

A SPATIAL & TEMPORAL ANALYSIS OF MILK DISTRIBUTION
IN DELHI

In partial fulfilment of the requirement
for the degree of
Master of Philosophy.

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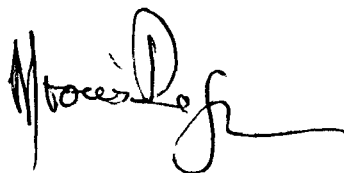
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I certify that the dissertation entitled "A Spatial
& Temporal Analysis of Milk Distribution in Delhi"
submitted by DEEP SHIKHA in fulfilment of six
credits out of total requirement of twenty - four
credits for the degree of Master of Philosophy(M.Phil)
of the University, is to the best of my knowledge, a
bonafide work and may be placed before the examiners
for evaluation.

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CHAPTER - I

INTRODUCTION.

The purpose of geography has been described as "to provide accurate, orderly and rational description of various characters of the earth's surface"* by Hartshone in his review of the Nature of Geography. Many other geographers have defined it "as the study of landscape, science of distribution, study of areal variations and as science which explains the diverse features of the earth's surface, in terms of their distribution pattern, inter-relationships and how these influence the distribution of man and his multifarious activities." Therefore, it follows from these definitions that the major interest of Geographer ought to be to observe the manner in which objectively existing phenomena are distributed over space. ~~Most of the geographical problems arise because the distribution of geographical phenomena are distributed over space.~~ Most of the geographical problems arise because the distribution of geographical phenomenon is seldom uniform. It is only a too obvious fact and the examples of such phenomena may be given to infinity. One such case is the distribution of human settlements which is a function of the distribution of natural resources, which lay in the land itself, and vary from place to place. The human settlements themselves vary according to their hierarchy and this hierarchy also becomes one of the reasons for spatial and areal variations. City in human

* Hartshone - Perspective on the Nature of Geography.
London, John Murray 1968.

settlements is an important unit which creates spatial variations in and outside itself, because city simultaneously affects the area around it. The region which comes under the influence of a city is called urban field (or hinterland or umland) of the city. It is not only the city which affects its surrounding region but the city is also affected by its hinterland to a considerable extent. As Mark Jefferson writes, "Cities do not grow of themselves but the countryside sets them up to do their task that must be performed in a central place". This is very much true and a fact that a city cannot work without the help of countryside even for a single moment and is largely dependent on it for its many needs which cannot be performed inside the city. Therefore, a city is nourished by the resources of a much vast area than it occupies. This dissertation deal with the study of the relationship of metropolitan city with its rural surrounding or hinterland, to be more precise, taking the case study of Delhi and its surrounding and their relationship with the city regarding its milk supply. First the city - hinterland relationship has been studied itself in general and how it has been dealt by different scholars, with different approaches. And same way what part does the milk supply play in studying the functional linkages between the two.

Data Base: The data base for the empirical work of this dissertation is mainly the office records of Delhi Milk

Scheme and Mother-Dairy. The procurement of milk, and production of by products have been of the main concern. The records have been maintained for procurement, distribution and production of by products through time, by the two dairies. Some data has been collected by personal survey conducted at the two milk collection & chilling centres of Delhi Milk Scheme at Dankaur & Ballabgarh. This survey has been conducted to study their social, economic & cultural behaviour regarding their dairying activity i.e. their daily production, the infrastructure they have for this particular activity etc. etc.

The source of map is the census of India 1971. District census handbook for Bulandshahr and Gurgaon districts for the Dankaur and Ballabgarh Tahsil maps. For Delhi Map the election commission map have been used.

Methodology: Main emphasis have been on procurement, its temporal & spatial variations. The change through time in procurement, the pattern of procurement etc. have been discussed with the help of the tables and data available from the Delhi Milk Scheme & Mother Dairy Office records.

The hierarchy of procurement centres have been worked out on the basis of the total quantity of milk procured in 1976; The latest year for which the centre-wise procurement data is available. An attempt has been made to work out the Milk

Shed area of Delhi Metropolitan city by girdle technique and then dividing it in two as inner and outer shed Area on the basis of the pattern of distribution of procurement centres. And then the seasonal procurement pattern has been analysed for both inner & outer milk shed Area.

Chapter arrangement:

Chapter - II This chapter deals with the general introduction of the studies done on this particular topic that is city hinterland relationship and how it has been dealt by different scholars and in which way both are interdependent in many respects. After this, how milk has been an active indicator in this particular respect to delineate hinterland & to study the city hinterland relationship. Then the salient features of dairying in India and Delhi shed area have been discussed.

Chapter - III deals with the procurement of milk from the shed area by Delhi Milk Scheme and Mother Dairy. The procedure adopted for procurement, Areas of procurement & temporal variations in procurement have been discussed separately for Delhi Milk Scheme and Mother Dairy.

A hierarchy of procurement centres have been worked out to see the importance of the procurement centres regarding the quantity of milk they contributed in the year 1976.

After this the seasonal procurement pattern has been analysed for all the procurement centres for the year 1976, by drawing the monthly procurement graphs.

Chapter - III. In this, milk shed area of Delhi city has ^{also} been discussed. And an attempt has been made to identify the shed area and divide it in inner and outer shed area, and what are their contributions, and how the seasonal procurement pattern differs from the inner and outer shed area.

Chapter - IV. This deals with the distribution of milk through Delhi Milk Scheme and Mother Dairy's booths separately. The system of distribution, the trend of distribution, pattern of distribution has been discussed for the two schemes separately. Here the emphasis have been on the temporal variations. And in last, the two schemes have been compared regarding their system of working.

Chapter - V. This includes the case study of the two milk procurement and chilling centres of Delhi Milk Scheme. For this, a survey was made at these two centres viz. Dankaur & Ballabgarh. And on the basis of this survey a study of the social & economic behaviour regarding their dairying activity of these two centres have been done. The study have been headed under conditions of procurement, number of villages & distance from the centre, occupation, quantity of milk supplied, employment, transport & caste-structure of the milkmen supplying milk at these two centres. And then a comparative analysis of the two centres have been done.

Chapter - VI. gives the summary & conclusion of the dissertation. The results which have been derived from these

chapters and then the suggestions for the improvement in the system of procurement & distribution of milk by Delhi Milk Scheme & Mother Dairy in Delhi.

CHAPTER - II

A CASE FOR MILK AS AN INDICATOR OF FUNCTIONAL LINKAGES

In pre-industrial age, the great majority of towns depended upon their immediate rural surroundings for supplies of food and were firmly rooted in the agricultural life of the countryside. Essentially, market towns were not in the countryside. Now the relationship between towns and surrounding area has been changed, the two are mutually inter-dependent economically and socially. Modern communications have enabled town and city greatly to extend the range of their services, and have afforded the surrounding population more direct and immediate contacts with urban life and institutions etc. There is always a range within which these inter-related services operate more efficiently and beyond which centrifugal forces set in. This is the limit that marks the umland or hinterland.

The whole complex of an urban field represents a series of inter-woven tributary areas. For some functions, urban field has very extensive service area and for some it has very small, because the service area depends upon the type of function or the city. Therefore, the city is surrounded by a series of unifunctional urban fields. The smallest city centre, on the contrary, will have only a service area which will be the smallest, and the largest city in the region, on the other hand, will cover the whole region to what one may term as inclusive hinterland which is the

outermost hinterland of a big city, inside which there are smaller hinterlands, belonging to the same city but delimited on different basis. Thus, there appears a cobweb of hinterlands from outer limit of the inclusive hinterland to its core.

The town and the country are inseparable. Towns exist as an organic part of "social whole". Town nourishes upon the resources of its country and country uses town as centre for trade, employment and recreation centre.

The hinterland boundaries above all are geographical regions in which functional unity has been impressed by human use as different from physical appearance which forms the basis for natural regions. The functional unity paves the way for psychological unity which has a significant bearing on planning for development, and which can become the driving force behind a plan. The built-up city is not necessarily co-terminus with the political city. In many cases, the economic and sociological city (the area within which people live the urban way of life) has extended far beyond the city limits, and in other cases, farms, on which people live rural way of life, are found within the political boundaries of the cities.

Therefore, the rural urban fringe is an extension of the city itself, actual and potential.

B. INDICES FOR DELINEATING HINTERLAND:

In selecting indices by which to measure hinterland or urban field, the essential function of the city must be

a governing consideration and the indices chosen must reflect these functions. Generally, towns act as centres for employment, as collecting and marketing centres for the products of the surrounding areas and as distributing centres for goods from outside. These are their primary economic functions. The hinterland of a city is of two types:

I. The region which is highly linked with the city and wholly dependent upon it for its needs and in return city also gets its needs fulfilled from it. This type of region is just next to city boundaries and is known as primary hinterlands.

II. The area which is wider in extent and has its contacts with city for specialised services, is known as secondary hinterland/umland. Secondary umland can be further sub-divided on the basis of intensity of influence, such as outer secondary umland for less intensive influence and inner secondary umland for high intensity of influence.

The influence of city can be shown by many functions, such as:-

- a) Areas covered by active commuting.
- b) Administrative jurisdiction:-Administrative divisions, University area, Postal area.
- c) Supply distribution zones:-Supply of perishable goods to city e.g.vegetables, fruits, milk.
- d) Bus service: - Range and frequency.
- e) Distribution of daily newspapers.
- f) Trade pattern.

Functions related to the immediate surrounding areas for which people are daily coming and going may show more or less identical results. For example, the milk supply zone, the vegetable supply zone, the primary catchment area of intermediate colleges and more or less identical. City life is closely linked with these zones and any break in the regular ebb and flow of commodities and services to and from these areas would freeze human activities in both rural and urban areas.

C. FUNCTIONAL RELATIONS BETWEEN A CITY & ITS TRIBUTARY AREA:

R.E. Dickenson* has divided the principal regional associations of a city into five categories as under:-

1. Trade Relations - which provide a series of trading areas growing out of different trading activities, e.g. retailing, wholesaling. Here it may be noted that the individual shops have their own catchment areas, wider in the case of stores selling furniture, carpets, jewellery and expensive clothes than for those retailing sweets, tobacco and newspapers and other every-day articles.

2 . Social relations - WHICH produce a social area comprising people who seek to benefit from the various entertainment and cultural activities a town provides.

3. Commuting relations - which produce an area of settlement around a town and perhaps a series of dormitory towns and

*R.E. Dickenson - - The City Region in Western Europe. London, Routledge & Kegan Paul Ltd. 1967.

also a zone of movement through which people pass on their way to and from their work. This area may also include small resorts and recreational land.

4. Agricultural relations - which lead to particular kinds of farming near a city, which itself acts as a convenient market. Characteristically, dairy farming and market gardening activities, the latter in part in glasshouses as near Brussels and London, are often associated with the city margins for supply of milk and vegetables which not only deteriorate quickly but also are fairly bulky commodities which are demanded daily at cheap prices by city shoppers.

5. Industrial relations - There also exist, of course, the industrial relations between towns and their sphere of influence. Some urban factories are concerned with processing and raw materials produced atleast in part within the urban field e.g. meat packing plants, dairies, egg packing plants, sugar beet refineries, canneries, timber mills, textile, industrial ~~plants~~ produce goods largely sold within the town itself and its immediate hinterland (e.g. agricultural machine packers, printers, local newspaper publishers and bakers).

D. MILK AS AN INDICATOR:

Milk has been taken as an important indicator for delineating the hinterland, by many scholars. The need for milk in the cities is so large that the city proper is hardly capable of supplying it. So the surrounding areas where milk is in plenty finds its market in the urban limits. For Delhi itself in 1959 a survey was carried out by

Richard Ellefesen* of the milk entering Delhi urban limits by cycles. This survey was made in order to determine the approximate milkshed by noting the direction and places from where milk came. The other reason for this survey was to record the existing supply system that was to be reformed by the operation of modern milk supply system i.e. Delhi Milk Scheme.

E. MILK SUPPLY ZONES **

Generally, the organisation of milk supply from areas surrounding the city can be divided under two heads:-

1. Milk supply from villages lying adjacent to the town or city which may be called the inner belt extending upto a radius of 15 miles.
2. Beyond this radius and upto 50 miles which may be called the outer belt. The outer belt should be taken up first and given more preference because that will help in augmenting the supply of milk without disturbing the present supply as the milk from the inner belt will automatically flow towards the city to get the market.

In most of the cities, in India, the milk supply is not only inadequate to meet the demands of the population but also the milk supplied is often adulterated and unwholesome. The Capital city of Delhi, is no exception to such a situation.

*Ellefeson, R. - "Report of the survey of milk entering Delhi by cycles" Indian Geographer Vol. 4 No. 2, 1969.

**Z.R. Kothavala - Improving the milk supply of towns - Indian Farming 7, 410-479, 1946.

In 1958-59, the estimated milk supply in Delhi was 7000 maunds a day (280,000 litres) which was, as per the recommendation of the nutritional authorities, only one-third of the requirements of the Capital's population of over two million.

Traditionally, the capital was supplied milk from two sources, rural and urban(local). Approximately, 5500 maunds come from rural area of U.P., Rajasthan and Punjab, and the remaining was supplied locally. The supply was not only irregular and adulterated but also with great fluctuations in prices. At such a critical stage, Delhi Milk Scheme was started under the Five-Year Plan in 1959.

F. DAIRYING IN INDIA

Dairying in India is very much unlike dairying in most the other countries that too specially in Western European countries. In industrialised countries, dairying is also modernised and the industry is often largely shaped by the needs of the milk producers, whereas it is not so in India. On the other hand, in some countries the industry may comprise of only a few projects for supplying milk to a well off urbanised minority e.g. in India, for large cities like Delhi, Bombay, Madras, Calcutta, Bangalore, Allahabad and some others. These cities have their individual dairies which collect milk from surrounding rural areas and distribute the same in the city.

** A M.C.D. survey, 1958.

The overriding characteristics of milk production in India are:-

- a) Millions of farmers are crammed in small holdings which are not profitable for the farmers who are not in a position to keep large number of milch animals to increase their milk production and most of them who have milch animals cannot afford to keep them properly, i.e. feeding and taking care of their cattle, which results in low milk production.
- b) Absence of land for pasture or fodder production. Most of the farmers feed their cattle with the wheat stalks and the husk which are not all that nutritional as fodder. Very few farmers have land to grow fodder for their cattle.
- c) Reliance on seasonal rains which affects the production and economy of the farmers.
- d) Milch animals largely selected by their ability to produce milk. The milk production varies from season to season.
- e) Low level of nutrition and ever increasing number of people on land which affects the availability of food for them and discourages the interest in the production of fodder for the cattle and encourages production of more foodgrains etc.
- f) Dairying being a subsidiary and cottage industry.
- g) The large demand of milk in urban areas which increases day by day.

On the other hand, milk consuming population is over 500 million. Almost all the households are avid milk

consumers, the demand for milk generally rises with the rise in income and milk supply is based on production through millions of inefficiently managed milch animals. An average Indian producer supplies milk to not more than two households. This figure has to be compared with 600 - 1000 consumers fed by an average milk producer in the countries where dairying is advanced.

G. DAIRY INDUSTRY IN DELHI MILK SHED AREA:

Many factors and conditions are responsible for the location of Dairy Industry in Delhi Milk Shed Area, such as climate, soils, terrain, availability of good breed of cattle, transport facilities and above all the size of market. The most important factor for fluid milk is the nearness to the market, and it tends to concentrate around the market or the consuming centre. The climate around Delhi is semi-arid and sub-tropical type and the maximum temperature lies around 106°F and minimum around 48°F. Precipitation is not very high being ^{24"-26"}26-24", the highest.

This type of climate coupled with sandy loamy character of deep alluvial soils is good for growing fodder and other grains whose stalks can be used as fodder for the cattle.

Moreover, the Dairy Plants in the city have also encouraged the dairying in the milk shed area by giving many incentives (which have been discussed in the following chapters) such as the establishment of cooperatives in the rural milk shed area and to provide technical and financial inputs to help farmer/producer to enhance his milk production.

The two main dairying plants in Delhi, as stated earlier also, are (a) Delhi Milk Scheme set-up by Government of India, Ministry of Agriculture & Irrigation;(Department of Agriculture) and (b) Mother Dairy set-up by National Dairy Development Board/Indian Dairy Corporation.

In the following paragraphs an introduction to the two schemes has been given.

a) DELHI MILK SCHEME - The Delhi Milk Scheme(DMS) project was taken up in collaboration with the Newzealand Government under the Second Five-Year Plan i.e. Nineteen years back in November, 1959. It is a subordinate office of the Ministry of Agriculture & Irrigation, Department of ~~Agriculture~~(Community Development & Cooperation). The project aimed at reorganisation of milk trade in Delhi City with a view to assure a remunerative market to the rural milk producers on the one hand and supply of good wholesome milk and milk products at reasonable prices to the people of Delhi on the other hand. The Scheme has been conceived as a link between the milk producers in the rural areas and the urban consumers in Delhi. It has been providing its services to Delhi city at a steady expanding rate for the last nineteen years of its existence and is now covering about 50% of the city's milk requirements. At present, more than 3.5 lakh litres of milk is processed at the Central Dairy (in West Patel Nagar in Delhi) in 7 lakh bottles. The milk is collected from 39 procurement centres which are located in the States of U.P., Rajasthan, Haryana and outer Delhi region, and there are about 1600 distribution booths for milk in urban Delhi.

b) MOTHER DAIRY: The name "Delhi Mother Dairy" came naturally because for the first time in India, the country's foremost dairy engineers were formulating an urban dairy project which would be designed to receive milk in bulk by road & rail tankers straight from the rural milk sheds and to pasturise and chill this milk, ready for despatch from the Mother Dairy to the mini dairies all over Delhi which are known to the professional dairy community as "Bulk Milk Vending Units" and to the local citizens as "Push button milk dairies". The Mother Dairy can receive, chill, pasturise and hold for distribution about 400,000 litres of milk daily. If desired, it can also re-combine milk conserved, milk solids (i.e. milk powder, frozen and anhydrous milk fats) into wholesome liquid milk ready for consumption. The milk is kept cold all the way from the producers to the consumers unlike in D.M.S.

With the planning of Delhi Mother Dairy, the plan for National Milk Grid was also under way. Subsequently, the grid became an integral part of the dairy project popularly known as "Operation Flood" which was designed to establish genuine milk producers' cooperatives in 18 of the country's milk sheds. These cooperatives are based on a tried and true pattern of cooperation, popularly known as "Anand pattern of Dairy Cooperatives" which was named after original model cooperatives of the Kaira District in Gujrat. And now Delhi is ringed with Anand Pattern of Dairy Cooperatives in Haryana, U.P., Rajasthan and Gujrat all of which despatch liquid milk direct to the Mother Dairy. Delhi has become the starting point of the National Milk Grid which incorporates facilities for long

distance transportation of milk by rail and road as well as a net-work for storage facilities for conserved milk products.

Mother Dairy has around 170 mini-dairies in urban Delhi each with a capacity to store 1000 to 1300 litres and a few 2000 litres. The total daily sale through these dairies averaged over 183000 litres in June, 1977.

PRIVATE DAIRIES: Apart from these two government owned dairies there are many small private dairies within the urban limits of Delhi and are spread all over in Delhi. These dairies provide milk to the local residential areas around them. Some dairies are shifting from one locality to another in the same day to provide to enlarge their catchment & increase the profit to the maximum. These dairies were shifted to outer Delhi during emergency in 1975 but again they have partly shifted back to urban Delhi.

CHAPTER - III

PROCUREMENT OF MILK.

A. INTRODUCTION:

Milk for urban Delhi is procured from the surrounding rural areas by Delhi Milk Scheme, Mother Dairy and Private Dairies both in Delhi and ~~outer~~ Delhi. The procurement of milk by D.M.S. and Mother Dairy is done through a uniform process which will be discussed in the following paragraphs. The Private Dairies, which were shifted to outer Delhi during the Emergency in 1975, have again partly come back to Urban Delhi now.

There are private Dudhias also who come from outside Delhi and sell their milk in urban Delhi.

B. 1) PROCEDURE ADOPTED FOR PROCUREMENT OF MILK BY DELHI MILK SCHEME:

The Delhi Milk Scheme procures milk in open competition under free market conditions. Therefore, procurement of adequate quantity of milk has always been the major problem facing D.M.S. The Scheme procures milk from the areas within the radius of about 500 Kilometres around Delhi which are located in the States of U.P., Haryana, Punjab, Rajasthan and the Union Territory of Delhi. It has established 39 milk collecting centres in these States for testing, chilling and proper

preservation of milk till it is transported to the Central Dairy in Delhi. These milk collection centres have been established in the milk shed areas (which has been discussed at the end of this Chapter) for the facility of milk producers and milk suppliers. Ten of these milk collection centres have been opened recently in Outer Delhi (rural Delhi) cattle colonies and six of these are run by the State Agencies.

As one of the objects of D.M.S. was to provide remunerative market to the rural producers in surrounding villages, it did not open the cattle colonies of its own as Bombay Arey Milk Scheme has done.

There are different sources through which the milk is collected at the D.M.S. milk chilling and collection centres, that is through -

- 1) Producers;
- ii) Dudhias or Middleman,
- iii) Cooperative Societies.

Before 1976, there were contractors who used to supply milk after collecting it from the Dudhias but now D.M.S. has abolished the system of procurement of milk through the contractors to benefit the Dudhias and producers both.

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The collection of milk continued to be organised largely by a chain of Dudhias functioning in the milk shed area. Dudhias earlier used to give their milk collected from the producers (Bhainsias) to the contractors but now they give the milk at the D.M.S. centres themselves. With this both the producers and the Dudhias have been benefitted because the profit which previously contractors used to get, is shared by the Dudhias and the producers. The milk sellers in the rural areas are mostly small farmers who own just one or two milk cattle. From their milk, a good proportion is consumed by the family itself or it is not at all consumed at home. This type of producers are mostly labourers who sell the entire production of their milk to Dudhias. Sometimes, some Dudhias help their Bhainsias to buy cattle etc. Generally, the price of milk is dictated by Dhudhias, who do not hesitate to exploit the producers to the maximum possible extent. The cattle are milched in the early morning hours usually in the presence of Dudhias to avoid any suspicion of adulteration and the producer is paid in cash on the spot.

Sometimes when the demand for the milk is high in the local area or outside or in Delhi, these middlemen do not give their milk at the milk collection centres

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because of the high prices outside. At the D.M.S. centres, they get their payments according to the presence of fats in the milk which is not the case outside. Outside they can adulterate the milk to the maximum possible extent to earn more profits. And if the whole quantity of milk is not sold in the market, they come back to the D.M.S. centres to give their left out supply which the collection centres are always ready to take for the urban consumers.

The cooperative societies are private as well as State owned. Various measures taken to encourage milk producers, cooperative societies such as:

1. Payment of higher rate of commission.
2. Substantially relating the terms and conditions of the milk supply agreements specially in relation to the security and levy of penalties.
3. Earmarking specified areas for procurement of milk through cooperative societies and direct from farmers without intervention of intermediaries etc. There has been increase in milk procurement by cooperative societies and state agencies from the farmers and also directly through departmental arrangements, as is witnessed by the fact that in 1970-71, about

8.1% of the total milk procurement was affected from cooperatives while in 1975-76 it was 53.08% and in quarter ending 31.3.1976 as much as 61% of the total milk procurement was from cooperatives and directly from the producers.

ii) PROCEDURE ADOPTED FOR PROCUREMENT OF MILK BY MOTHER DAIRY

The procurement method of Mother Dairy is completely different from that of Delhi Milk Scheme. It hasn't got any procurement centres or chilling centres of its own as those of Delhi Milk Scheme in the milk shed areas. It procures its milk from the cooperative societies already established in the areas by National Dairy Development Board/Indian Dairy Corporation and have been set up particularly to supply milk to specially to Mother Dairy. The milk is collected from these milk cooperative societies by a number of insulated vans. These insulated vans go as far as Anand, Bikaner and Jodhpur to collect milk. These vans run up and down from Delhi to these milk cooperative societies daily to collect fresh milk. These cooperatives are located in Jaipur, Meerut, Ajmer, Jodhpur, Anand, Moradabad, Alwar, etc. and sometimes Mother Dairy is supplied by D.M.S. its surplus milk.

These cooperatives are based on Anand Pattern of Dairy Cooperative at Anand. And now Delhi is ringed with Annand Pattern of Dairy Cooperatives in Haryana,

Uttar Pradesh, Gujrat, Punjab and Rajasthan, all of which supply fresh milk direct to Mother Dairy. Delhi, therefore, has become the starting point of the National Milk Grid which has facilities for long distance transportation of milk by rail and road.

C. A R E A S OF PROCUREMENT

i) DELHI MILK SCHEME: Delhi Milk Scheme procures its milk through a network of procurement & chilling centres in the milk shed area. These centres are distributed in the States of Uttar Pradesh, Haryana, Rajasthan and Outer Delhi. The milk is mainly collected from the districts of Gurgaon and Karnal in Haryana, Bulandshahar, Meerut and Muzaffarnagar in U.P., Bikaner and Alwar in Rajasthan and Mehsana in Gujarat from where milk is not regularly coming to Delhi.

The Scheme has entered in an established market and has adopted these established sources for procurement of milk. The bulk of its requirement is being supplied by ^{cooperative Societies} ~~milk suppliers~~ and only a limited quantity is being procured from ^{milk suppliers} ~~coopera-~~ tives. Milk from rural areas is collected by Dudhias who carry the same to convenient roadside points where milk suppliers of the Scheme

have established their milk collection centres.

The milk procurement centres of D.M.S. are located at the following places:

Rajasthan

- | | |
|-------------|----------------|
| 1. Ajmer | 20. Dankaur |
| 2. Jodhpur | 21. Mathura |
| 3. Bhilwara | 22. Agra |
| 4. Jaipur | 23. Gulaothi |
| 5. Kota | 24. Baghpat |
| 6. Bikaner | 25. Muradnagar |
| 7. Alwar | 26. Niwari |

Haryana

- | | |
|----------|-----------|
| 8. Sohna | 27. Dadri |
|----------|-----------|

Outer Delhi

- | | |
|----------------|---------------|
| 9. Karnal | 28. Gazipur |
| 10. Palwal | 29. Masudpur. |
| 11. Gurgaon | 30. Nangli |
| 12. Ballabgarh | 31. Najafgarh |
| 13. Punahana | 32. Ghuroli |

Uttar Pradesh

- | | |
|--------------|---------------------|
| 14. Sonapat | 33. Bawana |
| 15. Meerut | 34. Chattarpur |
| 16. Sardhana | 35. Madanpur Khadar |
| 17. Pilia | 36. Daulatpur |
| 18. Kithore | 37. Goala |
| 19. Masouri | 38. Kakrola. |

A personal survey was made in two of these centres i.e. Ballabgarh, Dankaur, to analyse the social and economic conditions of the milk producers,

milkmen and contractors supplying milk at these chilling centres, which will be discussed in the following chapters.

The availability of cow milk is small in U.P. and Haryana areas and it is found in plenty in Rajasthan. D.M.S. started procuring cow milk from Bikaner in 1962. The milk is collected from deserts in Rajasthan where hardly any road exists and is transported to Delhi by rail after freezing in a local ice factory.

The D.M.S. is procuring milk from Karnal through cooperatives only. D.M.S. have been setting-up its milk collection and chilling centres year after year. The following table gives the names of the centres with the dates of commencement:-

<u>State</u>	<u>Location of centre.</u>	<u>Date of commencement</u>
Uttar Pradesh	Muradnagar	29th October, 1959
"	Baghpat	9th May, 1960
"	Pilakhua	11th February, 1961
"	Dankaur	1st March, 1961
"	Pilua	9th August, 1961
"	Gulaothi	29th September, 1961
"	Masouri	17th March, 1962
"	Dadri	25th July, 1962
"	Kithore	4th September, 1964
Haryana	Ballabgarh	6th August, 1960
"	Palwal	2nd November, 1960
"	Sohna	11th January 1962
"	Bahadurgarh	1st October, 1962
"	Kakrola	22nd February, 1964
Rajasthan	Bkaner	February, 1962.

The table clearly shows that most of the important centres were set-up in between 1960 to 1962 i.e. within a period of three years, after the inception of the Scheme. In addition to the above, at the commencement of the Scheme, milk collection and chilling centres were also established in Sonapat, Bahadurgarh, Kharkhoda, Bawana, Najafgarh and Alipur. But adequate supply of milk was not procured as the appropriate policies were not adopted and the milk producers didn't consider it convenient and profitable to supply milk to D.M.S. and these chilling centres had to be closed down. But now the chilling centres at Sonapat, Najafgarh and Bawana have reopened and milk is supplied in adequate quantity by the milk producers.

It was only after promulgation of Emergency that D.D.A. and D.M.C. adopted congenial policies with the result that the number of cattle colonies in the outskirts of capital city were set-up. The milch cattle from most parts of the capital city were shifted to these cattle colonies. Delhi Milk Scheme then started collection of milk from these cattle colonies. The cattle colonies are located at Gazipur, Madanpur, Khadar, Goala, Kakrola and Masudpur.

ii) MOTHER DAIRY: As it has already been mentioned that the Mother Dairy procures its milk through a number of insulated tankers which go and collect milk from the cooperative societies in Jaipur, Ajmer, Jodhpur, Alwar, Meerut, Moradabad and Anand etc. The major share of milk is collected from Meerut, Jodhpur, and Anand. Delhi's Mother Dairy has been linked to the major milk sheds of the country via the National Milk Grid. These milk sheds are Mehsana and Anand in Gujarat State. The milk procurement cooperatives are at the following places:

Meerut

Moradabad

Alwar

Jaipur

Ajmer

Jodhpur

Anand

Punjab Dairy Corporation.

Apart from these cooperatives, Mother Dairy gets the surplus milk from the Delhi Milk Scheme also whenever needed.

C. QUANTITY OF PROCUREMENT

There are around 40 centres and places from where milk flows to Delhi through different channels i.e. Delhi Milk Scheme, Mother Dairy and private milkmen,

which has already been discussed earlier. In the following paras, an attempt has been made to analyse the trend in milk procurement both by Delhi Milk Scheme and Mother Dairy, and the procurement in 1976 has been analysed in detail to see the latest position of milk procurement.

TIME SERIES ANALYSIS

i) DELHI MILK SCHEME: Table No.1 gives the procurement of milk from 1959-60 (year of inception of D.M.S.) to 1975-76. The procurement has constantly been increasing every year except for a few years. The quantity of milk changes simultaneously for buffalo and cow milk which finally affects the total procurement. Table No.2 gives the procurement of milk for buffalo and cow milk separately which shows the trend in their procurement.

The quantity of milk procured was the highest (ever since the inception of D.M.S.) in 1975-76 i.e. 7,76,50,000 litres. The highest level of daily procurement was achieved in February, 1976, i.e. 4.30 lakh litres as against the previous highest level in January, 1975, which was 3.5 lakh litres (Ref. Appendix No.1).

These fluctuations in the procurement quantity can be explained by many reasons. Earlier D.M.S. had contractors who used to supply a definite quota

Table No. 1

Table giving the total procurement of milk by D.M.S. from 1959-60 since the year of its inception with the index of yearly progress with 1961-62 as the base year = 100.

<u>Year</u>	<u>Procurement of milk in litres.</u>	<u>Index progress</u>
1959-60	37,21,198	--
1960-61	1,98,85,722	--
1961-62	3,16,81,114	100
1962-63	4,48,90,369	142
1963-64	4,83,31,391	153
1964-65	3,90,12,149	123
1965-66	5,16,40,819	163
1966-67	6,28,32,714	198
1967-68	5,78,24,067	183
1968-69	6,10,06,839	193
1969-70	7,20,17,769	227
1970-71	6,28,28,497	198
1971-72	6,32,18,979	199
1972-73	5,80,16,845	183
1973-74	2,84,77,056	89
1974-75	5,72,67,439	181
1975-76	7,41,66,404	233

Source - Office records of D.M.S., New Delhi.

of milk which was fixed with them in advance, and the other producers were free to supply their production of milk. These producers used to prefer to sell their supply locally and privately because there was no risk for quality check and profit was more. Therefore, the fluctuation depended upon these private producers who used to give second preference to D.M.S. and that too only when their supplies were not exhausted.

But now the whole supply comes through Dudhias who collect milk from producers (Bhainsias) in their individual villages and supply at D.M.S. chilling centres. This way the producers get maximum benefit and contractors are no where in the scene who previously used to exploit these Bhainsias and Dudhias.

From Table No.1, the index of progress shows the progress in procurement level of milk with 1961-62 as the base year of 100, which has finally increased to 233 in 1975-76 and decreased to 89 in 1973-74. The average daily procurement has also been fluctuating simultaneously. Graph No.1 shows the levels of procurement from 1959 to 1974.

The table No.2 gives the yearly and average daily procurement of buffalo and cow milk from 1959-60

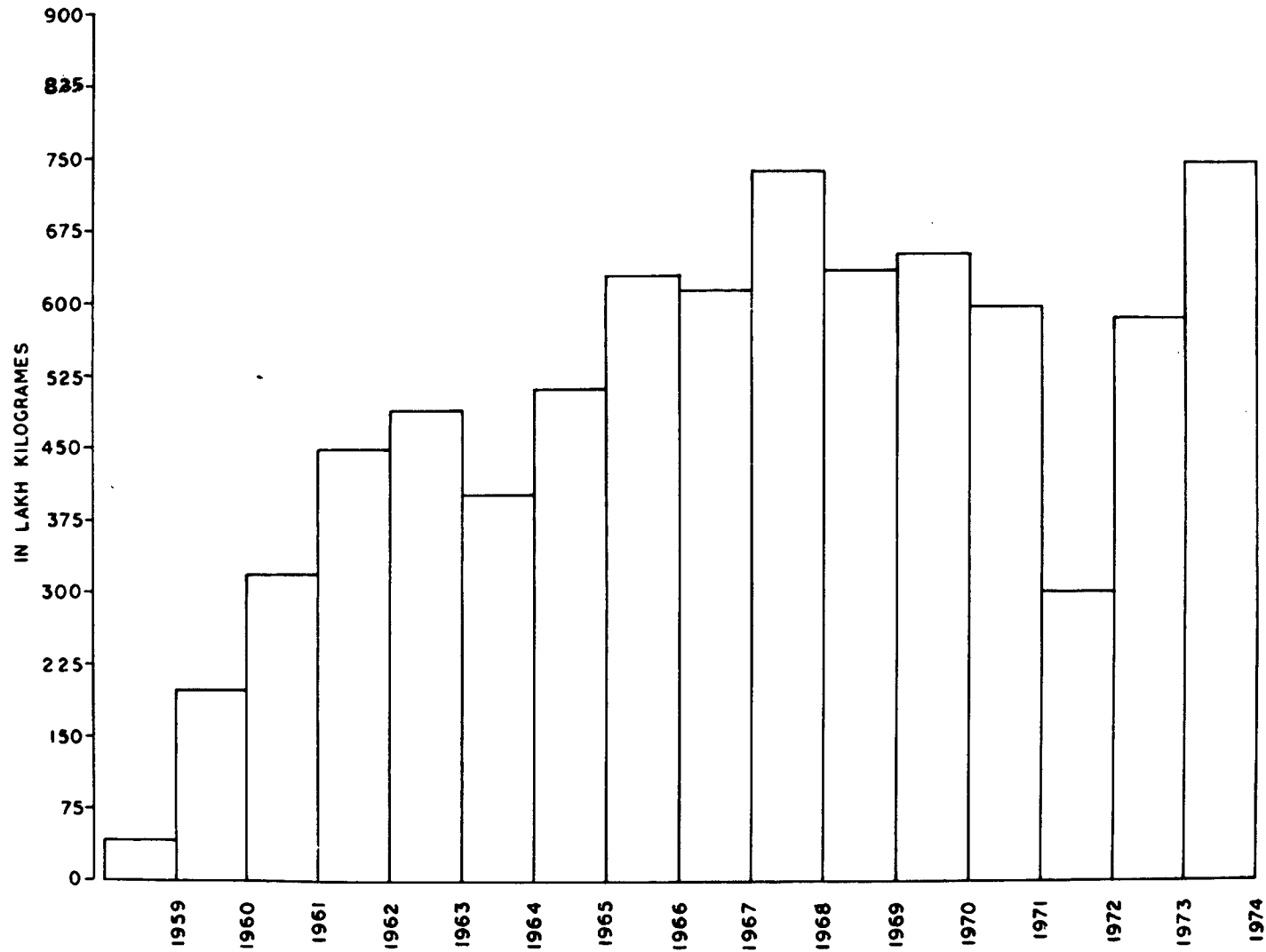
Table No.2

PROCUREMENT OF MILK(Figures in litres)

Year	Buffalo		Cow	
	Total	Daily average	Total	Daily average
1959-60	36,76,863	24,350	44,835	760
1960-61	1,95,32,671	53,368	3,53,051	965
1961-62	3,11,90,728	85,454	4,90,386	1,344
1962-63	4,29,94,229	1,17,792	18,96,140	5,625
1963-64	4,62,71,446	1,26,771	20,59,945	5,725
1964-65	3,79,54,018	1,03,700	10,58,131	2,899
1965-66	5,66,09,689	1,37,013	16,31,130	4,469
1966-67	6,14,10,900	1,68,249	14,21,814	3,895
1967-68	5,45,20,183	1,48,962	33,03,889	9,027
1968-69	5,80,41,220	1,59,017	29,65,619	8,125
1969-70	7,13,96,335	1,95,606	6,21,434	1,703
1970-71	6,11,30,349	1,67,480	16,98,148	4,652
1971-72	5,88,48,885	1,60,789	43,70,094	11,940
1972-73	5,48,44,692	1,50,259	31,72,153	8,691
1973-74	2,76,06,953	75,636	8,70,103	2,384
1974-75	5,30,13,386	1,45,242	42,54,053	
1975-76	5,80,29,193	1,58,550	1,61,37,211	44,091

Source - Office Records, D.M.S. New Delhi.

PROCUREMENT OF MILK DMS.



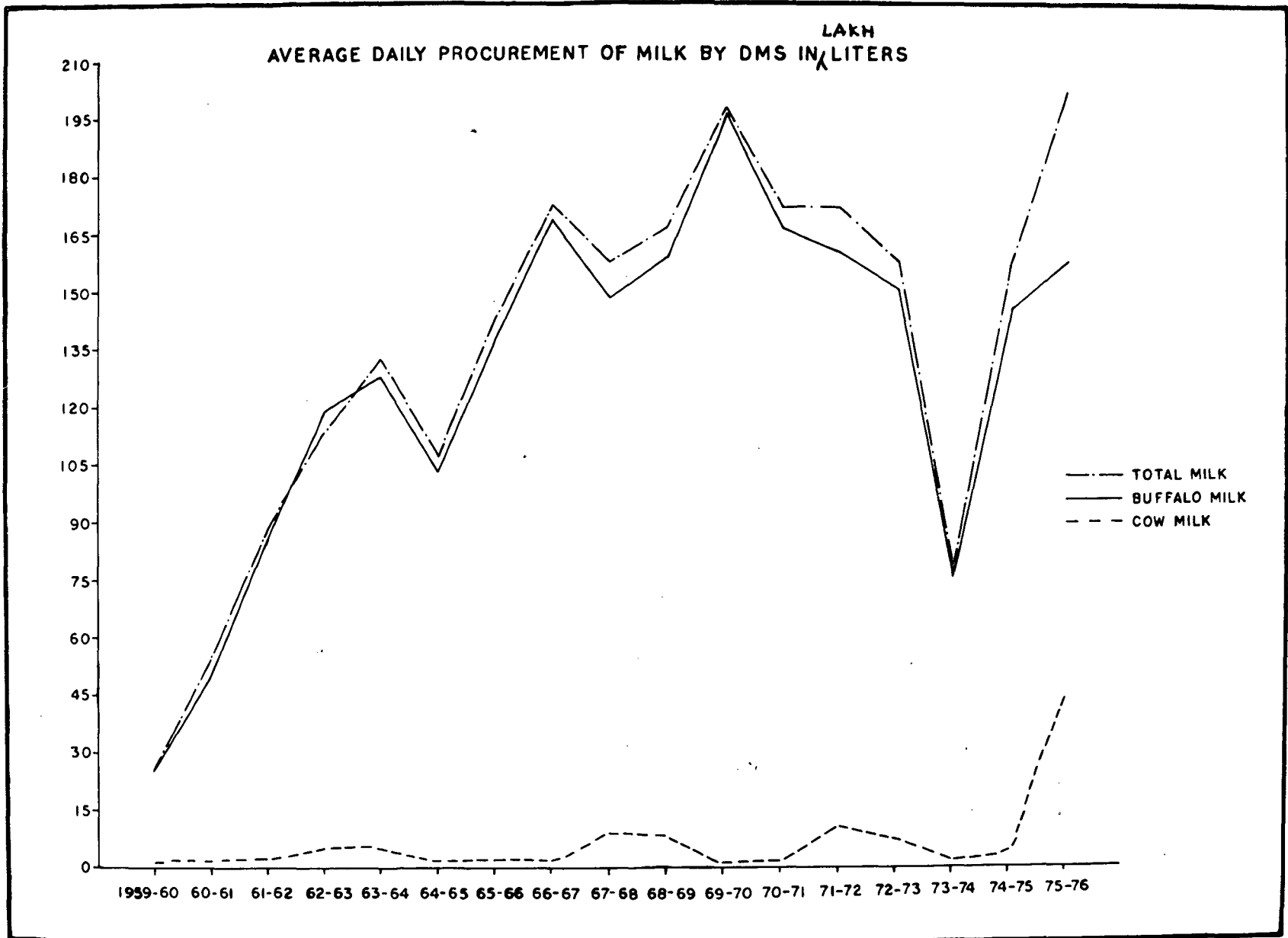
GRAPH No.1.

to 1975-76. The procurement of buffalo milk is much more than the cow milk because the demand for buffalo milk in the city is more than that of the cow milk. The quantity is fluctuating from year to year with maximum procurement of buffalo milk in 1969-70 i.e. 713 lakh litres and daily average of 1.95 lakh litres, and minimum procurement in the first year 1959-60 i.e. 36.76 lakh litres and daily average of 0.25 lakh litres. (Refer Appendix No.2).

For cow milk, the maximum level of procurement was in 1971-72 i.e. 43.73 lakh litres with daily average of 11940 litres and the minimum level was in the first year i.e. 1959-60 that of 44835 litres with daily average of 760 litres which has been continuously increasing since that year.

The procurement of milk has been low in the last few years comparatively because of the opening of Mother Dairy in 1974 which has shared the milk in the shed area to some extent.

The graph No.2 shows the comparative trends of buffalo, cow and a total milk procurement quantities in one figure which at a glance shows the situation of procurement through the years.



GRAPH No. 2.

Table No.3

Table giving monthly procurement of milk by Mother Dairy from its various collection centres from April 1976, to March 1977.

<u>Year</u>	<u>Procurement of milk in litres</u>	<u>Index of progress with April as base month = 100</u>
April '76	9,71,776.69	100
May	15,18,898.20	156
June	16,00,973.70	164
July	17,58,966.00	181
August	21,34,262.10	219
September	21,40,038.80	220
October	23,60,563.10	242
November	27,33,308.70	281
December '76	30,37,194.10	312
January '77	35,03,902.90	360
February '77	30,68,621.30	315
March '77	31,72,398.00	326

ii) MOTHER DAIRY:

Since Mother Dairy is a new dairy which opened only in December 1974, the data available has been analysed for three years from 1974-75 to 1976-77. Mother Dairy gets its procurement fulfilled through milk cooperatives in far off areas such as Anand in Gujrat and Bikaner in Rajasthan and many more. The insulated milk tankers of Mother Dairy go and collect milk from these far off cooperatives. Mother Dairy doesn't have any milk procurement centres of its own. The procurement of milk by Mother Dairy has been as follows:

Year	Procurement of Milk in litres.	Index of progress with 1974-75 as base year=100
1974-75	4,26,000	100
1975-76	54,09,075	1269
1976-77	2,80,00,815	6572

These figures for 3 years show how fast the Mother Dairy has increased its procurement. The index of yearly progress is showing large increase. Table No.3 gives the monthly procurement of milk from April, 1976 to March 1977, with the index of monthly progress which shows the increase in the procurement of milk monthly. In one year the index has increased from 100 to 326. Appendix No.3 shows the monthly procurement from different procurement centres.

Mother Dairy has been paying the milk producers cooperatives 5 paise per litre extra for their milk to increase the procurement and to collect the large amount of milk. Some incentive had to be given to these milk cooperatives. Mother ^{Dairy} has made tremendous progress during the short period because of its incentives in procurement and the quality of milk supplied to the consumers. This is because the fat content is higher in Mother Dairy milk than in D.M.S. bottled milk.

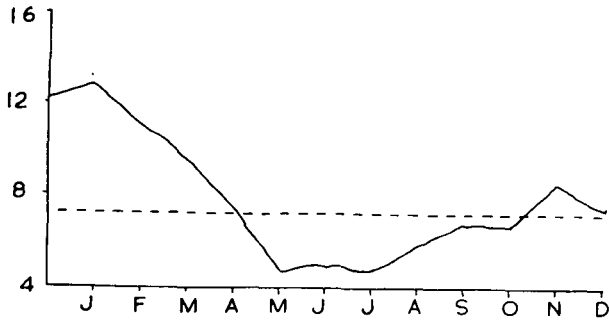
SEASONAL PROCUREMENT PATTERN FOR DIFFERENT CENTRES

According to the ^{lactation} ~~location~~ cycle of the milch animals in the area, their milk yields are at the peak level in the winter season and at the minimum during the summer season, whereas on the other hand the demand/consumption of milk increases in summer because of the increased consumption of milk products like curd, lassi, ice-cream, kulfi, etc. The availability of milk in the market in summer declines and the prices rise significantly. Therefore, there is an increased pressure on the two dairies for milk in the summer season when availability is at the lowest ebb. Then in the area around Delhi, there is a heavy demand for milk or milk products but also from the neighbouring milk product factories. Therefore, the shortage of milk has to be supplemented by

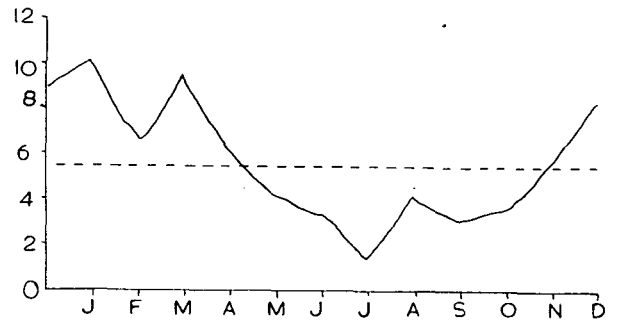
MONTHLY PROCUREMENT OF MILK IN 1976

(IN LAKH LITRES)

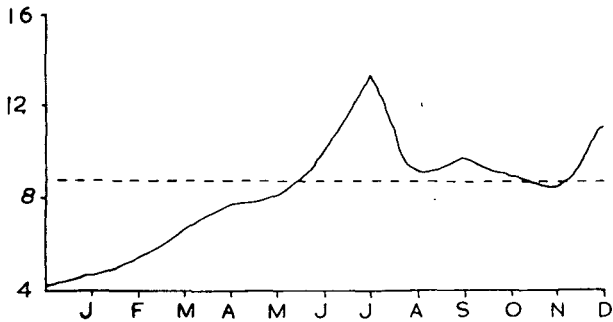
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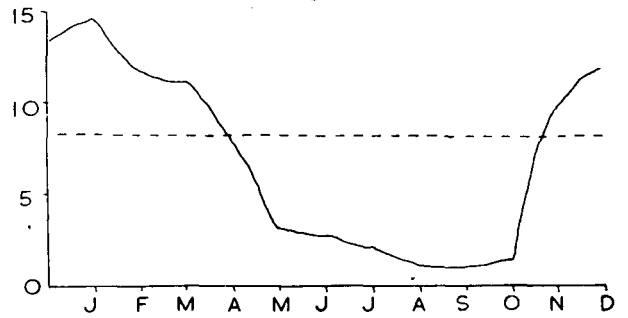
AJMER II



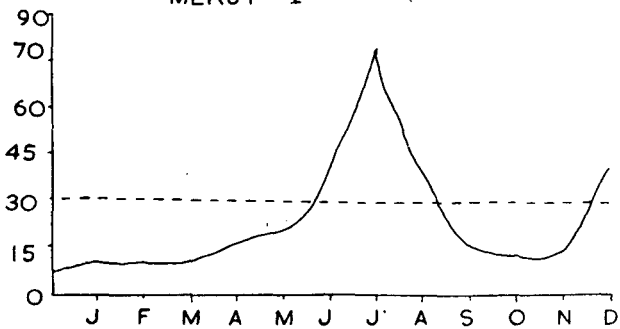
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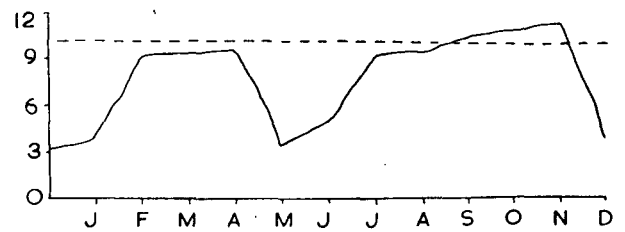
SOHNA II



MERUT I



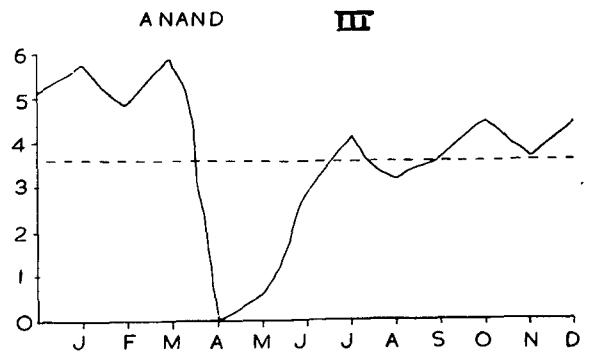
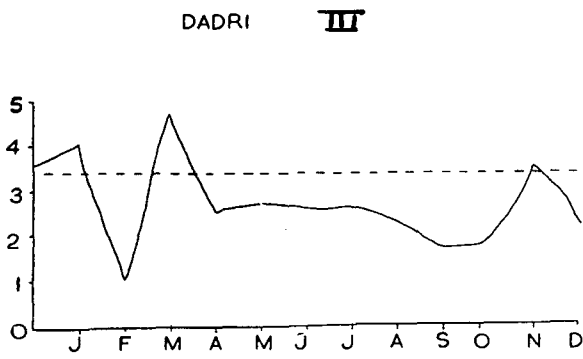
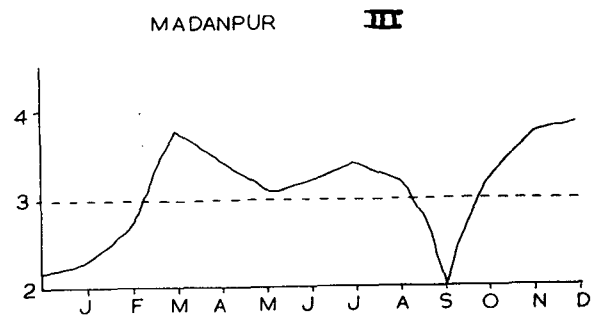
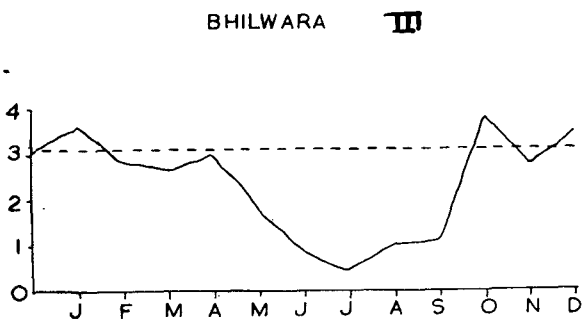
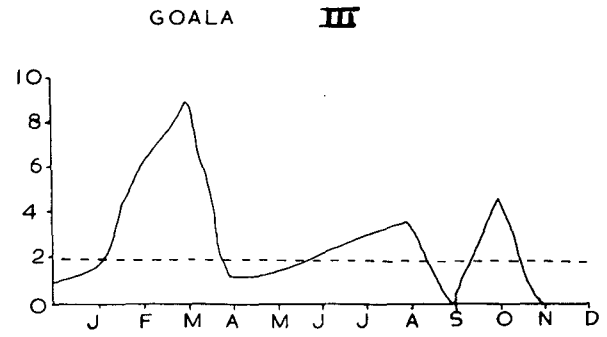
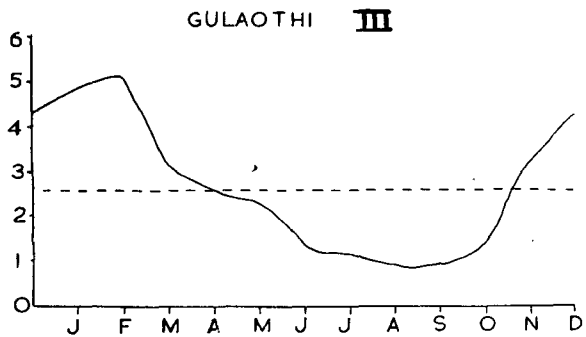
JODHPUR I



----- MEAN MONTHLY PROCURMENT
I & II HIERARCHY OF CENTRE

MONTHLY PROCUREMENT OF MILK IN 1976

(IN LAKH LITRES)

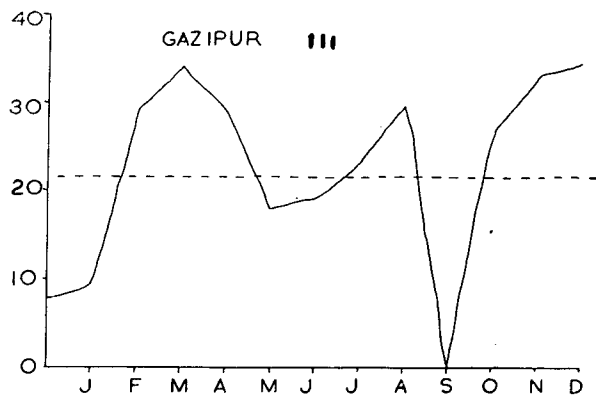
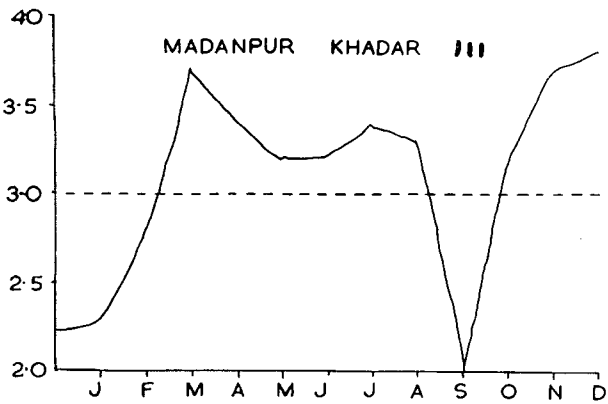
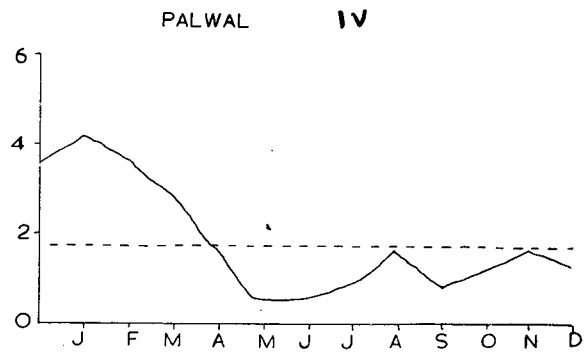
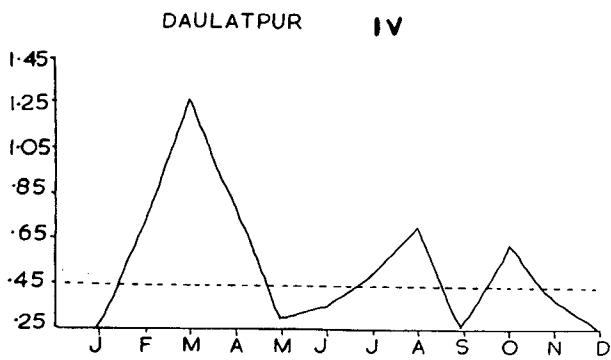
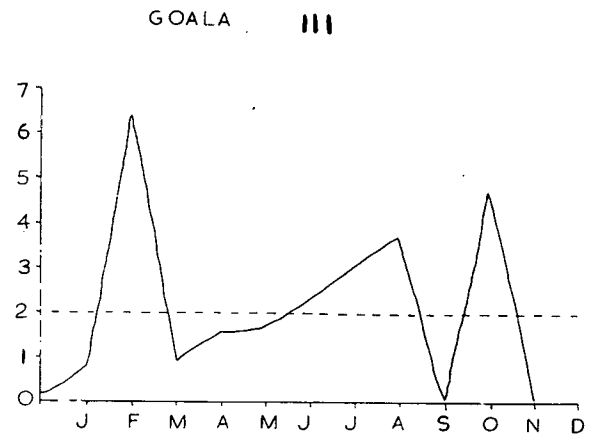
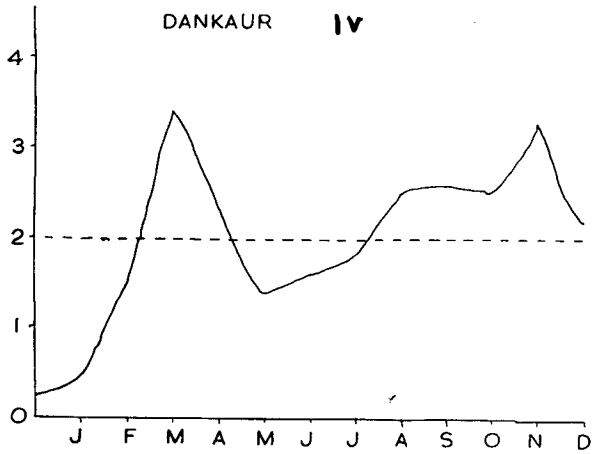


----- MEAN MONTHLY PROCUREMENT
III HIERARCHY OF CENTRE

GRAPH NO. 4.

MONTHLY PROCUREMENT OF MILK IN 1976

(IN LAKH LITRES)

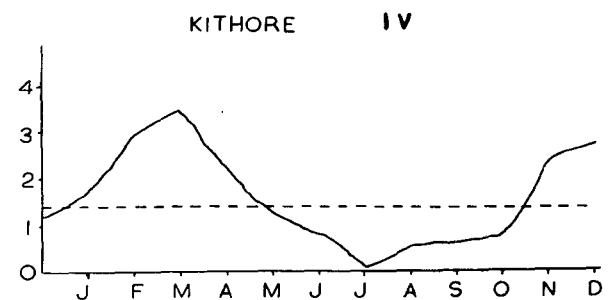
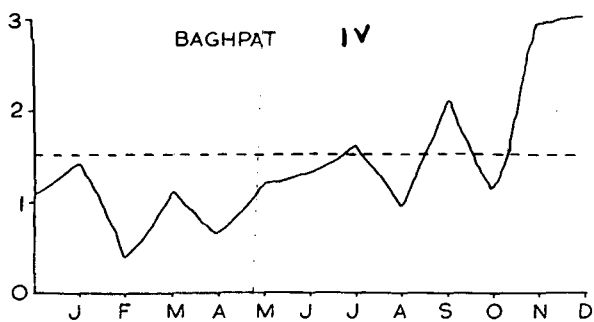
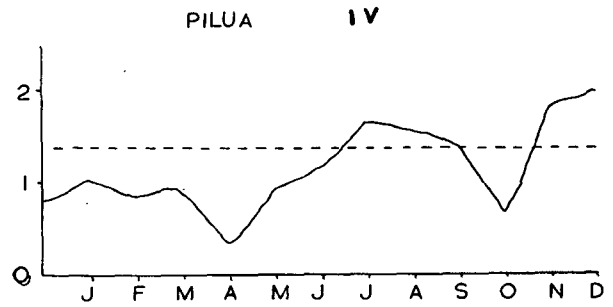
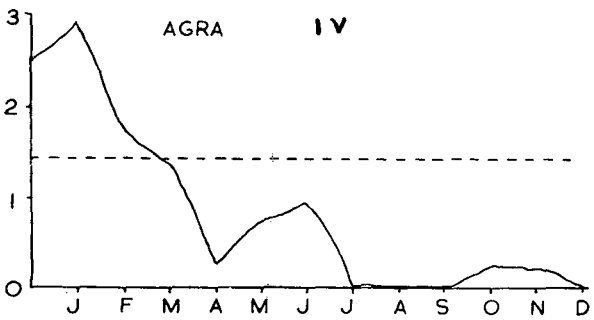
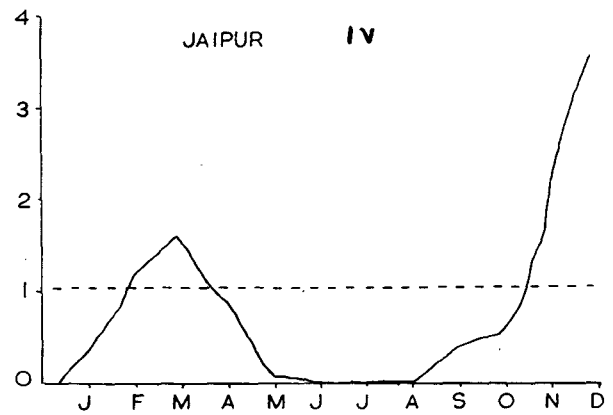
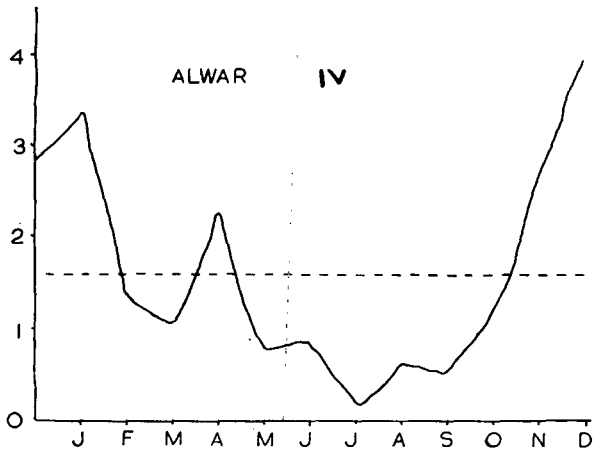


----- MEAN MONTHLY PROCUREMENT
IV HIERARCHY OF CENTRE

GRAPH No. 5.

MONTHLY PROCUREMENT OF MILK IN 1976

(IN LAKH LITRES)

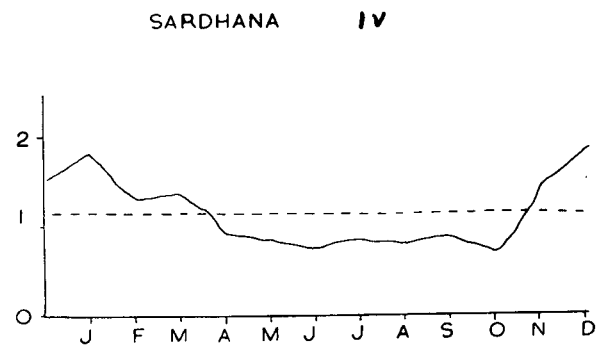
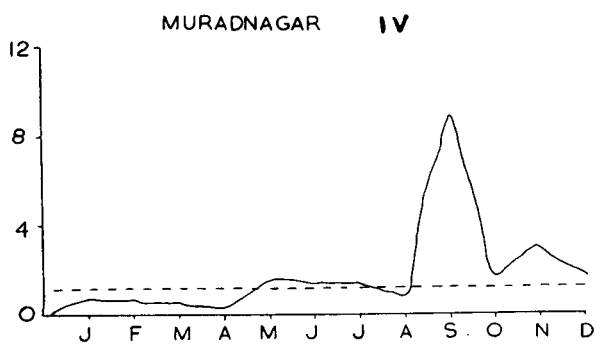
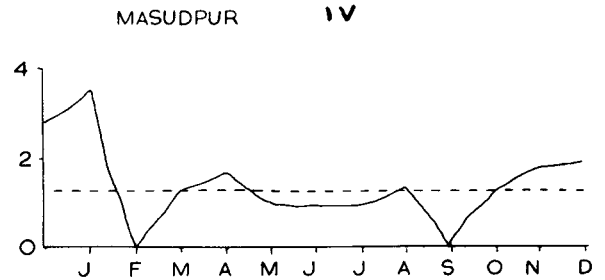
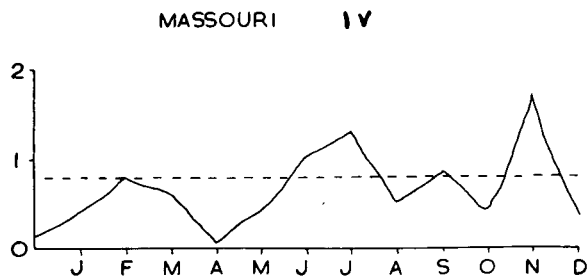
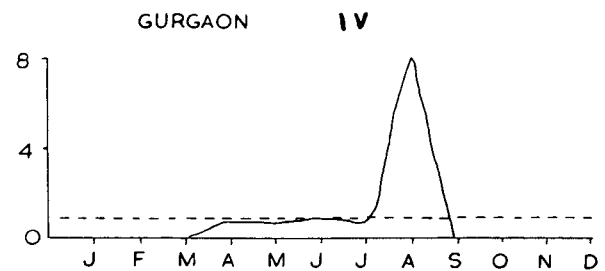
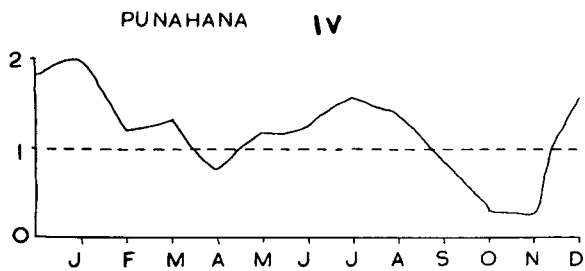


----- MEAN MONTHLY PROCUREMENT
IV HIERARCHY OF CENTRE

GRAPH No. 6.

MONTHLY PROCUREMENT OF MILK IN 1976

(IN LAKH LITRES)

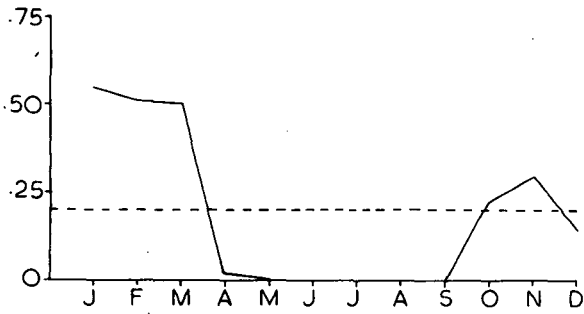


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IV HIERARCHY OF CENTRE

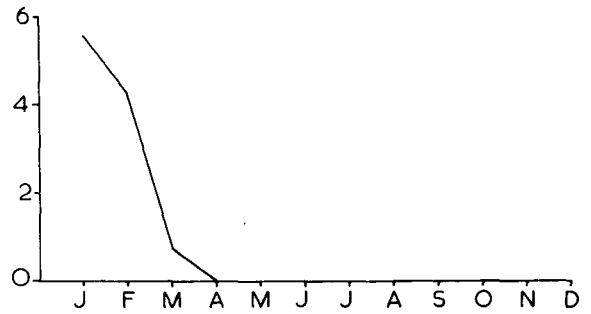
MONTHLY PROCUREMENT OF MILK IN 1976

(IN LAKH LITRES)

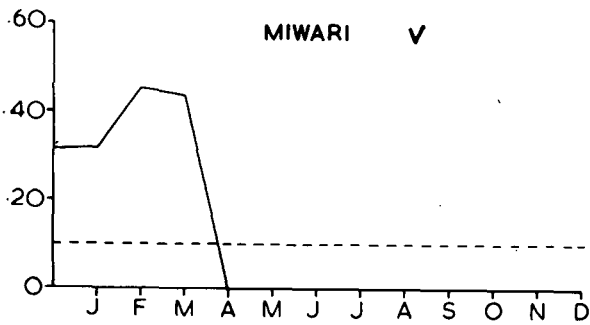
SONEPAT V



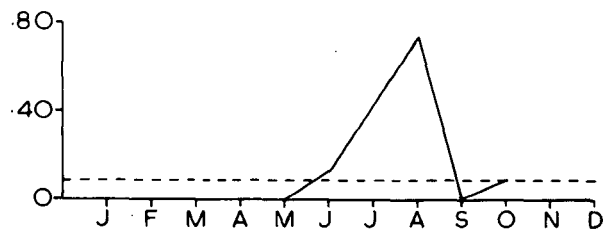
CHATTARPUR IV



MIWARI V



KAKROLA V



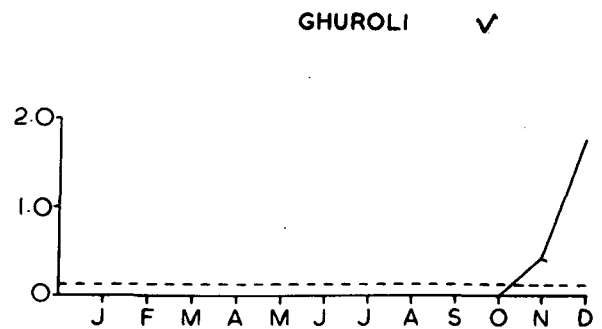
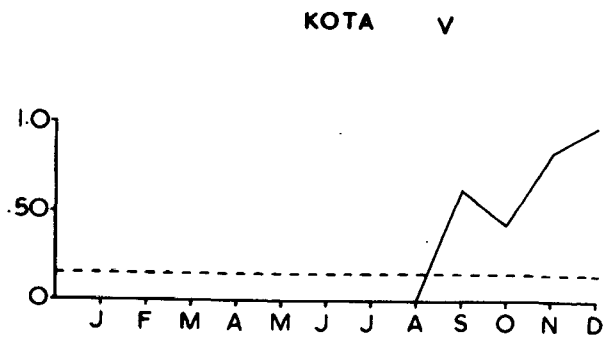
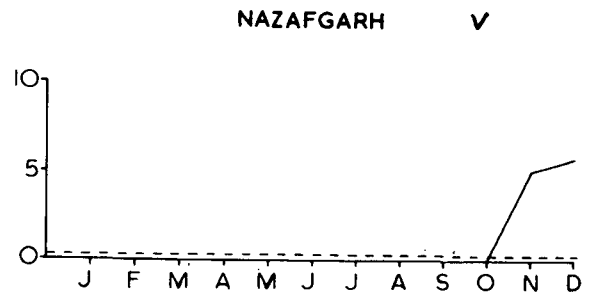
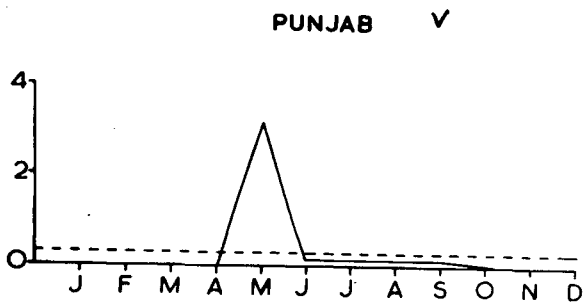
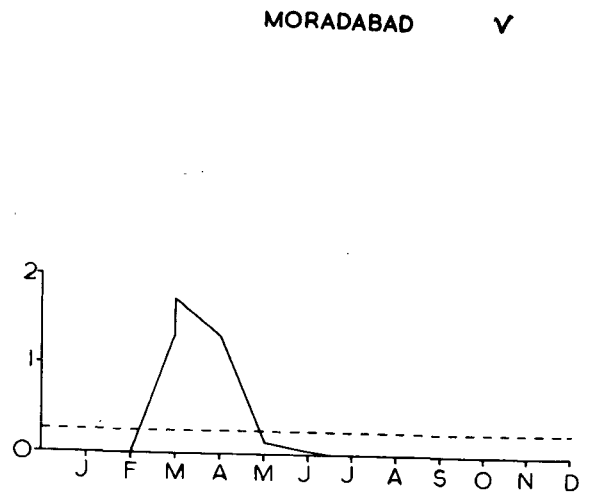
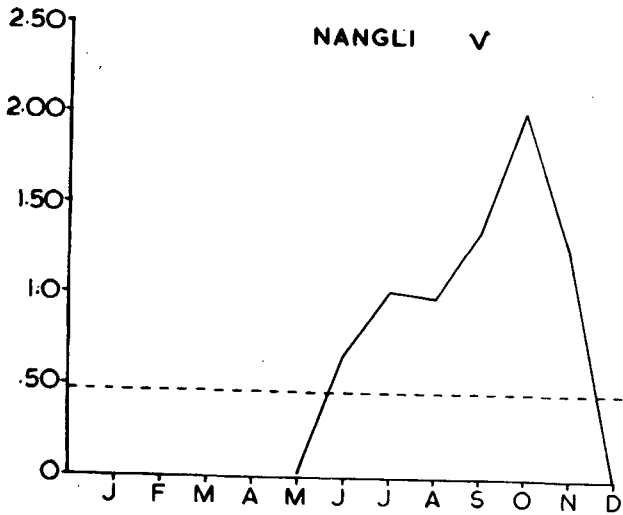
----- MEAN MONTHLY PROCUREMENT

IV HIERARCHY OF PROCUREMENT CENTRE

GRAPH NO. 8.

MONTHLY PROCUREMENT OF MILK IN 1976

(IN LAKH LITRES)



----- MEAN MONTHLY PROCUREMENT
✓ HIERARCHY OF CENTRE

GRAPH No. 9.

by bringing milk from more distant areas or the shortage necessarily has to be made good by reconstituting milk from butter fat and milk powder in order to overcome the fluctuations in the availability of fresh milk and maintain a steady supply of milk round the year.

The graphs for all the milk collection centres providing milk to Delhi Metropolis are drawn which show the monthly procurement (Graph Nos. 3 to 9 are marked with their hierarchy). These graphs show the increase and decrease in the procurement in different months for the year 1976 and this is compared with the mean (average) monthly procurement of the same year by drawing a straight line in the graph. This helps in showing the months which have procurement above the mean and the months when procurement is below the mean yearly procurement and in comparing the procurement pattern with the ^{lactation} ~~location~~ cycle of the milch animals.

These graphs show a peculiar trend and it does, of course, follow the ^{lactation} ~~location~~ cycle in the case of most of the centres, except a few which have shown different trend in the seasonal procurement. But the summer months don't really stick to the summers only. The variation starts from April and prolongs to August/September. All the centres have different months for their lean milk production.

The Centres which have graphs following the location cycle are Sonapat, Chattarpur, Niwari, Mathura, Ajmer, Sohna, Gurgaon, Sardhana, Gulaothi, Bhilwara, Dadri, Alwar, Jaipur, Kithare, Palwal, Daulatpur, Moradabad, Punjab. These centres have low milk procurement during summer months. The procurement is below mean during summer months for these centres. The procurement of milk is below mean from May to September for Sonapat, Mathura, Sohna, Sardhana, Gulaothi, Bhilwara, Dadri, Jaipur, Alwar, Kithore, Palwal but the supply for other months differs from centre to centre. There are fluctuations in the procurement in some centres in months other than summer months e.g. Jaipur and Kithore have low procurement during January and February, Dadri has low procurement during February and December months. These fluctuations can be explained only by temporary and local reasons as producers not supplying milk regularly at the centre or breakdown of machinery at the chilling and collection centre etc.

The centres which have high milk procurement during summer months and low milk procurement during winter months are Meerut, Bikaner, Jodhpur, and Goala. The graphs for these centres show a reverse trend to the ^{lactation} location cycle. The main reason for such a trend is that cooperatives are collecting milk from all these centres except Goala. When the demand for milk is

high, these cooperatives increase the purchase price of milk to give incentive to the producers. So the producers prefer to sell their milk to the cooperatives whereas it is reverse during the winter months.

But Goala in outer Delhi doesn't have such conditions. The trend shows not much of fluctuations in the procurement of milk. This is because its being a village, the ^{local} demand is low and there is not much fluctuation in the procurement of milk.

The procurement is not at all stable for a few centres, as shown in the graph. Sharp ups and downs occur in every month that is there are large fluctuations in procurement every month. Centres with such a type of graph are Baghpat, Dankaur, Daulatpur, Madanpur, Kakrola, Agra, Gazipur, Masudpur, Masouri and Anand.

A few centres like Nangli, Moradabad, Nazafgarh, Punjab, Kota, Ghuroli, Gurgaon, Chattarpur and Niwari supplied milk for a few months in the year 1976. So they don't show much of seasonal change in the procurement pattern of a few months.

Therefore, if on the whole we see the procurement pattern, the average, more or less, comes out to be uniform, because the lean months of one centre

don't tally with the other to a large extent, and the shortage of one centre is overcome by the other because if we see the total yearly procurement, it is increasing every year as seen from Table No.1. Sometimes, if DMS is short of fresh milk, it reconstitutes milk from the butter fat and milk powder.

The other reasons for the changes in monthly procurement are the natural calamities like floods, diseases among cattle and increase in prices of foodgrains and cattle feed, and the rise in local demand because of festivals etc.

The other main reason for this fluctuation is the fluctuation in the sale of milk from day to day and month to month in the metropolitan area. The sale of milk is high in the first week of the month which gradually reduces with the advancement of dates. This is because people spend lavishly in the first few days of the month when they get their salary, and with the advancement of dates, expenditure decreases. The per day sale for a month has shown this trend. When the demand for milk reduces, the procurement also reduces, because DMS doesn't buy extra milk from the producers which it doesn't need. With this, the procurement shows fluctuations. On the other hand during the festivals etc. the demand

for milk increases in the rural as well as urban areas tremendously and the DMS tries to procure more milk to meet the demand.

Table No. 4 gives the winter and summer procurement of milk with the percentage decrease for a few milk collection centres of DMS. This shows that the maximum percentage decrease is for Ballabgarh Centre followed by Palwal, Meerut and Baghpat and Muradnagar with 50%, 40%, 33%, 20% and 16.6% respectively. The two centres Pilakhua and Dankaur don't show any seasonal change in the procurement of milk.

Table No. 4

Showing seasonal procurement of milk in thousand litres, during 1964-65.

<u>Chilling Centre</u>	<u>Winter procurement</u>	<u>Summer procurement</u>	<u>Percentage decrease</u>
Muradnagar	600	500	16.6
Pilakhua	500	500	Nil
Baghpat	500	400	20.0
Dnankaur	150	150	Nil
Palwal	250	150	40.0
Ballabgarh	120	60	50.0
Meerut	300	200	33.3

HIERARCHY OF PROCUREMENT CENTRES:

Human activity requires an organisational framework within which it can function, this may be economic or social. The spatial form of this organisational

framework manifests itself in a system of settlements in hierarchy starting from a small village and encompassing the market town and trading centre, large city and metropolitan complex. Socio-economic development, as manifested by the spatial arrangement of human activities, is always uneven both in time and space. It is marked by concentration and secular tendencies towards persistence of uneven distribution whether we consider a small region or the whole world we find certain areas more advanced in one respect and backward in other respect, and one region more advanced than the other in one respect or the other.

They form a hierarchy of places passing through different stages of socio-economic development. The spatial arrangement of human activities have two concomitant but opposite tendencies that is concentration and diffusion. The concentration tends to leave transitional areas between the developed areas whereas diffusion process tends to spill over the developmental forces in the transitional zones.

The ranking of settlements according to the population size and number of services they perform is a helpful

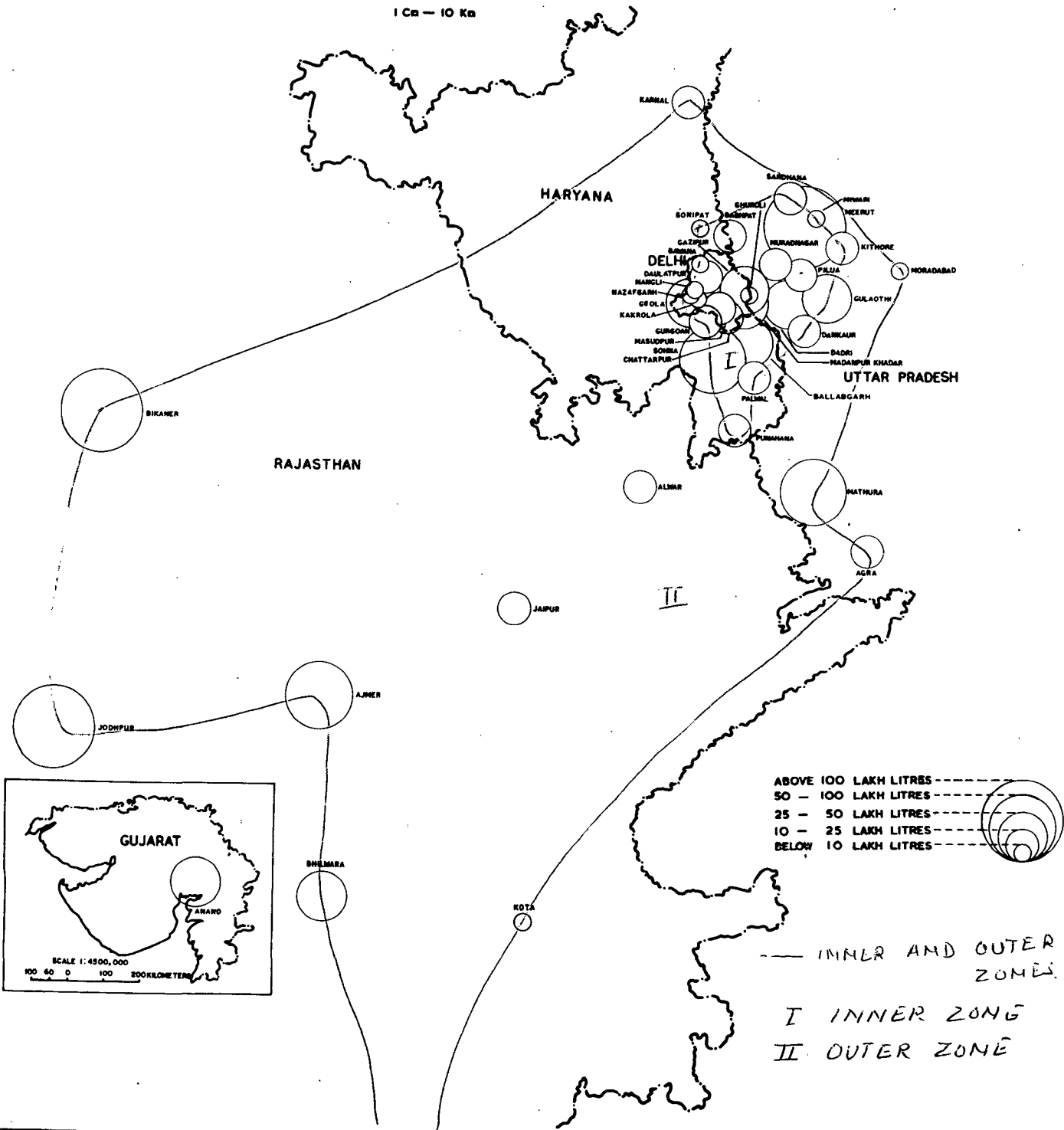
preliminary step in classification of settlements and in the grouping of settlements according to their place in the hierarchy. The first step in this is to divide different functions into different levels which result in functional hierarchy.

Here in this Chapter, a hierarchy has been tried to work out on the basis of the quantity of milk procured at each procurement centre which provides milk to the Delhi Metropolitan City. This shows the procurement centres according to their hierarchy in the procurement and their importance to Delhi metropolitan city. The hierarchy has been worked out on the basis of the yearly procurement made in the year 1976. Following five hierarchies have been worked out after setting the data in ascending order and locating the breakpoints in it:-

- | | |
|---|------------------------|
| I. Centres supplying milk below 10 lakh litres | Very
- /Low supply. |
| II. Centres supplying milk between 10 to 25 lakh litres. | - Low supply. |
| III. Centres supplying milk between 25 to 50 lakh litres. | -- Medium supply. |
| IV. Centres supplying milk between 50 to 100 lakh litres. | - Large supply |
| V. Centres supplying milk above 100 lakh litres. | - very large supply. |

HEIRARCHY OF PROCUREMENT CENTRES

STATE BOUNDARY _____
 KMS: 10 0 10 20 30 40 50 60 70 80 90 KMS.
 1 CM = 10 KM



MAP NO. 1.

The number of centres falling in each hierarchy is as follows:

	<u>No. of centres</u>	<u>% to total centres.</u>
I. Below 10 lakh litres	11	27.5%
II. Between 10 to 25 lakh litres	15	37.5%
III. Between 25 to 50 lakh litres	8	20.0%
IV. Between 50 to 100 lakh litres	3	7.5%
V. Above 100 lakh litres	3	7.5%
<u>Total:</u>	<u>40</u>	
	<u>£</u>	

The above table shows that the main concentration is in the medium, low and very low supply centres, that is the lower three classes. There are just 3 centres which have the highest hierarchy and 3 which have lower hierarchy than the highest. Thus, there are just 6 centres which are very important and contribute a great amount of milk supply to the total supply.

Map No.1 and graphs Nos.3 to 9 show the hierarchy of the procurement centres and the seasonality of procurement.

A. Above 100 lakh litres:

In this hierarchy, there are three centres viz. Meerut, Jodhpur and Bikaner and these centres contribute their supply both to Delhi

Milk Scheme and Mother Dairy. The highest procurement was in Meerut Centre i.e. 361 lakh litres in the year 1976. Jodhpur and Bikaner contributed 140 lakh litres and 105 lakh litres respectively during the same year. The milk is transported by rail tankers from Jodhpur and Bikaner and in road tankers from Meerut. The distance of these three centres from Delhi is as follows:-

Meerut	71 kilometres.
Jodhpur	625 Kilometres.
Bikaner	463 Kilometres.

The milk at all these three centres is procured through the milk cooperatives and that is one of the main reasons for this high procurement at these centres and especially at Meerut in Uttar Pradesh. And the seasonality of these procurement centres in graph No.3 shows that during the summer the procurement increases during summer and the peak season is during June-July, and then it starts decreasing and again it starts increasing after October. This trend is for the two centres out of three that is Bikaner and Meerut. In Jodhpur, there are two peak seasons, one is during February, March & April and then there is a lean season in March and again procurement increases and another peak season is there. The procurement is almost regular for Jodhpur Centre.

B. Between 50 to 100 lakh litres:

In this hierarchy also, there are just three centres, namely Sohna, Mathura and Ajmer. All these centres are in Haryana, Uttar Pradesh and Rajasthan with distances from Delhi of 37 Kilometres, 45 kilometres and 44 kilometres respectively. Milk is procured at Sohna and Mathura through D.M.S. Chilling Centres whereas at Ajmer it is procured through the milk cooperatives. The seasonality of these two centres, shown in graph No.3, is almost same and the trend of the graphs is also almost same. The peak season is during the winters that is during November-December, January, February & March and the lean procurement is during May, June, July. So here the hierarchy and seasonality of these three centres is same.

C. Between 25 to 50 lakh litres:

This category has got 8 centres in it from five different States, as follows:-

1. Dadri & Gulaothi in U.P.
2. Anand in Gujarat.
3. Bhilwara in Rajasthan.
4. Madanpur, Khadar, Gazipur and Goala in outer Delhi.
5. Ballabgarh in Haryana.

The centres in outer Delhi are contributing less milk than the centres in Rajasthan, U.P., and Gujarat. The main reason for this is that the supply is high and demand is low in Bhilwara and milk is procured through cooperatives at Mehsana and Kaire in Anand which is one of the largest cooperatives in India.

But the centres like Gazipur, Goala, Madanpur, Gulaothi and Dadri, the demand is very high because they are located nearer to Delhi and Milkmen prefer to sell their milk personally in the metropolitan city to get maximum benefit themselves, and they can afford to come to Delhi Metropolitan city daily either by rail or by road. The seasonality of the centres in this hierarchy, shown in graph No. 4 & 5, is very peculiar and it is same to some extent for all the centres except Gulaothi, Anand, and Bhilwara which have same seasonality regarding the procurement of milk. They have a lean season in summer i.e. during April, May, June & July, and peak season for the procurement of milk in winter months. The other centres have very fluctuating graphs for their monthly procurement. Fluctuations are very high in Madanpur, Gazipur and Goala's procurement graphs.

D. Between 10 to 25 lakh litres:

This category has the maximum number of centres in it i.e. 15. These centres are Dankaur, Palwal, Baghpat, Kithore, Agra, Alwar, Pilua, Masudpur, Chattarpur, Muradnagar, Sardhana, Punahana, Jaipur and Gurgaon and Delhi Milk Scheme, which supply its surplus milk to Mother Dairy for distribution. Graph Nos. 5, 6 & 7 show the monthly procurement graphs for these centres. Dankaur, Daulatpur, Palwal, Alwar, Kithore, Agra, Jaipur, Chattarpur & Niwari have their peak season in January, February and March. For a few centres, it is an extension from November, December i.e. in Jaipur, Alwar, Kithore. For other centres like Pilua, Gurgaon, Punahana, and Muradnagar, the peak season is in summer months in May, June and July.

E. Below 10 lakh litres:

There are 11 centres which supply below 10 lakh litres yearly and fall in the last hierarchy or the lowest hierarchy. These centres are Massouri, Nangal, Daulatpur, Nazafgarh, Moradabad, Sonapat, Kakrola, Niwari, Ghuroli, Kota and Punjab Dairy Development Corporation. These centres give very irregular supply of milk and that is one of the reasons for their very low supply of milk, and the other reason for the

centres in outer Delhi is that the demand for milk is very high in these areas and milkmen mostly sell their milk personally in the city to get the maximum benefit. The Graphs Nos. 8 & 9 show the monthly procurement of milk. But they don't show much about the seasonality of these centres because these centres were very irregular in supplying milk. The procurement is done only for a few months in a year. From Chatterpur, Sonapat, Niwari, Nangli, Nazafgarh, Kota and Ghuroli procurement is done in winter months. And from Kakrola, Moradabad, and Punjab (Moga) procurement is only in summer months.

MILK SHED AREA OF DELHI

The milk shed area of a city is the area from which the city receives its market or fluid milk and is a tangible expression of the relationship between city and farm. Where many large cities are near together, the area coalesces into one tremendous milk shed. Every day without fail truck tankers, bearing the name of the city dairies or milk marketing associations, wear a steady path up and down the rural roads of milk sheds, collecting fresh milk. The expansion of milk shed area is related with the rapid

growth of urban population, because with the growth of urban population, the demand for milk also increases with the result that the existing milk shed becomes insufficient and thus the milk shed area tends to expand.

Same was the situation in Delhi, when the milk of D.M.S. and private dairies could not meet the demand of Delhi's growing population. Mother Dairy, a subsidiary of National Dairy Development Board/ Indian Dairy Corporation, was established and the milk shed area expanded upto Anand and Mehsana in Gujrat and Ajmer and Jodhpur in Rajasthan.

An important problem, rather peculiar and unique, to Delhi is the fact that its metropolitan region has a multi-state character. The Union Territory of Delhi itself is too small and compact to be a viable metropolitan planning unit. The influence of the metropolis transcends its administrative boundary and covers parts of Uttar Pradesh, Haryana and Rajasthan. Broadly, two layers of metropolitan influence can be recognised in terms of intensity of interactions, spatial affiliations and inter-linkages.*

*Master Plan of Delhi, Delhi Development Authority
1968, New Delhi.

The milk shed area of Delhi extends along the highways connecting Delhi with Meerut, Mathura and Moradabad in Uttar Pradesh, Jodhpur, Ajmer, Bikaner in Rajasthan and Karnal in Haryana and Anand in Gujrat. There are many more centres connected to Delhi from where fluid milk flows to Delhi. These places are further connected with small villages from where the milk initially is produced and sent to Delhi through these big centres.

There are in all 40 places both large and small in the milk shed area of Delhi which are involved in the process of milk supplying. These include small villages like Dankaur in U.P. which is also known as village of Dudhias (Milkmen) and there are cities as big as Jaipur, Meerut etc. The milk is transported by road as well as by rail. And apart from these places, there are many other places from where milk is brought privately to Delhi by the Gwalas who sell their production personally in Delhi. There is no record for such Gwalas and the places from where they come. The data is available only for the places from where the milk comes through the D.M.S. or the Mother Dairy. Map No.1 shows

the location of all these centres with their hierarchy.

The names of the places from where the milk comes regularly are as follows:

HARYANA

1. Sohna
2. Gurgaon
3. Sonapat
4. Punahana
5. Karnal
6. Ballabgarh
7. Palwal.

UTTAR PRADESH

8. Meerut
9. Masouri
10. Sardhana
11. Dadri
12. Baghpat
13. Dankaur
14. Pilua
15. Gulaothi
16. Muradnagar
17. Mathura
18. Kithore
19. Agra
20. Niwari
21. Moradabad.

RAJASTHAN

22. Ajmer
23. Alwar
24. Jodhpur
25. Kota
26. Bhilwara
27. Bikaner
28. Jaipur

OUTER DELHI (Rural Delhi)

29. Madanpur
30. Goala
31. Gazipur
32. Nangli
33. Daulatpur
34. Kakrola
35. Masudpur
36. Ghuroli
37. Najafgarh
38. Chattarpur
39. Bawana

GUJRAT

40. Anand

PUNJAB

41. A Punjab Dairy Development Corporation.

Table No.5 shows the total quantity of milk supplied by these centres with their percentage of contribution to the total supply, in the year 1976.

The milk is collected from as far as the deserts of Rajasthan. It is because Rajasthan is on the threshold of a break-through in dairy development. This dry State with sandy tracts covering more than half its area where no profitable farming is possible under present conditions, has paradoxically a tremendous potential for producing milk. Unsurprisingly cattle breeding is the principal means of livelihood of a large majority of the population in the western districts. The eastern region of Rajasthan where the climatic and soil conditions are suitable for cultivation, the rural folk maintain cows to supplement their income. About 4,40,000 farm families maintain cattle to increase the milk production of the State and to provide it to other States through cooperatives. Even when there were no dairies worth the name in Rajasthan, milk production was in a way pretty high by the Indian Standards. The per capita output of milk was 250% of the national average. In absolute terms,

12.7 million cows and 4.7 million buffaloes produced 4 million tonnes of milk annually and 6 million litres daily, leaving an exportable surplus of 2 million litres daily.

An effort is now being made to supply surplus milk to areas where it is needed mainly ⁱⁿ Delhi. Milk producers' cooperative societies, which have been established in different parts of the State, collect more than 2,00,000 litres of milk daily. Apart from these, there are the chilling and collection centres of D.M.S. which have already been stated earlier. Milk collection in Ajmer area has exceeded the expectations.

In the areas of U.P. and Haryana, the situation is completely different, especially in the areas lying adjacent to the Delhi boundaries. From these areas, every morning one can see the milkmen on the cycles or on railway trains coming to Delhi with their milk for selling the same personally. These areas are mainly Ghaziabad, Faridabad, some villages of rural Delhi and many more big and small villages inside and outside Delhi. This practice continues every morning.

These milkmen come personally to sell their milk just to earn more profits because in the areas from where they come the sale value of milk is very less compared to Delhi and they can adulterate the milk to the maximum possible extent. The surplus milk which they are not able to sell privately is given at the D.M.S. procurement centres, because the price of milk at the D.M.S. procurement centres, is fixed on the basis of fat content of milk. Map No.2 shows the flow of milk from rural Delhi to urban Delhi which shows quantity of milk, supplied by these centres in 1976. From rural Delhi, Gajipur, Chattarpur, Madanpur & Goala are the main centres supplying milk to urban Delhi.

Table No.5

The quantity of milk procured in the year 1976 from all the centres in Delhi milk shed area arranged in descending order with the percentage of their milk contribution in the same year to the total quantity of 1241 lakh litres is given below:

S.No.	Name of Place	Total quantity of milk in lakh litres	Percentage to the total yearly procurement.
1.	Meerut	169.11	13.62
2.	Jodhpur	139.93	11.27
3.	Bikaner	105.18	8.47
4.	Sohna	98.59	7.94

5. Mathura	89.80	7.24
6. Ajmer	67.62	5.45
7. Dadri	44.34	3.57
8. Anand	43.18	3.48
9. Bhilwara	41.16	3.32
10. Madanpur Khadar	36.17	2.91
11. Gulaothi	31.99	2.58
12. Gazipur	26.13	2.11
13. Goala	25.63	2.07
14. Dankaur	23.72	1.91
15. Daulatpur	21.11	1.70
16. Palwal	20.99	1.69
17. D.M.S.	19.10	1.54
18. Alwar	18.99	1.53
19. Baghpat	18.09	1.46
20. Kithore	17.87	1.43
21. Agra	17.11	1.38
22. Pilua	16.67	1.34
23. Masudpur	16.21	1.31
24. Chatterpur	15.59	1.26
25. Muradnagar	14.21	1.16
26. Sardhana	13.69	1.06
27. Punahana	13.16	1.06
28. Jaipur	12.61	1.02
29. Gurgaon	11.23	0.90

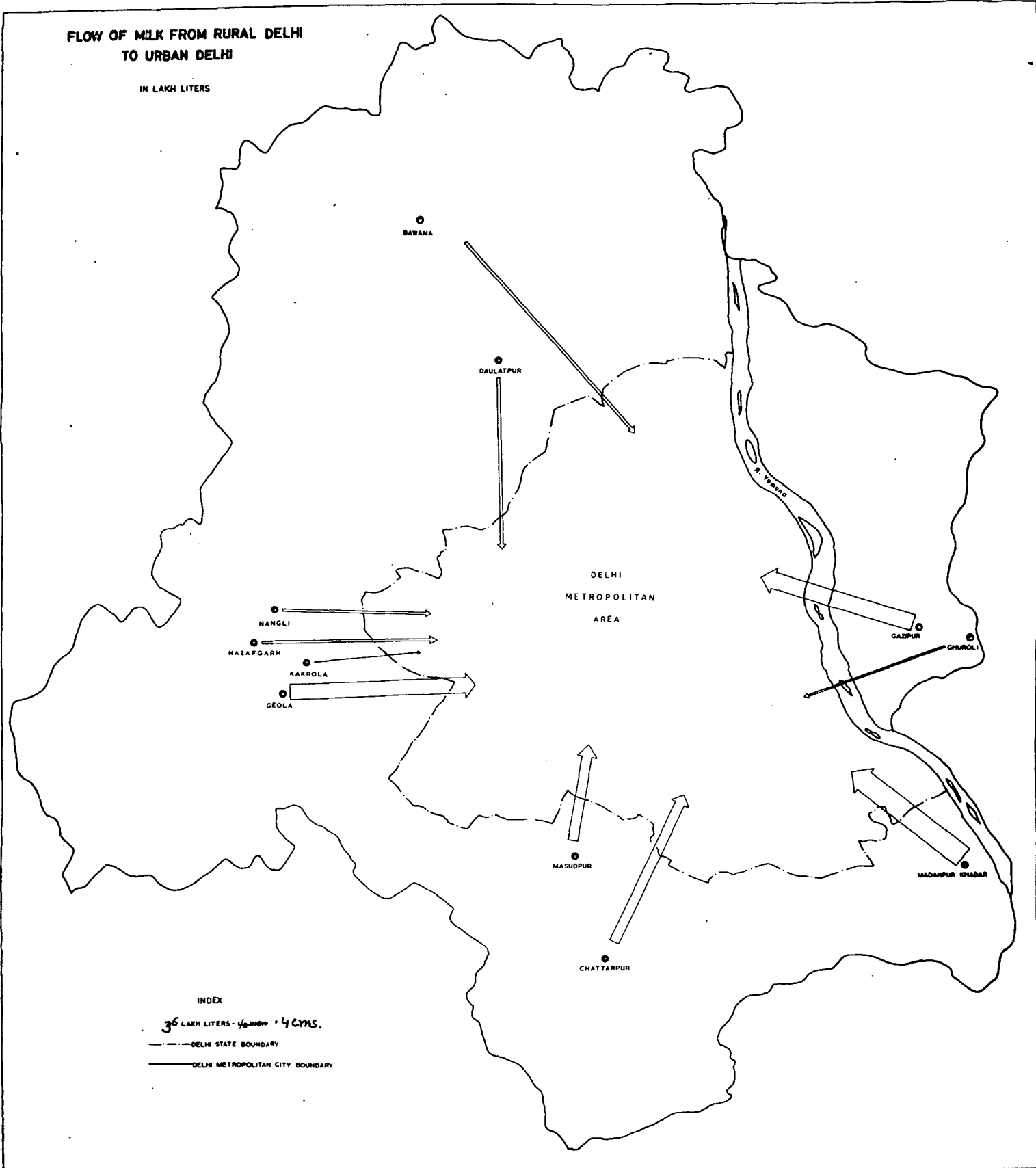
30. Karnal	10.73	0.86
31. Masouri	8.49	0.68
32. Bawana	5.64	0.45
33. Nangli	5.28	0.42
34. Najafgarh	4.91	0.39
35. P.D.D.C. (Moga)	3.59	0.29
36. Moradabad	3.25	0.26
37. Sonapat	2.56	0.21
38. Ghuroli	2.32	0.19
39. Kota	1.97	0.15
40. Kakrola	1.51	0.12
41. Niwari	1.21	0.10

Dr. Z. R. Kothawala* has tried to divide the milk shed of a city into two belts or zones around the city.

One zone is the immediate influence area around Delhi called Metropolitan area which is roughly enclosed within a circle of 15-20 miles in the central city and shows a close affinity and intimate inter-linkages of economies with the central city of Delhi. The economies of towns falling within this area are subservient to Delhi and almost entirely dependent

**FLOW OF MILK FROM RURAL DELHI
TO URBAN DELHI**

IN LAKH LITERS



MAP NO. 2.

upon Delhi for many of their daily requirements. A great deal of interaction and communication is maintained in this area both by rail and by road.

The second zone of influence around Delhi - The Metropolitan Region or National Capital Region covers a much larger area and encircles area of around 70 miles from Delhi. There is a great degree of economic inter-dependence between the towns in this zone and Delhi. It is this area from which the city mainly procures its essential supplies of milk, meat, fresh vegetables, fruits etc. and other perishable food items. Though there exists a considerable degree of inter-action between some cities in this zone and Delhi, these two zones are the main part of Delhi's milk shed area.

If we see the distribution of milk procurement centres in Map No.1, it shows a pattern similar to this, and we can divide the milk shed of Delhi city into two zones ~~belts~~ as in Map No.3. There is a concentration of procurement centres around city and centres are dispersed with the increase

* Z. R. Kothawala - Indian Farming.

in distance from the city. Out of the total ^{milk} procured in 1976, 73% was procured from inner zone or belt which has 69% of the total number of centres and 27% of total milk quantity was procured from outer zone which has 31% of the total number of milk procurement centres.

Table No.6 gives the monthly procurement from these two zones. The seasonality of the two zones is also different. The procurement is at the peak level in the winter months and at lean in the summer months in outer zone. The lean season prolongs for 3 months i.e. April, May & June, where as the inner zone the lean season is distributed in two parts of the year, one in April & May and the other in September, October and November. The highest procurement for inner belt is in July. This is because all the outer Delhi Centres are included in it which don't have much of local demand and the procurement of milk doesn't show much of fluctuations and the other reason is the large number of centres in this zone.

Table No.6.

Monthly procurement of milk from inner and outer zones in 1976. (figures in lakh litres).

	<u>Inner zone</u>	<u>Outer zone</u>
January	113.4	52.15
February	107.7	49.15
March	114.16	55.27
April	100.27	43.73
May	103.02	32.73
June	119.92	35.02
July	158.79	39.19
August	128.11	39.23
September	82.93	44.89
October	88.1	45.92
November	103.99	51.47
December	138.12	53.27.

CHAPTER - IV
DISTRIBUTION OF MILK IN DELHI

Milk procured both by Delhi Milk Scheme and Mother Dairy is processed and distributed in urban areas of Delhi through their respective milk distribution booths. The total number of milk distribution booths is around 1500, out of which around 1300 are of D.M.S. in which the milk is distributed in bottles and 200 are of Mother Dairy's mini dairies where the "Push Button" system operates. These booths operate in the morning and evening for limited period of time. Just like procurement system, the distribution system for both the dairies differs, which has been discussed in the following paragraphs:-

A. DELHI MILK SCHEME:

The 1300 milk booths of D.M.S. distribute the milk both in the morning and in the evening and apart from these, there are 21 whole day working stalls located in the selected areas of urban Delhi. These booths sell only the by-products of D.M.S. like flavoured milk, curd, butter, ghee and icecream. These booths are mainly located in the Universities and Govt. Offices. The list of

location of these whole-day stalls is as follows :

- | | |
|--------------------------|---|
| 1. Parliament House | 2. Central Secretariat
(North Block) |
| 3. Rail Bhavan | 4. Krishi Bhavan |
| 5. Yojna Bhavan | 6. Dak Tar Bhavan |
| 7. Indraprastha House | 8. Municipal Town Hall |
| 9. Udyog Bhavan | 10. Old Secretariat |
| 11. Central Dairy (DMS). | 12. Milk Bar Parliament House |
| 13. All India Radio | 14. South Block |
| 15. Delhi University | 16. Nehru University. |
| 17. I.I.T. | 18. Safdarjang Hospital. |
| 19. Eastern Court | 20. R. K. Puram |
| 21. I.N.A. (Super Bazar) | |

i) System of Distribution: The Scheme was issuing milk in the beginning against advance payment to cover a month's supply. The system was found unsatisfactory particularly because of the difficulty of refund for short supply or non-supply of milk by any cause. Cash and carry system with on the spot payment for the milk purchased was introduced on the pattern of Bombay Milk Scheme from 13th October 1964. The system has eliminated large number of complaints in respect of refunds. Customers are able to draw milk as per their requirement under this system. This changeover to the cash and

carry system has enabled the Scheme to issue metal tokens on the lines of tokens issued by Bombay Milk Scheme. Under this system, each customer is individually identified by a token number at a particular depot nearest to his house. In the metal token, the number of bottles according to the fixed quota is mentioned which is based on the number of persons in his family. So the quota for milk is fixed according to the members in a family. On the basis of the number of customers and their quotas, the quota for each depot is fixed, i.e. the number of bottles supplied to a depot is fixed. This differs from depot to depot and even from morning to evening. Sometimes, this quantity alters because of short supply.

The location of milk distribution booths depends upon many factors. The main one, of course, is the demand for milk in different areas. The authorities have fixed a particular quantity which is necessary to set-up a new milk booth. But apart from this, there is the importance of the area which plays a tremendous role for setting-up the milk booths. At some milk booths, the rush of

customers is too heavy whereas at some others the rush is comparatively low. The map shows the location of milk booths in the urban areas of Delhi. The areas which are thickly populated such as Karol Bagh, Patel Nagar and some areas of old Delhi, have large number of milk booths and they are clustered whereas in thinly populated areas of New Delhi the milk booths are scattered. Map No.4 shows the location of milk booths in Urban Delhi.

These depots(booths) are run mostly by part-^{time}~~time~~ workers, who are students of high schools and colleges. D.M.S. is thus giving facility to the students to earn while they continue their studies. They have to perform their duties for about two hours in the morning and two hours in the evening for distribution of milk. This facility has enabled the deserving and interested students to pursue their higher studies which they would have otherwise not undertaken. The number of workers employed by the scheme to look after the distribution of milk in 1976

DELHI: MILK DISTRIBUTION BOOTHS OF
DMS AND MOTHER DAIRY

METERS 1000 500 0 2 KILOMETERS



D.M.S DELHI MILK SCHEME H.O.
M.D. MOTHER DAIRY H.O.

MAP NO. 3.

was as follows:

	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
Depot Managers	410	600	1010
Depot Assistants	470	740	1210
<u>Total:</u>	<u>880</u>	<u>1340</u>	<u>2220</u>

Apart from the distribution of milk from these depots, D.M.S. also distributes milk in bulk to schools, hospitals and canteens of offices, colleges and other institutions.

ii) Pattern of Milk Distribution: D.M.S. was earlier issuing three types of milk, viz. buffalo, cow and toned. From May 1975, the D.M.S. replaced the buffalo milk by standard milk with lesser fat content. From June 1965, with the assistance of the World Food Programme, which contributes 800 tons of skimmed milk powder, D.M.S. introduced double toned milk. This had 1.5% fat and 9.7% solid non-fat. This milk was introduced for the low income group of people and weaker sections of Delhi with income not exceeding Rs.300/- per month. This was specially introduced in the Jhuggi Jhonpri colonies of Delhi.

To begin with, by the end of March 1966, about 17000 litres of double toned milk was distributed daily. Thus in 1966 the various types of milk distributed with their respective fat contents and prices were as follows:-

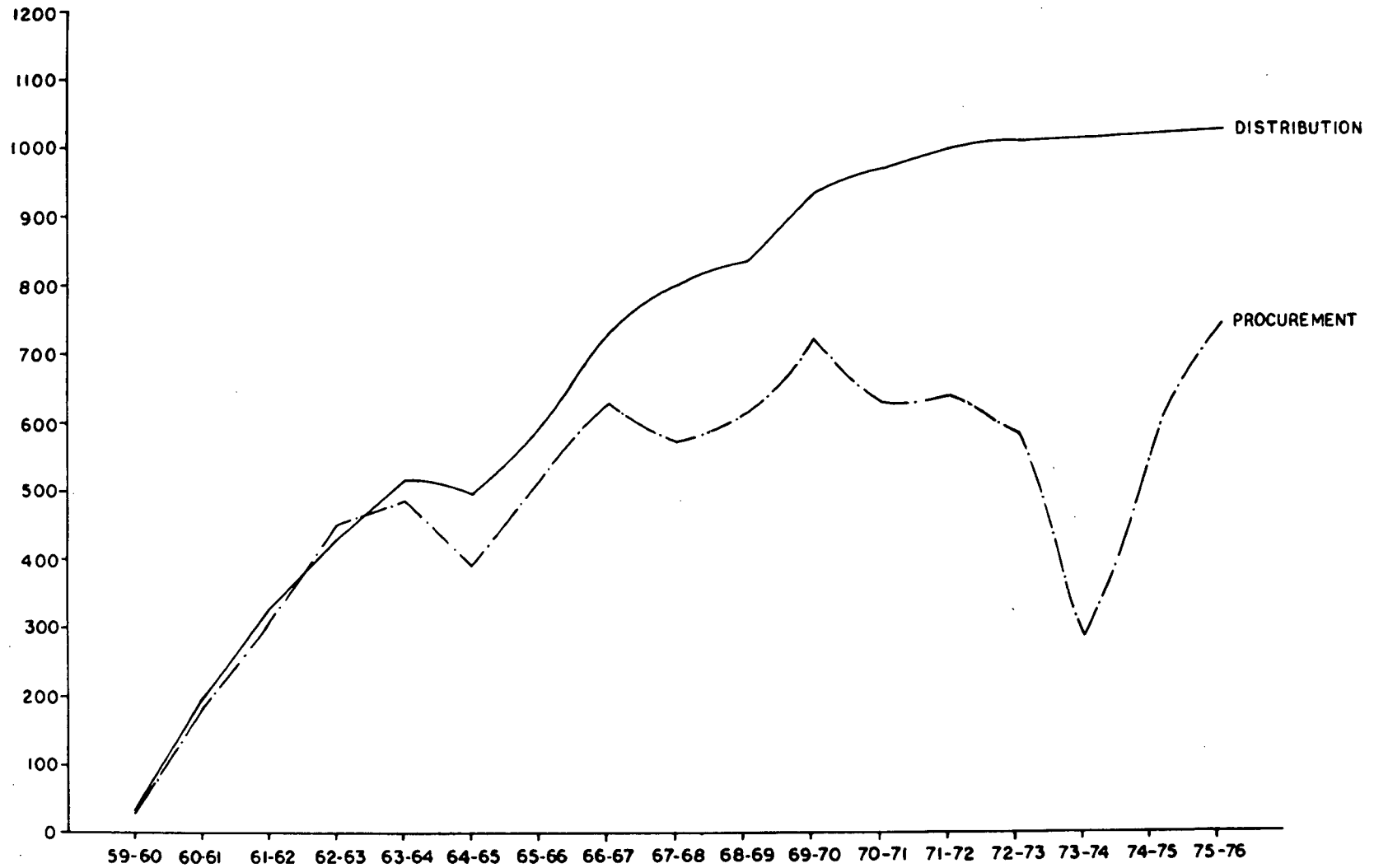
<u>Type of milk</u>	<u>Fat content</u>	<u>Price per litre</u>
Cow	3.5%	84 paise
Toned	3.0%	54 "
Double toned	1.5%	40 "
Standard	5.00%	84 "

In 1975-76 about 113 million litres of milk was distributed and it gives the daily average of 317000 litres. The milk requirement of the city has been estimated by the D.M.S. authorities as 7 lakh litres per day. D.M.S. is supplying only 46% of the total requirement. The table No.7 gives yearwise distribution and average supply of milk through D.M.S. from 1959-60 to 1975-76:-

<u>TABLE No.7</u>			
<u>Year</u>	<u>Index of progress</u>	<u>Total quantity in litres with 1961-62 as base year.</u>	<u>Average supply per day in litres.</u>
1959-60	--	36,85,661	24,248
1960-61	--	1,95,99,292	53,697
1961-62	100	3,24,17,688	88,816
1962-63	133	4,27,82,000	1,17,211
1963-64	160	5,18,45,530	1,41,654

Year	Index of progress	Total quantity in litres with 1961-62 as base year.	Average supply per day in litres.
1964-65	154	4,99,22,791	1,36,775
1965-66	182	5,90,51,936	1,61,786
1966-67	224	7,26,76,263	1,99,113
1967-68	248	8,02,41,779	2,19,248
1968-69	256	8,30,87,184	2,27,636
1969-70	289	9,38,47,432	2,54,376
1970-71	297	9,65,19,594	2,64,436
1971-72	311	10,10,99,563	2,79,406
1972-73	325	10,55,59,436	2,89,304
1973-74	324	10,53,13,584	2,88,530
1974-75	329	10,68,91,469	2,92,854
1975-76	348	11,27,63,141	3,08,096
1976-77	379	12,03,93,290	3,29,845

LAKH
PROCUREMENT & DISTRIBUTION OF MILK SINCE BY DMS IN LITERS



GRAPH NO. 10.

iii) Trend of Distribution: The Delhi Milk Scheme started with an average daily supply of 24,248 litres of milk which increased to 1.37 lakh litres in 1964-65 and to 3.30 lakh litres in 1975-76. In 1964, approximately 2.50 lakh cardholders were served by the Delhi Milk Scheme from its 774 milk booths i.e. covering 30% of Delhi's population. Graph No.10 shows the procurement & distribution of milk by D.M.S. from 1959-60 to 1975-76.

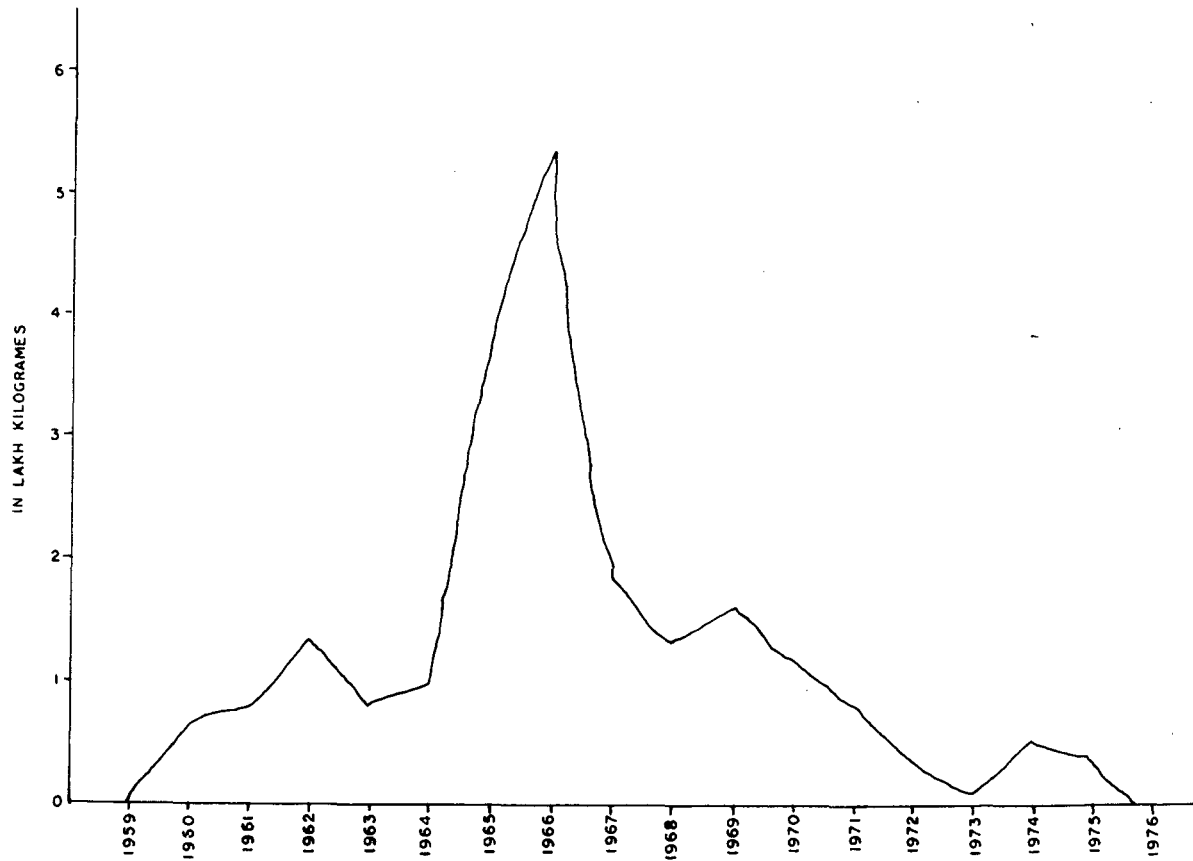
Table No.7 shows the total milk distribution from 1959-60 to 1975-76 with the daily average and the index of yearly progress in the supply of milk. The index shows sharp increase upto 1967-68 and after that it shows steady progress in the supply of milk. The decrease in index has been only in one year i.e. 1964-65 when the index fell to 154 compared to the previous year's index of 160.

From 1959-60, the Scheme was supplying buffalo milk with 6.0 to 6.5% fats and 9% solid non-fat but in 1965-66, it stopped supplying buffalo milk and in its place standard milk with 5% fat and 4.5% solid non-fat was introduced. The

supply of standard milk has been increasing since it started except in 1973-74 when its supply fell down tremendously from 708.3 lakh litres to 258.51 lakh litres and then finally D.M.S. stopped supplying standard milk and special toned milk with 3.5% fat and 8.5% solid non-fat was started, which is now supplied in maximum quantity i.e. 1101 lakh litres yearly and the only other quality of milk supplied with this now is double toned milk with 1.5% fat and 9% solid non-fat and it was supplied to the tune of 26.52 lakh litres in 1975-76, making a total supply of milk by D.M.S. of 1127.6 lakh litres.

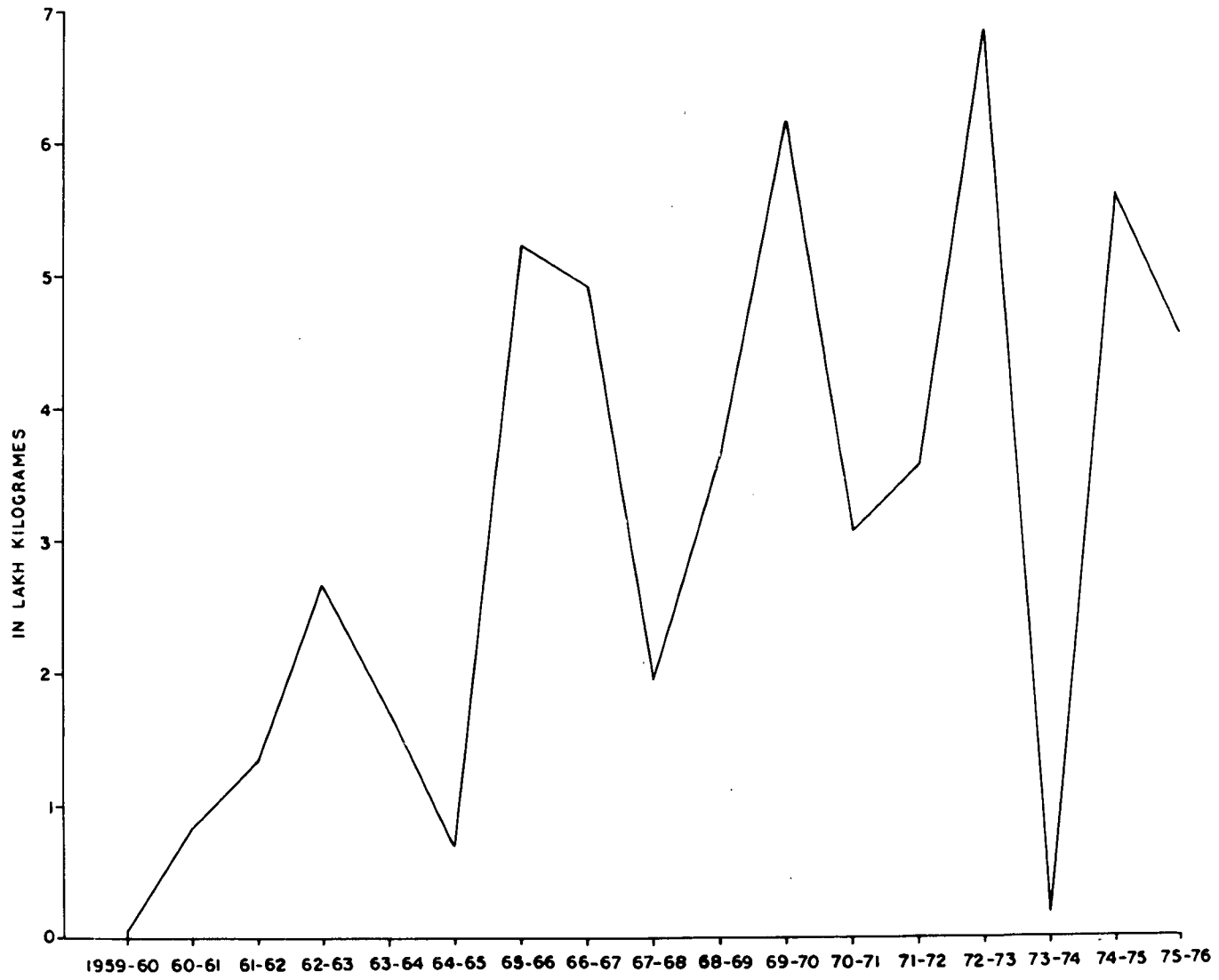
iv. Distribution of by-products: Delhi Milk Scheme manufactures, more or less, the entire range of milk products including ghee, butter, ice-cream, flavoured milk, curd, skimmed milk poser etc. For the sale of the milk products, Delhi Milk Scheme has set up 22 milk stalls in various govt. offices and other important places. A number of dealers have also been appointed throughout the capital city for the sale of

PRODUCTION OF TABLE BUTTER BY DMS



GRAPH NO. II.

PRODUCTION OF GHEE BY DMS



GRAPH NO. 12.

milk products particularly ghee and butter. Graph Nos.11 & 12 show the production of Butter & Ghee from 1959 to 1976.

The quantity of various milk products manufactured by Delhi Milk Scheme during the years 1975-76 and 1976-77 is given in Table No.8.

Table No.8

<u>Name of milk product</u>	<u>1975-76</u>	<u>1976-77</u>
1. Ghee	656633 kgs	458432 kgs.
2. Table butter	108147 kgs	49481 kgs.
3. Flavoured milk	495447 bottles	876633 bottles
4. Curd(plain)	83595 kullars.	84192 kullars
5. Curd(sweet)	532555 kullars	478986 kullars
6. Casein	19035 kgs	--
7. Roller Dried B.M.P.	35140 kgs	13750 kgs.
A Grade	3920 kgs	10340 kgs
B Grade	37860 kgs	31510 kgs
Trade Waste	?	?
8. Spray Dried B.M.P.		
A Grade	115050 kgs	28140 kgs
B Grade	330 kgs	2210 kgs
Trade Waste	650 kgs	5070 kgs

9. Ice-Cream

75 cc.	9148 cups	14392 cups
125 cc.	268823 cups	130168 cups
500 cc.	3037 bars	900 bars
1000 cc.	762 bars	786 bars

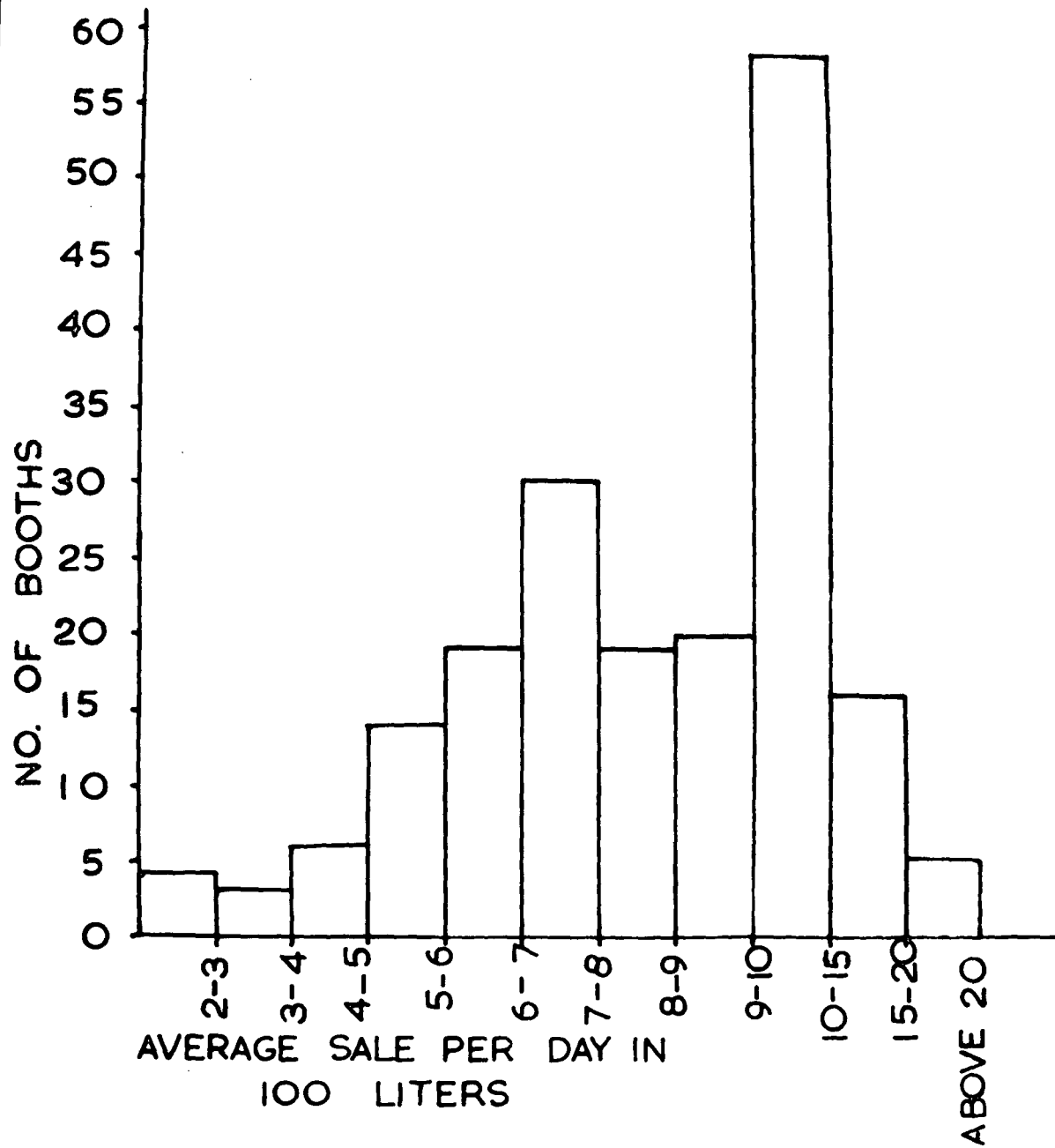
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B. MOTHER DAIRY

Mother Dairy, a subsidiary of Indian Dairy Development Corporation, distributes its milk through 200 milk booths, known to the professional dairy community as the "bulk milk vending units" and to the local citizens as "Push Button Dairies". These milk booths have large tank which refrigerates milk throughout the day but the booth opens only in the morning and in the evening for limited period of time. The Mother Dairy is providing to the citizens of Delhi 4,00,000 litres of fresh, pure and wholesome ^{quantity} ~~quality~~ of milk daily which is kept cold all the way in the system. Graph no 13 shows the no of booths with their average sale of milk and graph no 14 shows the monthly sale of milk.

The only comparable token operated milk vending system other than the Mother Dairy - Mini Dairy System in Delhi - is in Mexico City. Originally, it was thought that the Mexico System could be imported for use in Delhi. Ever since the installation of the first "Push Button Mini Milk Dairy" in Delhi, the consumers have signified their appreciation of the quality and value for their money which they get from the Mother Dairy's Milk. More than one-third of mini dairies (each of which can receive and store 1000 litres of milk) are

NO. OF MOTHER DAIRY MILK BOOTHS
WITH AVERAGE DAILY SALE OF MILK
IN 1976



GRAPH NO. 13.

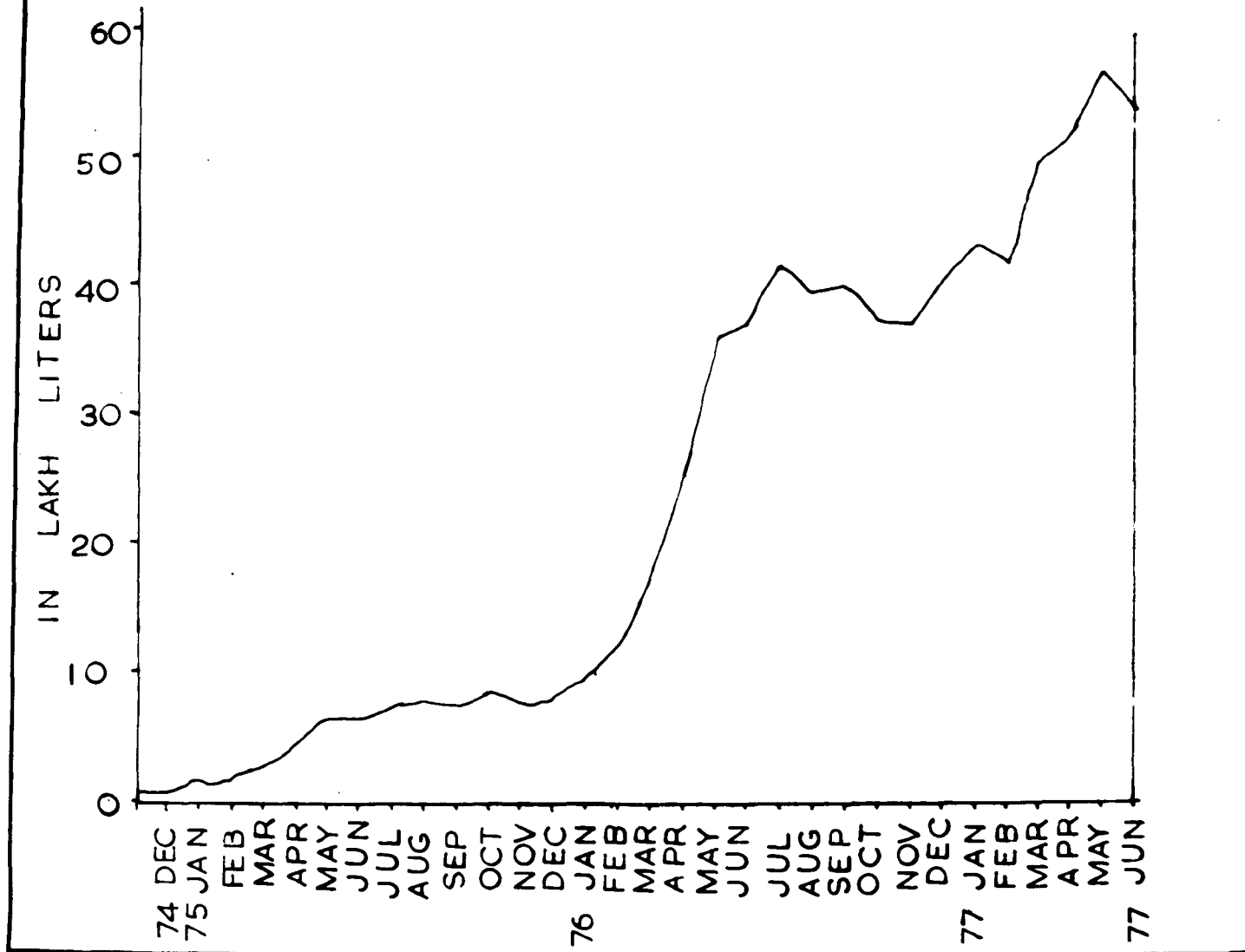
selling more than 1000 litres of milk daily. Altogether the total sales through mini dairies averaged over 183000 litres in June, 1977.

By March 1976, a total of only 87 Push Button Dairies had been commissioned in Delhi and the sales were for 57,000 litres of milk daily. Just one year later, the number of these mini-dairies had risen to 181 and the daily sales were 159000 litres. At present, there are about 200 mini dairies and the total daily sale is above 184000 litres. Map No.4 shows the location of milk distribution booths.

Table No.9 gives the total number of booths, total monthly sale, average daily sale and average sale of milk per day per booth from December 1974, to June 1977.

These mini dairies are run by ex-servicemen, who have been allotted these dairies. They work on commission basis subject to a minimum guaranteed profit of Rs.400/- per month, i.e. if the sale of milk is less than 1000 litres per day then he is guaranteed a minimum profit of Rs.400/- but if the sale of milk is more than 1000 litres per day then

MONTHLY SALE OF MILK BY MOTHER DAIRY



GRAPH NO.14

day, then he gets his commission ^{also} only. Here also to see that the distribution of milk is proper in respect of quality and quantity, surprise che^cks are made by the Officers concerned. These checks are made at mid night many a times. Some depot-incharges have tried to adulterate the milk but in that case they have been suspended on the spot.

For distribution of milk, there is no need for the tokens etc. as in the case of Delhi Milk Scheme. Any one can go and get the milk. The smallest quantity which one has to buy is half a litre, which was 1 litre earlier. D.M.S. bottle is of half a litre and many people can't afford to buy a litre of milk daily. Keeping all this in view, the quantity was reduced to half a litre immediately after six months of the functioning of this system. Now Mother Dairy is also selling milk in polythene bags which contains more fat than the milk which the Mother Dairy is selling normally and it is costlier also. These bags are of 500 gms. each.

The by-products which the Mother Dairy is selling at all its booths are ghee(butter oil) and cheese.

Table No.9

Statement showing number of booths, total monthly sale, average daily sale of milk and average daily sale of milk per booth.

Month/Year	No.of booths	Total sale of milk in litres	Average sale of milk per day in litres	Average sale of milk per day per booth in litres.
<u>1974</u>				
December	4	47311	1526	382
<u>1975</u>				
January	16	119746	3863	241
February	27	126350	5238	194
March	34	260626	8407	247
April	39	424171	14139	363
May	40	630610	20342	509
June	42	630727	21024	501
July	45	719059	23195	515
August	45	769704	24289	552
September	48	752111	25070	522
October	58	820976	26483	457
November	61	722877	24096	395
December	61	799022	25775	423
<u>1976</u>				
January	65	983856	31737	488
February	69	1164654	40160	582
March	87	1774122	57230	658

April	100	2578770	85959	860
May	105	3579483	115467	1100
June	112	3621351	120712	1078
July	114	4126039	133098	1168
August	115	3906208	126007	1096
September	117	3965279	132175	1130
October	120	3797351	122495	1021
November	137	3722136	124071	906
December	156	4013711	129475	880
<u>1977</u>				
January	169	4275735	137927	816
February	178	4139246	147830	831
March	181	4946675	159570	882
April	188	5150743	171691	913
May	188	5635893	181803	967
June	189	5499688	183323	975

C. COMPARISON BETWEEN MOTHER DAIRY AND DELHI MILK SCHEME:

Mother Dairy and Delhi Milk Scheme differ with each other in each and every respect except that they supply milk to the urban population of Delhi. The process of procurement, processing and distribution all differ

at every stage. Delhi Milk Scheme procures milk through a channel of milk chilling and procurement centres established by itself whereas Mother Dairy gets all its milk through milk cooperatives. After processing also Mother Dairy doesn't have to bottle its milk for distribution as is done by the D.M.S. Therefore, Mother Dairy's system is more economical. This reduces the losses because of breakage of bottles every day to a considerable extent. D.M.S. has employed over 4400 persons out of which 2100 are working as distribution agents and are students, whereas Mother Dairy has employed just 500 persons out of which 200 are working as Depot Managers. For processing of milk in D.M.S., the number of persons needed is much more than in Mother Dairy because in D.M.S, all the bottles are checked properly while washing, filling, sealing and transporting. So much of labour is needed to load and unload the milk in D.M.S. which is not so in Mother Dairy. Each depot of Mother Dairy is run by just one person who is wholly and solely incharge of the depot, which is not so in the case of D.M.S. depot. The other point which is different for both the distribution booths is the supply timings, which is more in the case of Mother Dairy depots than

the D.M.S. depots. The regularity of supply depends upon the arrival of vans carrying milk bottles from Central Dairy to the Depot for D.M.S. and milk tankers for Mother Dairy.

The location of Mother Dairy and D.M.S. booths both depends upon the demand for milk in the area. Mother Dairy sells its by products at these milk distribution booths only whereas it is not so in the case of D.M.S. which has separate by product distribution centres than milk distribution booths.

The by-products of both the dairies differ. D.M.S. is selling ghee, butter, ice-cream, curd, etc. whereas Mother Dairy is selling only butter oil imported from Canada and cheese which has now been stopped because of increase in the milk demand in the city.

CHAPTER - V

CASE STUDY

SOCIO-ECONOMIC STUDY OF TWO MILK CHILLING AND COLLECTING CENTRES OF DELHI MILK SCHEME.

To analyse the procurement pattern in space, a field survey was conducted of two Milk Chilling and collection Centres of Delhi Milk Scheme, outside Delhi. These two Centres were chosen at random, one of them is in Haryana i.e. Ballabgarh, and the other is Dankaur in Uttar Pradesh.

A questionnaire^{*} was first made out to make a format for asking questions from the milkmen who give milk at the Chilling Centres. The questions were mainly based on the socio-economic study of the milkmen who provide milk to the urban population of the capital city. The other purpose was to see that the procurement pattern, method and the process which is followed in transporting milk from a small village to the metropolitan city of Delhi. The economic pattern i.e. whether this relation between the rural village and urban metropolis is beneficial to the milkmen or not and what credit they get by selling their milk production at the chilling centre of Delhi Milk Scheme.

* Questionnaire is given in appendix No.8.

In the following paragraphs, the two Centres' study has been discussed in detail:-

INTRODUCTION

Ballabgarh: Ballabgarh is an industrial town situated in south of Delhi at a distance of 36 kilometres. It is one of the nearest milk chilling and collection centres of D.M.S. in Gurgaon District of Haryana State. It is just 4 kilometres from the famous industrial township of Faridabad. The Chilling and collection centre is located right on the highway connecting Delhi with Mathura and Agra. It is one of the important milk collection and chilling centres supplying about 15 lakh litres in a year. (Appendix No.9B gives the details of the survey).

Dankaur: Dankaur is situated 20 miles west of Bulandsheher town and 40 kilometres from Delhi Metropolitan city. It is a large village locally known as Dhudhias' village (or milkmen's village). The main occupation of people here is dairying. They supply milk to Delhi Metropolitan City through D.M.S. as well as privately. It is also one of the important milk collection and chilling

centres supplying about 24 lakh litres of milk yearly, which comes to about 2.1% of the total milk supplied to Delhi Metropolitan City by both D.M.S. and Mother Dairy (Appendix No.9A gives the details of the survey).

CONDITIONS OF MILK PROCUREMENT:

Milk is procured twice a day, once in the morning and once in the evening. About 20% of the milk is received between 9 A.M. and 9.30 A.M. The milk is accepted after checking its fat content by mechanical methods and then it is chilled there. For all these purposes, i.e. collecting milk, checking its quality, chilling the milk and paying money for the milk, etc., two persons are appointed at each centre. One is a Depot Manager and the other is an Assistant.

Depot Manager generally looks after the accounts and checking work. Other laborious works are done by the Assistant.

The milk at Ballabgarh Centre is procured from 7 milkmen regularly. Apart from these milkmen,

there are a few other milkmen and contractors, who, besides selling their supply locally or in Delhi, also supply their milk to D.M.S. occasionally, i.e. when they have surplus supply of milk which is not sold outside in the market, factory or shopkeepers. In ballabgarh, there are factories which buy milk from these milkmen but not regularly, and this being an industrial town, the local demand of milk is also quite high, which fluctuates with seasons and festivals etc. The local shopkeepers' demand is also quite high for making milk products like sweets, curd, tea etc. which have high demand in the ~~town~~^{town} markets.

Milkmen try to sell their milk to factories, shops and local people because these people pay high prices irrespective of the quality of milk. But the milkmen cannot do such adulteration if they give ~~thir~~ milk at D.M.S. centre because D.M.S. pays the price according to the fat content of the milk. In the long run, the milkmen don't get much benefit because the shopkeepers, contractors and factory people don't pay for their milk right at the time of buying. They pay in instalments or monthly which is subject to errors for the illiterate milkmen whereas the D.M.S. pays the

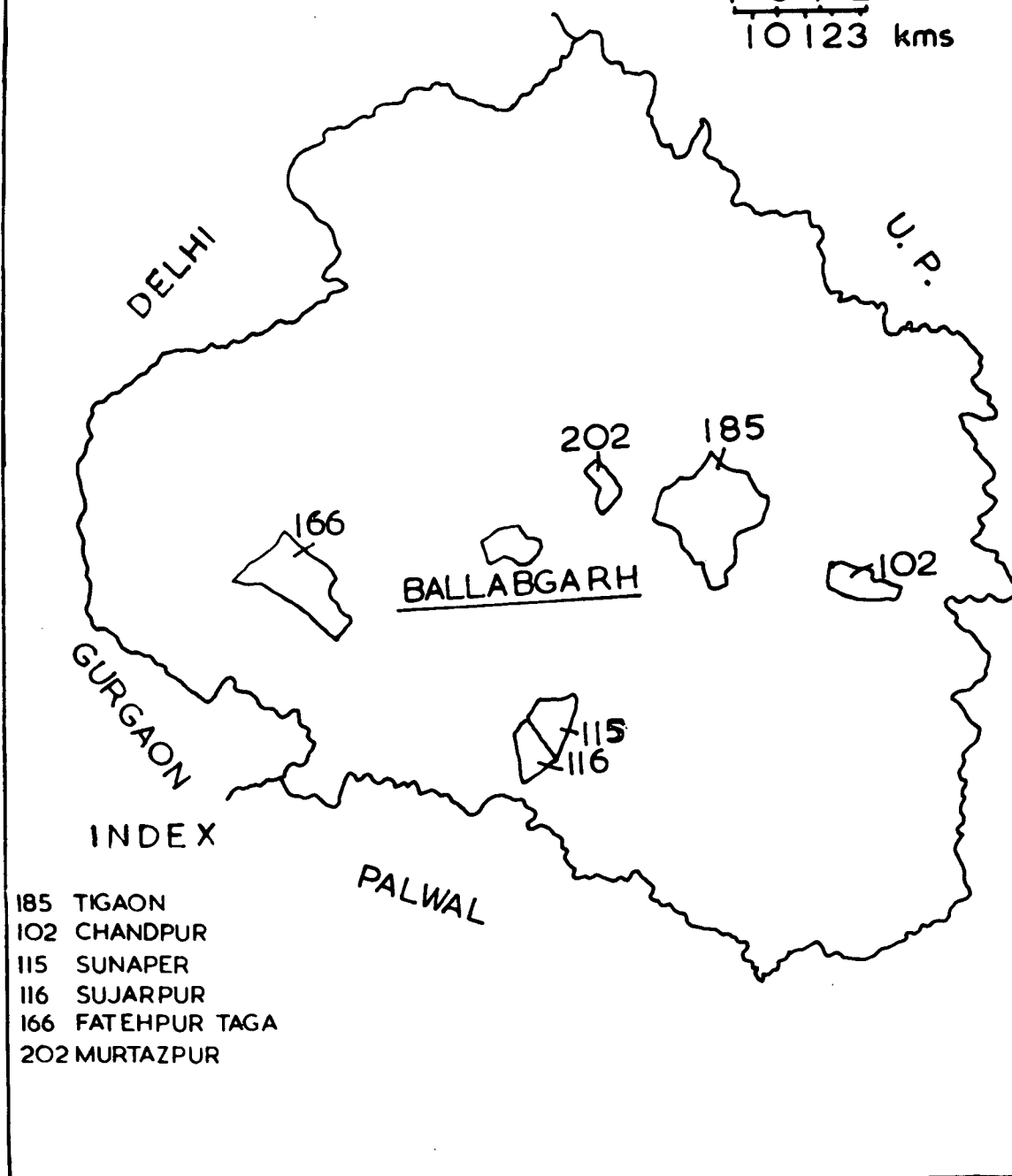
price of the milk right at the time of buying milk and the milkmen can use the money daily to feed their cattle properly and thus get more milk.

Dankaur Centre also has more or less the same situation. Here there used to be contractors who used to buy milk from the milkmen at lower price and sell the same to D.M.S. at higher price and thus used to exploit the primary producers and the middlemen. But now D.M.S. has abolished the contractors' system and is now accepting milk from the primary producers who bring their milk supply personally as well as the milk supply of other producers. Previously D.M.S. had fixed quota which the contractors used to supply but now there is no such quota fixed. Milkmen are free to give their supply of milk at the centre. At Dankaur Centre, there are about 13 milkmen and middlemen^{or} who supply milk at this centre. All these milkmen who give milk at Dankaur Centre are milk producers as well as middlemen except two, out of which one is milk producer only and sell his own supply and the other one is only a middleman who collects milk from other producers and supplies the same to this centre and does not sell his

BALLABGARH

MILK PROCUREMENT VILLAGES

1 0 1 2 miles
1 0 1 2 3 kms



own milk supply which is only for his family consumption.

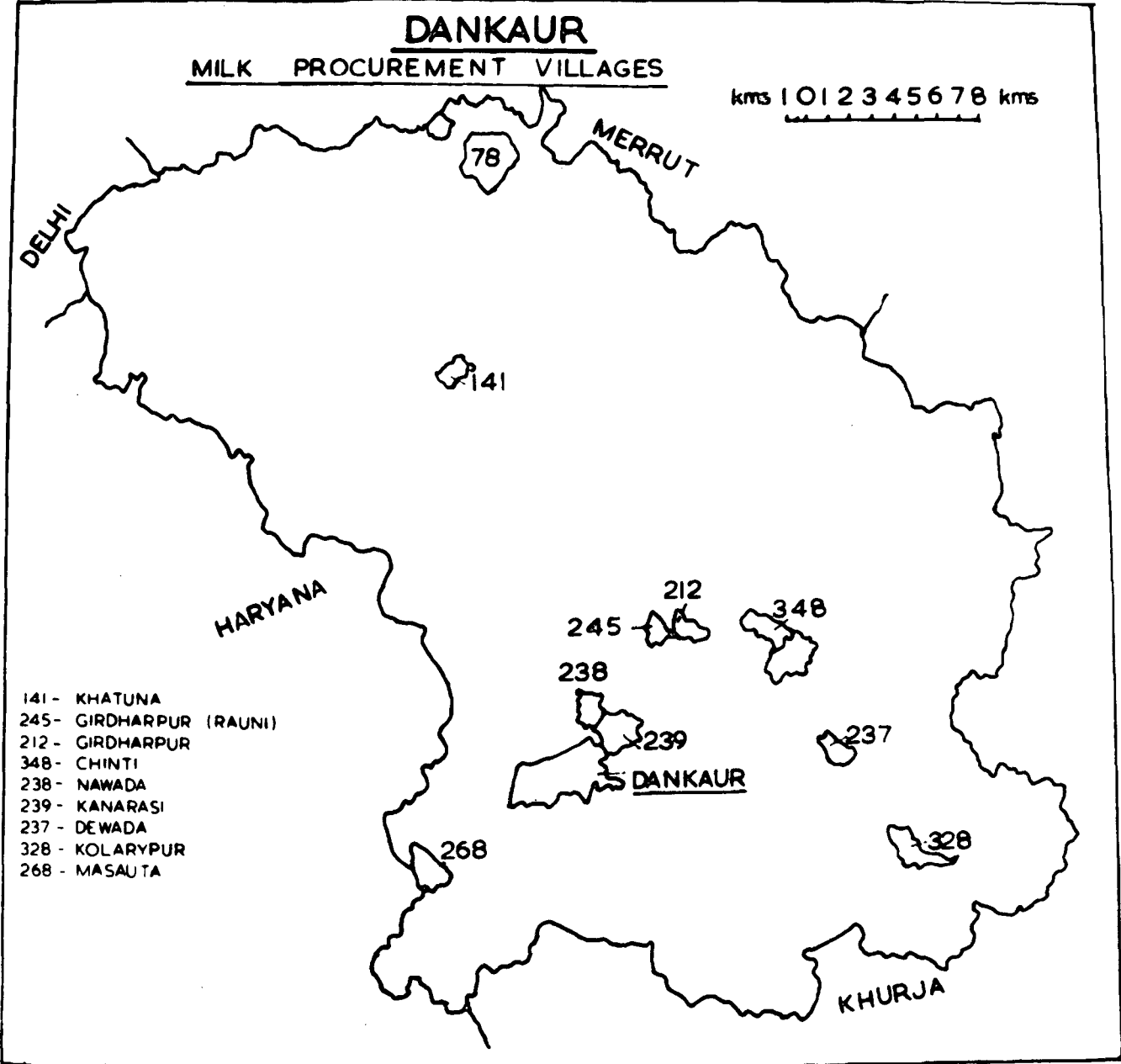
At Ballabgarh Central, out of 6 milkmen, three are middlemen as well as milk producers and the other three are only middlemen who supply milk of other producers.

NO. OF VILLAGES & DISTANCE FROM THE CENTRE:

At Ballabgarh, milkmen come from six different villages within a distance of 19 kilometres. These villages are Chandpur, Sujhapur, Sunaped, Murtazpur, Tigaon and Fatehpur. Map No. 4 shows the location of these villages.

At Dankaur, the milkmen bring milk from ten villages within a distance of 6 kilometres only. These villages are Chinti, Kilarjpur, Dewade (Mahipa), Girdhapur(Patale Kheda), Girdhapur(Roni), Mesute, Girdharpur, Dewade, Kanarasi, Naveda, Khetana, Map No. 5 shows the location of these villages.

The distance of villages in Dankaur Centre is smaller and the number of villages and the milkmen is more than those in Ballabgarh Centre. Therefore,



MAP No. 5

the collection of milk is more in Dankaur Centre, than in Ballabgarh Centre. This is mainly because Dankaur itself is a village and has many villages around it at nearby distance, whereas Ballabgarh town itself is very large and the villages also are at far off distance. Therefore, the number of milkmen is less but the quantity of milk which milkmen carries is more than that of Dankaur Centre, i.e. the milkmen supply milk in bulk.

OCCUPATION:

At Ballabgarh Centre, the main occupation of the milkmen is dairying except one who has agriculture as his main occupation. The others have dairying as their main occupation in the sense that they collect the milk from the farmers in their village and supply the same at the Centre. Therefore, they act as middlemen here. Two of the middlemen don't have any cattle of their own and are carrying on the collection and supply of milk as their main occupation which shows that they get enough profit in this activity alone.

In Dankaur Centre, out of 13 milkmen, only 8 have agriculture as their main occupation and supply

milk at the centre for extra income. These milkmen just collect the milk and supply the same at the centre. There are four milkmen who are carrying on agriculture and dairying simultaneously.

They have their own cattle and they sell their own milk production as well as the collection of other milk producers. Only dairying is practiced by one milkman.

NO. OF BHAINSIAS AND THE QUANTITY OF MILK SUPPLIED:

At Ballabgarh Centre, there is too much of variation. The number of bhainsias from whom the six milkmen collect milk for supply at the Centre vary from 4 to 56 and the number of their bhainsias is 172 and the total number of cattle is 278. The quantity of milk which these six milkmen supply at the centre varies from 52 kgs. to 350 kgs. daily. The maximum quantity of milk i.e. 350 kgs. is supplied by the milkman who has dairying as the main occupation and is collecting milk from 35 bhainsias. These Bhainsias' cattle number is 80 on the whole.

** The milk producers in the village from whom milkmen collect milk and supply at the centre. These producers are known as Bhainsias.

The next number comes of the milkman who is only a middleman and collects milk from 56 bhainsias who have 70 cattle. The total quantity supplied by this middleman is 300 kgs. daily.

The average yield of each cattle varies from 2.08 kgs to 4.28 kgs. in Ballbgarh Centre. The yield is the highest for the two milkmen who supply the largest quantities of milk i.e. 350 kgs. and 300 kgs. This shows that the big milk producers and milkmen have better knowledge and cattle of their own. They have developed dairying properly and have kept their cattle properly in order to get better and large quantity of milk.

In Dankaur Centre, the number of bhainsias vary from zero to 20 because one milkman is selling only his own supply i.e. 20 kgs. from 6 cattle and doesn't collect any milk from other milk producers. The number of their cattle varies from 11 to 45 among the 13 milkmen who give the milk supply at this centre. The quantity of milk which they supply varies from 20 kgs to 150 kgs. The maximum quantity of milk is supplied by the one who is carrying on agriculture and dairying

both simultaneously and collects milk from 20 Bhainsias whose cattle numbers 45. He supplies 150 kgs. daily. His Bhainsias have taken loan from the banks to develop their dairying activity. He has to bring milk only from a distance of 1 mile. The average yield of each cattle varies from 1.17 kgs to 3.33 kgs. which is very low than that of the Ballabgarh Centre. Here again the yield is high for the milkmen who supply large quantities of milk.

EMPLOYMENT & TRANSPORT:

At Ballabgarh Centre, out of 6 milkmen, 2 have employed 2 servants each to look after their dairying activity. One milkman who is supplying the largest quantity of milk i.e. 350 kgs. and brings his supply on a tonga to the Centre. The other one is supplying only 100 kgs.daily and bring his supply on a cycle. Other milkmen also bring their supply on cycles except one who bring it on a tonga again. So 2 milkmen are bringing their supplies on tonga and another one has got 2 cycles to bring his supply. Rest of the three have only one cycle to bring their supply.

At Dankaur Centre, out of 13 milkmen, 3 have employed 4, 2 and 2 servants for their dairying activity. One milkman who has 6 cattle of his own and supplies 20 kgs. daily at the Centre and doesn't collect milk from other producers, has employed 4 servants to look after his dairying activity because his main occupation is agriculture. The other is the one who supplies largest quantity i.e. 150 kgs. and brings his supply by tonga and carries agriculture and dairying simultaneously. The third one is also doing both agriculture and dairying and has employed 2 persons and brings his supply of milk on a cycle. All the milkmen bring their supply of milk on cycles except the one who brings it on a tonga.

CASTE STRUCTURE

The caste structure of the two Centres differs tremendously. Both have completely different caste structure of their milkmen supplying milk at the Centres.

At Ballabgarh Centre, the situation is very peculiar. There all all types of castes milkmen carrying on dairying. All six milkmen have different castes. Therefore, this activity is not bound up with any particular caste. These castes are Rajput(Muslim),

Rajput(Thakur), Pandit, Thakur, Jat(Muslim).

As the Centre is very near to Delhi and well connected too, the dairying is more profitable here. And people get more benefit in dairying because two of the milkmen here were employed in the local factories and they left their service and started practising dairying and supplying milk to local people and D.M.S. Centre. The other reason is that they have to work only in the morning and in the evening for this activity and the milkmen are free for the whole day.

In Dankaur Centre, dairying activity is done only by Gujars. No other caste is occupied in this activity. So the dairying occupation is bound only to one caste in this area. The other reason for this is that it being a village, people are afraid of social well-beings and don't practise any such occupation which is not fit for their caste. At Dankaur market, therefore, D.M.S. has to face competition and it can't afford to pay high price for their milk, because D.M.S. fix the price only after checking the fat contents in the milk.

The only benefit they get by supplying milk to D.M.S. is that they get the price of their milk right at the time of supplying whereas contractors don't do so. They pay for the milk in instalments, monthly or fortnightly, which is not beneficial to the milkmen,

Moreover the milkmen are cheated by the contractors.

COMPARATIVE ANALYSIS OF THE TWO CENTRES (BALLABGARH & DANKAUR)

The study of the these two Centres shows clearly that the distance from Delhi has affected the procurement pattern, i.e. the caste structure, the distance of villages, the occupational structure and the quantity of milk. In Ballabgarh Centre, most of the milkmen have dairying as the main occupation and all types of castes are employed in this occupation whereas this is not so in the case of Dankaur Centre. There only one caste i.e. Gujars are employed in the milk selling profession. Milkmen come from long distances to sell milk at Chilling Centre in Ballabgarh but in Dankaur milkmen only from nearby villages come and sell their milk production, just for extra income because dairying is their secondary occupation, whereas in Ballabgarh Centre all the milkmen who give milk are just doing dairying occupation only. They get enough profit from this activity and they are holding it as their main activity.

Taking the financial benefit too, the Ballabgarh milkmen were more satisfied with the scientific method of fixing prices of milk by D.M.S. than the

Dankaur milkmen. This is mainly because the Dankaur has many contractors who buy their milk at high prices and sell the same in the city after adulteration at higher prices and the city people have to buy the milk at any cost.

CHAPTER - VI

SUMMARY & CONCLUSION

One of the major characteristics of urbanisation in India, as in other developing countries, is lop-sided development of urban heirarchy. It is important to note that 19% of urban population of India is concentrated in cities having population of 1 million or more and 48.9% of the population in those cities having population of 1 lakh or more. And while planning a city is often treated as an entity in isolation, it is rarely considered as an element of human ecology of the country and its various regions. Each aspect of its development is looked into vertically and sectorally. The horizontal and spatial dimensions are lost sight of. It is only recently that the spatial integration of sectoral plans has been accepted as an important topic by planners.

Many large urban agglomerations continue to increase in size at a faster rate than the countries in which they are situated. During the next decades even more people will be withdrawn from primary occupations and

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transferred to urban occupations. While planners aim at decentralisation of its variants, these objectives have been of no avail in checking the more rapid growth of the big cities. As a result these big cities became developed islands in the underdeveloped countryside. But city can never be treated in isolation and no doubt that the problems of urbanisation in India can never be solved without deliberate and detailed planning to integrate rural & urban settlements and thus the two sectors of our economy into single.

The same problem has been dealt within this dissertation. The focus has been on the relationship of a metropolitan city with its rural surrounding, how the two are inter-dependent and integrated as a whole if we analyse the processes which take place daily in these two different wholes.

To study the relationship milk supply of Delhi city is taken as the indicator to see the interaction between these two wholes.

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Summarising the whole discussion we can say that the procurement of milk has been of the main interest to both the dairies in order to ^{over}come ~~over~~ the high demand of milk in the city. DMS has been procuring milk from its own established milk collection and chilling centres in the surrounding states of U.P., Rajasthan and Haryana. And Mother Dairy procures its milk from the cooperatives set-up in U.P., Gujrat & Rajasthan by Indian Dairy Corporation. The procurement of DMS is not adequate to meet the demand of the city. It fulfills around 50% need of the city's people and has a capacity to handle 3.5 lac litres daily. Both Dairies distribute milk through their respective milk distribution booths spread over in urban Delhi. The distribution by Mother Dairy is more mechanical & economical than Delhi Milk Scheme but employment opportunities are very less.

So the catchment area of milk supply is an important and convenient tool to determine the catchment or functional area of a city as it is perennial in nature and shows functional linkages of the city with its rural

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surroundings and its being a perishable commodity it shows the exact catchment area which is directly in touch with the city daily. But it could be quite misunderstanding in some cases, like Delhi's milk shed extends upto Anand in Gujrat, Jodhpur, Bikaner, Alwar & Ajmer in Rajasthan, which are very far off and supply fresh milk to Delhi city by insulated road & rail tankers. So there is a great gap in between. If we see the location of procurement centres in Map No.1, it shows dispersion of procurement centres. There is quite large gap which is unfilled between the city and the procurement centres. It may show that the technology has developed and has played a great role in showing such a picture which has emerged. But if we see it regarding the milk shed of Delhi city, it is not the real functional region or catchment area of Delhi city. Such a picture has emerged just to fulfill the milk demand of the city, and the direct linkage is great with the places far off than the places near to Delhi, which should have more functional relation with the city and get economical benefits from it.

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So Delhi Milk Scheme and Mother Dairy are playing the major role in fulfilling the milk demand of the city people, through time. Though they differ from each other in every respect regarding their working except that they have established a link between rural areas and Delhi metropolitan city, and they supply milk to the people of Delhi city. And the two have solved the problem of milk supply of Delhi city to a great extent and the two are working quite satisfactorily.

The main points which one notes is the imbalance of mechanisation and employment in two dairies. Delhi Milk Scheme has employed about 4400 persons out of which 2200 are engaged on booths for distribution and the system is not very well mechanised especially in distribution sector and has not improved much through time. Whereas Mother Dairy has employed only 500 persons out of which 200 are employed for distribution and the system is very well mechanised in all procurement, processing and distribution. The average milk distributed per person of Delhi Milk Scheme is only 145 litres whereas it is 915 litres per person by Mother Dairy.

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But the employment opportunities are high in Delhi Milk Scheme which is ideal for Indian situation. With every additional booth, 4 persons are needed for distributing milk and atleast four for bring^{ing} the milk at the booth and the loading and unloading^g milk bottles. Whereas it is not so in Mother Dairy. There just one person is employed for distribution of milk and one driver for bringing the milk at the booth.

The other drawback for the dairies is the irregularity in production of by-products because of lack of adequate procurement of milk. The case studies of two centres have shown that the catchment area of milk is a limited and is not very vast and doesn't include a large no. of villages in the milk shed area. This is because procurement centres are located at a few places and producers have to come there and sell their milk production. So the middleman are playing a major role in bringing their milk production at the centre and the actual producers profit is shared by the middlemen too. This system of procurement if possible can be modified and the procurement centres can be opened

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at village level if possible or DMS vans can go and buy the milk from the villages itself. That way the procurement would also increase and the actual milk producers would get the whole profit. The cooperatives would also help in same way to increase the milk procurement and give full profits to the milk producers. Further incentives could be given to the milk producers like giving loans and medical facilities and proper guidelines for developing their dairying activity rather than just carrying it as a side profession to increase their income.

After making all this possible the milk supply would act as an important functional linkage between the metropolis and the village. And it would show the actual catchment or functional area of the city. As a result, the metropolis and its regions would form a unified field of the social and economic relationship which has to be interpreted in terms of services, production consumption relationship, in order to make the metropolitan studies most meaningful, dynamic and action oriented.

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APPENDIX NO. 1

PROCUREMENT OF MILK.

(figures in litres)

Year	Buffalo		Cow		Total	
	Total	Daily Average	Total	Daily average	Total	Daily average
1959-60	36,76,863	24,350	44,835	760	37,21,698	24,484
1960-61	1,95,32,671	53,368	3,53,051	965	198,85,722	54,481
1961-62	3,11,90,728	85,454	4,90,386	1,344	316,81,114	86,797
1962-63	4,29,94,229	1,17,792	18,96,140	5,625	448,90,369	1,22,987
1963-64	4,62,71,446	1,26,771	20,59,945	5,725	483,31,391	1,32,052
1964-65	3,79,54,018	1,03,700	10,58,131	2,899	390,12,149	1,06,882
1965-66	5,66,09,689	1,37,013	16,31,130	4,469	516,40,819	1,41,481
1966-67	6,14,10,900	1,68,249	14,21,814	3,895	628,32,714	1,72,144
1967-68	5,45,20,183	1,48,962	33,03,889	9,027	578,24,067	1,57,989
1968-69	5,80,41,220	1,59,017	29,65,619	8,125	610,06,839	1,67,142
1969-70	7,13,96,335	1,95,606	6,21,434	1,703	720,17,769	1,97,310
1970-71	6,11,30,349	1,67,480	16,98,148	4,652	628,28,497	1,72,133
1971-72	5,88,48,885	1,60,789	43,70,094	11,940	632,18,979	1,72,729
1972-73	5,48,44,692	1,50,259	31,72,153	8,691	580,16,845	1,58,950
1973-74	2,76,06,953	75,636	8,70,103	2,384	284,77,056	78,019
1974-75	5,30,13,386	1,45,242	42,54,053	44,691	572,67,439	1,56,897
1975-76	5,80,29,193	1,58,550	1,61,37,211	44,091	741,66,404	2,02,640

Source - Office Records, D.M. ^b. New Delhi.

APPENDIX NO. 2

STATEMENT OF PROCUREMENT OF BUFFALO & COW MILK MONTHLY, DAILY
AVERAGE - LITRES.

	January	February	March	April	May	June	July	August	September	October	November	December
<u>Daily Average - 1971</u>												
Buffalo Milk	2,26,179	2,25,452	2,10,895	1,41,157	1,45,455	1,20,271	1,12,208	1,15,254	1,45,041	1,59,772	1,82,908	2,15,902
Cow Milk	3,478	6,268	10,366	12,853	14,318	13,186	13,816	12,525	13,769	11,431	9,778	6,928
<u>Total:</u>	2,29,657	2,31,720	2,21,211	1,54,010	1,59,773	1,33,457	1,26,024	1,27,779	1,58,810	1,71,203	1,92,686	2,22,830
<u>Daily Average - 1972</u>												
Buffalo Milk	2,20,436	1,95,194	1,76,389	1,21,068	90,276	85,121	92,667	1,08,972	1,68,669	1,68,009	1,99,636	2,22,932
Cow Milk	10,198	12,572	12,463	14,263	13,788	13,653	12,039	9,334	11,421	6,490	3,880	3,933
<u>Total:</u>	2,30,634	2,07,766	1,90,652	1,35,331	1,04,064	98,834	1,04,706	1,18,306	1,20,150	74,499	2,03,576	1,25,862
<u>Daily Average - 1973</u>												
Buffalo Milk	2,13,318	1,79,978	1,54,418	66,665	43,884	36,789	45,182	52,053	80,375	72,337	96,786	1,20,167
Cow Milk	3,727	5,962	5,851	6,478	5,027	5,175	4,551	4,391	2,986	1,364	1,689	1,982
<u>Total:</u>	2,17,055	1,85,440	1,60,269	73,143	48,911	41,964	49,182	56,444	83,361	73,701	98,475	1,22,149
<u>Daily Average - 1974</u>												
Buffalo Milk	1,17,022	97,258	65,064	84,462	42,002	26,105	40,903	65,168	89,838	1,40,055	2,04,368	2,60,140
Cow Milk	2,039	1,928	2,697	4,025	3,523	4,809	8,563	8,000	5,306	4,477	6,394	14,945
<u>Total:</u>	1,19,061	99,126	67,761	88,487	45,525	30,914	49,466	73,168	95,144	1,44,532	2,10,762	2,75,585
<u>Daily Average - 1975.</u>												
Buffalo Milk	2,83,225	2,81,815	2,10,936	1,34,002	74,326	47,955	82,747	1,31,696	1,93,942	1,55,752	1,72,842	1,63,751
Cow Milk	24,955	34,918	38,363	34,184	37,154	39,591	40,452	42,916	26,919	19,554	23,153	40,227
<u>Total:</u>	3,08,180	1,16,538	2,49,299	1,68,186	1,11,480	87,546	1,23,199	1,74,502	2,20,851	1,75,306	1,95,995	2,03,978
<u>Daily Average - 1976</u>												
Buffalo Milk	2,49,696	2,53,322	2,12,354	1,71,207	1,29,988	1,33,387	1,32,868	1,35,690	1,31,019	1,27,835	2,01,103	2,25,441
Cow Milk	55,223	67,175	73,032	75,167	49,183	58,775	54,158	41,545	45,031	53,780	68,449	69,449
<u>Total:</u>	3,04,919	3,20,497	2,85,386	2,46,374	1,79,171	1,92,162	1,87,026	1,77,235	1,76,050	1,81,615	2,69,552	3,15,632*

* Proc. suspended on 29/12, 30/12, 31/12 & Restricted for Coop.agencies. New contracts not taken.

Source - DMS Office Records

APPENDIX NO.3

MONTHLY PROCUREMENT OF MILK BY MOTHER DAIRY IN 1976 FROM DIFFERENT CENTRES

(Figures in litres)

	PDDC	Meerut	Moradabad	Alwar	Jaipur	Ajmer	Jodhpur	DMS	Amul Anand	Total
January		6,34,203.90	-	1,21,796.10	-	66,349.50	93,029.12	56,398.06	-	9,71,776.69
February	3,19,436.89	5,26,912.62	-	-	-	53,330.09	4,76,737.86	1,01,796.11	40,679.61	15,18,893.20
March	26,708.74	4,76,883.50	1,71,087.37	-	-	-	4,77,631.06	1,72,539.80	2,81,854.36	16,00,873.70
April	-	4,49,626.21	1,46,873.80	-	-	66,708.74	4,25,203.88	2,62,757.28	4,07,796.11	17,58,966.00
May	-	5,75,844.66	13,145.63	-	-	2,53,407.76	3,17,766.99	6,47,543.68	3,26,553.39	21,34,262.10
June	13,388.35	6,85,000.00	-	-	-	1,59,912.62	3,57,970.87	5,56,932.03	3,66,854.36	21,40,038.80
July	-	8,69,281.55	-	-	-	1,59,980.58	7,82,660.19	99,669.90	4,48,970.87	23,60,563.10
August	-	12,24,563.10	-	-	-	1,99,708.73	9,28,514.56	13,271.84	3,67,242.71	27,33,308.70
September	-	12,42,621.30	-	-	40,009.71	3,46,737.86	9,98,980.58	-	4,48,854.36	30,37,194.10
October	-	12,90,485.40	-	-	-	4,26,970.87	10,49,097.00	-	5,69,475.72	35,03,902.90
November	-	11,83,106.70	-	-	-	3,47,067.96	10,44,339.80	-	4,89,349.51	30,68,621.80
December	-	11,83,233.00	-	-	-	3,73,582.52	-	-	5,71,242.71	31,72,398.00
Total for the year 1976	3,59,533.91	103,41,762.00	3,25,281.55	1,21,796.11	40,009.71	12,45,375.72	81,28,893.20	19,10,883.40	43,18,873.70	290,00,791.00

Source - Mother Dairy Office Records

APPENDIX NO. 4

MONTHLY PROCUREMENT OF MILK FROM DIFFERENT CENTRES IN 1976

(Figures in litres)

MONTH	Meerut	Jodhpur	Bikaner	Sohna	Mathura	Ajmer	Dadri	Anand	Bhilwara	Madanpur	Gulaothi
January	12,58,980.50	3,70,572.80	4,55,438.83	14,83,842.43	12,88,911.65	10,19,461.16	4,12,382.52	5,69,475.72	3,70,946.60	2,32,095.15	4,90,078.64
February	9,17,473.26	9,12,213.08	5,47,815.53	11,72,239.81	11,28,684.48	6,42,824.71	1,18,756.30	4,89,349.51	2,97,373.78	2,77,659.22	5,15,050.57
March	9,36,424.42	9,73,587.37	6,87,219.41	11,05,939.81	9,56,568.92	9,81,757.17	4,83,376.39	5,71,242.75	2,71,077.66	3,70,577.67	3,74,068.84
April	15,19,860.20	9,27,470.87	7,87,921.35	8,04,781.59	7,63,977.72	6,05,033.96	2,67,269.89	-	3,03,776.69	3,42,074.76	2,65,722.02
May	22,47,253.50	3,70,407.76	8,19,190.28	3,07,134.95	4,54,962.13	4,17,516.49	2,88,307.76	4,40,679.61	1,88,262.13	3,19,783.50	2,36,471.83
June	40,02,053.80	5,27,617.47	10,73,965.04	2,80,044.66	4,88,435.62	3,44,959.22	2,78,783.49	2,81,854.36	96,752.43	3,22,236.89	1,42,897.08
July	78,88,362.40	9,54,800.96	13,71,905.82	2,74,731.04	4,56,297.08	1,63,956.31	2,77,647.56	4,077,96.11	52,417.47	3,40,388.35	1,20,288.33
August	42,07,989.05	9,94,597.08	9,54,532.03	2,48,800.00	5,75,972.81	4,25,784.45	2,44,528.15	3,26,553.89	1,19,582.52	3,29,887.38	99,674.75
September	15,42,164.70	10,21,145.60	9,86,099.03	1,14,744.66	6,57,899.02	3,05,994.87	1,82,046.51	3,66,854.35	1,19,213.59	-	94,591.22
October	12,94,523.87	10,84,669.80	9,04,040.78	1,09,758.25	6,32,086.40	3,83,048.54	1,93,989.37	4,48,970.87	3,97,083.50	3,26,129.13	1,45,899.02
November	14,76,441.60	11,46,718.40	8,52,383.50	1,32,337.86	8,34,100.00	5,94,669.80	3,64,265.04	3,67,242.71	2,91,527.18	3,73,567.96	3,22,901.94
December	40,13,610.30	4,42,363.11	11,07,759.22	1,96,997.08	7,68,212.62	8,11,562.04	2,49,343.69	4,48,854.36	3,69,844.66	3,83,000.97	4,35,023.27
Total for the year	360,92,315.20	139,93,714.10	105,18,445.10	98,59,152.40	89,80,117.70	67,62,605.90	44,34,994.70	43,18,873.70	44,16,033.70	36,17,403.60	31,99,915.70
Mean for the month	30,07,692.10	11,66,142.84	8,76,537.09	8,21,596.03	7,48,343.14	5,63,550.49	3,69,582.89	3,59,906.14	3,43,002.80	3,01,450.30	2,66,659.64

Source - DMS Office Records

	Goala	Dankaur	Palwal	DMS	Baghpat	Kithore	Agra	Alwar	Pilana	Masudpur	Chhattarpur
January	83,361.17	49,268.93	4,10,565.05	56,398.06	1,43,647.57	1,79,934.95	2,96,611.65	3,31,170.87	1,09,368.93	3,57,733.01	5,58,649.51
February	6,40,371.84	1,51,146.60	3,61,991.26	1,01,796.11	38,093.20	2,98,728.15	1,70,990.29	1,35,614.56	85,691.26	-	4,26,145.63
March	95,019.42	3,40,748.53	2,83,432.04	1,72,539.80	1,16,699.03	3,52,538.84	1,45,436.89	1,07,310.67	91,979.61	1,35,803.88	57,990.29
April	1,62,164.08	2,32,391.26	1,69,114.56	2,62,757.28	68,966.99	2,05,531.07	29,563.10	2,22,534.93	36,853.11	1,63,569.91	-
May	1,70,991.26	1,40,038.83	53,766.99	6,47,543.68	1,29,944.66	1,36,917.48	79,740.77	71,370.87	91,654.37	1,07,916.50	-
June	2,47,019.42	1,62,396.11	55,392.23	5,56,932.03	1,30,756.31	83,398.06	92,395.14	84,655.33	1,17,278.04	1,08,978.64	-
July	3,11,755.34	1,87,031.06	93,568.93	99,669.90	1,62,382.52	-	-	19,145.63	1,60,199.03	1,09,940.78	-
August	3,77,123.30	2,51,600.97	1,66,330.10	13,271.84	91,266.13	67,848.54	-	60,203.88	1,56,310.68	1,40,270.87	-
September	-	2,57,485.72	88,186.41	-	2,07,671.65	61,103.88	-	59,165.04	1,43,552.43	-	-
October	4,76,105.83	2,07,943.68	1,24,488.35	-	1,15,847.59	68,031.84	29,685.36	1,17,131.06	69,809.71	1,25,008.74	-
November	-	3,37,542.71	1,76,683.20	-	2,91,445.63	2,41,380.57	23,106.79	2,62,359.22	1,86,576.70	1,72,783.01	-
December	-	2,23,227.18	1,31,448.54	-	3,12,453.40	2,79,342.72	-	4,28,505.82	2,22,856.31	1,99,203.88	-
Total for the year 1976.	25,63,911.50	23,72,483.00	20,99,490.60	19,10,883.40	18,09,171.10	17,87,625.40	17,11,955.70	18,99,167.61	16,67,700.90	16,21,092.00	15,59,207.70
Mean for the month	2,13,659.29	1,97,706.91	1,74,957.55	1,59,240.28	1,50,764.25	1,48,968.78	1,42,662.97	1,58,203.96	1,38,975.07	1,35,091.00	1,29,933.97.

Source DMS Office Records

	Muradnagar	Sardana	Punahana	Jaipur	Gurgaon	Massouri	Nangli	Najafgarh	Punj
January	73,519.42	1,81,828.16	2,03,670.87	35,077.67	-	46,750.48	-	-	-
February	70,587.38	1,33,392.23	1,27,184.46	1,21,805.82	-	88,579.60	-	-	-
March	67,948.55	1,44,216.50	1,57,727.18	1,65,000.00	-	63,907.77	-	-	-
April	32,309.71	95,614.56	1,33,733.000	93,310.68	79,427.18	5,834.95	-	-	-
May	1,79,183.49	87,964.08	80,590.29	7,165.05	79,339.81	46,151.45	4,032.04	-	3,19,436.89
June	1,28,112.63	74,263.11	1,25,550.48	-	89,495.15	1,01,805.81	65,862.14	-	26,708.74
July	1,01,790.87	84,745.63	1,64,557.28	-	63,524.27	1,32,288.34	1,11,178.04	-	-
August	74,702.99	73,859.22	1,44,194.17	-	8,11,656.00	53,971.84	1,48,258.25	-	-
September	89,366.02	85,833.01	85,340.77	40,009.71	-	84,486.46	-	-	13,388.35
October	1,66,392.23	70,050.49	33,253.39	55,830.16	-	47,890.29	2,04,960.19	-	-
November	2,80,101.94	1,46,631.07	38,490.28	1,95,757.28	-	1,77,997.08	1,27,606.80	5,58,225.24	-
December	1,57,096.12	1,90,947.57	1,16,008.74	3,65,899.03	-	-	-	6,12,056.31	-
Total for the year 1976.	14,21,461.10	13,69,343.30	13,16,300.04	12,61,039.01	11,23,436.04	8,49,664.00	5,28,465.06	11,70,281.55	3,59,533.91
Mean for the month	1,18,455.09	1,14,111.94	1,09,691.70	1,05,086.58	92,619.70	70,805.33	44,038.75	97,523.46	29,961.16

	Moradabad	Gazipur	Sonepat	Ghuroli	Kota	Kakrola	Niwari.
January	-	95,543.69	63,606.79	-	-	-	31,184.46
February	-	2,90,699.03	54,930.09	-	-	-	45,849.51
March	1,71,087.37	3,41,875.73	51,121.35	-	-	-	44,331.06
April	1,46,873.80	2,90,773.79	17,241.74	-	-	-	-
May	13,145.63	1,80,271.84	3,498.05	-	-	-	-
June	-	1,92,026.21	-	-	-	17,581.55	-
July	-	2,32,233.01	-	-	-	48,682.52	-
August	-	3,00,665.05	-	-	-	73,574.76	-
September	-	-	-	-	61,194.00	-	-
October	-	2,74,212.62	24,293.20	-	43,340.78	12,159.22	-
November	-	3,33,951.46	29,081.55	42,746.60	82,709.71	-	-
December	-	3,49,684.47	12,600.97	1,89,873.78	97,086.41	-	-
Total for the year 1976	3,25,281.55	26,11,337.70	2,56,373.74	2,32,620.38	1,97,030.90	1,51,999.05	1,21,385.05
Mean for the Month	27,106.79	2,17,611.47	21,365.00	19,385.03	16,419.24	12,666.58	10,115.42

APPENDIX NO. 5

DISTRIBUTION OF MILK

Source of Data - Office Records DMS.

(Figures in litres)

Years	Buffalow 6½ to 6.5% fat 9% SNF	Index of progress	Standard 5% 4.5%	Index of progress	Cow 3.5% 8.5%	Index of Progress	Toned 3% 8.5%	Index of progress	Special toned 3.5% 8.5%	Index of pro - gress	Double toned 1.5% 9%	Index of pro - gress	Total	Index of progress
1959-60	32,02,358.	-	41,955	-	41,955	-	4,41,448.	-	-	-	-	-	36,85,761	-
1960-61	156,97,191	100	-	-	3,38,666	100	35,63,436	-	-	-	-	-	195,99,292	-
1961-62	262,07,783	167	4,42,	-	4,42,082	133	57,67,328	100	-	-	-	-	324,17,688	100
1962-63	331,51,704	211	-	-	22,40,110	678	73,90,186	128	-	-	-	-	427,82,000	133
1963-64	411,46,706	262	-	-	19,43,681	587	87,55,143	152	-	-	-	-	518,45,530	160
1964-65	254,67,645	162	-	-	8,69,139	263	235,85,407	408	-	-	-	-	499,22,791	154
1965-66	30,50,012	19	324,05,152	100	8,57,638	257	183,68,073	318	-	-	43,71,061	100	590,51,936	182
1966-67	-	-	477,95,815	147	6,87,395	206	166,85,906	289	-	-	75,17,147	172	726,86,263	224
1967-68	-	-	478,26,782	148	12,77,348	349	226,73,339	392	-	-	84,67,310	193	802,44,779	248
1968-69	-	-	497,64,342	153	12,52,478	379	250,97,537	434	-	-	69,72,827	159	830,87,184	256
1969-70	-	-	699,20,759	215	13,50,625	409	186,28,940	323	-	-	51,63,059	118	938,47,432	289
1970-71	-	-	609,62,605	188	5,10,905	154	308,15,183	534	-	-	42,30,901	97	965,19,594	297
1971-72	-	-	678,81,558	209	21,66,284	654	261,00,528	452	-	-	49,61,193	114	1010,99,563	311
1972-73	-	-	708,25,936	218	18,81,968	569	280,11,615	485	-	-	49,39,917	113	1055,59,436	325
1973-74	-	-	258,50,593	80	63,441.	19	335,15,451	580	418,57,044	100	40,27,055	92	1053,13,584	324
1974-75	-	-	-	-	-	-	-	-	1041,50,184	249	27,40,685	63	1068,91,469	329
1975-76	-	-	-	-	-	-	-	-	1101,10,524	263	26,52,617	60	1127,63,141	348

APPENDIX, NO. 6

PRODUCTION OF BY-PRODUCTS

Year	Ghee in Kgs.	Index of progress	Table Butter in kgs.	Index of progress	Sterilised Milk Bottles in bottles of 220 ml.	Index of progress	White Butter in kgs.	Index of progress	Ice-Cream 75 cc	Index of progress	Ice-cream 125 cc	Index of progress	Ice-cream bars,	Index of progress	Ice-cream bars, in 500 cc	Index of progress	Ice-cream bars in 1000 cc	Index of progress
1959-60	3,622	-	1,433	-														
1960-61	84,223	-	66,949	-														
1961-62	1,44,538	100	71,382	100														
1962-63	2,66,921	185	1,38,238	183														
1963-64	1,76,076	125	76,361	107														
1964-65	72,550	50	91,772	129														
1965-66	5,20,096	371	3,98,715	549														
1966-67	4,99,810	350	5,41,392	760														
1967-68	1,93,019	135	1,88,715	253	5,63,924	100	4,13,123	100	28,872	100	10,891	100	1,90,747	100	2,962	100	663	100
1968-69	3,67,248	257	1,37,967	183	9,14,152	162	6,09,208	148	67,930	242	67,327	609	1,57,109	79	1,762	61	1166	175
1969-70	6,15,901	439	1,62,994	228	3,73,309	66	9,07,497	234	53,241	189	49,537	445	1,63,472	84	1,185	41	668	101
1970-71	3,06,697	218	1,16,182	154	82,069	14	6,44,389	156	36,513	128	32,772	290	nil	0	74	3	74	11
1971-72	3,58,834	250	84,974	118	85,982	15	8,91,038	217	30,276	117	42,405	390	-do-	-do-	189	6	368	55
1972-73	6,74,162	478	37,909	53	1,43,919	25	13,37,797	326	30,926	110	45,041	409	-do-	-do-	611	21	550	82
1973-74	18,406	12	7,034	9	2,08,488	37	3,50,318	87	51,994	182	54,023	490	-do-	-do-	400	14	405	61
1974-75	5,66,365	400	52,537	73	6,46,261	114	10,37,307	251	35,235	125	41,860	381	-do-	-do-	832	29	2,454	370
1975-76	4,58,432	327	38,079	53	8,76,683	155	10,58,224	258	14,392	51	1,30,168	118	-do-	-do-	950	33	789	119

Source - DMS Office Records

APPENDIX - 7

Sale of Milk per depot by Mother Dairy in 1975.

<u>No. of the Depot</u>	<u>Sale per depot in litres</u>
001	1363
002	795
003	1136
004	1615
005	806
006	632
007	1262
008	1004
009	1002
010	350
011	821
012	696
013	647
014	922
015	913
016	891
017	1136
018	901
019	1188
020	2798
021	1327

.....contd.

Appendix No. 7 Contd.

022	1106
023	1049
024	922
025	1620
026	786
027	727
028	998
029	1075
030	921
031	1216
032	1273
033	1659
034	1034
035	1029
036	1026
037	737
038	704
039	786
040	1077
041	694
101	1151
102	805
103	831
104	1043
105	1074

.....contd.

Appendix No. 7 Contd.

106	1076
107	881
108	317
109	775
110	700
111	280
112	559
113	849
1 14	668
115	937
116	564
117	958
118	531
119	1282
120	737
121	584
122	1376
201	910
202	1013
203	1153
204	1256
205	499
206	691
207	753
208	811
209	694

contd.....

◦
Appendix No. 7 Contd.

210	656
211	613
212	212
213	528
214	603
215	770
216	758
217	934
218	239
219	472
220	781
221	896
222	626
223	433
224	875
225	425
226	508
227	215
301	810
302	1238
303	942
304	873
305	1025
306	812
307	830
308	662

.....contd.

Appendix No. 7 Contd.

309	665
310	764
311	899
312	1340
313	1404
314	1364
315	2234
316	1471
317	800
318	801
401	1926
402	2503
403	879
404	874
405	1418
406	1495
407	1056
408	1132
409	1110
410	888
501	710
502	1081
503	1303
504	1201
505	1217
506	1941

.....contd.

Appendix No. 7 Contd.

507	1317
508	896
509	1362
510	763
511	1289
512	1766
513	1184
514	1465
515	812
516	1119
517	948
518	1173
519	683
520	843
521	891
522	1389
523	709
524	1269
525	1117
526	1723
601	771
602	735
603	547
604	451
605	568
606	1106

.....contd.

Appendix No. 7 Contd.

607	860
608	731
609	566
610	785
611	1115
612	1301
613	530
614	1535
615	1353
616	742
617	1000
618	561
619	845
620	1056
621	1151
622	1183
623	874
624	693
625	692
626	835
627	982
628	705
629	721
630	475
631	776
632	986
633	591

.....contd.

Appendix No 7 Contd.

634	587
635	1015
701	1265
702	1510
703	2223
704	1677
705	2566
706	969
707	924
708	1632
709	1203

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APPENDIX - 8

QUESTIONNAIRE FOR THE MILK PRODUCERS

1. Name of the producer:
2. Caste of the producer:
3. Name of the village he belongs to:
4. Name of the centre where he supplied his milk and since when:
5. Whether he is a milk producer or a middleman:
6. What is his main occupation:
(agriculture, dairying or any other).
7. How many milch cattle he has:
8. What is his total average daily production of milk:
9. How much milk does he sell to D.M.S. daily on an average:
10. At what price:
11. Whether there has been any change in the price of milk from time to time:
12. How many people has he employed for dairying purposes or is he only getting the help of his family members:

.....contd.

13. Has he any means to store the milk:
14. What was he doing with the milk before selling to D.M.S.:
15. Is he getting any benefit by this or not:
16. Has he got any benefit by abolition of contractor or middleman:
17. Has there been any economic or other benefit by selling his milk at the centre. If so, how much:
18. Has he developed his dairying in order to sell more milk to DMS:
19. Has he taken any loan to develop his dairying:
20. Has it helped in improving the standard of living of the farmer:
21. How far is the chilling/collection centre from his village:
22. How does he bring his milk to the centre:
23. Whether he would like to continue selling his milk to DMS or not:

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A P P E N D I X - 9(A)

Details of the Survey done at Dankaur Milk Chilling & Collection
Centre in Uttar Pradesh

S. No.	Name of the Milkman	Caste	Name of the village from where milk is procured with distance in kms	Milkman is a producer or	Middle-man.	Main Occupation	No. of personal milch cattle	Personal milk production in kgs.	No. of Bhain-sias from whom he collect milk.	No. of Bhain-sias's milch cattle	Average quantity of milk he sells daily at the centre in Kgs	No. of people employed.	Means to bring the milk at the Centre	Remarks
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	Balbir	Gujar	Chinti(1)	yes	Yes	Agril.	3	6	10	11	35	nil	Cycle	-
2.	Bule Singh	-do-	-do-	yes	yes	Dairying	3	8 $\frac{1}{2}$	20	45	150	2	Tonga	-
3.	Godhu Ram	-do-	Kolarajpur (2)	yes	yes	Agril & dairying	4	8	15	15	44	1	Cycle	-
4.	Bijender Singh	-do-	Dewada(1) (Mahipa)	no	yes	Agril	2	5	20	40	80	nil	-do-	-
5.	Khem Chand	-do-	Girdharjpur (Patalakheda) (2)	yes	yes	Agril & dairying	2	4	12	12	50	nil	-do-	-
6.	Mahipal	-do-	Girdharpur(2) (Roni)	yes	yes	dairying	2	5	6	15	22	nil	-do-	-
7.	Soraj Singh	-do-	Masauta(2 $\frac{1}{2}$)	yes	no	Agril	3	15	18	18	25	nil	-do-	-
8.	Des Raj	-do-	Girdharpur(2)	yes	no	Agril	6	20	nil	nil	20	4	-do-	-
9.	Fateh Singh	-do-	Devada(1)	yes	yes	-do-	1	8	5	11	30	nil	-do-	-
10.	Jit Ram	-do-	Kananasi(4)	yes	yes	-do-	3	12 $\frac{1}{2}$	20	20	50	nil	-do-	-

.....contd.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.1	15.
11.	Mahipal	-do-	Masaute(2 $\frac{1}{2}$)	yes	yes	Agril	3	12 $\frac{1}{2}$	15	45	100	nil	cycle	-
12.	Tag Ram	-do-	Girdharpur(2)	yes	yes	-do-	4	20	14	16	80	nil	cycle & tonga	-
13.	Charan Singh	-do-	Naveda(4)	yes	yes	-do-	3	8	12	14	48	2	cycle	-
14.	Dhanpal (contractor)	-do-	Girdharpur(2)	contractor		-do-	5	Not for sale	20	100	150	4	Cycle & tonga	-

A P P E N D I X - 9(B)

Details of the Survey done at Ballabgarh Milk Chilling & Collection
Centre in Haryana.

S. No.	Name of the Milkman	Caste	Name of the village from where milk is produced with distance in kms.	Milkman is a producer of	Middle- Main man. Occu- pation	No. of perso- nal milch cattle	No. of perso- nal milk pro- duction in kgs	No. of Bhain- sias from whom he collects milk,	No. of Bhain- sias's milch cattle.	Average quan- tity of milk he sells daily at the centre in kgs	No. of people employed.	Means to bring the milk at the centre	R e m a r k s
1.	Sher Mohammed	Rajput (Muslim)	Chandpur 17	Yes	Yes Dairying	8	15	20	40	100	2	Cycle	-
2.	Lakhi Ram	Rajput (Thakur)	Sujhapur 19	Yes	Yes -do-	2	10	4	18	52	Nil	-do-	-
3.	Sukhbir	-do-	Sunnaper 6	No	Yes Agril & dairying	1	Not for sale.	20	25	60	-do-	-do-	-
4.	Anil Kumar	Pandit (Brahmin)	Mirtazpur 3.5	Yes	Yes Dairying	4	16	35	80	350	2	2 cycles	-
5.	Seodan	Thakur	Tigaon 11	No	Yes -do-	nil	nil	37	45	150	nil	cycle	-
6.	Abdullah Bukhari	Jat(Muslim)	Taga 9.5	No	Yes -do-	nil	nil	56	70	350	nil	Tonga.	-