land holding pattern of the plain is much better than that of hills.

DISTRIBUTION OF MILCH ANIMALS :

"Most of the cultivating households, irrespective of the size of their land-holdings, own some milch animals or the other. Cattle rearing continues to be an integral part of Indian agricultural scene. These animals can easily be maintained on the crop residues, on weeds and green grass collected by the landless, etc."⁶. And the

milk production is the subsidiary income of the farmers in dairy villages as well as non-dairy villages. A sample survey of households and the number of milch animals disclose (Table 7.3) that,

TABLE 7.3

Milch Bovine Distribution Pattern of Sample Households of Amul and Himul

Group (Holding Pattern)*	Milch bovine distribution								Total no. of households rearing milch animals	
	0		1		2		3+			
	A	H	A	H	A	H	A	H	A	H
DAIRY VILLAGES										
A	1	-	18	14	3	5	-	3	21	22
B	4	1	28	16	20	25	1	13	49	54
C	-	-	4	3	8	3	1	9	13	15
D	-	-	3	-	5	1	4	7	12	8
Total	5	1	53	33	36	34	6	32	95	99
NON-DAIRY VILLAGES										
A	-	11	6	4	1	6	1	-	8	10
B	1	8	7	14	7	1	1	2	15	17
C	1	2	8	1	5	-	4	-	17	1
D	-	-	1	1	6	-	1	-	8	1
Total	2	21	22	20	19	7	7	2	48	29

* Vide Table 7.1

In Amul the number of households keeping one milch bovine is highest in both dairy and non-dairy villages. And the number of households keeping two milch bovines is the second. Whereas in case of Himul the number of households keeping one, two or above milch bovines are almost the same in dairy villages. But in non dairy villages the number of households keeping only one milch bovine is the highest. It is to be noted that 42% of the total households of non-dairy villages of Himul keep no milch bovine and most of them are landless households. However, in Amul most of the households i.e. 95 percent and 96 percent in dairy villages and non-dairy villages respectively, have atleast one milch bovine. In Himul, 99 percent of the sample households of dairy villages have one or more milch bovine but in non-dairy villages, this percentage is only 58. Besides in Amul and Himul in both the situations the number of households keeping one or above milch animals belong to the weaker section.

The Table 7.4 discloses that in hills, all the sample households of dairy villages are keeping atleast one milch animal, but in case of plains 2 percent of the total sample households in dairy villages are not keeping any milch animals. Whereas in non-dairy villages in hills only 40 percent of the total households are keeping milch animals. In plains the position in this respect is much

TABLE 7.4

Milch Bovine Distribution Pattern of Sample Households of
Plains and Hills of Himul

Group (Hold- ing Pattern)	Milch bovine distribution								Total no. of households rearing milch animals	
	0		1		2		3+		P	M
	P	M	P	M	P	M	P	M		
Dairy Villages										
A	-	-	6	8	-	5	-	3	6	16
B	1	-	6	10	13	12	7	6	26	28
C	-	-	1	2	3	-	6	3	10	5
D	-	-	-	-	1	-	6	1	7	1
Total	1	-	13	20	17	17	19	13	49	50
Non-dairy Villages										
A	3	8	1	3	5	1	-	-	6	4
B	2	6	10	4	1	-	1	1	12	5
C	1	1	1	-	-	-	-	-	1	-
D	-	-	-	1	-	-	-	-	-	1
Total	6	15	12	8	6	1	1	1	19	10

better than that in the hills i.e. 76 percent. In plains number of milch bovine keeping by the households of dairy villages is gradually increasing. But in the hills this

figure is gradually decreasing. In both dairy and non-dairy villages the maximum number of households, those who are keeping one milch bovine or more, are belonging to the weaker section.

TYPES OF MILCH ANIMALS :

Table 7.5 shows the number of different types of milch animals kept by the sample households.

In both Amul and Himul, goats are not kept by the households in general in dairy villages. And it is also remarkable that in Amul, buffaloes are kept in general and in Himul Cows are kept in general by the sample households in both dairy and non-dairy villages with a few exceptions. In dairy villages in Himul average number of milch animals per family is higher than that of Amul but in non dairy villages it is higher in Amul. The average number of milch animals (buffaloes/cows) per family rises with rise in the size of landholding in both dairy and non-dairy villages with the exception in non-dairy villages of Himul. It is observed in Amul, on an average a household keep in dairy and non-dairy villages 1.5 and 1.6 units of milch buffaloes respectively; but in Himul, a household in the dairy and in the non-dairy villages own 2.2 and 0.8 units of cows respectively.

TABLE 7.5

Number and Different type of Milch Animals woned by the Sample Households

Group (Holding Pattern)	No. of milch animals woned						Average No. of milch buffalo/ cow per family	
	Cows		Buffaloes		Goats		A	H
	A	H	A	H	A	H		
Dairy Villages								
A	-	34	24	-	-	-	1.1	1.5
B	2	108	71	-	-	-	1.3	1.9
C	-	44	24	-	-	-	1.8	2.9
D	-	36	29	3	-	-	2.4	5.1
Total	2	222	148	3	-	-	1.5	2.2
Non-Dairy Villages								
A	1	17	12	-	-	12	1.5	0.8
B	-	23	24	-	1	11	1.5	0.9
C	4	1	28	-	15	3	1.6	0.3
D	-	1	16	-	2	-	2.0	1.0
Total	5	42	80	-	18	26	1.6	0.8

Considering all the groups together, there is no remarkable difference between dairy and non-dairy villages in Amul but in Himul it is comparable difference.

TABLE 7.6

Number and Different types of Milch Animals owned by the Sample Households in Plains and Hills of Himul

Groups (Holding Pattern)	No. of milch animals owned						Average No. of milch buffalo/ cows per family	
	Cows		Buffaloes		Goats		P	M
	P	M	P	M	P	M		
Dairy Villages								
A	6	28	-	-	-	-	1.0	1.7
B	54	54	-	-	-	-	2.0	1.9
C	31	13	-	-	-	-	3.1	2.6
D	31	5	3	-	-	-	4.8	5.0
Total	122	100	3	-	-	-	2.5	2.0
Non-dairy Villages								
A	11	6	-	-	-	12	1.2	0.5
B	16	7	-	-	-	11	1.1	0.6
C	1	-	-	-	-	3	0.5	-
D	-	1	-	-	-	-	-	1.0
Total	28	14	-	-	-	26	1.1	0.6

In both dairy and non-dairy villages the average number of milch animals per family in the Plains is higher

than those in hills. It is also remarkable that the average number of milch animals per family increases with the increase in the size of landholding in both the situations except in non-dairy villages of the Plains where the reverse happens. The difference between the average number of milch animals per family of dairy and non-dairy villages in Plains is more than the difference between the average number of milch animals per family of dairy and non-dairy villages in hills.

PERCENTAGE OF WET AND DRY MILCH ANIMALS :

The quantity of milk production depends mainly upon what types of milch animals are kept and what are the percentages of the Wet and the Dry milch animals in the sample villages. The picture of percentage of Wet and Dry milch animals with each group is given in Table 7.7.

In Amul and Himul the percentage of Wet animals is higher than that of the percentage of Dry animals in both the situations i.e. dairy and non-dairy villages. The weaker section of the sample households has highest percentage of Wet animals in Amul and Himul in dairy

TABLE 7.7

Percentage of Wet and Dry milch animals with each group
of Amul and Himul

Group (Holding Pattern)	Percentage of buffaloes or cows			
	Wet		Dry	
	A	H	A	H
Dairy Villages				
A	75	59	25	41
B	72	68	28	32
C	58	59	42	41
D	65	53	35	47
Total	69	62	31	38
Non-dairy Villages				
A	72	53	28	47
B	62	52	38	48
C	64	100	36	00
D	50	100	50	00
Total	62	55	38	45

villages. But in non dairy villages this picture is reverse with the exception of Amul.

TABLE 7.8

Percentage of Wet and Dry Milch Animals With Each Group
of Plains and Hills of Himul

Group (Holding Pattern)	Percentage of buffaloes or cows			
	Wet		Dry	
	P	M	P	M
Dairy Villages				
A	50	60	50	40
B	55	80	45	20
C	71	31	29	69
D	51	60	49	40
Total	58	67	42	33
Non-dairy Villages				
A	36	83	64	17
B	37	86	63	14
C	100	-	-	-
D	-	100	-	-
Total	39	86	61	14

Further in hills of Himul the percentage of Wet animals is higher than that of percentage of Dry animals

in both the situations. But in Plains of Himul, that percentage is higher only in dairy villages. In hills, the weaker section of the sample households have the highest percentage of wet animals in dairy and non-dairy villages, whereas in the Plains, this picture is different in both the situations.

PRODUCTION OF MILK :

Table 7.9 represents the data of dairy milk production by different size group of sample households as well as the milk production of different types of milch animals. The above table depicts that in Amul 99.4 percent of the total milk production and in Himul 98.2 percent of the total milk production are contributed by buffaloes and cows respectively in Dairy villages. In non-dairy villages same percent of the total milk production in Himul and 92.8 percent of the total milk production in Amul are contributed by cows and buffaloes respectively. Only 0.6 percent and 7.2 percent of the total milk production are produced by cows and goats in Dairy and non-dairy villages of Amul. And in Himul only 1.8 percent of the total milk is produced by buffaloes in Dairy villages. Thus it is quite apparent that the existing pattern of milk production is perfectly based on cow and buffalo rearing in Himul and in Amul respectively.

TABLE 7.9

Milk Production by Sample Households (Per Day)

Group (Holding Pattern)	Production of milk by each group in litres per day							
	Buffaloes		Cows		Goats		Total	
	A	H	A	H	A	H	A	H
Dairy Villages								
A	129.0 (19.90)	-	-	61.5 (22.28)	-	-	129.0	61.5
B	311.0 (47.95)	-	4.0 (100.0)	157.0 (56.89)	-	-	315.0	157.0
C	89.5 (13.80)	-	-	32.5 (11.77)	-	-	89.5	32.5
D	119.0 (18.35)	3 (100.0)	-	25.0 (9.06)	-	-	119.0	28.0
Total	648.5 (100.0)	3 (100.0)	4.0 (100.0)	276.0 (100.0)	-	-	652.5	279.0
Non-Dairy Villages								
A	40.5 (16.63)	-	3.5 (29.17)	28.0 (58.95)	-	-	44.0	28.0
B	73.5 (30.19)	-	-	18.5 (38.94)	-	-	73.5	18.5
C	89.0 (36.55)	-	8.5 (70.83)	1.0 (2.10)	6.0 (85.71)	-	103.5	1.0
D	40.5 (16.63)	-	-	-	1.0 (14.29)	-	41.5	-
Total	243.5 (100.0)	-	12.0 (100.0)	47.5 (100.0)	7.0 (100.0)	-	262.5	47.5

Suman

In both Himul and Amul, major portion of the total milk production of sample households in dairy villages is contributed by small farmers. The weaker section which constituted 7.7 per cent in Himul and 7.5 per cent in Amul of the total sample households in dairy villages produces almost 78 percent and 68 percent of the total milk respectively. Here, contribution of the weaker section according to its strength of mass is almost the same in Himul but in Amul it is 7 percent less than their strength of mass in dairy villages.

However, in non-dairy villages, the weaker section constituted 46 percent in Himul and 43 percent in Amul of the sample households produced almost 100 percent and 47 percent of the total milk respectively. Only in non-dairy villages of Amul, the proportion of different groups of households indicates a nice relationship with their production of milk. It is clear that in both the situation of Amul and Himul, the weaker section is the potential factor of milk production and this is so specially in Himul.

The daily milk production by the sample households in plains and hills of Himul (table 7.10) shows that, the biggest producers of milk in both the plains and hills in dairy villages are small farmers. But in non-dairy villages the biggest milk producers belong to small farmers group in plains and landless households in hills.

TABLE 7.10
Milk Production by Sample Households (Per Day) of Plains
& Hills of Himul

Group (Holding Pattern)	Production of milk by each group in litres per day							
	Cows		Buffaloes		Goats		Total	
	P	M	P	M	P	M	P	M
Dairy Villages								
A	3.0 (4.25)	58.5 (28.46)	-	-	-	-	3.0	58.5
B	35.0 (49.64)	122.0 (59.36)	-	-	-	-	35.0	122.0
C	17.5 (24.82)	15.0 (7.30)	-	-	-	-	17.5	15.0
D	15.0 (21.29)	10.0 (4.88)	3 (100.00)	-	-	-	18.0	10.0
Total	70.5 (100.00)	205.5 (100.00)	3 (100.00)	-	-	-	73.5	205.5
Non-Dairy Villages								
A	10.0 (44.44)	18.0 (72.00)	-	-	-	-	10.0	18.0
B	11.5 (51.11)	7.0 (28.00)	-	-	-	-	11.5	7.0
C	1.0 (4.45)	-	-	-	-	-	1.0	-
D	-	-	-	-	-	-	-	-
Total	22.5 (100.00)	25.0 (100.00)	-	-	-	-	22.5	25.0

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However, in both plains and hills and in both the situations the weaker section as a whole produces maximum quantity of milk. But according to the number of households of weaker section in plains of dairy villages the percentage of the total milk production is not good. Because 66 percent of the total households of the plains belong to the weaker section but only 53.89 percent of the total milk production of dairy villages is produced by the said group. In otherwards, this figure is almost the same or above in both the situation of plains and hills.

HOME CONSUMPTION :

In Amul and Himul all the sample households are rearing milch animals with some exceptions in non-dairy villages in Himul for the additional source of income. After keeping some milk for their home consumption, the surplus milk is sold indirectly through the existing marketing channels or directly to the consumers. In some places where there is no ready market i.e. in non-dairy villages, the households process the milk into ghee and sell it to the nearby market in Amul; but in Himul there is no such market facilities and that is why the households are bound to keep large portion of milk for

their home consumption except in size group A. and size group D (Table 7.11) where the households are not

TABLE 7.11
Percentage of Home Consumption and Marketing of Milk

Group (Holding Pattern)	Home consumption		Marketing surplus			
	Amul	Himul	Amul		Himul	
			Milk	Ghee	Milk	Ghee
Dairy Villages						
A	16.67	22.69	83.33	-	77.31	-
B	20.95	28.34	79.05	-	71.66	-
C	27.38	27.69	72.62	-	72.31	-
D	21.43	32.00	78.57	-	68.00	-
Non-Dairy Villages						
A	14.77	19.64	60.23	25.00	80.36	-
B	23.82	43.24	61.22	14.96	56.76	-
C	30.92	100.00	16.42	52.66	-	-
D	34.94	-	-	65.06	-	-

interested to keep milch animals or to increase production of the milk. However, they are purchasing milk from the local milkman.

The trend of percentage of marketing surplus in both Dairy and Non-dairy villages is at a declining level

with the large size group with some exception. This is more or less a natural phenomenon. The increase in the size of holding is corelated with the increase in the economic status of the sample households which help them to keep a larger part of their produced milk.

TABLE 7.12

Percentage of Home Consumption and Marketing of Milk in Plains and Hills of Himul

Group (Holding Pattern)	Home Consumption		Marketing Surplus (Milk)	
	Plains	Hills	Plains	Hills
Dairy Villages				
A	-	23.07	100.00	76.93
B	47.14	22.95	52.86	77.05
C	28.79	26.66	71.21	73.34
D	53.33	-	46.67	100.00
Non-Dairy Villages				
A	25.00	16.66	75.00	83.34
B	60.51	14.29	39.49	85.71
C	100.00	-	-	-
D	-	-	-	-

The number of sample households keeping milk for home consumption in Dairy and Non-Dairy villages in Amul is 21 percent and 27 percent respectively and in Himul 27 percent and 31 percent respectively of their total milk

production. All the groups of the milk producers in non-dairy villages except landless group, keep a larger part of their milk production for their home consumption than the dairy villages.

In dairy villages of Himul, the percentage of home consumption of milk in plains is larger than that of hills. And also in non-dairy villages this picture is the same (Table 7.10). The quantity of production is higher in weaker section of hills than plains in both the situations and is lower in stronger section of hills than plains in both the situations.

However, it may be concluded that the households of the plains are not dependent on milk marketing. They are keeping cows mainly for agricultural purpose. Though they have some milch animals, they are not taking proper nursing and also they are not trying to increase the productivity of milch animals by adopting scientific measures.

MARKETING CHANNEL :

The milk is more perishable than the farm products. It requires either timely disposal or conversion into milk products or quick transport facilities to a ready market. Due to the above natural phenomena the milk

producers do not always get proper price of the milk or milk products.

In the sample villages, there are different types of milk marketing channels, such as (1) milk co-operatives (2) local 'gowallas' (milk traders) (3) Urban 'gowallas' and (4) local consumers. In the areas where the milk co-operatives are functioning (i.e. in dairy villages) the milk producers sell all the liquid milk through the milk co-operatives, but in the plains of Himul it is an exception. In the plains of Himul, the milk producers are getting loan advance from the local or Urban 'gowallas' at the time of their need subject to the condition that some part of their surplus milk is to be sold through them. Some times they sell some milk to the local consumers and private traders.

In non-dairy villages (i.e. where there is no milk co-operatives) maximum portion of the produced milk is sold through the local or Urban 'gowallas'. Some of the producers of non-dairy villages, specially in Amul and also in hills of Himul, carry their milk to the nearest milk co-operatives (located at a distance of 5 to 6 kilometers) regularly to avoid malpractices persued by the local or urban 'gowallas' and get **fair** price.

THE MILK CO-OPERATIVES AND ITS IMPACT :

The milk producers are provided a number of facilities by the milk cooperatives of Amul and Himul. They are getting weekly cash payments for their milk, ready market for their surplus milk, medical facilities for their milch animals, a uniform rate, subsidised cattle feed, 'lucerne' seeds, and free artificial insemination, etc. Besides, they are also getting indirect facilities like village organisations, development of infrastructure, etc. The producers are also distributed in the form of 'vao-tafat' (price-difference) or bonus every year by their milk cooperative societies out of their profit. These facilities make the dairying a subsidiary or some times a main source of income. According to the opinions expressed by most of the rural milk producers of the sample dairy villages, the creation of milk societies in the rural areas has provided some positive benefit and thereby a positive impact on the rural economy.

It is difficult to measure the impact of the above facilities provided to the rural milk producers. It is more difficult to measure the impact of each benefit separately. However, an attempt has been made to measure their impact in the following form.

- i) Impact on production of milk;
- ii) Impact on income from sale of milk;
- iii) Impact on milk producers' own opinions.

i) Impact on production of milk :

Some scientific measures as well as continuous efforts provided by the milk co-operative societies (i.e. extension of animal husbandry practices) have helped the producers adopting scientific animal management practices. It increases the yielding capacity of milch animals in the areas covered by the milk cooperatives. Yet, the provisions of extension services (i.e. inputs for milk production) and animal husbandry services, by the milk cooperative services depends upon the agreeable infrastructure, adequate funds, inputs and appropriate personnel.

a) Extension services :

In dairy villages of Amul and Himul the milk cooperative societies have the provisions for providing animal husbandry services (viz. artificial insemination, routine veterinary services etc.) and the inputs of milk production (viz. cattle feed, 'lucerne' seeds etc.). The adoption of extension services by the sample milk producers of Amul and

TABLE 7.13

Adoption of Extension Services by the Producers of Amul and Himul in Dairy Villages

Group (Holding Pattern)	No. of families adoption of															
	A. I.				Routine Vet. Service				Special visits of Vet. Doctors				Cultivating green fodder			
	A		H		A		H		A		H		A		H	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
A	18	82	12	54	20	91	0	0	15	68	18	82	0	0	0	0
B	39	74	40	73	44	83	4	18	34	63	32	58	16	30	10	18
Total	57	76	52	67	64	85	4	5	49	65	50	65	16	21	10	13
C	12	92	10	67	13	100	4	27	12	92	6	40	6	46	2	13
D	10	83	7	87	10	83	1	12	10	83	7	87	7	58	1	12
Total	22	88	17	74	23	92	5	22	22	88	13	56	13	52	3	13
Grand Total %	79	79	69	69	97	97	9	9	71	71	63	63	29	29	13	13

Notes : A.I. = Artificial Insemination
Vet. = Veterinary

Himul in dairy villages is indicated in the following table. It (Table 7.13) indicates that in case of Amul and Himul extension services are adopted by most of the sample milk producers according to their size of holding. In both the situations the producers of the weaker section adopt extension services less than those of stronger section due to their economic and social conditions. However, adoption of extension services of Amul almost in all respect is better than that of Himul. Seventy six (76) percent of the Weaker section of Amul has got artificially inseminated milch animals but only 67 percent is in Himul. In Amul and Himul 65 percent of the weaker section uses the services of Veterinary doctors by calling them for special visits. The tendency in adoption of improved extension services by stronger groups of both Amul and Himul shows a better position except special visits of veterinary doctors in Himul. In Amul all the groups are getting facilities of routine veterinary services more than Himul.

It may be observed that in Amul the position of adoption of improved extension services (i.e. improved animal husbandry practices) by all the groups is much better than that of Himul. Due to agricultural advancement of Kaira district (i.e. area of Amul) and to the longstanding of Amul dairy with continuous efforts in the

TABLE 7.14

Adoption of Extension Services by the Producers of Hills and Plains of Himul in Dairy Villages

Group (Holding Pattern)	No. of families adoption of															
	A.I.				Routine Vet. service				Special visits of Vet. doctors				Cultivating green fodder			
	P		M		P		M		P		M		P		M	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
A	6	100	6	37	0	0	0	0	2	33	16	100	0	0	0	0
B	26	96	14	50	4	15	0	0	14	52	18	64	10	37	0	0
Total	32	97	20	45	4	12	0	0	16	48	34	77	10	30	0	0
C	9	90	1	20	3	30	0	0	5	50	1	20	2	20	0	0
D	7	100	0	0	0	00	0	0	6	86	1	100	1	14	0	0
Total	16	94	1	17	3	12	0	0	11	65	2	33	3	18	0	0
Grand Total/%	48	96	21	42	7	14	0	0	27	54	36	36	13	26	0	0

Notes : A.I. = Artificial insemination

Vet. = Veterinary

field of extension, this achievement is possible.

However, an analysis of the position of adoption of extension services by household in the plains and the hills of Himul depicts that in all respects the adoption of extension services by the producers of hills of Himul is less than that of Plains of Himul except special visits of veterinary doctors (Table 7.14). Here also the stronger section of the sample village producers adopt the extension services in both the plains and the hills except routine veterinary services in the plains and special visits of veterinary doctors in the hills. Ninety six (96) percent of the producers of plains has got artificially inseminated milch animals whereas the number of the same in the hills is 42%. It is peculiar that there is no producer members of the sample villages of Hills who have reported that they are getting routine veterinary services and they have no plot where they can cultivate green fodder. In view of the above it is undeniable that the provisions for extension services or activities for extension services are very poor.

b) Productivity :

The daily production of milk per milch animal of dairy and non-dairy sample villages and a statistical

analysis have been attempted (Table 7.15).

TABLE 7.15
Daily Milk Production of Per Milch Buffalo or Cow (in litre)

Group (Holding Pattern)	Dairy Villages		Non-Dairy Villages	
	Amul	Himul	Amul	Himul
A	8.0	3.0	4.7	3.1
B	6.8	2.1	4.9	1.5
Average	6.5	2.3	4.8	2.2
C	6.3	1.2	4.9	1.0
D	6.2	1.3	5.6	0.0
Average	6.3	1.3	5.0	0.5
Overall	6.5	2.0	4.9	2.1

It can be observed from the above table that the yielding capacity of the milch animals (i.e. milk obtained by the milk producers) in dairy villages of both Amul and Himul is higher than that of non-dairy villages of Amul and Himul, with some exception. The producers of the Weaker section of Amul in Dairy Villages, obtain on an average 6.5 litres of milk per milch animals daily but in this situation the producers of non-dairy villages

obtain on an average 4.8 litres of milk per milch animal per day. However, in Himul in the same situation the producers obtain 3.1 litres of milk per cow per day in non-dairy villages as against 3.0 litres obtained by the similar group in dairy villages. In all the situations the Himul is lagging behind Amul.

The same distribution considered in respect of hills and plains of Himul discloses a different picture (Table 7.16).

TABLE 7.16

Daily Milk Production of Per Milch Cow (in litre) in Hills and Plains of Himul

Group (Holding Pattern)	Dairy Villages		Non-Dairy Villages	
	P.	M.	P.	M.
A	1.0	3.4	2.5	3.6
B	1.2	2.8	1.9	1.1
Average	1.1	3.0	2.1	2.3
C	0.8	3.7	1.0	0.0
D	0.9	3.3	0.0	0.0
Average	0.8	3.6	1.0	0.0
Overall	1.0	3.1	2.0	2.1

The yielding capacity of the milch animals of non-dairy villages in hills is higher almost in all respect than the dairy villages in Plains. But the yielding capacity of the milch animals of dairy villages in hills is higher than that of non-dairy villages in hills. In both the situations i.e. in dairy and non-dairy villages and also in both plains and hills the difference between the yielding capacity of the milch animals of weaker section and stronger section is negligible. However, on an average the producers of hills obtain higher percentage of milk than that of the producers of the plains do in both the situations. However, it is to be noted that in hills, the big farmer i.e. group D has one milch animal but produces a negligible quantity of milk.

The milk yielding capacity of milch animals depends upon the factors like scientific management of milch animals, balance feeding and proper breeding. In dairy villages, the different facilities given to the farmer (i.e. milk producer) by the milk co-operatives has not only helped them directly but also helped them to increase the yielding capacity of the milch animals. Whatsoever, this may be said that the facilities provided by the milk co-operatives to producers or farmers would be one of the casual factors for increasing milk yields in dairy villages.

ii) Impact on income from sale of milk :

a) Sources of income :

The basic objective of the rural milk co-operative societies is to develop the economic conditions of rural milk producers, especially, to that of the landless and marginal farmers, i.e. the weaker section. They own most of the milch animals in the milkshed and providing ready milk marketing facilities for their surplus milk. And this basic objective depends upon two factors viz.

(1) what average price of the milk is obtained by the milk producers and (2) what amount is earned by the rural households through dairying.

Dairy farming, crop farming and other occupation like Govt. & non-Govt. services, business, labour etc. are the major source of income of the rural households in the milkshed areas of Amul and Himul. In order to compare the share of dairy farming as a source of income of the rural households of Amul and Himul in Dairy and non-dairy villages, the average income earned by the sample households from various sources as well as their total income (of Amul and Himul in both dairy and non-dairy villages) have been analysed (Table 7.17).

In dairy villages of Amul, dairy farming is the main source of income of the landless families . but in non-dairy villages the households depend upon mainly other

TABLE 7.17

Average Yearly Income Per Sample Households From Different Sources of Income of Amul and Himul (in Rupees)

Group (Holding Pattern)	Average yearly income per sample household from different sources of income								Crop farm ing income per hectre of land	
	Dairy farming		crop farming		other sources		total income		A	H
	A	H	A	H	A	H	A	H		
DAIRY VILLAGES										
A	4492 (65.41)	5436 (40.65)	-	977 (7.30)	2376 (34.59)	6959 (52.05)	6868 (100)	13372 (100)	-	-
B	4035 (35.01)	4340 (29.71)	6070 (52.67)	3804 (26.05)	1419 (12.32)	6460 (44.25)	11524 (100)	14604 (100)	5432	2921
C	4950 (23.36)	3900 (19.50)	15831 (74.72)	7467 (37.84)	407 (1.92)	8627 (43.16)	21188 (100)	19994 (100)	4888	2002
D	8443 (13.54)	3662 (18.55)	53473 (83.59)	12500 (63.36)	1833 (2.87)	3562 (18.09)	63749 (100)	19724 (100)	8798	2642
Overall	4809 (26.65)	4461 (28.66)	11693 (64.78)	4437 (28.65)	1546 (8.57)	6663 (28.53)	18048 (100)	15561 (100)	6710	3130
NON-DAIRY VILLAGES										
A	3703 (40.48)	1195 (11.67)	-	181 (1.77)	5445 (59.52)	8857 (86.56)	9148 (100)	10233 (100)	-	-
B	2449 (26.44)	1640 (12.87)	3318 (35.83)	2100 (16.48)	3494 (37.73)	9000 (70.65)	9261 (100)	12740 (100)	3630	1270
C	3381 (26.14)	100 (1.76)	8912 (68.89)	3633 (64.12)	642 (4.97)	1933 (34.12)	12935 (100)	5666 (100)	2889	1003
D	2695 (11.43)	3600 (11.39)	18163 (77.02)	10000 (31.64)	2724 (11.55)	18000 (59.97)	23582 (100)	31600 (100)	3036	1703
Overall	3025 (23.53)	1400 (11.49)	7176 (55.82)	1544 (12.68)	2655 (20.65)	9236 (75.83)	12856 (100)	12180 (100)	3040	947

Note : Digits within brackets denote the percentage of different sources of income in total income.

- We have assumed that the rate of change of income and the rate of change of price of milk followed an identical rate which happened to be 2.2. Income figures ^{of Amul} have been adjusted by using this multiplier. These estimated income are of course very rough.

occupations like labour etc. Whereas in Himul in both the situations the main source of income of the landless household families is not dairy farming. They earn something from the crop farming like zinger, vegetable, oranges, tea (green leaves) etc. in their residential premises. However, in both the situations of Amul the crop farming on an average is the largest source of income i.e. 64.78 and 55.82 percent of the total income. But in Himul the share of dairy farming, crop farming and other sources of income are almost the same in dairy villages and in non-dairy villages; more than 75 percent of the total income comes from other sources. In both dairy and non-dairy villages of Amul and Himul the percentage of income from crop farming increases with the increase in the size of holding with the exception of group D of non-dairy villages in Himul.

In dairy villages of Amul and Himul and in non-dairy villages of Amul the percentage of income from dairy farming decreases with increase in the size of holding. However, the percentage of income from both the dairy farming and crop farming in both the situations of Himul is lagging behind Amul in all groups of households. In both Amul and Himul, the income from crop farming in dairy villages is higher than that in the non-dairy villages. The average income from dairy farming and crop farming in

all groups of Amul in dairy and non-dairy villages are higher than that of Himul in all respects. The income from crop farming per hectre in both Amul and Himul are higher in dairy villages than that of the non-dairy villages. Again the incomes from crop farming per hectre in Himul in both the situations are very poor compared to Amul. Unlike in Himul, the dairy farming in Amul is next important occupation to crop farming in both the situations. In non-dairy villages of Himul the income from other sources (i.e. 75.83 percent of the total income) is the main occupation and in dairy villages of Himul the income from three categories is almost the same.

The dairy farming is the important source which influences the development of income for the economically weaker section in the rural areas especially in dairy villages of Amul. In dairy villages, the landless group has earned about 65.41 percent in Amul and 40.65 percent in Himul. And the percentage of average income from crop farming in all groups in dairy villages of Amul is higher than that of Himul. As the average income from crop farming is lower in all the groups of non-dairy villages in Amul, it become evident that the dairy farming of Amul is one of the important factors which influences the crop farming. Whereas in Himul, the crop farming is not influenced by the dairy farming so much as Amul. The average income from dairy farming is proportionately high

in Himul than Amul according to their milk production. (Table 7.9 and Table 7.17) it indicates that the producers of Himul are not spending more for the betterment of their milch animals.

However, in the plains and in the Hills of Himul, what is the picture of average income per sample households from dairy and other sources has been elaborated below (Table 7.18).

In both the situations, in Hills of Himul, the percentage of average income from dairy farming is more than that of plains in respect of all groups. Again the percentage of average income from crop farming in Plains of Himul in both the situations is more than hills in respect of all groups except the landless one. The sample households of hills in both the situations realises higher percentage of average income through other sources than in the Plains except the landless group. The proportion of farm income of hills and plains under both the situations increases with increase in the size of land holding (with one exception). But in case of dairy farming the proportion of income of hills and plains decreases with increase in the size of land holding under both the situations with two exceptions. However, the average income under both the situations in respect of all groups of hills are higher than that of plains with a few exceptions.

TABLE 7.18

Average Yearly Income Per Sample Households From Different Sources of Income of Hills and Plains of Himul (in Rupees)

Group (Holding Pattern)	Average yearly income per sample households from different sources of income							
	Dairy farming		Crop farming		Other sources		Total income	
	P	M	P	M	P	M	P	M
DAIRY VILLAGES								
A	1200 (19.15)	7025 (43.80)	417 (6.65)	1187 (7.40)	4650 (74.20)	7825 (48.80)	6267 (100)	16037 (100)
B	1615 (16.60)	6969 (37.48)	4518 (46.44)	2757 (14.83)	3596 (36.96)	8868 (47.69)	9729 (100)	18594 (100)
C	3070 (15.98)	5560 (25.55)	9200 (47.89)	4200 (19.30)	6940 (36.13)	12000 (55.15)	19210 (100)	21760 (100)
D	2900 (17.09)	9000 (23.08)	12857 (75.75)	10000 (25.64)	1215 (7.16)	20000 (59.28)	16972 (100)	39000 (100)
Overall	2036 (16.13)	6886 (37.22)	6330 (50.15)	2544 (13.75)	4256 (33.72)	9070 (49.03)	12622 (100)	18500 (100)
NON-DAIRY VILLAGES								
A	1122 (11.66)	1250 (11.69)	133 (1.38)	217 (2.03)	8367 (86.96)	9225 (86.28)	9622 (100)	10692 (100)
B	564 (5.40)	3009 (19.22)	2814 (26.93)	1191 (7.60)	7071 (67.67)	11456 (73.18)	10449 (100)	15654 (100)
C	-	400 (3.74)	5250 (31.53)	300 (2.80)	11500 (68.47)	10000 (93.46)	16650 (100)	10700 (100)
D	-	10000 (31.65)	-	3600 (11.39)	-	18000 (56.96)	-	31600 (100)
Overall	720 (6.76)	2080 (15.17)	2044 (19.29)	1044 (7.61)	7884 (74.04)	10588 (77.22)	10648 (100)	13712 (100)

The average income from dairy farming of hills is the next to other sources under both the situations. But in plains under both the situations income from crop farming is next to other sources of income. And average income from the dairy farming of plains is very poor. So it is to be noted that the crop farming income is not influenced by the dairy farming income. But the economic status of the hills' sample households is influenced partly by the dairy farming especially in the dairy villages.

b) Pricing :

In dairy villages as well as non-dairy villages in Himul surplus milk is sold in the form of liquid, but in dairy villages of Amul maximum portion of milk after keeping home consumption is sold in the liquid form. Whereas in non-dairy villages it is sold half in the form of liquid and the rest in the form of ghee etc. as there is no marketing facilities in non-dairy villages of Amul for selling the milk produced in the form of liquid milk.

The price of milk products varies in relation to forms or grades, time and place, but the price of the liquid milk does not vary to a significant extent except during occasions like religious festivals etc. Considering all these factors a comparative analysis of price of the milk and milk products, the price of liquid milk has been taken into account.

TABLE 7.19
Average Price of Fluid Milk of Amul and Himul in Rs./
Litre

Group (Holding Pattern)	Average price of fluid milk			
	Dairy Villages		Non-Dairy Villages	
	A	H	A	H
Weaker section	3.56	3.24	3.06	4.11
Stronger section	3.78	3.55	3.06	3.75
Overall	3.63	3.33	3.06	4.06

The Table 7.19 shows that the average price of liquid milk in dairy villages of Amul is higher than that of non-dairy villages. But in Himul this average price is higher in non-dairy villages than it is in dairy villages. However, the average price of liquid milk in dairy villages is higher in Amul than in Himul but in non-dairy villages it is higher in Himul than that of Amul. It depicts that the milk marketing channel of dairy cooperatives has provided better milk marketing facilities to the producers of dairy villages than what has been provided by other milk marketing channels in Amul. In Himul the other milk marketing channels have offered better price to the producers especially in non-dairy villages.

When we observe the same in respect of plains and hills of Himul, it could be observed that (Table 7.20) in both the situations the average price are higher in plains than that of hills. However, the average prices of liquid milk in non-dairy villages of plains and hills both are higher compared to the dairy villages. Thus it may be concluded that the dairy cooperative marketing channel cannot provide better price to the producers of dairy villages.

TABLE 7.20
Average Price of Fluid Milk of Plains and Hills (in Rs./Litre) of Himul

Group (Holding Pattern)	Dairy Villages		Non-Dairy Villages	
	P	M	P	M
Weaker section	3.66	2.98	4.47	3.70
Stronger section	3.72	3.15	4.00	3.50
Overall	3.69	3.01	4.39	3.67

It may also be concluded that in Amul and in Plains and Hills of Himul, the stronger section of the households in dairy villages is getting higher prices than what the weaker section gets. But in non-dairy villages the weaker section of the households is getting better prices than

the stronger section of the households in Amul and the same is applicable to both Plains and hills of Himul.

c) Income from dairying :

"The annual income from dairy farming depends upon many factors like (a) total milk yield and consumption of milk by milk producers, which ultimately determines the marketed surplus of milk (b) price offer - depending upon the fat and S.N.F. contents of the milk and unit price of Rs./kg. fat and (c) Wet period of milch animals in the year under consideration. Such factors further depend upon certain basic criteria like (1) type of milch animal i.e. breed, yield potentials, age, etc. indicating the possibly obtainable quantity and quality of milk (ii) feeding practices and health care of the animals and (iii) pricing policy adopted by the milk marketing channels"⁷.

In favour of milk producers, only the milk co-operatives may make a combination of all the above factors which lead to positive effect on the income of the milk producers. The Table 7.21 shows a picture of average yearly income from dairying of Amul and Himul.

In both Amul and Himul overall average yearly income per milch animal from dairying is higher in dairy villages. Such income of weaker section is higher than that

TABLE 7.21

Average Yearly Income from Dairying of Amul and Himul (in Rupees)

Group (Holding Pattern)	Average yearly income per milch animal			
	Dairy Villages		Non-Dairy Villages	
	A	H	A	H
Weaker section	3291	2523	1905	1652
Stronger section	3126	1097	1872	1950
Overall	3124	2009	1887	1666

of stronger section in both the situations of Amul and Himul except non-dairy villages of Himul. The average yearly income per milch animal in dairy villages in both weaker and stronger sections is higher than that of non-dairy villages of Amul and Himul. The sole exception being the stronger section of non-dairy villages of Himul. However, this average yearly income is higher in both dairy and non-dairy villages of Amul than Himul.

Again it may be discussed in respect of Plains and Hills of Himul in the following (Table 7.22).

The position of Dairy villages in Plains is better than that of non-dairy villages of Himul in respect of average yearly income per milch animal (Table 7.21 and

TABLE 7.22
Average Yearly Income From Dairying of Plains and Hills of
Himul (in Rupees)

Group (Holding Pattern)	Average yearly income per milch animal			
	Dairy Villages		Non-Dairy Villages	
	P	M	P	M
Weaker section	1927	3750	667	3700
Stronger section	823	2044	-	3900
Overall	1366	3443	643	3714

7.22). But it is peculiar that the average yearly income per milch animal is higher in non-dairy villages than that of dairy villages especially in the group of stronger section (Table 7.22). It is evident that the overall average income per milch animal in dairy and non-dairy villages of hills of Himul is higher than that of Amul (Table 7.21 and 7.22).

d) Per capita milk consumption :

Now in the following table the per capita milk consumption in the sample villages is discussed.

TABLE 7.23
Per Capita Milk Consumption in the Sample Villages of
Amul and Himul

Group (Holding Pattern)	Dairy Villages (in M.L)		Non-Dairy Villages (in M.L)	
	A	H	A	H
Weaker section	177	189	144	48
Stronger section	255	88	145	38
Overall	199	145	144	47

The per capita milk consumption, in both dairy and non-dairy villages of Himul is more in Weaker Section of the sample households than in the stronger section. But in Amul in both the situations the per capita milk consumption of the stronger section is more than that of Weaker Section. However, the overall milk consumption of Amul in both the situations is higher than that of Himul. In the dairy villages of both Amul and Himul the per capita milk consumption is 199 ml. and 145 ml. respectively as against their counterparts in the non-dairy villages which can hardly manage to consume 144 ml. and 47 ml. respectively per head. And this difference is more significant in Himul. In both the situations of Amul and only in dairy villages of Himul the per capita milk consumption is over

the national per capita milk consumption which is 144 ml. per head⁸. But according to the recommendation of Indian Council of Medical Research the per capital milk consumption should be 210 ml.⁹. Here this target has been fulfilled only in stronger section of Amul in dairy villages.

However, in respect of hills and plains of Himul, such per capita income discloses a different picture (Table 7.24).

TABLE 7.24

Per Capita Milk Consumption in the Plains And Hills of Himul

Group (Holding Pattern)	Dairy Villages (in ml.)		Non-Dairy Villages (in ml.)	
	P	M	P	M
Weaker section	135	225	68	29
Stronger section	84	103	83	-
Overall	104	199	69	26

The per capita milk consumption only achieves the target of national average in dairy villages of the hills of Himul. And only the Weaker section of dairy villages in the hills achieves the recommendation of the Indian council of Medical Research. In both the situations the

per capita milk consumption is very much low in the plains of Himul. However, the per capita milk consumption of dairy villages in the hills of Himul is the same as the per capita milk consumption in dairy villages of Amul.

The milk cooperatives have created a situation to raise the level of milk consumption especially among the milk producers of Amul and hills of the Himul.

iii) Impact on milk producers' own opinion :

Dairy co-operatives actually are the media of services rendered by the milk union and the village milk producers as well as a nice milk marketing channel. The main objectives of the milk cooperatives are to elevate the productivity of cows and to uplift the economic status of the rural people. However, these objectives depend mainly on the individual interest and awareness of the milk producers regarding the activities of dairy co-operatives. Some data, opinions and information have been used as sample from the sample milk producers of Amul and Himul to ascertain the awareness of the milk producers (Table 7.25). These are plotted on the following table.

TABLE 7.25

Percentage of Respondents Point Out a Special Reason in Favour of Milk Cooperatives

Group (Holding Pattern)	Reasons :									
	Good source of income		Offers fair price for milk		Provides ready market for milk		Fair practices		Other reasons	
	A	H	A	H	A	H	A	H	A	H
A	36.35	-	54.55	4.54	4.55	4.54	4.55	90.92	-	-
B	30.19	-	43.40	1.82	3.77	0.09	16.98	89.09	5.66	-
Weaker section	32.00	-	46.67	2.60	4.00	7.79	13.33	89.61	4.00	-
C	15.38	-	30.77	-	15.38	-	23.09	93.33	15.38	6.67
D	25.00	-	41.67	-	-	-	25.00	100.00	8.33	-
Stronger section	20.00	-	36.00	-	8.00	-	24.00	95.65	12.00	4.35
Overall	29.00	-	44.00	2.00	5.00	6.00	16.00	91.00	6.00	1.00

At the time of survey the producers are requested to state why they are motivated to form the milk society and to sell their surplus milk to the society. However, there are so many reasons in favour of dairy cooperatives but they were asked to state only one prominent reason. The Table 7.25 depicts that the most of the sample milk producers of Amul have voted for the dairy cooperatives as society offers fair price for milk as well as good source of income whereas most of the sample milk producers of Himul have given their particular opinion in favour of milk cooperatives as these societies operate their activities in a fair way. In Amul, weaker section especially landless families also speak in favour of the milk cooperatives for offering fair price. There are other reasons the milk society renders services such as artificial insemination, subsidised cattle feed, veterinary aid etc. In both Amul and Himul the weaker section especially landless families of Amul and both A and B Groups of Himul have no awareness of such advantages. And this awareness is also very poor in stronger section of Himul.

It may further be discussed in respect of Plains and hills of Himul.

TABLE 7.26

Percentage of Respondents Pointout a Special Reason in Favour of Milk Cooperative of the Plains and Hills of Himul

Group (Holding Pattern)	Reasons :									
	Good source of income		Offers fair price for milk		Provides ready market for milk		Fair Practices		Other reasons	
	P	M	P	M	P	M	P	M	P	M
A	-	-	-	6.25	16.67	-	83.33	93.75	-	-
B	-	-	3.70	-	1.11	7.14	95.19	92.86	-	-
Weaker section	-	-	3.03	2.27	1.21	4.54	95.76	93.19	-	-
C	-	-	-	-	-	-	90.00	100.00	10.00	-
D	-	-	-	-	-	-	100.00	100.00	-	-
Stronger section	-	-	-	-	-	-	94.12	100.00	5.88	-
Over all	-	-	2.00	2.00	8.00	4.00	88.00	94.00	2.00	-

The Table 7.26 shows that in both the plains and hills of Himul most of the milk producers have given their opinion in favour of milk cooperatives as society carry on their activities in a fair way. Besides, all the groups especially weaker section of the plains and weaker and stronger sections of the sample households of the hills are not aware of the facilities provided by the society.

In Amul, the milk producers are motivated to join and to sell their surplus milk to the society mainly for fair price for the surplus milk. Before Amul was set up such facility through other means was quite absent. Whereas in Himul, in both the plains and Hills, the milk producers are motivated to join and to sell their surplus milk to the dairy cooperatives mainly for fair practices rendered by the Himul. Before Himul, the 'gowallas' as well as local milk contractors had been practicing unfairness in dairy business.

To ascertain the producers' opinion regarding the impact of dairy cooperatives on their livelihood, they have been asked question mainly on the following three categories of impacts of dairy cooperatives.

- a) Impact on agriculture;
- b) Impact on Dairying;
- c) Impact on economic status of the milk producers.

In Himul most of the sample milk producers believe that the dairy cooperatives have uplifted their economic status in the hills as well as in the plains. But in Amul most of them believe that the dairy cooperatives have been beneficial in farm production. A significant number of sample milk producers have also expressed their opinion regarding impact of dairy cooperative saying that the dairy cooperatives have been beneficial in their milk production (in both Amul and Himul and especially in the hills of Himul). And also a few milk producers in the plains of Himul believe that the dairy cooperatives have been beneficial in their farm production. Some of the milk producers of Amul believe that the dairy cooperatives have been useful in uplifting their economic status. Some milk producers have, however, refused to air their opinions regarding the impact of dairy cooperatives in both Amul and Himul.

On the whole, it may be observed that in Himul most of the milk producers believe that the dairy co-operatives have uplifted their economic status in the hills and in the plains through inducement of the habit of dairying. But the majority of the producers in Amul holds a contrary view. They believe that the dairy co-operatives have been much beneficial primarily to the matter of their farming in agriculture.

SUMMARY :

Amul induced an impact on rural economy. The same is also observed in case of Himul though its impact is not as impressive as Amul. The rate of domesticating milch animals in the dairy villages of both Amul and Himul is higher than that in non-dairy villages. On the other hand the number of milch animals per family in Himul is larger than the dairy villages of Amul. Yet the productivity of milch animals in Amul villages is much higher than that of the plains of Himul. The productivity of milch animals in the plains of Himul is less than that in hill areas.

Even today there is no ready milk market in non-dairy villages. For that reason in case of both Himul and Amul, the producers of those areas use a large part of their product for home consumption and even this rate of home consumption is higher than that of dairy villages. Again, the per capita milk consumption is high in dairy villages of both Himul and Amul.

The producers of Amul get the advantage of extension services, more than those of Himul villages. So the yielding capacity of milch animals in those areas is also higher. But though the producers of hilly areas of Himul receive the benefit of extension services less than those

of plain areas, yet the yielding capacity of milch animals is higher in hill areas. Even the non-dairy hilly villages have milch animals with very significant yielding capacity. Again average yielding capacity of milch animals in dairy villages of Amul and plain as well as hill areas of Himul is higher than that of non-dairy villages.

A comparative analysis regarding the income from dairy farming in dairy villages of Amul and Himul shows that the income of dairy villages of Himul from dairy farmings proportionately higher than that of Amul. Of course, the percentage of income from Agriculture and dairy farming in dairy villages of Amul is higher than that of non-dairy villages and the percentage of income from agriculture is the highest. On the other hand the percentage of income from dairy farming, agriculture and other sources in dairy villages of Himul is almost equal though the percentage of income from those sources is higher in dairy villages of Himul than that in non-dairy villages. The percentage of income from Agriculture of the dairy villages of Amul is higher than that of the dairy villages of Himul. However, in dairy villages of both Amul and Himul, the percentage of income from dairy farming and agriculture is higher than that of non-dairy villages. Again in hilly areas the percentage of income from dairy farming is much higher than that from agriculture though the matter is just the reverse in case of

plain areas. In short dairy farming has remarkably made an impact on the agriculture of Amul villages and Himul also has done the same though its role is not so remarkable. Of course, Himul has contributed to the betterment of economic status of the people of dairy villages, specially in hill areas.

The producers of dairy villages of Amul get comparatively high price of milk than those of non-dairy villages. But both the plains and the hills of Himul pay smaller price to the producers of dairy villages, than to those of non-dairy villages. Besides, the producers of dairy villages get higher price of their product if they sell it to other existing marketing channel instead of Himul dairy.

Most of the producer members of Amul sell their product to Amul because they get fair price from it. According to the producer members of Himul, they get many facilities from Himul and so they sell their milk there.

However, view point of the producers in the matter of uplifting their economical status differ widely between Amul producers and Himul producers.

Notes & Reference

1. Prof. Raj Krishna, 'Indian Dairyman', Vol.32. Delhi : Published by Indian Dairy Association, 1980.
2. M.S.Randhawa, 'Indian Dairyman', Vol.28. Delhi : Published by Indian Dairy Association.
3. Surjit Sing Barnala, "New Strategy for Rural Development", 'Yajana'. Delhi : Government of India, March 1979.
4. M.S.Bedi, Dairy Development Marketing And Economic Growth. New Delhi : Deep & Deep Publications, 1987, p.87.
5. "In stratified sampling, the population is subdivided into several parts, called strata, and then a sub-sample is chosen from each of them. If the selection from strata is done by random sampling, the method is known as stratified random sampling. The subdivision into strata is purposive, but the selection from strata is

purely random. Stratified random sampling may, therefore, be viewed as a mixture of purposive and random sampling, and combines the advantage of both.

Stratified sampling is generally used when the population is heterogeneous, but can be subdivided into strata within each of which the heterogeneity is not so prominent. Some prior knowledge is, therefore necessary for subdivision into strata, called stratification. If proper stratification can be made such that the strata differ from one another as much as possible, but there is much homogeneity within each of them, then a stratified sample will yield better estimates than a random sample of the same size" - N.G.Das, Statistical Methods in Commerce, Accountancy & Economics. Calcutta : M.Das, 1973, p.455.

6. M.S.Bedi, op.cit., p.9.
7. Dr. S.M.Patel and Shri M.K.Pandey, Economic Impacts of Kaira Districts Co-operative Milk Producers' Union (Amul Dairy) in Rural Areas of Kaira Districts (Gujrat State). Ahmedabad : Published by Institute of Co-operative Management, 1976, pp. 23 & 24.
8. Operation Flood - A Progress Report. Baroda : Published by Indian Dairy Corporation, 1986, p.1.
9. Dr. Prafulla Kumar Das, "Dairying in India : Constraints and Prospects" National Dairy Research Institute, Kalyani, West Bengal.P.1.

Chapter - VIII

Summary & Conclusion

The analysis and interpretation of data of the last ten years has made it clear that Amul continues to maintain its forward step since its inception. On the contrary, its counterpart in West Bengal the Himul, is yet to step out of its infancy and overcome teething trouble. It cannot be denied that Himul came into existence when Amul had already completed 29 years of service with a record that Himul could never touch. But Amul had to fight against great odds in order to establish itself as a pioneer Organisation in the country. In comparison to it Himul had a much smooth sailing from the very beginning as it had the patronage of Government and

semigovernment departments. Still it failed to stand on a firm footing.

Amul was born out of the concerted move and great eagerness of the local people. Himul, on the other hand was established with the government help and started functioning almost as any other government undertaking. It tried to imitate Amul in every way and it boomeranged because the geographical location, socio-economic infrastructure and the climate of the places that fall within the jurisdiction of Amul differs much from those in the areas of Himul.

Amul is located in the West of India. The Arabian sea is not very far. The location of Himul is in the bosom of the Himalayas. The latitude and longitude of the two are totally different. Regarding the life style, dress, social set up and mental make-up of the people, Amul and Himul are two poles apart. Naturally, the founder fathers of Himul acted unwisely in trying to transplant the Amul model at a place which had nothing in common with the areas of Amul. So the basic difference between Amul and Himul may be discerned in the fact that, whereas Amul grew out on its own Himul was like something imposed from outside.

In order to find out the differences a detailed analysis in the last three chapters through necessary data plottings in different tables have been attempted. In addition to this, an attempt have been made to assess the working of both the organisations through discussions and interviews with different officials connected with the Dairy Development Programme and with the local people.

Now, we attempt to analyse the findings obtained in the above noted ways under three categories : (i) Organisational (ii) Financial (iii) Social.

(i) ORGANISATIONAL :

As per the set up of a "Milk Union", it has to depend primarily on the village milk societies for its own existence. The more is the number of village milk societies within the jurisdiction of a Milk Union, the more is its milk collection. In that case, the union is sure to stand on its feet unless it is faced with some serious problems. So the first thing needed is to organise the targeted number of societies within a fixed period of time, Himul is lagging far behind in this matter. It aimed at organising 500 village milk societies within 5 years, but it could not manage to organise more than 350 during the last ten years. Of them only 233 societies are functioning. The most surprising fact is that the number of

societies that never functioned, but existed only in official papers, is not negligible. There are 78 such societies. Again there is another group of societies that had a pre-mature death. Table 5.3 makes it clear that no effective steps were taken to revive them.

The picture in the plains of Himul is much more distressing. Of the 300 societies that were to be established only 65 could be come up. Later, 20 societies ceased to exist. The hill areas present a somewhat different picture. Of the 200 societies 188 are on the run. The rate of percentage of growth of societies is also better in the hills than that in the plains. The backwardness of the plains in this respect lies in the fact that the drive for setting of societies was not initiated here with the same society and dedication as in the hills. Lack of proper supervision has contributed much to this dismal picture. While talking to the author members of many societies they alleged that field supervisors are seldom seen in their areas. In sharp contrast to this, the supervision system in Amul is quite commendable.

Though the mobile veterinary units are proportionately greater in number in Himul than it is in Amul, the average number of treated animals per unit is ten times greater in Amul. It is needless to say that the veterinary service in Himul is insufficient and undeveloped.

The doctors visit the societies only on special calls, and, that too, not in time. Medicine is also scarce and the members have to pay for it. These factors have created a general apathy against keeping costly and high-breed milch animals. But in Amul, the regular visits by the veterinary doctors along with the regular supply of necessary medicines have encouraged the producers.

Table 5.7 has shown it clearly that, in Himul, the local people are less interested in dairy cooperative. In each society the number of producer members is, on an average, over ten times less than that of Amul. In case of Amul, the trend of percentage of growth of average number of farmer members of each society is very encouraging. But that cannot be said of Himul. Here the producers lack the realisation that they are to be benefited by aligning themselves with the dairy cooperatives. In Amul the producers are always being encouraged to do so and film-shows, demonstration visits to other societies etc. are arranged regularly to bring the producers close to the society.

In the field of breed improvement too, Himul's performance is worse. This fact becomes evident when we observe that Himul has only 57 artificial insemination cases per 'Artificial insemination Centre' against 574 in Amul. This number is on the increase but the rate of

increase is negligible when compared to that of Amul. The dairy business could not be profitable without good quality hybrid milch animals. This ensures more milk at less cost.

The producers of Himul, unlike their counter parts of Amul, refrain from taking the advantage of artificial insemination for their milch animals. They look upon artificial insemination as something unnatural. Some of them even think it to be a anti-religion. As a result, the breed improvement has not been successful here. The authorities concerned have not taken any initiative to remove such beliefs cherished by those people. There is another problem. The few calves that are artificially inseminated are believed to have been sold to agents of the neighbouring States of the country and even of other neighbouring countries like Nepal and Bangladesh.

In most cases, the artificially inseminated calves are not found in the houses of the producers when they become grown up. No justifiable answer is also made by them when they are questioned about it. This practice has been noticed in Himul specially situated in plain areas. The tottering economic condition of the producers has led to such a position.

All the above-mentioned factors have made it quite difficult for Himul to achieve its procurement target,

and even after the completion of ten years, Himul could achieve not more than 45 percent of its target. While in Amul, the average milk procurement per society is 2.22 lakh kg., in Himul, it is only 0.28 lakh kg. in a year. However, of the total milk procurement of Himul, 97 percent comes from hill areas.

There are some other factors also that hindered Himul's progress in the field of milk procurement. In every nook and corner of West Bengal, tea stalls and sweet meat shops can be seen in large numbers. The only exception is the hill areas. In order to make varieties kinds of sweets, milk is curdled (a process) which, in Gujrat, is considered to be an "uncustom". This explains why Gujrat has fewer tea-stalls and almost no sweet-meat shops. In West Bengal the lion's share of the total milk production go to the sweet-meat shops and tea-stalls. People of Bengal entertain a guest at home with tea and milk-made sweets. But the people of Gujrat entertain their guests rather differently.

In West Bengal a section of people called middlemen are engaged in collecting milk from the villages and selling the same to the owners of sweet meat shops and tea-stalls. In Himul, particularly in the plains these middlemen are very active. Sometimes they offer to the milk producers a better price. But at times the middlemen

buy milk mixed with water at a low price. This is supplied mainly to the tea-stalls and small traders to sell the milk by going from door to door. The ignorant producers think that they have been benefited because the water they mix makes the milk weigh more.

Sometimes the middlemen lend the poor milk producers money at a low rate of interest or without interest. This system is called 'Dadan' (advance loan). At the time of accepting 'Dadan' the milk-producers have to come into a contract to sell all the milk they produce to the middlemen at a fixed price. This fixed rate is undoubtedly, less than the market price or the price paid by Himul. Again, it happens sometime that the price of milk fixed by the Himul authorities is less than the existing market price. This is simply because within Himul areas the quantity of milk produced is much less than the local demand. This is a common experience particularly in the plains. Naturally the producers sell their milk to the milkmen in order to make some profit. On the contrary in the areas of Amul the supply of milk always surpluses local demand. This impels the milk producers to sell their surplus milk to Amul. Moreover, Amul has succeeded in fostering a feeling of faith in the producers' minds about its usefulness. As the supply of milk is more than its demand in the hill areas of Himul the producers here

follow the foot steps of their counter parts in Amul.

Himul buys milk on the basis of the quantity of fat in it. The milk the producers bring seldom contains the required amount of fat and so they get less price for the same. But the producers can sell the same milk at a higher price in the open market.

The discrepancy between demand and supply in Himul is a result of another factor. The cows in the plain areas have low productivity, while those in the hill areas have got high productivity. This is because of the genetic improvement to be seen among the cows in the hills. History says that Europeans who used to live here in the past brought high breded cows from their own countries. Besides, the producers of the hill areas are keen on getting their animals artificially inseminated as insemination with local bulls is not very convenient here. But in the plains the producers who are mostly not favourable to artificial insemination use the bulls for the same purpose. The producers of Amul will never do that. Experience has taught them that artificial insemination leads to higher production and better returns. So to them artificial insemination has no alternative.

(ii) FINANCIAL :

Financial ratio of balance sheet and income statement data, permits the charting of a firm's history and the evaluation of the present position of a firm. For our analysis, the financial ratios of both the enterprises have been classified into five distinct groups from the point of view of solvency, liquidity, profitability, efficiency and earning power. The magnitude and trends of different ratios have been presented in chapter six. Here, we want to draw some meaningful conclusions based on our previous computations. Needless to mention that a ratio is not a meaningful number in itself, it must be compared with something before it becomes useful. The two basic kinds of comparative analysis adopted here are :

(a) trend analysis, which involves computing the ratio of a particular firm for several years and comparing the ratios over time to observe if the firm is doing well or not, and (b) comparison with other firms in the same industry.

In the structural group altogether seven ratios have been computed to get a vivid picture of financial structure of both the organisations. The Funded Debt to Total Capitalisation ratio clearly indicates that debt burden is much higher in Himul. This is further reflected in the Debt-Equity ratio which is 'an index of the degree of

protection the creditors of an enterprise have . The Debt-Equity ratio of Himul is abnormally high and the situation becomes more critical if we consider grants and subsidy. The numerator of the ratio (i.e. debt) is much more higher than its denominator (equity) which clearly reflects a poor performance from financial point of view. The dismal performance of Himul is again reflected in the Equity to Net Fixed Asset ratio. Actually, when quantum of net fixed asset is more than the equity or net worth (as we find in the case of Himul), the creditors of the organisation must have contributed towards large proportion of the net fixed assets. This ratio indicates the extent to which equity capital is inserted in net fixed asset.

The Funded Debt to Net Working Capital ratio also reflects very dismal performance of Himul. Similarly, the long-Term Debt to Equity ratio is abnormally high for Himul where-as the same ratio during the ten year period of Amul is more consistent.

The coefficient of variations of seven ratios which come under the structural group reveal that the financial position of Amul is more consistent and variability is lower than what we find in the case of Himul. The magnitude of coefficient of variations of different ratios in this group necessarily lead us to infer that the management

of Himul has failed to employ its long-term as well as short term resources efficiently.

In the liquidity group we have computed two important ratios viz. "Liquidity" and "Acid-Test" ratio. These ratios are abnormally low for Himul where as for Amul these ratios are quite satisfactory which is also reflected by poor degree of coefficient of correlation between the ranks of Amul and Himul.

Both the ratios in the liquidity group and their variability also establish poor management of current asset in Himul.

So far as Profitability ratios are concerned, Himul shows a very unsatisfactory trend. The cost of production of Himul is much higher than the sales proceeds. This ratio is always negative for Himul which means that the organisation has miserably failed to generate profits. The Return On Capital Employed is also abnormally negative in the case of Himul. This ratio measures the 'earning capacity' of the capital employed in the business. Unfortunately, Himul could not generate profits to earn a minimum rate of return and it has suffered heavy losses over the period of ten years.

The Profitability ratios also depict the dismal performance of Himul. This organisation has a very

unsatisfactory performance record since its inception.

Turnover ratios measure how effectively the firm employs the resources at its disposal. These ratios all involve comparisons between level of sales and the investment in different assets viz. inventory, fixed assets etc. For Himul, all turnover ratios are unsatisfactory. As for example, the net working capital turnover ratio of Himul from the year 1982-83 to 1984-85 is negative. This is a very alarming sign because the net working capital of Himul is negative.

The Inventory Turnover ratios of Himul are higher than Amul due to some other reasons and not due to efficient management of inventory. Himul only markets liquid milk which has a very high turnover but Amul produces and markets different byproducts (viz. babyfood, chocolates, milkpowder etc.) which are slow moving products.

In the miscellaneous group two important ratios, the Net Profit to Total Assets and Net Profit to Net Worth ratios show that Himul has no earning power whereas the earning power of Amul is more or less steady over the years under study.

Changing pattern of different ratios of a particular group is studied individually and then to get a composite

effect we have computed Rank correlation coefficient of each ratio with others and represented in the matrix form (For obvious reason it takes the shape of a triangular matrix which, in short, is mentioned as t-matrix). This analysis helps us to understand the intra-ratio direction of movement over time. While in case of Amul, we observe the consistency between the different ratios, but in case of Himul, due to poor financial performance and management, no meaningful financial analysis can be done solely on ratio analysis.

To conclude, it should be remembered here that ratios are exceptionally useful tools, they have some limitations and must be used with caution. Here we have calculated twenty one odd ratios and find that in Himul there is virtually no sign of efficient resource management, (especially financial management) in Himul and steps should immediately be taken to revive the situation.

(iii) SOCIAL :

Although, from the organisational point of view, Himul has not been able to achieve its target, it has been able to leave an impact on the rural economy. May be this impact is not as glaring as in Amul. Still, Himul has won a place among the people of the hills. Here the amount of cultivable lands is quite negligible. The local

people mostly do not have their own land. But in the plains of Himul and also in Amul most of the households possess agricultural land whatever its area may be. Under these circumstances Himul has come as a boon to the hills' people.

In the dairy villages of both Amul and Himul the milk producers are more keen to keep milch animals in their houses than those in the non-dairy villages are. In the non-dairy villages of Himul 48 percent of the households do not have any milch bovine. This is also true of the non-dairy villages in this hills. This revelation makes it quite clear that the setting up of co-operative societies has made the producers in both Amul and Himul interested in rearing milch animals. This is particularly true of Amul and in the hills of Himul.

The cattle animal are generally classified in three groups : (a) Agriculture based cattle animal which are kept solely for agriculture; (b) Cattle animal kept for making business only and (c) Cattle animal kept to serve both purposes mentioned above. In the areas of Amul the third category of cattle animal are mainly reared by the households. And in Himul households in the plains prefer the first group while those in the hills rear the second one. It is natural that the number of milch animals would be higher in those areas where they are used in

cultivation but want of proper care for the cattle animals lessens their productivity that is why the number of milk animals per family in Amul is less than that of Himul. On the other hand, in the dairy and non-dairy villages in the hills of Himul the number of milch bovine per family is less than that of the plains. But this number is much higher in the dairy villages of Amul and Himul because of the existence of dairy co-operative. Even in the non-dairy villages of Amul existence of dairy co-operative societies has encouraged the producers to sell their milk to the milk societies even they have to walk on foot on an average 5 to 6 kilometres. So the number of milch animals in the non-dairy villages of Amul is higher than that in the non-dairy villages of Himul.

Although the number of milch animals of Himul is higher, the milk production is less than that of Amul. The position is better in the hill areas where milk production is high inspite of the less number of milch animals. The hill people look upon the cattle animals as their prime source of livelihood and most of the families keep high productive milch animals. As a result, milk production is also higher. Apart from this, milk production in dairy villages in all cases is higher than that of the non-dairy villages.

In dairy and non-dairy villages of both Amul and Himul the home consumption of milk is on the increase with the increase in the size of land holding. But as the advantage of ready market is not always available in the non-dairy villages, the percentage of home consumption is higher than that of dairy villages. This is true both in Amul and Himul. Again the absence of ready market causes a large portion of the total milk production in the non-dairy villages of Amul to be used in making ghee, butter, "khowa" (dried milk). Another noticeable factor is that the home consumption of milk in the families of weaker section of the non-dairy villages in the hills of Himul is too low. This is mainly because of the poverty of the producers. The producers of Amul have been getting improved 'extension services' as a natural consequence of agricultural advancement of Kaira district and the selfless services of the Amul workers. So, the milch animals in the dairy villages there have greater productivity. Besides, the yielding capacity of the milch animals does not depend upon improved extension services only, but on other factors like scientific management of milch animals, balanced feed, proper breeding etc. This is because of this fact that though the producers of the dairy villages in the plains of Himul can avail the advantages of improved extension services more than those in the hills, the yielding capacity of the milch animals of the hills

is considerably higher. In addition to that the milch animals in the hill areas have undergone a genetic improvement over the years. So even in the non-dairy villages of the hills the milch animals have almost the same yielding capacity which the milch animals in the dairy villages of the plains do have.

One of the objectives of the dairy cooperative societies is to improve the economic conditions of the rural people, particularly of the landless and marginal farmers. In the dairy villages of Amul about 65.1 percent of the total income of landless farmers come from dairy farming. In Himul it is only 40.64 percent. Again, above 50 percent of the overall income of dairy villages of both Amul and Himul is derived from crop farming. In Himul the income from crop farming is comparatively low than that of Amul. However, in Amul the income from dairy farming is less than those derived from other sources. But in Himul they are almost the same. Now it needs no clarification that the crop farming in Amul has much more been influenced by the dairy cooperative societies in comparison to that of Himul. The producers of Himul spend less time and money needed for taking care of the milch animals; and, hence they have failed to raise their total dairy-farming-income. But they have the potentials to do it because the average income from doing farming is proportionately higher in Himul than in Amul

as per their respective milk production. On the other-hand, in both the plains and hills of Himul the income from the dairy farming is not considered to be the main source of income, but third one. So, the crop farming in both the areas have had no influence on the dairy farming. Still it can't be denied that the dairy cooperative societies have at least helped the producers in the dairy villages to raise the economic status even partly.

In the dairy villages of Amul the producers get higher price for their milk than what the producers on the non-dairy villages manage to get. But in the non-dairy villages of Himul the milk marketing channels pay more for the milk than what the dairy cooperative societies do. This is happening in the plains as well as hills of Himul. This has resulted in a general apathy towards the milk societies. The producer members do not intend to sell their milk to the societies; rather, they are inclined to sell the same to different channels in the open market. The societies get only a small portion the producers sell them quite reluctantly.

In the dairy villages of both Amul and Himul milk production of the milch animals is in all cases higher than that of the non-dairy villages, the only exception being the stronger section of the hills of Himul. One thing to be marked well is that, in both dairy and

non-dairy villages, in hill areas of Himul the overall yielding capacity of the milch animals is greater than that of even Amul. So it is needless to say that the dairy cooperative societies have influenced the rural economy not only in Amul but in Himul also.

The per capita milk consumption is higher in dairy villages. This is true of both Amul and the plains and hills of Himul. Not only that, in the dairy villages of Amul and hills of Himul the per capita milk consumption is quite satisfactory. The sole credit for this goes to cooperative societies which have, at least, created an environment to raise the level of milk consumption of the rural people.

While interviewing the local producers of Amul and Himul we are convinced that most of the producers of Amul have joined the dairy cooperative societies. They sell their surplus milk to the society willingly because they have realised that the setting up of Amul has ensured a fair price of their milk. Even in Himul almost every producer member has expressed his faith in the fair practices of the organisation.

Detailed discussion with the producer members have made it clear that Amul has been quite helpful for the area producers in the field of agriculture. On the other

hand Himul has contributed little to the upliftment of the economic status of its rural milk producers.

In view of the above discussion in different phases it may be opined that Amul has played a major role in the rural development of its area. Although Himul has not been successful in this matter as much as Amul has, it cannot be said that Himul is a complete "failure". After all it has also made an economic impact in the field of rural development, particularly in the hill areas. The impact may be little, but it has immense possibilities.

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Bibliography

BOOKS :

- * Bhattacharya, Dhires. Indias Five Year Plan : an economic analysis, including an analysis of the fifth plan. Calcutta:Progressive Publishers, 1976.
- * Bazaraa, S. and Jarvis, J.Linear Programming and Net Work Flows. New York:John Wiley & Sons, 1977.
- * Bedi, M.S. Dairy Development Marketing and Economic Growth. New Delhi:Deep & Deep Publications, 1987.
- * Batty, J. Management Accounting. Plymouth:Macdonald And Evans Ltd., 1976.
- * Batliboi, J.R. Typical Problems In Advance Accountancy. Bombay:The Standard Accountancy Publications Private Ltd., 1960.
- * Barthwal, R.R. Industrial Economics : an introductory text book. New Delhi:Wiley Eastern, 1984.
- * Bhar, B.K. Cost Accounting Methods And Problems. Calcutta:Academic Publishers, 1976.
- * Chakrabarty, H. Advance Accountancy. Calcutta:Oxford University Press, 1983.
- * Dasgupta, Manas. An Audience Profile - Darjeeling District. Rajarammohunpur:North Bengal University, 1986.
- * Das, Biswanath. Uttar Banga Purakirtty (Bengali Scripts). Calcutta:Nath. Brothers, 1985.

- * Das, N.G. Statistical Methods In Commerce, Accountancy and Economics. Calcutta:Published by M.Das, 1973.
- * Dewett, Kewal Krishna and Varma, J.D. Indian Economics (Development Oriented Study). Delhi:Sultan Chand and Sons.
- * Dutt, Rudra and Sundaram, K.P.M. Indian Economy. Delhi: Sultan Chand & Company Ltd., 1979.
- * Elhance, D.N. Revised by Veona Elhance. Fundamental Statistics. Allahabad:Kitab Mahal, 1984.
- * Frederick, C.Mills. Statistical Method. London:Sir Isaac Pitman & Sons, Ltd., 1955.
- * Gupta, S.P. Statistical Methods. Delhi:Sultan Chand & Sons, 1984.
- * Ghosh, P.K. and Gupta, G.S. Fundamentals of Management Accounting. Delhi:National Publishing House, 1979.
- * Gupta, R.L. Advance Accountancy. Delhi:Sultan Chand & Sons, 1976.
- * Hogle, Homer. The Influence of Agricultural Extension In Selected Villages of Kaira District (Gujarat, India). Michigan, USA : The University of Michigan School of Education, 1972.
- * Hough, E.M. The C-Operative Movement In India. Bombay: Oxford University Press, 1959.
- * Hunter, W.W. A Statistical Account of Bengal, Vol.VII. Delhi:D.K.Publishing House, 1876.

- * Horn, J.C. Van. Financial Management & Policy. New Delhi: Prentice Hall of India, 1975.
- * Imbaden, N. A Management approach to Project Appraisal and evaluation. Published by Industrial Development Bank of India.
- * Jain, S.P. and Narang, K.L. Advance Accountancy. Delhi: Kalyani Publishers, 1983.
- * Jain, S.P. and Narang, K.L. Cost Accountancy. Delhi: Kalyani Publishers, 1982.
- * Kulkarni, K.R. Theory & Practice of Co-operative In India and Abroad, Vol. III. Bombay: Bombay Co-operators Book Depot, 1958.
- * Khan, Abid Ali. Memories of Gour and Pandua. Calcutta: Department of Information And Cultural Affairs; Government of West Bengal, 1986.
- * Kuchal, S.C. Financial Management - An Analytical and Conceptual Approach. Allahabad: Chaitanya Publishing House, 1980.
- * Kuchal, S.C. Corporation Finance - Principles And Problems. Allahabad: Chaitanya Publishing House, 1985.
- * Lewis, John P. Quiet Crisis in India: Economic Development and American Policy. Garden City, New York: Anchor Books, 1962.
- * Maslennikov, V. The Cooperative Movement In Asia And Africa. Moscow, USSR: Progress Publishers, 1983.

- * Neelamagham, S. Marketing - Its Changing Role And Indian Economy. Journal of Management Education, Vol.I, 1969.
- * Prasad, N.K. Principles & Practice of Cost Accountancy. Calcutta:Book Syndicate Private Limited, 1977.
- * Roy, Nihar Ranjan. Bangaleer Itihas, Adi Parba (Bengali Scripts). Calcutta:Lekhak Somabay Samitee, 1966.
- * Sur, Atul. Bangla-O-Bangaleer Bibaran (Bengali Scripts). Calcutta:Sahityaloke.
- * Sarkar, Sadhan. Gorkhaland Sonsodhanbadider Atanka (Bengali Scripts). Calcutta:102 S.N.Banerjee Road, 1988.
- * Sarkar, N. Book Keeping And Accountancy. Calcutta:Academic Publishers, 1975.
- * Sarkar, N. Principles & Practice of Cost Accountancy. Calcutta:Academic Publishers, 1965.
- * Srivastava, R.M. Essentials of Business Finance. Delhi: Himalaya Publishing House, 1986.
- * Sukla, M.C. and Grewal, T.S. Advance Accountancy. Delhi: Sultan Chand & Company (Pvt. Ltd.), 1988.
- * Weston, J.Fred and Brigham, Eugene F. Managerial Finance. New York:Holt, Rinehart & Weston, 1969.

JOURNALS AND REPORTS :

- * A Background Report - Problems and Prospects for Development of North Bengal. Calcutta:Published by Government of West Bengal. 1976.

- * Annual Reports (from 1975-76 to 1984-85). Siliguri:
Published by HIMJL.
- * Annual Reports (From 1975-76 to 1984-85). Anand:Published
by AMJL.
- * Annual Report - 1984-85. Anand:Published by National
Dairy Development Board.
- * Amul. Anand:Published by Anand Press, 1980.
- * A Comparative Study of Operation Flood Benefits In 1977
-78 and 1983-84. "Quarterly Economic Report" Published
by Indian Institute of Public Opinion. Vol.XXVIII, No.2.
- * Barnala, Surjeet Sing. New Strategy For Rural Develop-
ment. Yajana. Delhi:Government of India, March 1979.
- * Changing Face of Dairying in India (A Case Study of
Ghanshyampur, Murshidabad District, West Bengal).
Journal of Rural Development. Vol.4, No.1. Hyderabad:
Published by National Institute of Rural Development,
January 1985.
- * Census of India. 1961, 1971 and 1981. Published by The
Government of India.
- * Compendium of Recent Press Reports on Operation Flood.
Vol.I and II. Anand:Published by National Dairy Deve-
lopment Board, 1984.
- * District Statistical Abstract - Kaira. 1960-61.
Published by Government of India.

- * Dairy Development - Amul 's exemplary progress. A staff writer. 'The Financial Express', 2.2.1964.
- * Deptt. Statistic and Full Count Census Table (Kheda District) 1971. Published by Government of India.
- * Ganguli, B.K. "Operation Flood : Progress and Potentials". Capital, Annual Vol.2. Anand:Published by National Dairy Development Board.
- * George, Shanti. "The Skimmed Milk of Human Kindness". Calcutta: 'The Amrita Bazar Patrika', 16.2.1986.
- * Gorkhaland Agitation. Calcutta:Published by the Government of West Bengal, 1986.
- * Gazetteer of Bombay Presidency, Vol.III-B. Kaira and Panch Mahals. Bombay:Government Central Press, 1879 and 1926.
- * Gazetteer of Bombay Presidency. Vol.VI-B:Rewa Kantha. Cambay and Surat Agency:Government Central Press, 1914.
- * Gujrat District Census Handbook. No.12. Kaira District. Ahmedabad:State Government Publications, 1966.
- * Imput Service Report For The Year 1985-86. Anand: Published by Amul Research and Development Association, 1986.
- * Jain, M.M."Dairy Development through co-operatives - A Study of Rajasthan". Indian Dairyman. Vol.31. Delhi: Published by Indian Dairy Association.
- * Kurien, Verghese. A Black lie. Anand:Published by Anand Press, 1983.

- * Laidlaw, Alex. "I Have Seen It". The Maritime Co-operator, July 1975.
- * Mitra, A. Census-1951. Published by Government of India.
- * Mitra, A. District Census Handbook - Jalpaiguri. Published by Government of India.
- * Mitra Barua. "Why Co-operative Milk Union of Calcutta, had failed" 'Dairying in Eastern India - 1980'. Calcutta:Published by Indian Dairy Association (East Zone), 1980.
- * Management Development Programme for the Senior and Middle Management of Dairy Federations and Unions of Eastern Region at Siliguri, Darjeeling. Anand:Published by Institute of Rural Management, 1985.
- * Mittal, S.P. "The True, Anand Pattern", 'Dairying in Eastern India-1980'. Calcutta:Published by Indian Dairy Association (East Zone), 1980.
- * Mehta, L.P. "Relevance of Cattle Insurance in Dairy Development", 'Dairying in Eastern India-1980'. Calcutta: Published by Indian Dairy Association (East Zone), 1980.
- * Operation Flood - A Reality. Baroda:Published by Indian Dairy Corporation, 1983.
- * Operation Flood I, Impact Series Digest-4. (Darjeeling Rural Milk Production and Co-operative Milk Marketing). Anand:Published by National Dairy Development Board, 1981.

- * Operation Flood. Published by Indian Dairy Corporation and National Dairy Development Board. 1972.
- * Operation Flood - A Progress Report. Baroda:Published by Indian Dairy Corporation, 1986.
- * Operation Flood - Quarterly Progress Report on Farmer's Organisation and Technical Inputs. January-March 1987. Published by Indian Dairy Corporation.
- * Pal, J.P. "Some Constrains of Milk Supply Management in West Bengal - With Special Reference to Greater Calcutta Milk Supply Scheme Under the Directorate of Dairy Development, West Bengal". 'Dairying in Eastern India - 1980'. Calcutta:Published by Indian Dairy Association (East Zone), 1980.
- * Punjraath, Jagjit Singh. "Reaching Milk to the City Consumers", 'Dairying in Eastern India - 1980'. Calcutta:Published by Indian Dairy Association (East Zone), 1980.
- * Patel Ramu. "Makwana raps detractors of white revolution - centre considers operation flood a grand success in rural uplift - Bahuguna factor raises issues". 'Western Times', 9.1.1984.
- * Patel, S.M. and Pandey, M.K. Economic Impacts of Kaira District Co-Operative Milk Producers' Union (AMUL DAIRY) in Rural Areas of Kaira District (Gujarat State). Ahmedabad:Published by Institute of Co-Operative Management, 1976.
- * Rao, Madhav, V. "Operation Flood-I - A Conceptual Analysis", 'Economic Times'. 29.12.1983.

- * Randhawa, M.S. 'Indian Dairyman', Vol.28. Delhi:
Published by Indian Dairy Association.
- * Sputnik. "Of The Record" 'The Economic Times', 17.2.1964.
- * Singh, Khushwant, Kurian - "The Nation's Doodhwala".
Bombay: 'Sunday Observer', 18.12.1983.
- * Sengupta, J.C. West Bengal District Gazetteers - West
Dinajpur. Calcutta: Government of West Bengal, 1965.
- * The AMUL Story - a saga of co-operative effort. Anand:
Published by AMUL, 1985.
- * Verghese, B.G. "Organised Technical Skill Scores At
Anand". Bombay: 'The Times of India', 21.6.1964.
- * West Bengal Gazetteers - Jalpaiguri. Published by
Government of West Bengal.

UNPUBLISHED MATERIALS :

- * "A Brief Review of Dairying In India" (Study Note).
National Dairy Research Institute, Kalyani, West
Bengal.
- * Bandyopadhyay, M.K. The Himalayan Milk Producers '
Co-operative Union Limited - An Appraisal. Unpublished
Project Thesis, North Bengal University, 1983.
- * Bhattacharyya, S. Financial Management In Tea Industry.
Unpublished Ph.D. Thesis, North Bengal University,
1984.

- * Das, Dr. P.Kumar, "Dairying In India : Constraints and Prospects" National Dairy Research Institute, Kalyani, West Bengal.
- * Dasgupta, M. Occasional Paper of The Department of Economics. North Bengal University.
- * Gopalan, R. "Dairy Cooperatives In India" (Study Note). National Dairy Research Institute, Kalyani, West Bengal.
- * "History of Cooperative Legislation In India" (Study Note). National Dairy Research Institute, Kalyani, West Bengal.

Annexures

ANNEXURE 1

Chronology of Dairy Research and Development in India

Prior to Imperial Department of Agriculture and World War I: Provincial Agricultural Departments carried out very limited work :

- i) Establishing pedigreed herds of India breeds;
- ii) Studies on composition of milk produced by indigenous cows and buffaloes;
- iii) Establishing dairy farms by defence department to supply milk to British troops;

- 1916 Board of Agriculture after a detailed review advised Government of India to appoint an "Imperial Dairy Expert" to supervise dairy instruction and advise on dairy development.
- 1919 First All India Livestock Census carried out.
- 1920 Mr. William Smith appointed as the first "Imperial Dairy Expert" under the Agricultural Adviser to the Government of India, with head-quarters at Kasauli (H.P.). Mr. Smith proposed utilising some of the military dairy farms as centres for education, cattle breeding and extension.

1923 Inchcape Committee supported the above proposal. Military dairy farms at Bangalore, Wellington and Karnal transferred to the Imperial Department of Agriculture and placed under the Imperial Dairy Expert and his headquarter moved to Bangalore.

Bangalore farm organised as the main educational and experimental centre under the name "Imperial Institute of Animal Husbandry and Dairying".

Karnal farm named as "Imperial Cattle Breeding Farm" and used for raising pedigreed herds of Maryana and Tharparkar breeds.

Wellington farm named as "Civil Dairy Farm" and used for raising foreign Ayrshire cattle and teaching hill dairy farming.

1924 Three courses of instruction started at Bangalore :

- i) 2 year diploma (I.D.L.) to train dairy managers.
- ii) 15 month post graduate diploma (Ass.L.D.I) to train research workers.
- iii) Short courses of dairying duration for field workers.

- 1925 Another substation established by taking over the military ccreamery at Anand to impart training in creamery methods.
- Physiological Chemists Section located at Bangalore to carry out research in animal feeding.
- 1929 Imperial Council of Agricultural Research (ICAR) established.
- Polsons' modern butter making factory established at Anand.
- 1931 Agricultural Advisers organisation reorganised due to economic depression in the country; Anand creamery closed down and Wellington farm reduced to the status of a milk depot.
- Pedigreed herds of Sindhi and Gir cows and Murrah buffaloes established at Bangalore.
- Office of the Imperial Dairy Expert together with the Bangalore Institute and the Wellington Milk Depot separated from IARI and placed directly under the then Department of Education, Health and Lands as an "Attached Office".
- Karnal farm transferred to L.R.I.

Bangalore Institute redesignated as "Imperial Dairy Institute".

1936 Dr. N.C.Wright, Director, Hannah Dairy Research Institute, Ayr. (Scotland), invited by Government of India to review the progress of dairying in India.

Dr. Wright's recommendations for the establishment of a Dairy Research Institute and appointment of a Director of Dairy Research accepted by Government of India.

1939 Dr. W.L.Davis of the National Institute for Research in Dairying (NTRD), Reading, England, appointed as the first Director of Dairy Research (DDR).

1940 The first report on "Marketing of milk in India and Burma" submitted, which emphasised the lack of an organised milk industry in the country.

1941 Dr. Davis suggested a site near Delhi for the proposed Dairy Research Institute. The scheme was accepted by the Government of India, but due to the financial constraints of World War II a start was made by locating two research sections of Dairy Chemistry and Dairy

Bacteriology with skeleton-staff at LARI, New Delhi.

Bangalore Institute renamed as "Imperial Dairy Research Institute".

Imperial Dairy Expert redesignated as Dairy Husbandry Officer (DHO) and placed under the Director of Dairy Research.

Dr. Zal R. Kothawalla, the then DHO, took over as DDR on the death of Dr. Davis and head quarter of DDR and the two research sections started at LARI shifted from New Delhi to Bangalore.

1944 Dr. Kothawalla appointed as Dairy Development Adviser under "Grow More Food Campaign", and Dr. K.C. Sen, then working as Officer-in-charge of Animal Nutrition Section at IVRI, appointed as DDR.

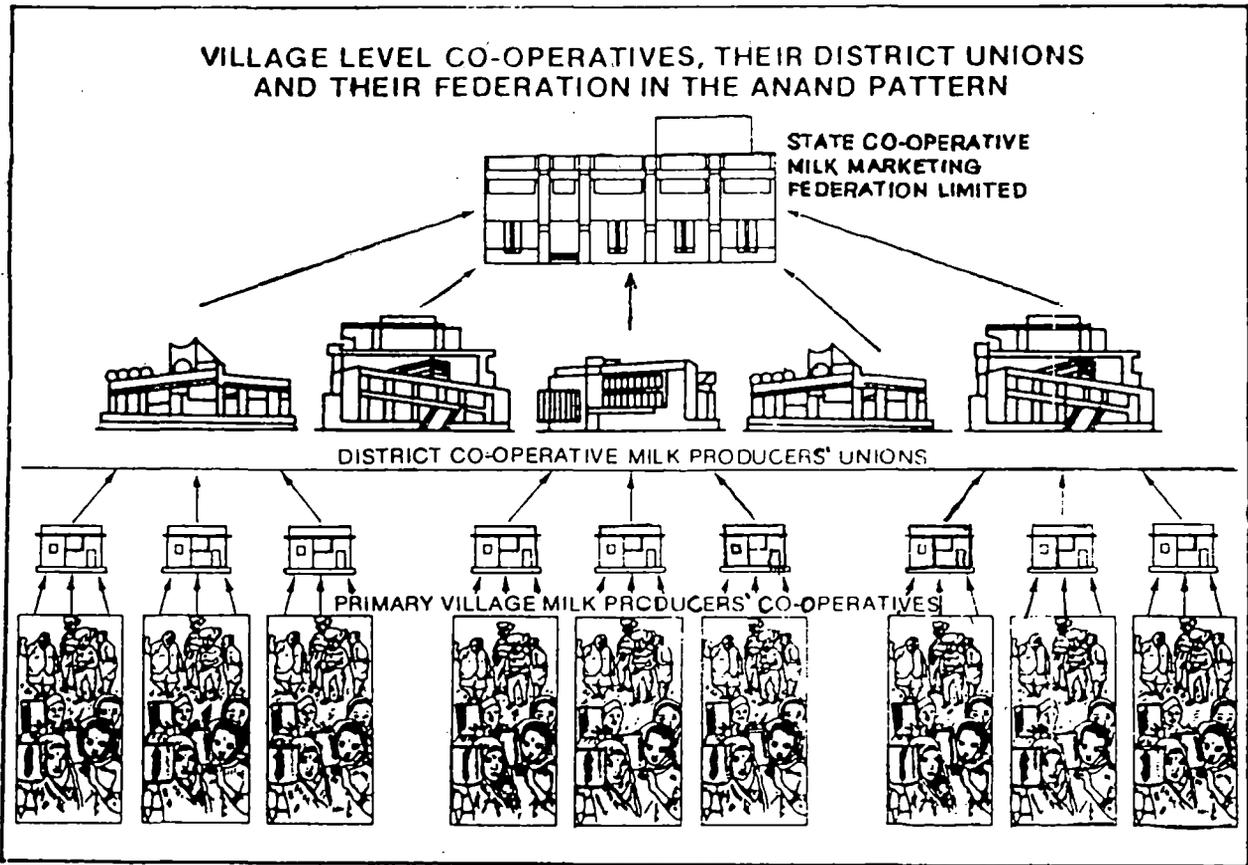
1945 Mr. R.A. Pepperall, an officer of the Milk Marketing Board of England, appointed as Milk Marketing Adviser for three months.

For the first time in India, supply of rurally produced, pasteurised and chilled milk started from Polson Dairy, Anand, to Bombay.

- 1946 Dr. H.D.Kay, Director, NIRD (England), invited by Government of India to advise on dairy research and education. Pending final decision on the proposal, the Government of India accorded sanction for augmenting staff and construction of temporary laboratories at Bangalore to meet the immediate demands of research and training.
- Training for IDL accelerated and a three-month short course started.
- Kaira District Cooperative Milk Producers' Union (AMUL) established.
- 1947 Work on Aarey Milk Colony started.
- 1949 First batch of animals moved into Aarey.
- 1951-55 A pilot scheme to improve milk supply of Delhi run by ICAR with the help of Dairy Development staff at Centre.
- 1955 National Dairy Research Institute (NDRI) established at Karnal and Bangalore converted into its southern regional sanction.
- 1957 First batch of students admitted for the B.Sc. Dairying Course at NDRI Karnal.

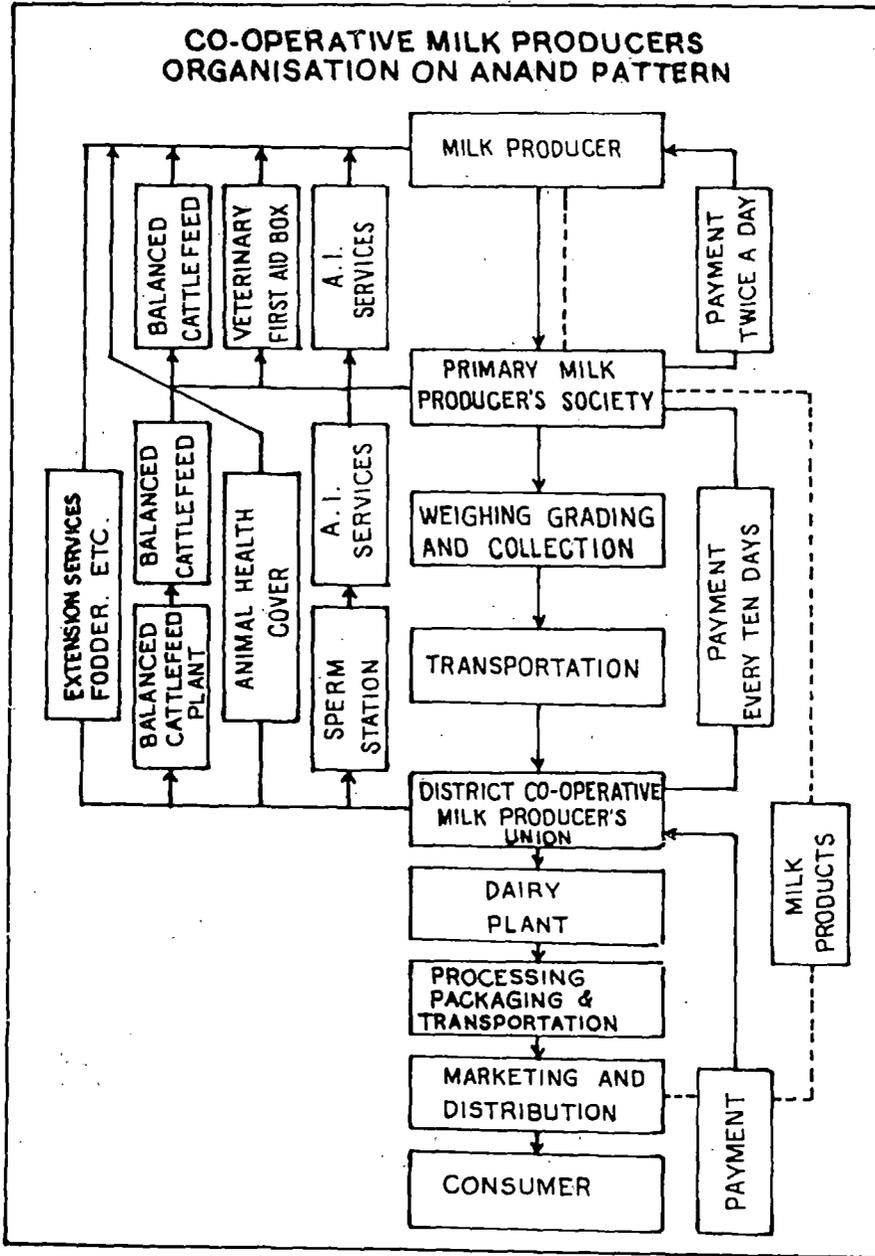
- Second Milk Colony at Haringhatta (Calcutta) established.
- 1962 Third Milk Colony at Madhavaram (Tamil Nadu) established.
- 1965 "National Dairy Development Board" set up by the Government of India to provide technical services to the Indian Dairy Industry.
- 1966 NDRI placed under the administrative control of Indian Council of Agricultural Research.
- 1970 "Indian Dairy Corporation" registered to oversee the Implementation of the "Operation Flood" project (India-WFP Project 618) which was launched on July 1, 1970.
- 1976 Preliminary work on "Operation Flood II" started.

Annexure 2



Source : Operation Flood : A Reality. Published by the Indian Dairy Corporation, Baroda and Printed at Anand Press, Anand, p.4.

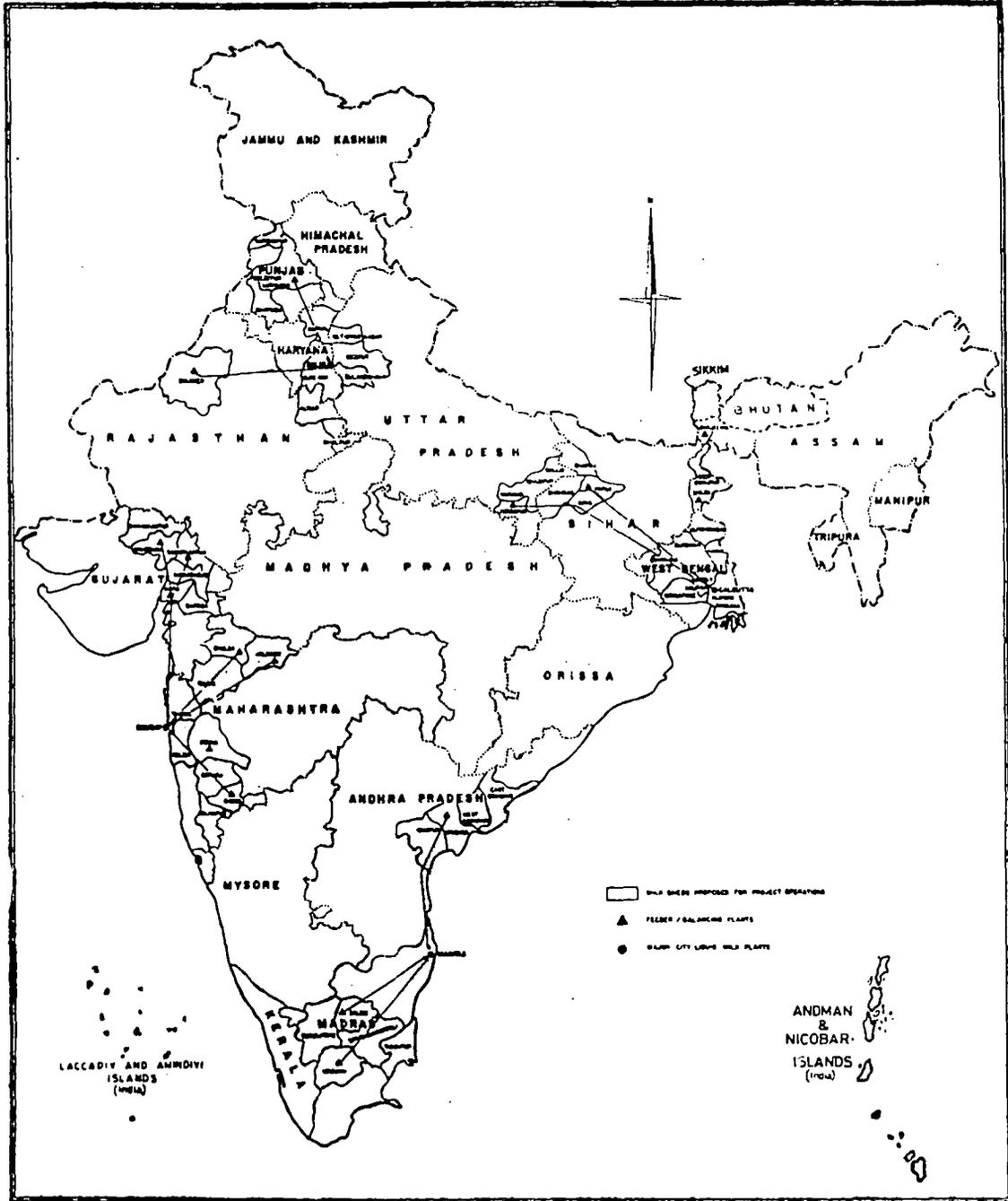
ANNEXURE - 3



Source: Operation Flood - A Reality, Published by the Indian Dairy Corporation. P.3.

Annexure 4

Proposed Project of Improve Milk Marketing And Production In
The Four Major Cities And Their Milkshed
Areas In India



Source : Operation Flood 1972, Indian Dairy Corporation/
National Dairy Development Board.

ANNEXURE 5

Dairy cooperatives in the Northern Region : Status as on
March 31, 1985.

Milkshed- districts	Anand Pattern coops	Producer- members ('000)	Milk proc		Technical inputs	
			'000 kg/d Peak month	ave- rage	Al cen -tres	Vet'y rou- tes
Haryana						
Ambala	394	19	30	17	30	4
Bhiwani	207	21	9	3	-	-
Gurgaon	304	14	25	10	-	-
Hissar	204	11	20	12	-	-
Jind	105	12	9	5	14	-
Karnal	211	10	17	10	21	1
Kurukshetra	161	6	15	6	10	-
Mohindergarh	315	17	4	2	-	-
Rohtak	210	24	29	14	22	4
Sirsa	179	8	27	16	51	3
Sonepat	93	6	2	2	2	-
Punjab						
Amritsar	325	15	75	48	39	5
Bhatinda	377	30	47	28	120	7
Faridkot	340	15	45	29	49	6
Ferozpur	210	10	30	19	18	5
Gurdaspur	255	9	32	19	40	5

contd...

Annexure 5 contd ...

Hoshiarpur	415	18	37	21	94	5
Jalandhar	515	25	100	57	98	11
Ludhiana	415	24	106	56	102	6
Patiala	323	9	38	21	43	4
Ropar	340	14	41	23	62	5
Sangrur	303	13	45	19	32	4
Uttar Pradesh						
Agra	87	3	9	6	12	2
Allahabad	119	4	11	8	10	3
Ballia	125	6	9	7	24	3
Barabanki	227	13	13	10	35	5
Bulandshahr	197	8	46	22	43	3
Etawa	29	11	3	2	-	2
Fatehpur	160	6	15	13	20	3
Ghaziabad	174	9	26	12	45	2
Kanpur	50	3	5	3	-	2
Lucknow	52	3	7	3	10	2
Mathura	40	2	3	2	-	1
Meerut	438	30	89	51	120	5
Mirzapur	68	3	3	1	16	1
Moradabad	241	10	37	21	98	4
Muzaffarnagar	86	4	11	9	15	2
Rai Bareilly	96	3	3	3	7	3

contd ...

Annexure 5 contd ...

Saharanpur	33	1	3	2	-	1
Sultanpur	65	2	1	1	8	2
Varanasi	216	9	7	4	37	2
Himachal Pradesh						
Mandi	33	5	5	3	-	-
Shimla	45	4	10	7	-	-
Jammu & Kashmir						
Srinagar	86	4	7	6	-	-
Rajasthan						
Ajmer	253	17	92	53	83	8
Alwar	416	29	88	42	72	4
Bhilwara	252	14	57	34	29	4
Bikaner	564	28	241	190	17	10
Jaipur	445	28	131	56	130	7
Tonk-Sawai						
Madhopur	134	8	17	9	15	3

Source : Annual Report - 1984-85 of National Dairy Development Board, p.26.

ANNEXURE 6

New plants in the Northern Region: Status as on March 31,
1985

Plant	Commissioned	Work in progress	At planning stage
Rajasthan			
Dairy	-	25,000 lpd. Kota	-
Dairy, expansion	-	1,00,000-1,50,000 lpd Jodhpur	-
Chilling centre	-	20,000 lpd Bikaner, Jodhpur 10,000 lpd Bikaner (3), Jodhpur	-
Aseptic pack- aging station	1,00,000 lpd Jaipur	-	-
Delhi			
Dairy, expansion	-	6,00,000-6,50,000 lpd. Mother Dairy	-
Jammu & Kashmir			
Dairy	-	-	60,000 lpd, Srinagar
Dairy, expansion	10,000-15,000 lpd Srinagar	-	-
Himachal Pradesh			
Chilling Centre, expansion	-	-	5,000- 10,000 lpd Nahan

contd ...

Annexure 6 contd ...

Punjab

Dairy	-	1,50,000 lpd Gurdaspur 1,00,000 lpd, Patiala 50,000 lpd, Ferozpur	- 50,000 lpd Faridkot
Dairy, expansion	-	45,000-2,50,000 lpd Jalandhar 45,000-1,50,000 lpd Sangrur 60,000-1,25,000 lpd Bhatinda, Hoshiarpur	- -
Chilling centre	10,000 lpd Patiala	10,000 lpd, Bhatinda, Sangrur	30,000 lpd, Faridkot
Chilling centre, expansion	-	20,000-30,000 lpd Jalandhar 10,000-20,000 lpd Jalandhar (2), Hoshiarpur, Ropar 5,000-10,000 lpd Bhatinda, Faridkot (2)	- -
	5,000-10,000 lpd Faridkot, Sangrur	-	4,000-30,000 lpd Ludhiana
Cattlefeed plant	-	100 mtpd Gurdaspur	-
Uttar Pradesh			
Dairy, renovation	40,000 lpd Lucknow	50,000 lpd Kanpur 1,00,000 lpd (with a 10 mtpd powder plant) Meerut (essential repairs)	-

contd ...

Annexure 6 contd ...

Dairy	-	-	2,00,000 lpd, Lucknow 1,00,000 lpd, Agra
Dairy, expansion	-	60,000-1,50,000 lpd (with 8-15 mtpd powder plant) IMFF, Moradabad	
	-	-	1,00,000- 3,50,000 lpd (with 10-15 mtpd powder plant), Meerut
Chilling centre	-	-	60,000 lpd Muzaffar- nagar, Bulandshahr 30,000 lpd Barabanki, Ballia, Etawah, Hapur 10,000 lpd, Barabanki
Chilling centre, expansion	-	10,000-30,000 lpd Fatehpur	-
Cattlefeed plant	100 mtpd Meerut (streamlin- ing of operations)	-	-
Haryana			
Dairy	-	60,000 lpd, Sirsa 10,000 lpd, Experimental Dairy at NDRI, Karnal, renovation	-

contd ...

Annexure 6 contd ...

			1,00,000 lpd, Rohtak (streamlining of opera- tions)
Dairy, expansion	-	-	Phase-I: 20,000- 50,000 lpd Ambala
			Phase-II: 50,000- 75,000 lpd Ambala
			Phase-I: 50,000- 75,000 lpd (with 5-10, mtpd powder plant), Jind
			Phase-II : 75,000- 1,00,000 lpd, Jind
Temporary chilling facilities	20,000 lpd Karnal	-	-
	10,000 lpd Kurukshetra, Jagadhari		

Source : Annual Report - 1984-85 of National
Dairy Development Board, pp.27-28.

ANNEXURE 7

Dairy cooperatives in the Southern Region : Status as on
March 31, 1985

Milkshed- districts	Anand Patte- -rn coops	Produ- cer- memb- ers ('000)	Milk proc '000 kg/d		Technical inputs	Vet 'y routes
			peak month	Annual average	Al centres	
Andhra Pradesh						
Chittoor	285	17	118	97	-	-
Cuddapah	159	10	59	37	-	-
Godavari	304	12	24	15	-	-
Guntur	482	73	156	81	120	12
Krishna	198	16	78	48	-	-
Kurnool	197	17	58	37	-	-
Nizamabad	191	13	37	17	1	-
Nalgonda	232	18	67	31	-	-
Visakhapatnam	321	26	49	34	-	-
Prakasam	149	12	61	32	-	-
Karnataka						
Bangalore	658	112	248	194	280	14
Belgaum	101	7	11	6	23	4
Dharwar	126	9	6	5	28	5
Hassan	350	50	43	33	103	8
Mysore	599	120	79	59	228	12
Tumkur	455	76	81	55	136	10

contd ...

Annexure 7 contd ...

Kerala

Ernakulam	231	43	39	34	79	7
Trivandrum	237	25	56	48	120	6

Pondicherry

Pondicherry	53	9	19	15	15	1
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Tamil Nadu

Chinglepet	460	31	27	21	52	4
Coimbatore	341	43	66	49	98	7
Dharmapuri	453	33	78	57	218	6
Madurai	767	133	148	63	215	10
Nilgiris	120	24	30	24	81	12
North Arcot	690	90	111	86	268	7
Periyar	490	59	108	82	140	12
Salem	573	111	139	102	173	13
South Arcot	355	49	48	41	74	9

Source : Annual Report - 1984-85 of National Dairy Development Board, p.36.

ANNEXURE 8

New plants in the Southern Region : Status as on March 31,
1985

Plant	Commissioned	Work in progress	At planning stage
Andhra Pradesh			
Dairy, expansion	-	2,50,000-3,50,000 1pd Sangam	-
Aseptic packaging station	-	1,00,000 1pd Sangam	-
Cattlefeed plant	-	100 mtpd, Mydukur	-
Karnataka			
Mother Dairy	2,00,000 1pd Bangalore	-	-
Cattlefeed plant	100 mtpd Tumkur	-	-
Kerala			
Dairy	-	1,00,000 1pd Ernakulam 60,000 1pd, Trichur, Quilon, Alleppey	1,00,000 1pd Trivandrum
Chilling centre	-	10,000 1pd Mivatupuzha, Mannar	
Cattlefeed plant	100 mtpd Thuravoor	-	-

contd...

Annexure 8 contd ...

Pondicherry

Dairy, expansion	-	10,000-30,000 1pd Pondicherry	-
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Tamil Nadu

Dairy	-	1,00,000 1pd Coimbatore	-
		50,000 1pd, Karaikudy	-

Dairy, expansion	-	1,50,000-3,00,000 1pd Erode	1,50,000- 2,50,000 1pd Madurai
		1,00,000-2,00,000 1pd Salem	-

Cattlefeed plant	-	-	100 mtpd, Madurai
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Chilling centre, expansion	30,000-50,000 1pd Attur	-	-
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Liquid nitrogen plant	45 lph Salem	-	-
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Source : Annual Report - 1984-85 of National Dairy Development Board, p.37.

ANNEXURE 9

Dairy cooperatives in the Western Region : Status as on
March 31, 1985

Milkshed- districts	Anand patt- ern coops	Produ- cer members ('000)	Milk proc '000 kg/d Peak month	Annual aver- age	Technical inputs Al cen- tres	Vet 'y routes
Goa, Daman & Diu						
Ponda	66	6	17	10	11	2
Gujarat						
Ahmedabad	388	23	64	49	13	-
Banaskantha	1,114	75	179	123	43	14
Bharuch	449	30	32	20	49	4
Bhavnagar	162	11	39	26	27	1
Gandhinagar	44	4	21	12	9	2
Junagadh	205	12	40	27	50	2
Kaira	870	359	744	532	736	42
Kutch	126	2	19	13	8	2
Mehsana	809	220	715	511	169	21
Panchmahal	371	54	70	45	63	6
Rajkot	356	19	62	40	18	4
Sabarkantha	1,232	121	359	267	86	24
Surat	644	96	173	124	141	11
Surendranagar	260	10	51	36	33	2

contd...

Annexure 9 contd ...

Vadodara	862	104	130	104	196	12
Valsad	-	10	22	15	45	-
Madhya Pradesh						
Bhopal	385	17	40	26	196	9
Gwalior	111	7	26	12	56	4
Indore	448	23	68	49	204	9
Jabalpur	138	5	12	6	70	4
Raipur	133	3	5	3	43	2
Sagar	63	2	3	1	24	2
Ujjain	407	20	80	58	230	9
Maharashtra						
Aurangabad	63	10	36	27	-	-
Beed	61	18	42	31	-	-
Bhandara	-	17	57	38	-	-
Buldhana	76	7	60	24	7	-
Chandrapur	-	10	9	5	-	-
Dhule	-	75	216	174	-	-
Jalgaon	746	75	214	164	131	13
Kolhapur	729	131	145	117	38	9
Nasik	-	-	78	54	-	-
Osmanabad	95	14	63	43	16	3

contd ...

Annexure 9 contd ...

Pune	73	57	211	191	-	-
Ratnagiri	-	-	43	23	-	-
Sangli	-	47	186	138	-	-
Satara	-	-	152	118	-	-
Solapur	81	6	39	25	22	1
Yavatmal	26	18	21	15	-	-

Source : Annual Report - 1984-85 of National Dairy Development Board, p.39.

ANNEXURE 10

New plants in the Western Region : Status as on March 31,
1985

Plant	Commissioned	Work in pro- gress	At planning stage
Gujarat			
Dairy (with drying facility), expansion	-	8,00,000-9,50,000 1pd (with 75 mtpd powder plant), Anand 30,000-1,00,000 1pd (with 10 mtpd powder plant), Junagadh 30,000-80,000 1pd (with 10 mtpd powder plant), Godhra	-
Dairy, expansion	20,000-60,000 1pd Bharuch	1,50,000-2,00,000 1pd (with 2 mtpd powder plant), Surat 90,000-2,00,000 1pd Baroda 45,000-1,00,000 1pd (with 2mtpd powder plant), Rajkot 20,000-1,00,000 1pd Surendranagar 30,000-60,000 1pd Valsad 20,000-60,000 1pd Bhuj	-
Dairy	-	60,000 1pd, Bhavnagar	-
Dairy, strengthening	-	2,00,000 1pd Ahmedabad	-

contd ...

Annexure 10 contd ...

Chilling centre	-	20,000 1pd Ahmedabad (2), Junagadh (2), Bhavnagar (2), Bhuj, Rajkot 10,000 1pd Valsad, Bhuj	-
Chilling centre, expansion	-	5,000-20,000 1pd Rajkot (2)	-
		4,000-10,000 1pd Bhavnagar	-
Cattlefeed plant, expansion	-	100-200 mtpd Surat	100-200 mtpd Rajkot
Aseptic packaging station	-	14,000 1pd Baroda	
Goa, Daman & Diu			
Fisheries project at Chapora	-	5 mtpd ice plant 30 ml ice storage for raw fish 1 mt fish freezing facility	Banaurim
Plasma/serum processing plant		75,000 litres/year (including storage facility for 5,000 litres of frozen plasma), Usgaon	-
Cattlefeed plant	-	50 mtpd, Usgaon	-

contd ...

Annexure 10 contd ...

Madhya
Pradesh

Feeder- balancing dairy	-	2,00,000 lpd (with 10 mtpd powder plant), Gwalior	-
Dairy	-	1,00,000 lpd Raipur, Jabalpur 30,000 lpd, Sagar	-
Powder plant, expansion	-	10-20 mtpd Indore	
Chilling centre	10,000,1pd, Bandol	20,000 lpd, Gwalior (3) Bhopal, Sagar 10,000 lpd Raipur, Sagar, Jabalpur	-
Chilling centre, expansion	-	20,000-30,000 lpd, Bhopal	20,000-30,000 lpd, Indore 10,000-20,000 lpd Ujjain (2)

Maharashtra

Feeder- balancing dairy	-	2,00,000 lpd (with 10 mtpd powder plant), Kolhapur	-
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Source : Annual Report - 1984-85 of National
Dairy Development Board, pp.40-41.

ANNEXURE 11

Dairy cooperatives in the Eastern Region : Status as on
March 31, 1985

Milkshed- Districts	Anand Patte- -rn coops	Produ- cer members ('000)	Milk proc '000 kg/d Peak month	Annual Average	Technical inputs Al cen- tres	Vet 'y routes
Andaman & Nicobar Islands						
South Andaman	20	1	1	1	6	-
Assam						
Gauhati	124	6	4	2	6	1
Bihar						
Muzzaffarpur	106	2	2	2	-	-
Patna	500	12	29	17	61	-
Saharsa	42	1	2	2	-	-
Samastipur	117	1	2	1	-	-
Orissa						
Cuttack	78	3	4	3	44	2
Dhenkanal	60	2	1	1	23	-
Keonjhar	49	2	1	1	34	1
Puri	98	4	2	1	32	2

contd ...

Annexure 11 contd ...

Sikkim						
Gangtok	107	5	4	4	34	2
Tripura						
Agartala	61	3	2	2	-	2
West Bengal						
Darjeeling	350	15	20	18	129	7
Hooghly	9	0.3	1	0.4	-	-
Malda	68	2	1	0.3	25	2
Midnapore	122	5	3	2	69	2
Murshidabad	272	16	17	9	135	5
Nadia	161	12	7	3	66	5

Source : Annual Report - 1984-85 of National Dairy Development Board, p.32.

ANNEXURE 12

New plants in the Eastern Region : Status as on March 31,
1985

Plant	Commissioned	Work in progress	At planning stage
Assam			
Dairy	-	60,000 lpd, Gauhati	-
Cattlefeed plant	-	100 mtpd, Gauhati	-
Andaman & Nicobar Islands			
Dairy	-	-	5,000 lpd. Port Blair
Bihar			
Dairy	-	-	60,000 lpd, Dhanbad, Gaya, Jamshepur, Mungyer, Rachi
Dairy, expansion	-	-	25,000-50,000 lpd, Bokaro 1,00,000- 1,50,000 lpd Patna
Chilling centre	-	-	40,000 lpd, Hazipur 20,000 lpd, Arah, Buxer, Gaya, Saran(2), East Champaran (2)

contd...

Annexure 12 contd ...

			10,000 lpd Biharsharif, Saharsa, Rohtas, Gaya
Chilling centre, expansion	-	-	10,000-20,000 lpd Darbhanga
Orissa			
Dairy	-	60,000 lpd Bhubaneswar 30,000 lpd, Rourkela	
Chilling centre	10,000 lpd Dhenkanal, Keonjhar	-	-
Cattlefeed plant	-	100 mtpd, Cuttack	-
West Bengal			
Dairy	60,000 lpd Berhampore	-	-
Cattlefeed plant	-	100 mtpd, Berhampore	-
Fisheries project MPEDA	-	300 mt, Calcutta	-
SMP godown & packaging station	-	3,000 mt, Calcutta	-

contd ...

Annexure 12 contd ...

Bulk milk-
vending booths:

Refrigerated

1,300 lpd Calcutta (82)	1,300 lpd Calcutta (25)	1,300 lpd Calcutta (93)
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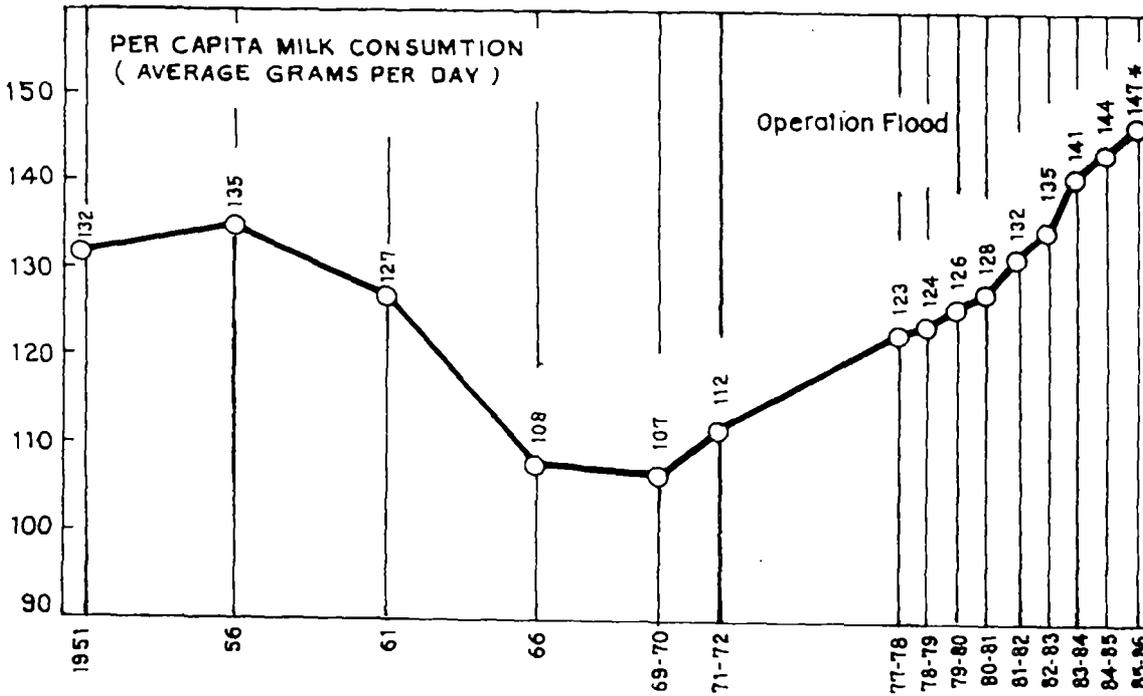
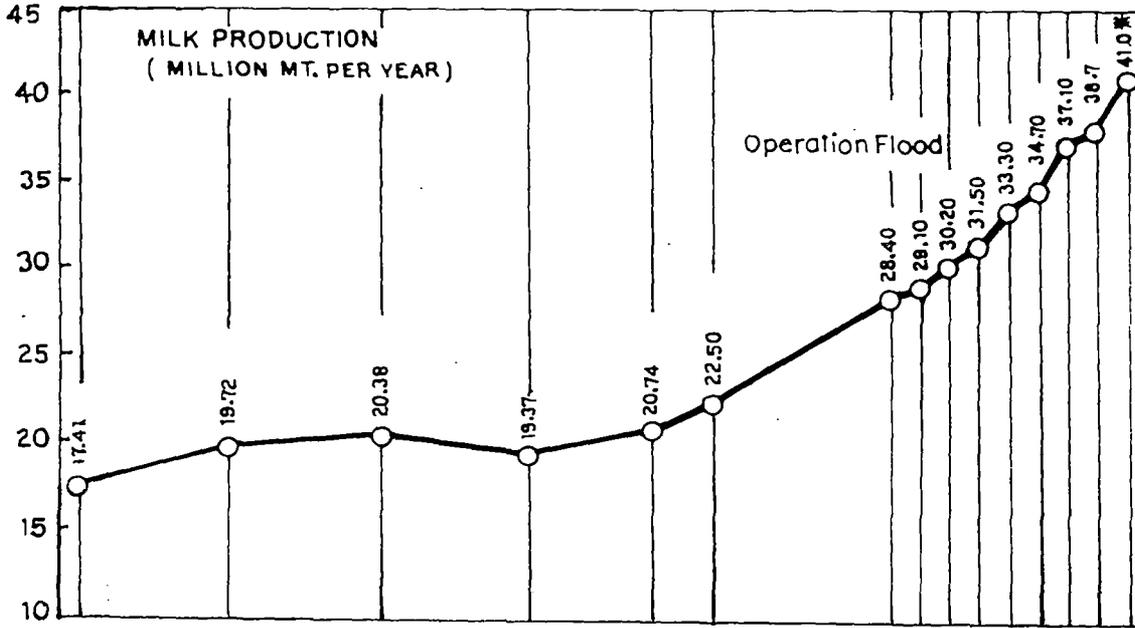
Unrefri-
gerated

-	400 lpd Calcutta (3)	400 lpd Calcutta (7)
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Source : Annual Report - 1984-85 of National
Dairy Development Board, p.33.

ANNEXURE - 13 .

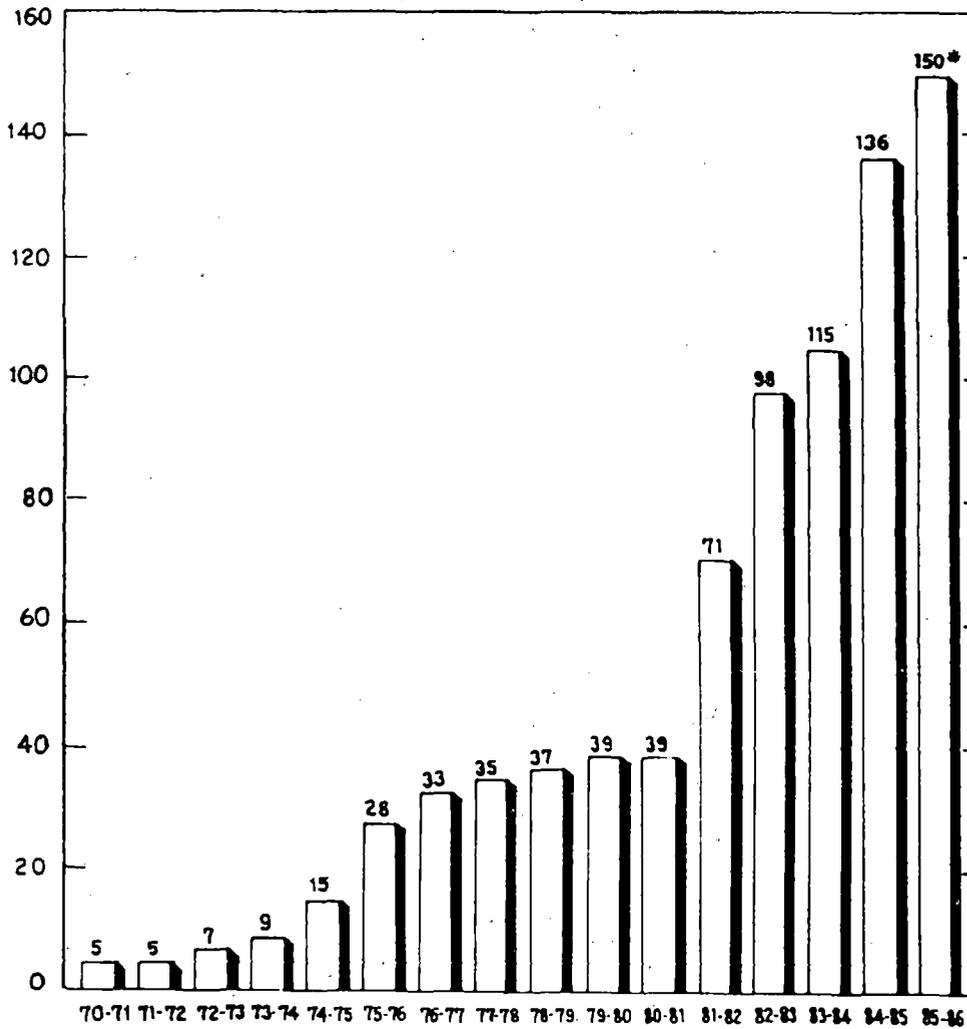
Milk Production and Consumption in India



* Anticipated achievement.

Source: Ministry of Agriculture, Govt. of India.,
Operation Flood, Progress Report, IDC, 1986. P. 1.

ANNEXURE - 14
OPERATION FLOOD
 Milkshed Coverage



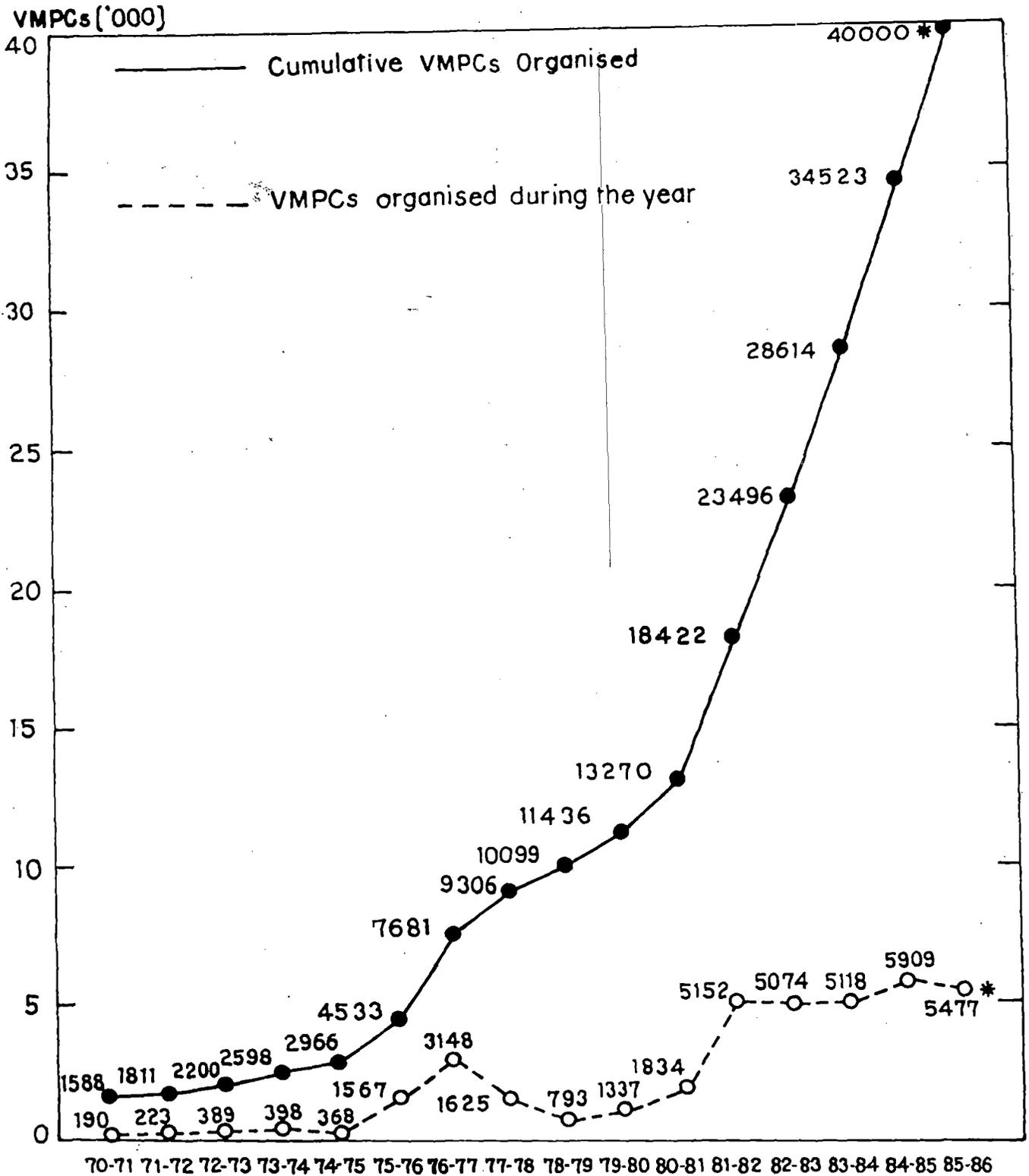
Note: For the period 1975-83, the milksheds include those of the World Bank-assisted projects included under Operation Flood.

* Anticipated achievement

Source: Operation Flood A progress Report, IDC, 1986. P. 3.

OPERATION FLOOD

Anand Pattern Village Milk Producers' Co-operatives



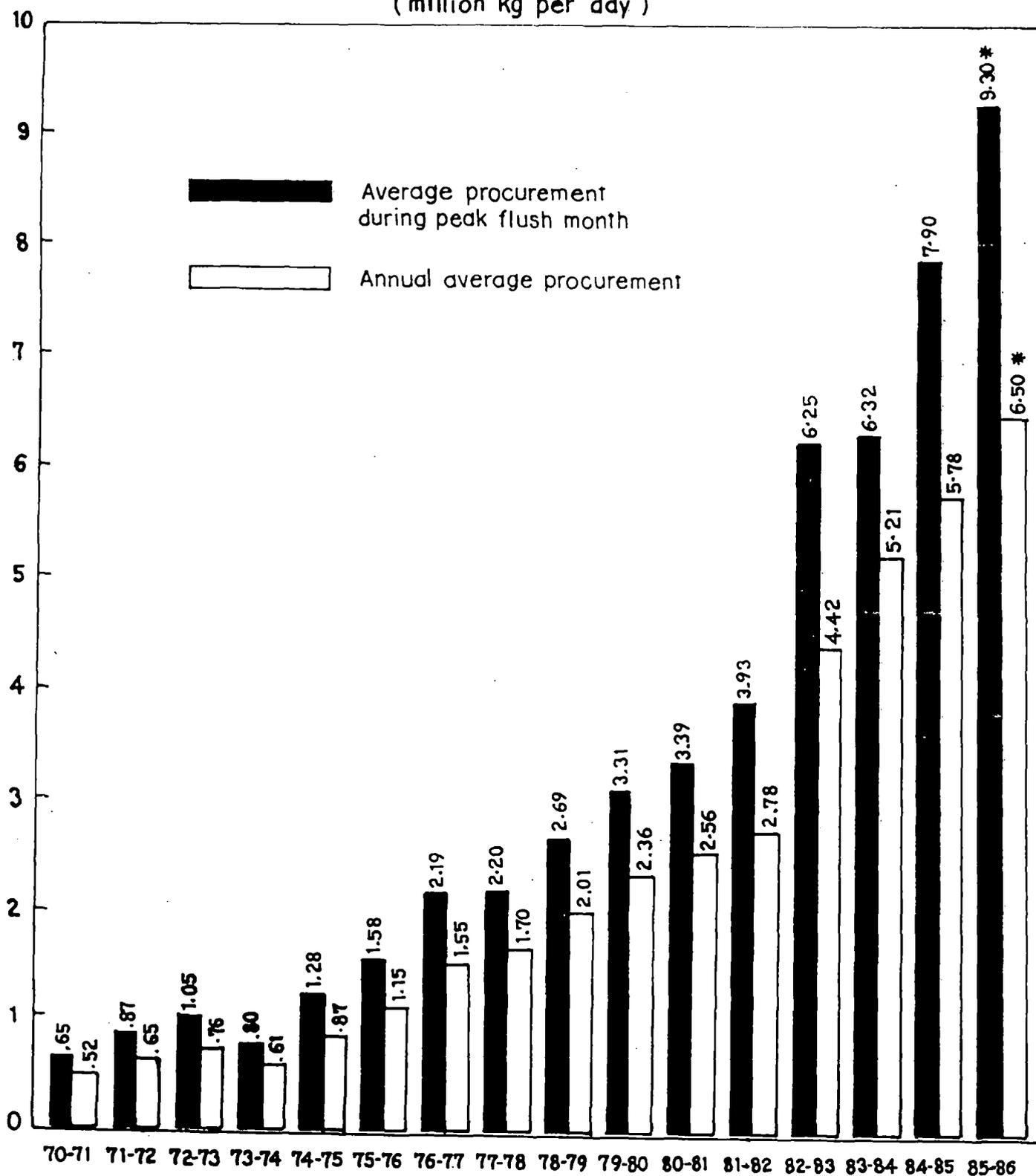
Note: In the case of a few milksheds where data for 1970 to 1977 were not available, estimated figures have been used. For the period 1975-83, the data include those of World Bank-assisted projects.

* Anticipated achievement.

Source: Operation Flood A Progress Report. IDC, 1986. P. 5.

OPERATION FLOOD

Average Rural Milk Procurement
(million kg per day)

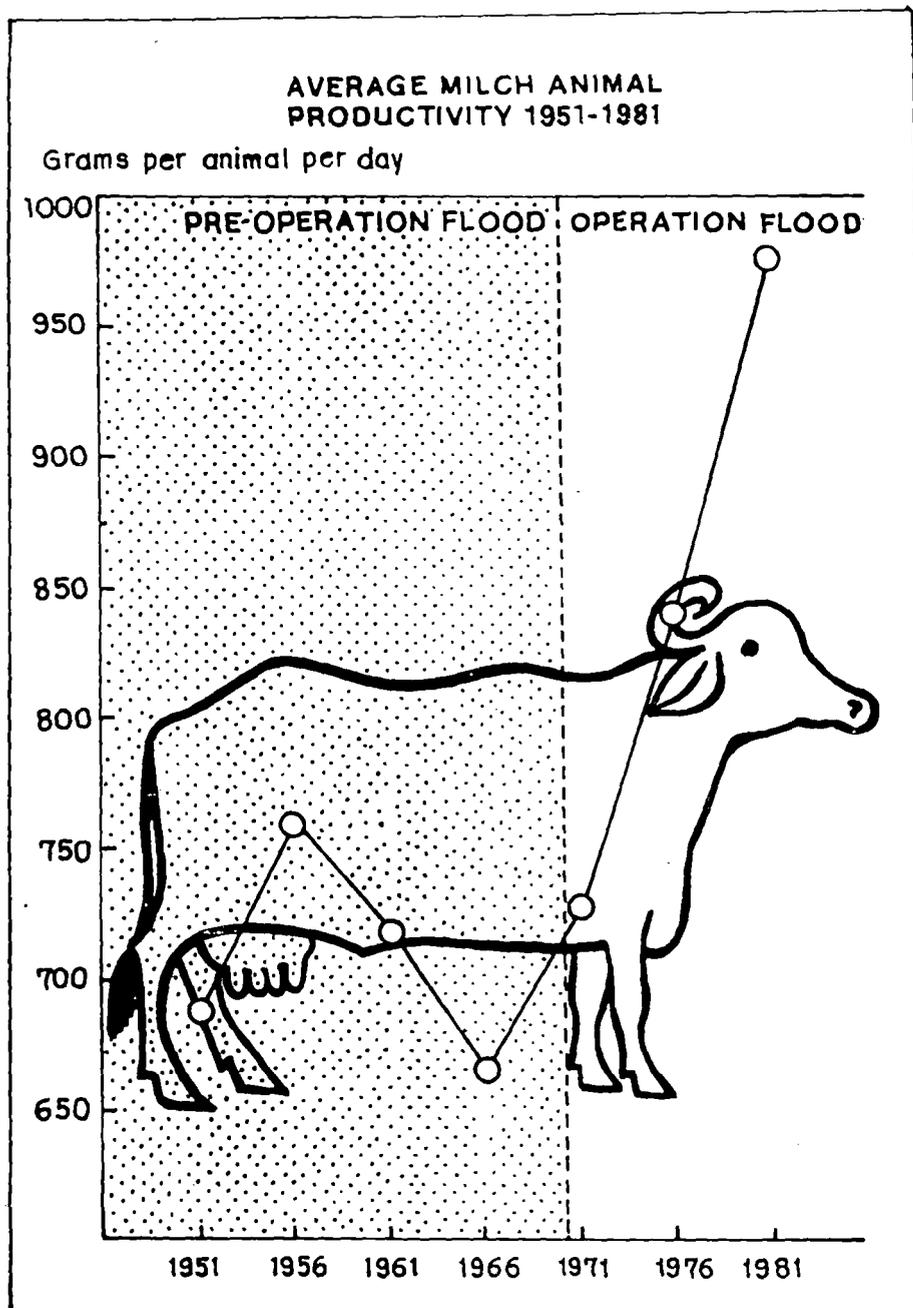


Note: In the case of a few milksheds where data for 1970-77 were not available, estimated figures have been used. For the period 1975-83, the data include those of World Bank-assisted projects.

* Anticipated achievement.

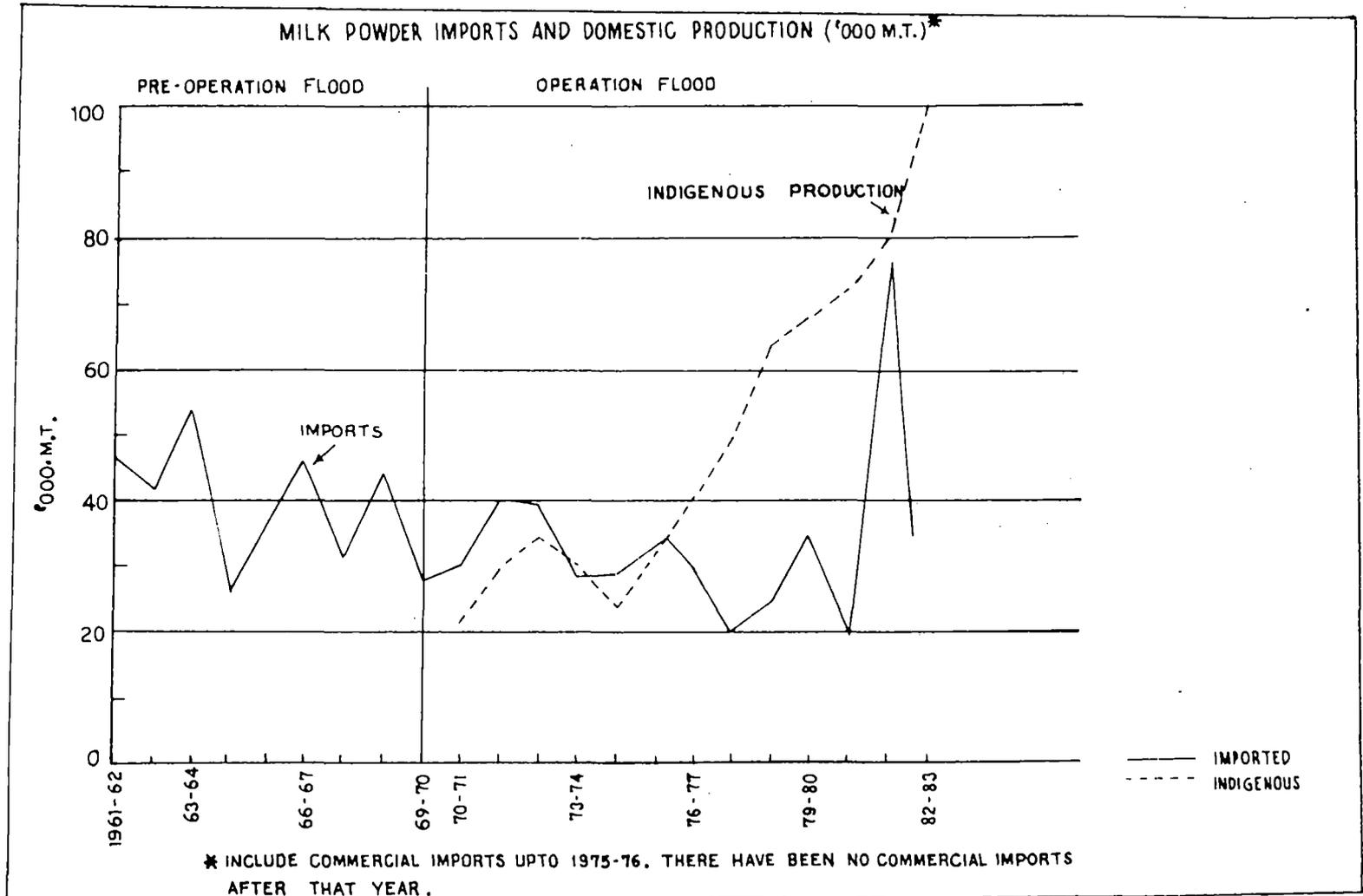
Source: Operation Flood A Progress Report IDC, 1986, P. 7.

ANNEXURE - 17



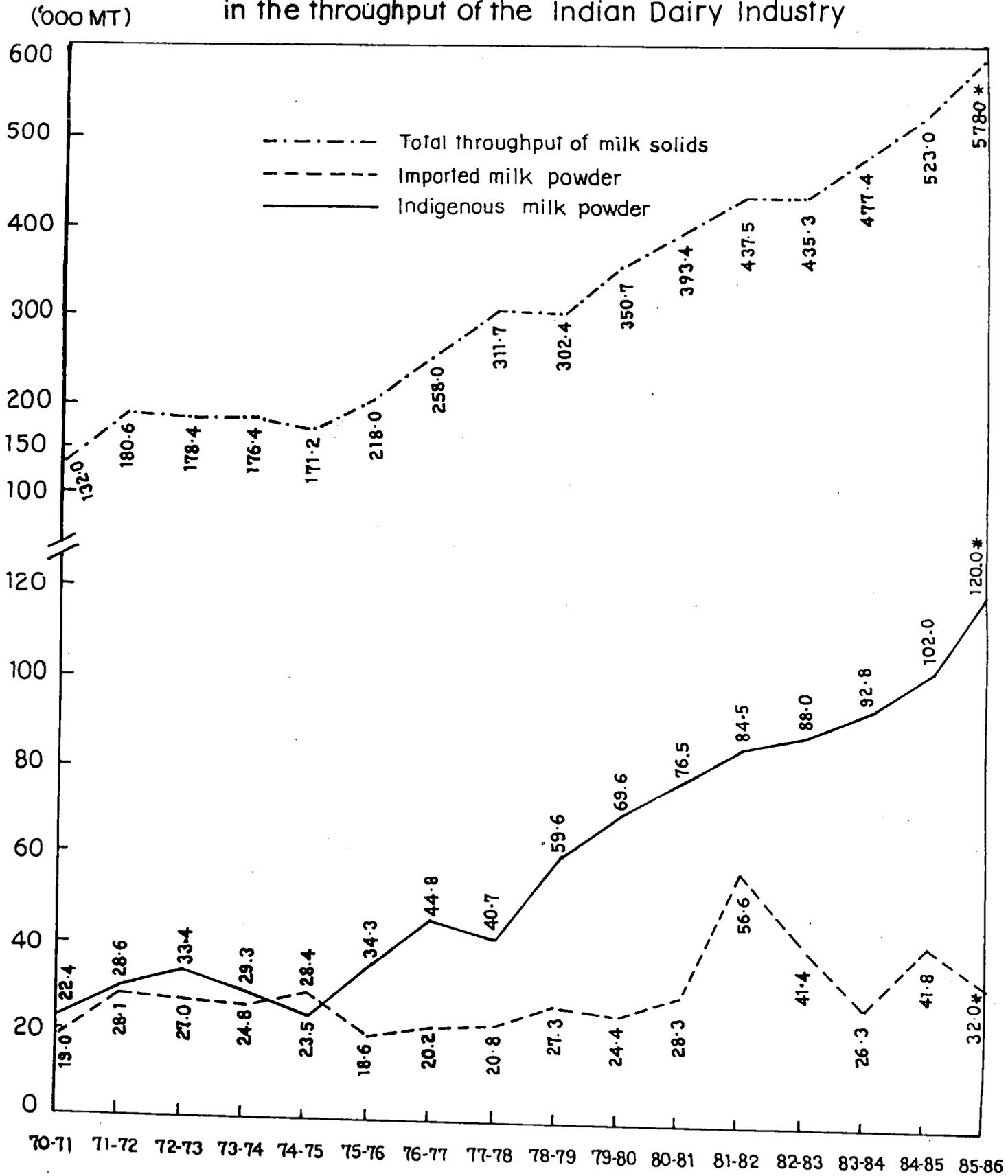
Source : Operation Flood ; A Reality , Indian Dairy Corporation . P.33 .

ANNEXURE - 18



Source: A Block Lie, Illustrated Weekly, October 30, November 5, 1983.

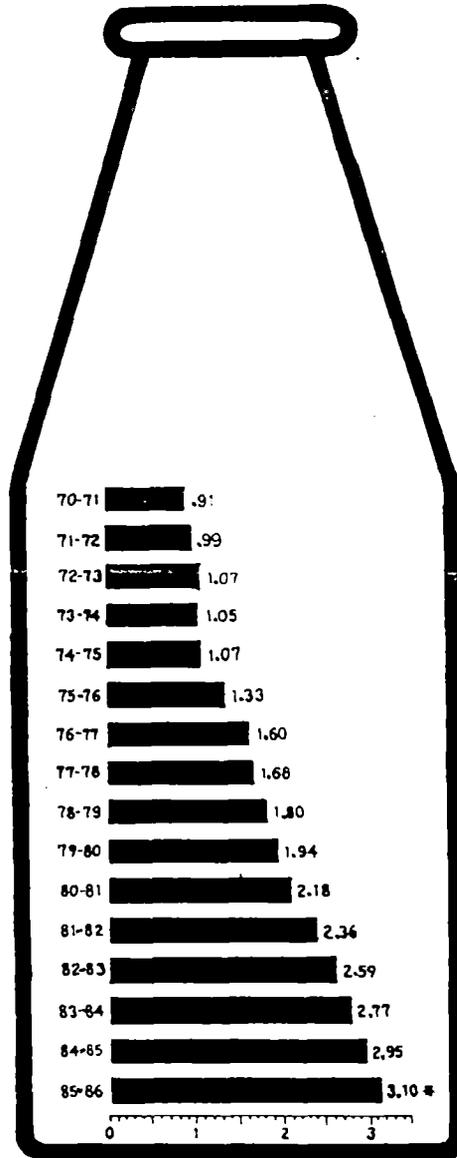
Indigenous milk powder production
and share of imported milk powder
in the throughput of the Indian Dairy Industry



* Anticipated achievement

Source: Operation Flood - A progress Report IDC, 1986. P. 13.

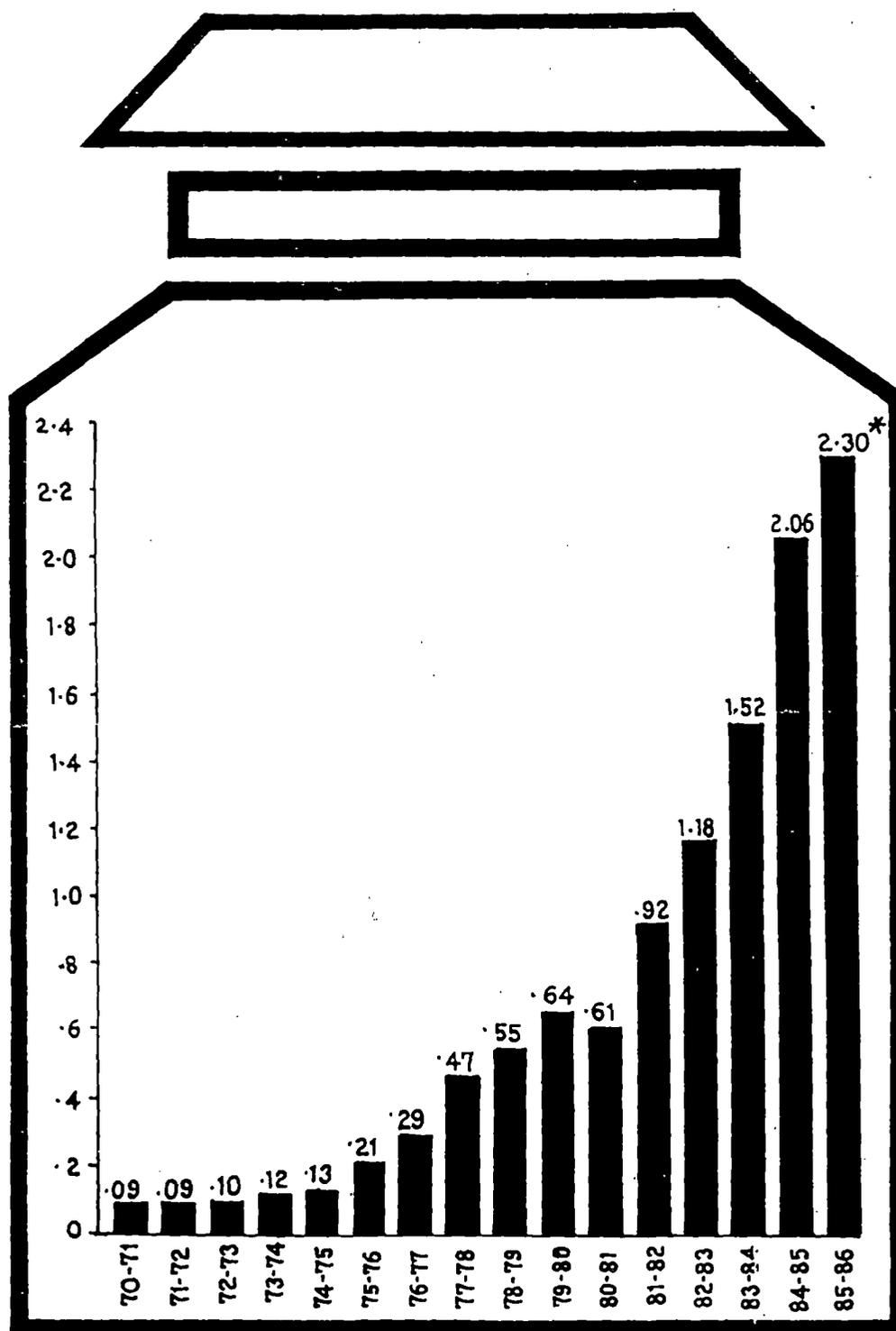
ANNEXURE - 20
 OPERATION FLOOD
 Throughput of Metro-Dairies
 (average million litres per day)



* Anticipated achievement.

Source: Operation Flood - A Progress Report,
 IDC, 1986. P. 9.

Annexure-21
OPERATION FLOOD
 Milk Marketed in Smaller Towns
 (average million litres per day)



Note: In the case of a few milksheds where data for 1970-80 were not available, estimated figures have been used. For the period 1975-83, the data include those of World Bank-assisted projects.

* Anticipated achievement

Source: Operation Flood- A Progress Report. IDC, 1986. P.11.

ANNEXURE 22

HISTORICAL SUMMARY OF AMUL

- Nov. 11, 1945 Inauguration of the Government of Bombay Milk Scheme.
- April 1, 1946 First meeting of milk producers at Samarkha village in Kaira district under the Presidentship of Shri Morarji Desai.
- Oct. 26, 1946 First cooperative society formed in the village of Hadgud.
- Oct. 26, 1946 First collection of milk by the Kaira District Cooperative Milk Producers' Union Ltd. Milk was processed by Polson Model Dairy.
- Dec. 14, 1946 Registration of the Cooperative Union.
- June, 1, 1948 Opening of the processing unit of the Kaira District Co-operative Milk Producers' Union Ltd. at Anand by Shri B.G.Kher and commencement of processing. Quantity of milk handled was 500 lbs. per day.
- Dec. 27, 1948 Quantity of milk handled increased to 10,000 lbs. per day.
- Mar. 3, 1949 First breeding bull provided.
- April 21, 1949 First pumping set installed in a village.
- Oct. 31, 1949 Local sale distribution of milk started through the Milk Cooperative Consumers Society at Anand.

- Feb. 14, 1950 Processing with plate pasteurizer inaugurated by Shri R.K.Patil, Commissioner of Food Production, Government of India. The capacity of the dairy increased to 35,000 lbs. of milk per day.
- April 18, 1950 First cattle standing constructed in a village.
- May 15, 1950 First silo tower constructed in a village.
- Oct. 14, 1950 Mobile veterinary van sent to the villages.
- Oct. 16, 1950 Dr. Rajendra Prasad, President of India, visited the dairy.
- Jan. 4, 1951 The government cancelled its contract with Anand Milk Product. The work was handed over to the Cooperative Union.
- Jan. 1, 1952 The government cancelled its contract with Polson Model Dairy; the business was given to the Cooperative Union.
- June 4, 1952 The government land purchased for the establishment of a dairy was given to the Union. The land improvement work was started.
- Dec. 22, 1952 Surplus milk, which was processed by Polson Model Dairy, was transferred to the Cooperative Union.
- Nov. 15, 1954 Foundation ceremony performed by Dr. Rajendra Prasad, President of India, for construction of the new dairy.

- Oct. 31, 1955 Opening ceremony of the new dairy plant was performed by the Prime Minister of India, Pandit Jawaharlal Nehru.
- Oct. 28, 1959 Foundation ceremony for the extension wing of the dairy building was performed by Shri Tribhuvandas K.Patel, President of Amul Dairy.
- Oct. 31, 1960 Opening ceremony of the extension wing of the dairy building was performed by Shri Morarji Desai, Finance Minister, Government of India.
- Aug. 31, 1963 The Magsaysay Award was present in Manila (Philippines) to :
1. Shri Tribhuvandas K.Patel, President of Amul,
 2. Shri Verghese Kurien, General Manager of Amul, and
 3. Shri D.N.Khurody of the Bombay Milk Scheme.
- Feb. 1, 1964 101 new cooperative societies started milk collection.
- April 28, 1964 The "Padma Bhushan" award, given for distinguished service, was presented to Shri Tribhuvandas K.Patel by Dr. S.Radhakrishnan, President of India.
- Oct. 31, 1964 The Cattle Feed Factory opening ceremony was performed by the Prime Minister, Shri Lal Bahadur Shastri.

- Jan. 26, 1965 The "Padma Shri" award was given to General Manager, Verghese Kurien, for distinguished service by Dr. S.Radhakrishnan, President of India.
- June 1965 An Honorary Doctor of Science Degree was awarded to General Manager, Verghese Kurien, by Michigan State University for service in developing dairying and the rural economy in India.
- Oct. 31, 1968 Opening of a new Assembly Hall-cum-Auditorium at Amul Dairy.
- Mar. 31, 1969 The new administrative block of the dairy was commissioned.
- July 1970 Opening of a new Chilling Centre with daily capacity of 5,000 litres in the village of Dev in Balasinor taluka, 52 miles from Anand.
- July 1970 Construction work was progressing on the expanded can fabricating unit of M/s. Kaira Can Company Limited in the Amul compound at Anand.
- 1980-81 The 1981-82 was declared as the 'Artificial Insemination Year' with a view to increase the total number of effective inseminations and thereby reducing the calving interval.

*Prince Charles, Prince of Wales visited the dairy plant and also took time off to visit Hadgud and Ramnagar Villages.

1981-82 *The 'AMUL' celebrated 1981-82 as the 'Artificial Insemination Year' and performed a record figure of 3,25,886 artificial insemination showing an increase of 15% over the previous year.

*For the first time in Kaira district was introduced Frozen Semen Technology at the village level by converting 70 village liquid Semen sub-centres into Frozen Semen Sub-Centres.

*Prime Minister, Sm. Indira Gandhi visited Amul Dairy when institute of Rural Management Organised their first convocation for awarding diplomas to their fairest batch of graduates in this dairy campus at Anand.

*On 20th November, 1981, H.F. Dr. Apolo Milton Obote, President of the Republic of Uganda visited the dairy plant with Mrs. Obote.

1982-83 *Giani Zail Singh, President of India visited the 'AMUL' Organisation.

1983-84 *Alterations were made in the existing equipment to benefit from modern technological innovations.

*To meet the increased demands, completed the expansion plan for cheese manufacture.

*To use the natural gas as fuel in the dairy plant, a 55 KM. natural gas pipeline from Navagam (Taluka Matar) to the dairy was made.

Source : *(1) The Influence of Agriculture
Extention in selected village of Kaira
District (Gujarat, India), Homer Hogla
(2) The Amul Story-a sage of co-operative
effort, Printed at Anand Press, Gamdi,
Anand. (3) Several Annual Reports etc.

ANNEXURE 23

The Progress Made by the AMUL From 1955-56 to 1984-85

Year ending 31st March	Number of societies	Number of farmer members of societies	Share Capital of the Union Rs.	Quantity of milk collected from societies (in kgs.)	Sales Rs.
Position before the New Dairy was built					
1955-56	64	22,828	3,17,400	1,11,36,363	74,36,000
Position after the New Dairy was built					
1956-57	107	26,759	3,16,500	1,41,64,800	89,47,000
1957-58	130	29,003	3,93,900	2,11,56,400	1,34,14,000
1958-59	138	33,068	4,73,500	2,75,57,800	2,11,65,000
1959-60	167	40,181	5,67,100	2,29,27,000	1,82,16,000
1960-61	195	40,500	7,41,100	2,39,15,000	1,98,53,000
Position after the Dairy was expanded for Baby Food & cheese					
1961-62	219	46,400	7,48,700	3,53,98,429	3,15,23,820
1962-63	254	58,500	8,19,200	5,04,17,811	4,56,24,311
1963-64	378	65,000	10,14,000	6,23,02,000	6,03,62,000
1964-65	421	85,000	12,57,000	6,06,41,000	6,27,26,000

contd ...

Annexure 23 contd ...

Position after the 2nd Dairy was built					
1965-66	518	1,10,000	13,70,060	6,59,05,000	9,22,19,207
1966-67	567	1,20,000	16,51,100	7,16,08,691	11,76,41,988
1967-68	592	1,35,000	18,82,800	8,05,99,111	14,83,77,000
1968-69	600	1,48,000	23,35,400	11,31,56,188	24,19,10,137
1969-70	610	1,75,000	28,37,700	12,38,84,347	27,19,37,761
1970-71	706	1,80,000	34,71,800	11,82,25,273	27,39,41,845
1971-72	744	2,15,000	38,57,400	13,32,22,528	33,60,39,477
1972-73	783	2,25,000	41,48,000	14,78,11,128	39,22,38,718
1973-74	794	2,35,000	43,18,300	11,19,48,121	36,61,78,247
1974-75	844	2,45,000	44,18,000	13,09,52,349	44,64,63,32 2
1975-76	829	2,50,000	52,92,700	12,90,41,218	42,72,55,597
1976-77	831	2,55,000	68,59,000	12,70,17,040	44,20,01,799
1977-78	831	2,75,000	68,67,400	14,11,97,710	53,55,29,349

contd ...

Annexure 23 contd ...

1978-79	856	2,95,000	68,98,200	15,92,62,615	58,11,33,173
1979-80	895	3,08,000	79,73,500	16,93,76,542	66,42,42,138
1980-81	895	3,27,000	89,61,500	16,95,76,969	75,29,97,024
1981-82	894	3,39,000	89,63,500	16,00,18,395	78,56,65,255
1982-83	895	3,52,000	1,09,70,100	18,38,20,076	95,36,07,757
1983-84	880	3,59,000	1,26,01,200	18,20,22,754	103,04,81,506
1984-85	870	3,59,000	1,41,16,000	19,32,20,249	122,47,95,663

Source : The Amul Story - a saga of cooperative effort, Printed at Anand press,
Gandhi, Anand, p.30.

ANNEXURE 24

Progress Report of Veterinary Work of AMUL

No.	Year	No. of vill- age soci- eties	No. of Mobile Vete- rinary Dispen- -sari- es	Cases treated by fi- rst aid Vet. Workers in vi- llages	Cases tre- ated by Vet. Offi- cers of Mobile Veterinary Dispensa- ries	No. of Special visits emerge- ncy calls	Total No. of Colum No.5,6 & 7
1	2	3	4	5	6	7	8
1.	1956-57	107	2	-	7796	20	7816
2.	1961-62	219	4	10829	18811	907	30547
3.	1966-67	567	12	62682	46385	7798	116865
4.	1968-69	575	15	92915	60543	13238	166696
5.	1970-71	586	16	141227	70078	22862	234167
6.	1971-72	625	19	215000	74256	26907	226163
7.	1972-73	728	21	120321	89931	30587	240839
8.	1973-74	756	21	134238	79886	28804	242928
9.	1974-75	758	21	130145	96659	29175	255979
10.	1975-76	823	23	163145	118258	34231	315634
11.	1976-77	823	23	165228	121310	39946	326419
12.	1977-78	831	21	167618	125239	45708	335566
13.	1978-79	829	21	167283	135041	66069	368393
14.	1979-80	895	23	182318	136081	74642	393041
15.	1980-81	895	23	219454	133695	70469	423618
16.	1981-82	895	23	220505	145199	71028	436732
17.	1982-83	887	18	233528	124198	78825	436551
18.	1983-84	874	18	219196	123045	90056	432297
19.	1984-85	876	18	218862	143080	97690	459632

ANNEXURE 25Progress Report of Artificial Insemination Work of AMUL

Sr. No.	Year	No. of Artificial Insemination Centres	No. of Insemination	No. of pregnancy diagnosis cases
1	2	3	4	5
1.	1950-51	5	578	50
2.	1955-56	7	3854	816
3.	1960-61	26	9077	4774
4.	1964-65	138	31582	24160
<u>Intensive Cattle Development Programme (Sept '65)</u>				
1.	1965-66	261	41841	28718
2.	1966-67	312	87445	56647
3.	1967-68	332	104308	84907
4.	1968-69	362	137808	113384
5.	1969-70	475	151085	118354
6.	1970-71	523	157547	113821
7.	1971-72	550	156823	105979
8.	1972-73	581	157316	106928
9.	1973-74	571	150419	109018
10.	1974-75	668	192626	123257
11.	1975-76	665	207674	130403
12.	1976-77	678	223218	128629
13.	1977-78	711	248263	133496
14.	1978-79	734	255011	138976
15.	1979-80	739	268792	142808
16.	1980-81	735	285073	159377
17.	1981-82	731	325886	184127
18.	1982-83	704	353152	194919
19.	1983-84	722	354744	192495
20.	1984-85	736	422876	211343

ANNEXURE 26Specimen Copy of Questionnaire Used

Date

1. Name & Address of farmer -
2. No. of family members -
3. Landholding :
 - A-Landless families (No land) -
 - B-Small farmers (1 to 2 hectares) -
 - C-Medium farmers (2.1 to 4 hectares) -
 - D-Big farmers (above 4 hectares) -
4. No. of milch animals kept -

Buffaloes -	Cows -	Other -
	G.	H.B.
5. No. of wetted milch animals :

Buffaloes -	Cows -	
	G.	H.B.
6. Total milk production in litres per day :

Buffaloes -	Cows -	Other -
	G.	H.B.
7. Total home consumption of milk -
8. Total marketed surplus of milk in the form of -

Milk :		Ghee :	
Quantity -	Price -	Quantity -	Price -

9. Adoption of improved Animal Husbandry practices :
 - i) A.I. ii) Routine vet. services
 - iii) Special visits of Vet. iv) Growing Lucerne for green fodder -
10. Average annual income from various occupations Rs.
 - i) Crop farming - Dairy farming - Other sources - iv) Farm income per hectare of land -
 - v) Total income -
11. Reasons for favouring the milk co-operatives as indicated by the milk producers :-
 - 1) Good source of income, 2) Offers fair price for milk, 3) Provide ready market for milk, 4) Fair practices, 5) Others.
12. Opinions about impact :-
 - 1) Impact of milk co-operatives on farm production,
 - 2) Impact of milk Co-operatives on milk production,
 - 3) Role of milk co-operatives in elevating economic status of the milk producers.

ANNEXURE 27

Profitability Estimates (Estimates of Working Results) of AMJL (Milk Trading)

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Remarks
Sales Realisation	427255597	442001799	535529349	581133173	664242138	752997024	785665255	953607757	1030481506	1224795663	S
<u>Cost of Production</u>											
Purchases	274785131	299146806	366248921	426044159	469269121	504329452	570987667	688645908	718717862	927768055	
Milk processing charge	8477907	9892095	11003328	9679568	14534615	22485539	19973140	15092904	17280842	20628055	
Power, Fuel etc.	11814567	14583103	13998263	15663403	19694547	26990164	32746442	38160952	32940768	42369612	
Repair & Maintenance	5025116	5218847	6422362	6690149	4736668	6352547	7334365	8439280	10894638	10812790	
Wages & Salary	13657061	13986665	15877614	17769643	19535948	22412308	26145053	28939970	33296063	35658743	
Depreciation	4990138	5037722	5168806	5686514	5478776	6407663	6015999	6181162	12769937	12971563	
Freight & Forwarding	881641	1223528	1405866	1474328	2255790	2452428	2216555	2804340	2898257	3315686	
Excise duty	9515879	12918110	14743394	10834137	12912725	15178181	17284468	23473909	19124531	28807880	
Opening stock	41241784	24478591	32046112	27989038	41797959	48723596	46232832	81763178	96975192	78286508	
Total	370389224	386485467	466914666	521830939	590216149	655331878	728936521	893501603	944898090	1160619892	
Less Closing stock	24478591	32046112	27989038	41797959	48723596	46232832	81763178	96975192	78286508	123197395	
Total Mfg. Expenses	345910633	354439355	438925628	480032980	541492553	609099046	647173343	796526411	866611582	1037422497	A
Administration & distribution expenses	4176837	5116590	6681654	6672662	2809157	3523622	4348043	4182830	4465412	5018516	
Packing expense	57379673	67067165	71919642	75435784	96956643	115941047	104070899	121932329	120839517	141077421	
Staff P.F, Gratuity & other amenities	2186682	3193790	3762933	3617357	4161962	5070039	5426953	6717488	8609655	8651177	
Research & Extension Exp.	6536228	6782374	6677371	6917098	9324651	11173836	14530431	13784990	16162586	17931515	

contd ...

Annexure 27 contd ...

I. Tax Provision	1750000	1250000	2250000	2557300	2952480	1455000	1900000	2300000	2300000	3200000	
Total selling & administration expenses	72029420	83409919	91291600	95300201	115704893	137163544	130276326	148917537	152377170	175879530	B
Interest & Bank Comm.	7865621	3990611	4630614	4693845	7476407	6946492	7714054	7878268	7484670	11001529	
Financial Expenses	7865621	3990611	4630614	4693845	7476407	6946492	7714054	7878268	7484670	11001529	C
COST OF GOODS SOLD	417940053	437849274	530217228	575333181	657197446	746262590	777449669	945443948	1019988752	1213301127	D=A+B
Total cost (Including Bank Int. + Comm.)	425805674	441839885	534847842	580027026	664673853	753209082	785163723	953322216	1026473422	1224302656	E=A+B+C
NET OPERATING PROFIT	9315544	4152525	5312121	5799992	7044692	6734434	8215586	8163809	11492754	11494536	F=S-D
Net Operating profit (after payment of Int.)	1449905	161914	681507	1106147	(-)431715	(-)212058	501532	285541	4008084	493007	G=S-E
Gross Operating Profit	81344964	87562444	96603721	101100193	122749585	143897978	138491912	157081346	163869924	187373166	H=S-A
Miscellaneous receipts	1112569	1307478	1783794	1858901	2761575	2454993	3311122	3280156	4104749	8155645	
TOTAL SUNDRIES INCOME	1112569	1307478	1783794	1858901	2761575	2454993	3311122	3280156	4104749	8155645	I
NET PROFIT (Before considering Reserve Fund)	2562474	1469392	2465301	2965048	2329860	2242935	3812654	3565697	8112833	8648652	J=G+I
RESERVES	77500	-	820000	1496000	587000	535000	1145000	5890000	5198000	4763000	K
NET PROFIT (After considering Reserve Fund)	2484974	1469392	1645301	1469048	1742860	1707935	2667654	2675697	2914833	3885652	L=J-K

Source : Compiled from the Annual Reports and Accounts

ANNEXURE 28

Balance Sheet (At the end of Each Year of Ten Years) of AMUL

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Remarks
Liabilities											
Share Capital	5292700	6859000	6867400	6899200	7973500	8961500	8963500	10970100	12601200	14115000	
Reserve Funds & Other Funds	56193344	61648781	64833052	69404444	73605848	73769480	75934945	78996943	95175961	103766297	
Depreciation Fund	35302440	39946874	44919814	50526118	55565741	61576790	66924356	72445875	84508433	97127479	
12% Redeemable Debenture	-	-	-	-	27000	396500	880500	6663500	14054500	23501500	
Loans	47156696	51120893	45540165	57797185	75325614	69412789	73139174	94261391	50199572	78570593	
Current liabilities & Provision (excluding sundry creditors)	37823585	40359286	44960138	49267811	61732317	76075605	96960306	108603766	131345399	206924105	
Sundry creditors	2679085	2626002	1768935	2740613	4402925	7156373	5500716	12508347	7439725	7869559	
Profit & Loss a/c (carried forward profit)	2484992	1469392	1645301	1469048	1742860	1707935	2667654	2675697	2914833	3885652	
TOTAL	186937842	204030228	210533810	238103419	280375805	299056972	330971151	387125619	398230623	535761275	
Assets :											
Gross fixed Assets :	141560441	148319243	109040389	121669789	125240044	137117334	145362852	159745870	187578827	215464837	
Less Depreciation	4990138	5037722	5168806	5686514	5478776	6407663	6015999	6181162	12769937	12971553	
Net fixed assets	91570303	98281521	103871583	115983275	120761268	130709671	139346853	153564708	174808890	203493324	
Investment	3244500	3248100	3360100	3407100	4177100	4188100	4525600	6464600	6789400	7115400	
Current Assets :											
Stock	67708033	72014457	63021593	73538312	103681505	94325376	131091820	153057420	146752695	195064792	
Loan & Advances	5739948	11049538	12823452	10135660	12480460	15866595	13542055	12121157	11017712	12088606	
Deposits	298739	265243	227401	256679	248064	1213613	1663692	1897127	1226835	983663	
Debtors	17611216	18980705	27033845	32389901	38872160	51957100	40444566	59309768	56518816	113276397	
Cash in hand	34807	10890	22166	26879	38569	22337	327713	34341	48098	60106	
Cash at bank	730296	179774	173670	2365613	116679	774180	28852	676498	1068177	3578987	
TOTAL	186937842	204030228	210533810	238103419	280375805	299056972	330971151	387125619	398230623	535761275	

Source : Compiled from the Annual Reports and Accounts

ANNEXURE 29

Profitability Estimates (Estimates of Working Results) of HIML (Milk Trading)

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	REMARKS
Sales realisation	1938567	6990002	9413171	8326131	10673769	15643607	17910681	22481637	26120463	29450439	S
COST OF PRODUCTION											
Purchase (Milk, SMP, Butter oil etc.)	1658277	5473764	6946732	6472262	7542741	11283080	13931961	16846805	18693379	20735465	
Milk Processing charges	8881	196746	286851	374435	422260	473699	578820	788821	902814	984252	
Power, fuel, water etc.	173570	303988	403209	388979	719515	975116	1085628	1072756	1185945	1209298	
Repairs & Maintenance	50037	187454	194187	240575	345276	194265	407948	369908	567253	742787	
Wages & Salary	214547	265077	569106	487196	852129	607460	825789	785200	1386339	788773	
Head Load charge	91463	249057	346408	317205	453526	496263	563189	747700	848875	633411	
Depreciation	49464	1480	221	20233	58814	81647	70647	80806	145550	461573	
Freight & forwarding exp.	217105	889302	1147377	1323754	1574598	1129314	1647838	1686234	1917583	2097721	
Retention money @ 0.05p./ltr.	-	226407	251558	205757	263161	259512	273764	592943	607186	511094	*.8p./ltr.
Excise duty	-	-	47991	10553	-	12826	-	-	-	-	
Opening stock	-	18488	266431	94842	437590	381319	*559492	770173	696839	838566	*including the closing stock of Technical Input Programme of 1980-81
TOTAL	2463344	7811763	10460071	9935791	12669610	15894511	19945076	23741345	26951763	29002940	
Less Closing stock	18488	266431	94842	*519152	381319	359584	770173	696839	838566	1559804	*including stock of Dairy chemicals for Dairy inputs programme.
Total Mfg. Expenses	2444856	7545332	10365229	9416639	12288291	15534927	19174903	23044506	26113197	27443136	A
Admn. & Distribution exp.	149740	205570	292987	196557	389456	588868	820597	885217	1057616	1311317	

contd ...

Annexure 29 contd ...

Packing expenses	-	1881	39168	13756	230482	533369	912387	1258966	1456478	1982710	
Staff P.F, Gratuity & Ors. amenities	8371	14160	26432	101026	191346	615234	576491	698920	681262	1540868	
Meeting expenses	472	125	3397	2778	1181	5826	18383	19966	51440	45125	
Sales Tax	-	-	44303	40018	54066	141139	23755	47184	11410	61405	
*Research & Etn. Exp.	-	951802	1027552	1203500	1375679	2091635	2843956	6414286	6271068	5934768	*Consumption Basis
Total Selling & admn. exp.	158583	1173538	1433839	1557635	2242210	3982071	5196569	9324539	9529274	11876193	B
Interest & Bank Commn.	5520	217922	238812	374823	513796	755956	542620	376594	581338	1174451	
Financial exp.	5520	217922	238812	374823	513796	755956	542620	376594	581338	1174451	C
COST OF GOODS SOLD	2603439	8718870	11799068	10974274	14530501	19516998	24371472	32369045	35642471	39319329	D=A+B
Total Cost (including interest & Bank commission)	2608959	8936792	12037380	11349097	15044297	20272954	24914092	32743639	36223809	40493780	E=A+B+C
NET OPERATING LOSS	664872	1728868	2385537	2648143	3856732	2873391	6460791	9887408	9522008	10868888	F=S-D
Net operating loss (after payment of Int.)	670392	1946790	2624709	3022966	4370528	3629347	7003411	10264002	10103346	11043341	G=S-E
Gross Operating Loss	506289	555330	951698	1090508	1614522	1108680*	1264222	562869	+*7266	2007303	*Profit. H=S-A
Miscellaneous receipts	7249	13066	11989	46186	30079	19970	37775	48209	50297	101242	
Interest received	8267	120814	167153	74617	86374	19062	15680	9513	7959	37541	
Income from research & extension services	-	181286	233566	57604	61739	418545	805651	1444397	1527159	71514	
Retention money (@0.05 paise per litre)	-	226407	251559	205757	263161	259513	273764	592942	607186	511094*	*@.08p. per litre.
TOTAL SUNDRIES INCOME	15516	541573	664267	384164	441353	717090	1132870	2095061	2192601	721391	I
NET LOSS (before considering the Grant and subsidy)	654876	1405217	1960442	2638802	3929175	2912257	5870541	8168941	7910745	10321950	J=G-I
Grant & Subsidy	18991	555853	552274	842022	1619636	2019621	2500708	5928180	5487199	3149677	K
Net Loss (after considering the grant & subsidy)	535885	849364	1408168	1795780	2309539	892636	3369833	2240761	2423546	2172273	L=J-K

Source : Compiled from the Annual Reports and Accounts

ANNEXURE 30

Balance Sheet (At the End of Each Year of Ten Years) of HIMUL

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Remarks
<u>Liabilities</u>											
Share capital	105300	313300	314100	714200	915700	917200	917700	918400	919800	920100	
Grant & Subsidy	892080	1334451	1252024	1830769	2748852	3059494	3527707	4093675	7367068	6145092	
Loan (Govt.)	1808315	3376115	4276115	4621263	6756263	6586989	7462729	8789085	9612329	13740498	
Current liabilities & Provision (excluding Sundry creditors)	41397	726879	1057762	2013982	2119507	2720670	3600480	4038410	5406593	7198360	
Sundry creditors	212074	383187	509757	520055	872011	609499	1124588	1514878	1408663	1420115	
Cattle feed plant	-	-	-	-	-	486460	54666	1268535	1825414	1977537	
Outstanding liabilities	-	-	-	-	-	-	-	418823*	-	-	*Purchase of Milk for the year 1982-83 not accounted for, now adjusted.
Total	3059166	6133932	7409758	9700269	13412333	14380312	16687870	21041806	26539867	31401802	
<u>Assets</u>											
Gross Fixed Assets	N.A.	639770	609800	N.A.	N.A.	982169	1444953	3080251	5021254	6230439	
Less Depreciation	N.A.	99373	73005	N.A.	117504	147743	181975	395640	789341	1009213	*Dep. of Trading A/c + P/L.a/c & +Technical input program
Net fixed assets	299572	535687	536795	714961	878106	834426	1262978	2684611	4231913	5221226	

contd ...

Current Assets :

Deferred Revenue expenditure	-	-	-	-	183361	-	-	-	-	-
Stock	57096	406100	358128	653998	604118	659717	846329	1010576	986165	2456033
Loans & advances	52234	102892	140459	297863	248081	685123	1038431	596553	2257670	2833265
Deposits	1582231	2321790	2424110	1183753	208935	557009	111009	310010	1050009	647009
S/Debtors	148699	429233	321649	875752	982181	1022071	1306564	1063417	1260714	1480748
Other assets	-	43669	27939	1410983	2590335	1014444	595417	1744070	683706	238640
Cattle feed plant	-	-	-	-	-	621124	-	-	-	-
<u>Cash in hand :</u>	16411	24769	45047	32925	24955	40812	135085	127142	160355	135554
Cash at Bank	139092	656597	534268	621702	1474380	1835069	811707	794216	764575	818657
Investments	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
Profit & Loss a/c (carried forward loss)	759331	1608695	3016863	3903842*	6213381	7106017	10475850	12716611	15140159	17566170
Total	3059166	6133932	7409758	9700269	13412333	14380312	16687870	21041806	26539867	31401802

*Rs. 909801.33 adjusted as transport subsidy receivable with previous years' P/L a/c. Balance Rs. 3016863 in the Balance Sheet but actual it should be Rs. 48,13,643.

Source : Compiled from the Annual Reports and Accounts.

ANNEXURE 31

Ratio Values of AMUL and HIMUL

Particulars		1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
1. Structural Group :											
i) Funded Debt to Total Capitalisation	A	0.34	0.33	0.29	0.33	0.36	0.33	0.33	0.37	0.20	0.25
	H	0.94	0.91	0.93	0.87	0.88	0.88	0.89	0.90	0.91	0.94
ii) Debt to Equity	A	0.88	0.85	0.78	0.85	1.02	1.05	1.14	1.34	1.04	1.45
	H	19.58	14.32	18.60	10.01	10.64	11.34	13.34	16.99	19.84	25.45
iii) Debt to Equity (considering grant & subsidies)	A	0.88	0.85	0.78	0.85	1.02	1.05	1.14	1.34	1.04	1.45
	H	28.05	18.58	22.59	12.58	13.65	14.68	17.18	21.45	27.85	33.13
iv) Equity to Fixed Assets	A	1.08	1.12	1.14	1.10	1.15	1.11	1.11	1.07	1.11	1.07
	H	0.35	0.58	0.58	1.00	1.04	1.10	0.72	0.34	0.22	0.18
v) Net Fixed Assets to Funded Debt	A	1.94	1.92	2.28	2.01	1.60	1.88	1.91	1.63	3.48	2.59
	H	0.16	0.16	0.12	0.14	0.13	0.13	0.17	0.30	0.44	0.38
vi) Funded Debt (long term) to Net Working capital	A	0.91	0.86	0.80	0.87	0.84	0.85	0.86	0.89	0.76	0.71
	H	1.03	1.17	1.87	1.82	2.03	2.51	45.28	- 5.49	-6.50	-6.92
vii) Long Term Debt to Equity	A	0.47	0.46	0.38	0.45	0.54	0.47	0.47	0.57	0.26	0.36
	H	17.17	10.77	13.61	6.47	7.38	7.18	8.13	9.57	10.45	14.93
2. Liquidity Group :											
i) Current Ratio	A	2.27	2.39	2.21	2.28	2.35	1.98	1.82	1.87	1.43	1.51
	H	7.88	3.59	2.46	2.00	2.11	1.69	1.03	0.78	0.93	0.81
ii) Acid Test Ratio	A	0.60	0.71	0.86	0.87	0.78	0.85	0.55	0.61	0.45	0.60
	H	7.55	3.22	2.23	1.74	1.90	1.51	0.86	0.64	0.71	0.58
3. Profitability Group :											
i) Operating Ratio	A	80.96%	80.19%	82.00%	92.60%	92.00%	80.00%	82.00%	84.00%	84.00%	95.00%
	H	126.12%	107.94%	110.11%	113.09%	115.13%	93.34%	107.06%	102.50%	99.97%	93.18%
ii) Operating Profit to Sales	A	02%	01%	01%	01%	01%	01%	01%	01%	01%	01%
	H	-34%	-25%	-25%	-31%	-36%	-17%	-36%	-44%	-36%	-37%

contd ...

Annexure 31 contd ...

iii. Net Profit to Sales	A	0.60%	0.33%	0.46%	0.51%	0.35%	0.30%	0.49%	0.37%	0.79%	0.71%
	H	-33.78%	-20.10%	-20.83%	-31.69%	-36.81%	-17.50%	-32.78%	-36.34%	-30.28%	-35.05%
iv. Net Profit to Sales (considering grant & subsidies)	A	0.60%	0.33%	0.46%	0.51%	0.35%	0.30%	0.49%	0.37%	0.79%	0.71%
	H	-32.81%	-12.15%	-14.96%	-21.58%	-21.64%	-5.36%	-18.81%	-9.37%	-9.28%	-7.38%
v. Coverage to Interest Payment	A	1.18	1.04	1.15	1.24	0.94	0.97%	1.07	1.04	1.53	1.04
	H	-120.45	-7.99	-9.99	-7.06	-7.51	-3.80	-11.91	-26.25	-16.38	-9.25
vi. Return on Investment	A	4.99	2.03	2.52	2.43	3.90	2.25	2.48	2.11	2.88	2.14
	H	-28.91	-38.20	-54.30	-45.59	-53.57	-39.50	-104.00	-118.76	-83.53	-78.56
4. <u>Turnover Group :</u>											
i. Assets Turnover	A	2.32	2.20	2.58	2.48	2.40	2.55	2.41	2.50	2.63	2.31
	H	0.84	1.55	2.14	1.44	1.48	2.29	2.88	2.70	2.29	2.13
ii. Net Working Capital Turnover	A	8.27	7.42	9.46	8.71	7.44	9.20	9.28	9.00	15.80	11.09
	H	1.11	2.43	4.12	3.27	3.21	5.35	109.68	-14.05	-17.68	-14.82
iii. Receivable Turnover	A	-	4.13%	4.29%	5.11%	5.36%	6.03%	5.98%	5.23%	5.62%	6.93%
	H	-	4.13%	3.99%	7.19%	8.70%	6.02%	5.50%	5.27%	4.44%	4.65%
iv. Inventory Turnover	A	-	15.49	17.66	16.49	14.52	15.72	12.15	10.58	11.63	12.04
	H	-	61.20	65.52	35.75	35.48	52.68	36.66	44.12	46.43	32.79
5. <u>Miscellaneous Group :</u>											
i. Net Operating Profit to Total Assets	A	0.05	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.02
	H	-0.29	-0.32	-0.54	-0.46	-0.53	-0.39	-1.04	-1.19	-0.83	-0.78
ii. Total Debt to Total Assets	A	0.47	0.46	0.44	0.46	0.50	0.51	0.53	0.57	0.51	0.59
	H	0.90	0.99	1.33	1.23	1.35	1.43	1.97	1.87	1.40	1.75

Source : Computed from the Annual Reports and Accounts of Amul and Himul

Note : A = Amul
H = Himul

Annexure 32

Name of the Sample Villages (Dairy and Non-Dairy) of Plains and Hills of the Hinterland of Himul

PLAINS

Dairy Villages

1. Adalgach, Dt. West Dinajpur
2. Khayerbari, Dt. Jalpaiguri
3. Mahipal Jote, Dt. Darjeeling

Non-Dairy

1. Mulai Jote, Dt. Darjeeling

HILLS

Dairy Villages

1. Upper Lama Hatta, Dt. Darjeeling
2. Rangbul, Dt. Darjeeling
3. Samsheer Basti, Dt. Darjeeling

Non-Dairy

1. Lower Ghaerbari, Dt. Darjeeling

GOVERNMENT OF WEST BENGAL
 DEPARTMENT OF AGRICULTURE
 10/10/1958

APPENDIX

1. A Project "The Himalayan Co-operative Milk Producers' Union Limited - An Appraisal" submitted to the Department of Commerce, University of North Bengal in 1983.
2. The topic "Problems of Dairy Co-operative and Himul" Presented in University Grants Commission's Seminar on 'Indian Industry - Challenges & Response' held on the 11th and 12th August, 1989 at Commerce Department, University of North Bengal.