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CUSTOMER RELATIONSHIP MANAGEMENT (CRM)



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PROJECT REPORT

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TITLE OF THE PROJECT

**CUSTOMER RELATIONSHIP
MANAGEMENT
WITH SPECIAL REFERENCE
TO SPENCER**

SUBMITTED BY

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Date:

(Signature of the Student)



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CHAPTER : 1

INTRODUCTION



1.1 BACKGROUND OF THE STUDY

Spencer Retail (India) Limited is India's leading retailer that operates multiple retail formats in both the value and lifestyle segment of the Indian consumer market. Spencer's headquarter is in Kolkata. As of November 2013, there are 120 Spencer stores in 35 cities.

The company's leading formats include a chain of fashion outlets, Food Bazaar, the hyper-market chain, blend the look, touch and feel of Indian bazaar with aspects of modern retail like choice, convenience and quality and central, a chain of seamless destination malls. The company also operates an online portal, Spencer retailers.com. As customers' tastes and preferences are changing, the market scenario is also changing from time to time.



It is the changing taste and preferences of customers which has brought in a change in the market. Income level of the people has changed. New generation people are no more dependent on 'haat' market and far off department's stores.

Today we can see a new era in market with the opening up of many departments 'stores. My study is based on a survey done on customers of a hypermarket named Spencer. Spencer is a new type of market which came into existence in India since 1863. It is owned by RP-Sanjeev Goenka Group.

It is a type of market where various kinds of products are available under one roof. My study is on determining the customers buying behavior in Spencer and also the satisfaction level of customers in Spencer.

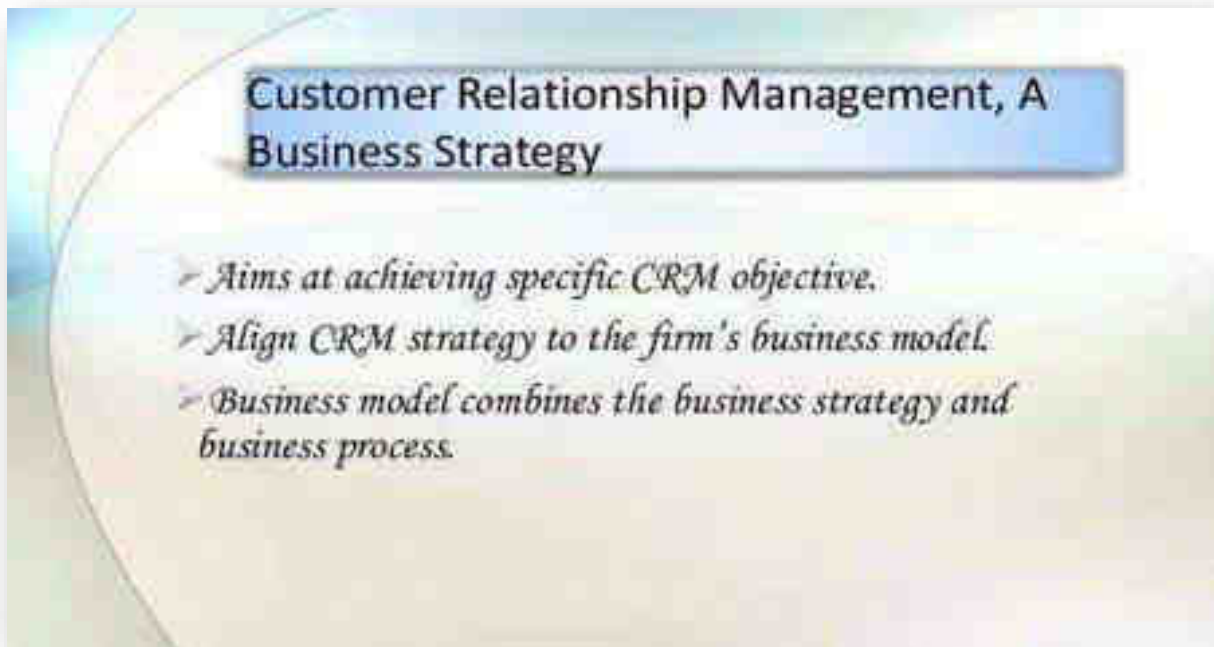
My study will be to find out the current status of Spencer and determine where it stands in the current market. The market field survey will help in knowing the present customers taste and preferences. It will help me in estimating the customer's future needs, wants and demand.



1.2 NEED OF THE STUDY

The Need of this study are as follows:

- The Major Objective of this study is to present the (CRM) Customer Relationship Management position prevailing in Spencer.
- This study is to present and to bring insight and deeper understanding into the objectives, strategies and the expected benefits of CRM initiatives by organizations, with reference to Spencer.
- Another basic objective of this study is to present the international as well as national scenario of (CRM) Customer Relationship Management.
- This study is also objected with the purpose of throwing light in relation to the major benefits and drawbacks of CRM in connection with that of Spencer.



1.3 LITERATURE REVIEW

Many researchers have conducted studies in measuring service quality in the past twenty years. In 1982, **McCleary and Weaver** indicated that good service is defined on the basis of identification of measurement behaviors that are important to customers.

Zemke and Albrecht (1985) suggested that service plays an important role in defining a restaurant's competitive strategies and identified systems and strategies for managing service.

Consumer relationship management is recognized to be relatively new approach in managing sales and marketing activities of an organization. One of the reasons of its emergencies is business understanding of benefits of building effective relationship with customers to increase profitability and stability.

Although the subject CRM implementation may seem quite specific and narrow the approaches various authors followed are quite different and diverse. However, most of the discussions reveal commonalities such as discussion of certain theory based on empirical study and on one of the aspects of system implementation while appreciating equal importance of other perspective as well.

Every business is a marketing business, as **John Jantsch**, author of "Duct Tape Marketing" says in his book. This is especially true for retail business. In a competitive business environment, starting a retail business is only half the job done.

Retailers must constantly work towards getting customers to buy their products and convert potential customers into sales. Knowing and applying basic marketing techniques can boost the retail business and give it an edge over competitor.

In 1988, **Parasuraman, Zeithaml and Berry** developed a multiple-item scale for measuring service quality called SERVQUAL. SERVQUAL is a generic instrument for measuring perceived service quality that is viewed as the degree and direction of discrepancy between consumers' perceptions and expectations. Thus, service quality, as perceived by consumers,



stems from a comparison of what they feel service providers should offer with their perceptions of the performance of service provided by service providers (Parasuraman, Zeithaml and Berry, 1988)

A border question of how these articles address practical needs and answer commonly raised questions of CRM implementers in field was also discussed but still leaves place for the broader and more in depth research.

Further research might also be directed at finding out which perspective of CRM implementation is of greater concern to a certain party involved in implementation ,be it software company, front line users, strategic management or project manager.

As managers, whether brand-new to their positions or well established in the corporate hierarchy, can use a little brushing-up now and then. As customer loyalty is increasingly becomes a thing of the past, customer relationship management (CRM) has become one today's hottest topics, cited by Lakshman Jha, author of 'Customer relationships management: A strategic approach.'

CRM principles supplies easy-to-apply solutions to common CRM problems, including how to maximize impact from CRM technology, which data warehousing techniques are most effective and how to create and manage both short-and long -term relationships.



1.4 OBJECTIVES OF THE STUDY

CRM, the technology, along with human resources of the company, enables the company to analyze the behavior of customers and their value. The objective of doing this project is to see:

- Whether Spencer is providing better customer service.
- How Spencer is discovering new customers.
- Steps taken by Spencer to increase revenue.
- Whether Spencer is selling products effectively or not.



1.5 RESEARCH METHODOLOGY

Methodology adopted for study

- Using presentation through bar charts and pie charts.
- Discussion with the executives, managers, employees.
- Visiting & surfing different websites of company.

Area of study

The study is exclusively done based on the Spencer outlet at 375 Prince Anwar Shah Rd, South City Complex, Jadavpur, Kolkata, West Bengal 700068. It is a process requiring care, sophistication, experience, business judgment, and imagination for which there can be no mechanical substitutes.

Sources of Data

- Primary Source
- Secondary Source

Primary Source- The primary data was collected by means of a survey. Questionnaires were prepared and customers of the Spencer were approached to fill up the questionnaires. The questionnaire contains **15 questions** which reflect on the type and quality of services provided by the Spencer to the customers there were **50 respondents**. The survey was taken in Howrah district from **3 Pm to 5 Pm** the response of the customer is recorded on a grade scale of outstanding, excellent, good, average, and bad for each question.

Secondary Source- In order to have a proper understanding of the customer service of Spencer a depth study was done from the various sources such as books; a lot of data is also collected from the official websites of the Spencer and the articles from various search engines like Google, yahoo search and answers.com.



1.6 LIMITATION OF STUDY

The study is only for the Spencer confined to a particular location and a very small sample of respondents. Hence the findings cannot be treated as representative of the entire retail industry. Data's are secondary in nature and therefore collection and extraction are difficult. Processing the data takes time, unnecessary time consumed which makes it cumbersome and lengthy.

Respondents may give biased answers for the required data. Some of the respondents did not like to respond. Respondents tried to escape some statements by simply answering "average" to most of the statements. This was one of the most important limitations faced, as it was difficult to analyze and come at a right conclusion. A lot of money is spent in printing and visiting internet cafes.

In our study we have included 50 customers because of time limit. Time constraint and limitation was a big hurdle in completion of the project.



1.7 CHAPTER PLANNING

My project has been divided into 4 Chapters.

- **Chapter 1: Introduction.**
- **Chapter 2 : Conceptual Framework / National / International Scenario**
- **Chapter 3 : Presentation of Data, Analysis and Findings**
- **Chapter 4 : Conclusion & Recommendations**



CHAPTER : 2

CONCEPTUAL FRAMEWORK / NATIONAL / INTERNATIONAL SCENARIO



2.1 NATIONAL SCENARIO

After 1960, with the advent of motivational research for understanding consumers, organizations were compelled to shift their focus from the products to the costumers. Earlier marketers could sell any product produced without considering the needs, demands and preferences of customers. In present times, with new products flooding the market place, multiple players craving for market share and customers having highly unpredictable and constantly changing expectations, it is a war like situation to win a customer. The Indian markets is now seeing better accessibility and more variety of products, a change in demographic and psychographic profile of the consumer, and an increasing disposable of the consumers. India is have to set the maximum percentage of the world's youngest population. This change will be a big opportunity and at the same time a challenge for the marketers. They will be juggling in understanding and knowing their customers on the one hand and creating customer satisfaction to generate loyalties on the other. The youngergeneration tends to experiment more in product usage patterns, as they appreciate novelty, however loyalty among young customers is a tough challenge for the marketers, a trend that is being already witnessed in the current era and will only get tougher in times to come.

Today, the Indian customers, in most product categories, are brand swingers instead of brand loyalists. They have no inhibitions in experimenting with new products in the current post liberalized age.



2.2 COMPANY PROFILE



Spencer is a chain of hypermarkets in India, with more than 100 stores in operation. It is a subsidiary of RP-Sanjeev Goenka Group. Facilities offered by Spencer Online shopping: Spencer has an official website, Spencer retail.com, which is one of the most favorite sites among people of India for online shopping. Spencer retail is an online business venture of RP-Sanjeev Goenka Group, which sells an assortment of products such as fashion, which includes merchandise for men and women, mobile accessories, mobile handsets and electronics like home theatres, video cameras, digital camera, LCD TVs, kitchen appliances and many more. Discounts: '*Hafta ka sabse saste din*' was introduced by the Spencer, wherein extra and special discounts were offered on Wednesday every week, to attract the potential buyers into their store. Security check: At each exit of Spencer, they use alarm systems or Electronic Article Surveillance system, which detects the products that has attached tags or not.



1. Spencer is a chain of hypermarket in India, which caters to every family's needs and requirements.
2. Spencer has released the doors for the fashion world, general merchandise like sports goods, cutlery, crockery, utensils, and home furnishings etc. at best economical prices.
3. Spencer group offers more than 100 stores all over the country with an amalgamation of Indian bazaars' feel and touch with a convenience and choice of the modern retail facilities
4. The worldwide country chain, Spencer, is formed by Charles Durrant & John William Spencer. Their basic attraction associated with reasonable prices is their Unique Selling Price.
5. Spencer has become a massive hit with lower middle-class and middle class people as a major client base.
6. Reflect the look and feel of Indian bazaars at their modern outlets

GROUP VISION

“To deliver Everything, Everywhere, Every time to Every Indian Consumer in the most profitable manner.”

GROUP MISSION

1. We share the vision and belief that our customers and stakeholders shall be served only by creating and executing future scenarios in the consumption space leading to economic development.
2. We will be the trendsetters in evolving delivery formats, creating retail realty, making consumption affordable for all customer segments – for classes and for masses.
3. We shall infuse Indian brands with confused and renewed ambition
4. We shall be efficient and cost-conscious and committed to quality in whatever we do.

CORE VALUES

1. Leadership: To be leader both in thoughts and business.
2. Respect and Humanity: To respect every individual and be humble in our conduct.



3. We will be the trendsetters in evolving delivery formats, creating retail reality, making consumption affordable for all customer segments – for classes and for masses.
4. Openness: to be open and receptive to new ideas, knowledge and information.
5. Valuing and Nurturing Relationships: to build long term relationships.
6. Adaptability: to be flexible and adaptable, to meet challenges.
7. Flow: to respect and understand the universal laws of nature.



EXECUTIVE BOARD

1. Managing director

- Mr. Mohit Kampani
- Mr. Shaswant Goenka

2. Deputy CEO

- Vipin Bhandari

3. Executive Director

- Sandip Gautam

SPENCER SUPER CENTER

Spencer	Hyper mart chain in India
Outlet	120 Outlets
Parent Group	RP-Sanjiv Goenka Group
Owner	Sanjiv Goenka
Founded	1990
Head Quarter	Kolkata, West Bengal
Industry	Retail
Slogan	Smart way to shop



OBJECTIVES OF SUPER CENTRE

1. To analyze how the mix influence the customer satisfaction level.
2. To determine the current status of Spencer.
3. To study the satisfaction level of customers with regard of Spencer.
4. To find out the buying behavior of the customers coming in to Spencer.

IMPORTANCE OF STUDY

Its provide guideline for further research in area for organized retail. Research says about customer buying behavior towards Spencer. The research is also important to identify Market size, growth and Market Potential of Spencer. The research shows future Scenario of Spencer- in current perspective. The study shows Opportunities and challenges for Spencer respect of internal & external environment. Research says about main competitors in the field of organized retail sectors. The study provides guideline to further extension of Spencer. The study provides help to know the customers satisfaction with Spencer stores.

SCOPE OF STUDY

The scope of this research is to identify the buying behavior of customers of Spencer. This research is based on primary data and secondary data. This study only focuses on urban buying behavior of customers. The study does not say anything about rural buying behavior of customer because rural norms/status/attitude & acceptance of the rural customers differs with urban customers. It provides help to further the research for organized retail sector. It aims to understand the skill of the company in the area like technological advancement, competition in management.





MARKETING MIX

4P's of Spencer

1. PRODUCT MIX

<i>APPARELS</i>	<i>FOOD</i>	<i>FARM PRO- DUCE</i>	<i>CHILL STA- TION</i>	<i>HOME AND PERSONAL CARE</i>
Denims & tea shirts	Staples	Fruits	Soft drinks	Shampoo
Fabric and cut pieces	Ready to eat	Vegetables	Packaged juices	Detergents
Formal wear	Exported fruits	Imported fruits	Milk items	Soaps
Casual wear	Spices	Dairy products	Frozen foods	Liquid wash
Party wear	Imported bazaar		Ice creams	Creams
Ethnic wear	Tea & coffee			Deodorants
Accessories				Home cleaners
Under garments				Utensils



Night wear				Plastics
Dress materials				Crockery
Sarees				Sundries



2. PRICING

The pricing objective at Spencer is to get —Maximum Market Share. Pricing at Spencer is based on the following techniques:

- Value Pricing (EDLP – Every Day Low pricing): Spencer promises consumers the lowest available price without coupon clipping, waiting for discount promotions, or comparison shopping.
- Promotional Pricing: Spencer offers financing at low interest rate. The concept of psychological discounting (Rs. 99, Rs. 49, etc.) is also used to attract customers. Spencer also caters on Special Event Pricing (Close to Diwali, GudiPadva, and Durga Puja).
- Differentiated Pricing: Differentiated pricing i.e. difference in rate based on peak and non-peak hours or days of shopping is also a pricing technique used in Indian retail, which is aggressively used by Spencer. e.g. Wednesday Bazaar
- Bundling: It refers to selling combo-packs and offering discount to customers. The combo-packs add value to customer and lead to increased sales. Spencer lays a lot of importance on bundling. e.g. 3 Good Day family packs at Rs 60(Price of 1 pack = Rs 22)5kg oil + 5kg rice + 5kg sugar for Rs 599



3. PLACE MIX

- Initially Identifies Future/Potential development areas.
- Acquire such areas at an early phase before the real estate value booms.
- Located at high traffic areas.
- Design to look crowded.

4. PROMOTION MIX

Types of promotion	Tools
Below the line	Coupons, Discount, more of the product at same price, gift with purchase, competition and prizes, money back offer, exchange offer, special occasion.
Above the line	Advertisements in news papers, TV, Internet (Own Website which gives on line shopping service). Spencer sponsors various events and festivals, which Provides them valuable promotion directed at strategic markets.

The various promotion schemes used at Spencer include:

- *Saal ke sabse saste 3 din.*
- *Hafta ka sabse sasta din —Wednesday bazaar.*
- Exchange Offers —Junk swap offer.
- Future card(3% discount)
- Shakti card.
- Advertisement (print ad, TV ad, radio)
- Brand endorsement by M.S Dhoni.





CUSTOMER SERVICES WITH REFERENCE TO SPENCER

Customer service is the provision of services to customers before, during and after a purchase. According to Turban "Customer service is a series of activities designed to enhance the level of customer satisfaction – that is, the feeling that a product or service has met the customer expectation." Its importance varies by product, industry and customer; defective or broken merchandise can be exchanged, often only with a receipt and within a specified time frame.

Spencer will often have a desk or counter devoted to dealing with returns, exchanges and complaints, or will perform related functions at the point of sale; the perceived success of such interactions being dependent on employees "who can adjust themselves to the personality of the guest,"

Customer service plays an important role in an organization's ability to generate income and revenue. From that perspective, customer service should be included as part of an overall approach to systematic improvement. A customer service experience can change the entire perception a customer has of the organization.



Customer support is a range of customer services to assist customers in making cost effective and correct use of a product. It includes assistance in planning, installation, training, trouble shooting, maintenance, upgrading, and disposal of a product.

A multi-task position drawing on extensive CUSTOMER SERVICE experience to advance a proven track record for developing and maintaining key accounts and improving departmental efficiencies.

Objectives of Customer Services

- Provide customers and staff with clear standards and expectations.
- Ensure all customer contact reaches an appropriate conclusion.
- Minimize incidences of repeat contact.
- Seek to provide a seamless service for customers.
- Provide equal and easy access to our services at a time, place and channel that meet the needs of residents, businesses and other stakeholders.
- Cater for customers' needs irrespective of age, gender, physical or financial ability, ethnic origin, race, religion or geographical location.
- Provide a prompt, courteous and knowledgeable response to all customer enquiries.
- Equip our staff to provide customers with an excellent standard of service.
- Enable our customers to provide feedback easily, through complaints, customer surveys, etc.
- Use customer compliments, comments and complaints to drive improvements to service.
- Improve the speed, quality and consistency of response to enquiries by having our information in a format that can be easily accessed.



Spencer uses 7 golden rules to deal with Customer Services.

- Answer the phone.
- Don't make promise unless you will keep them.
- Listen to your customer.
- Deal with complaints.
- Be helpful.
- Train your staff to be always helpful, courteous and knowledgeable. Take the extra step.
- Throw in something extra.

Customer satisfaction in Spencer

- The degree of customer satisfaction you deliver determines the level of long- term success you will achieve in business.”

Customer satisfaction their top priority

Don't just make sales. Create customers - satisfied customers. In addition to the

Immediate profit they provide on the first sale, satisfied customers help you build

Your business in 2 other important ways:

1. They become a reservoir of repeat buyers. For some businesses that means repeat buyers for more of the same product or service. For every business, it means buyers for additional products and services.
2. They automatically refer more business to you from their friends and business contacts. This is highly profitable business for you because it doesn't cost you any time or money to get it.

Customer services offered by Spencer

Online shopping: Spencer has an official website, Spencer retail.com, which is one of the most favorite sites among people of India for online shopping. Spencer retail.com is an online business venture of RP-Sanjiv Goenka Group, which sells an assortment of products such as fashion, which includes merchandise for men and women, mobile accessories, mobile hand-



sets and electronics like home theatres, video cameras, digital camera, LCD TVs, kitchen appliances and many more.

Discounts: “Hafte ke sabse saste din was introduced by the Spencer, wherein extra and special discounts were offered on Wednesday every week, to attract the potential buyers into their store.

Security check: At each exit of Spencer, they use alarm systems or Electronic Article Surveillance system, which detects the products that has attached tags or not.

Customer oriented Strategy

- Attracting & retaining customers.
- Uses Non- Traditional Strategy.
- Moving demo-trolley.
- Used young population as strategic blessing.
- Attractive Design, interior & good atmosphere.



CHAPTER : 3

PRESENTATION OF DATA, ANALYSIS & FINDINGS



3.1 DATA ANALYSIS

Question 1. How frequently do you visit Spencer?

SCALE	FREQUENCY
Twice in a week	10
Once in a week	17
During Special offers	15
Whenever the need arises	8



ANALYSIS:

This is aimed at understanding how frequently customer visit shops & buy their product or avail their services. The highest responses have been attributed to once a week shopping.

FINDINGS:

It is found that customer can be presumed to have high disposal income & may buy more daily & fashion products. Whereas 15 of them visit during special offers, 8 when need arises, 10 twice in a week.



Question. 2 How do you find the shopper assistant behavior?

Helping	27	54%
Not Helping	15	30%
Rude	8	16%



ANALYSIS:

It is analyzed that 54% of the customers finding the shopper assistant behavior helping. 30% of the customer are finding the shopper assistant behavior helping and 16% of the customer are finding it rude.

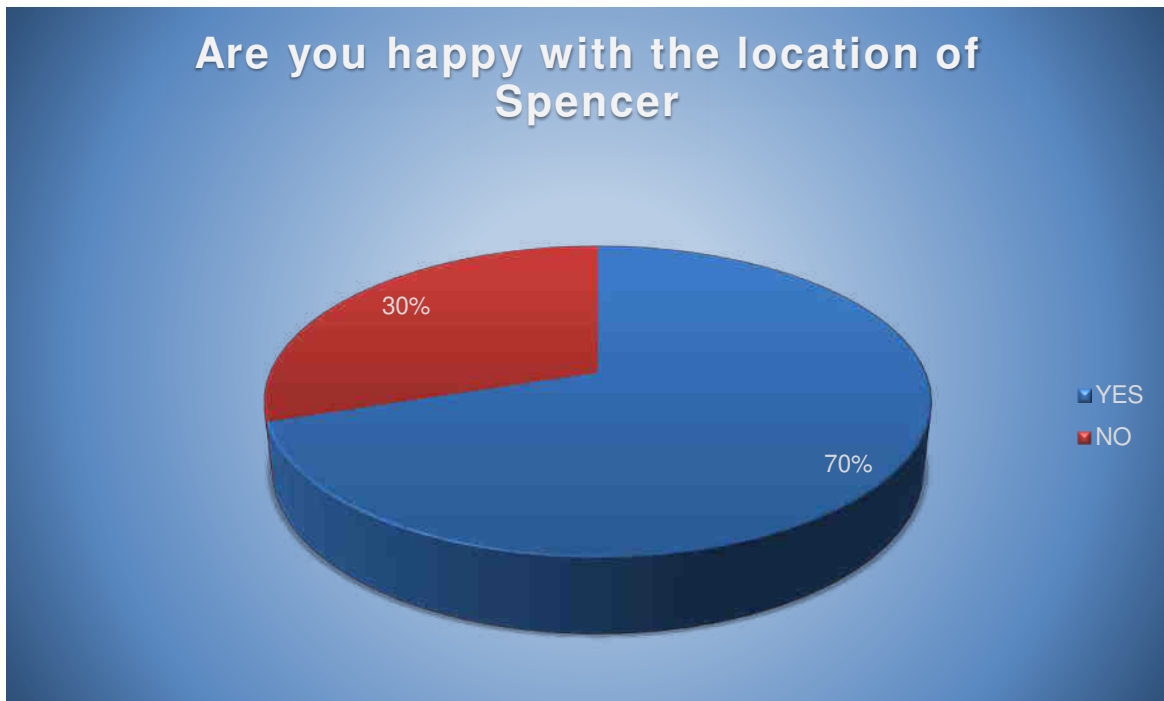
FINDINGS:

From the above table it is clear that most of the customers are satisfied with the service of Spencer because out of 50 customers 27 has given positive answer in favors of Spencer.



Question.3 Are you happy with the location of Spencer?

SCALE	FREQUENCY	PERCENTAGE
Yes	35	70%
No	15	30%



ANALYSIS:

It is analyzed that Spencer physical facilities are visually appealing.

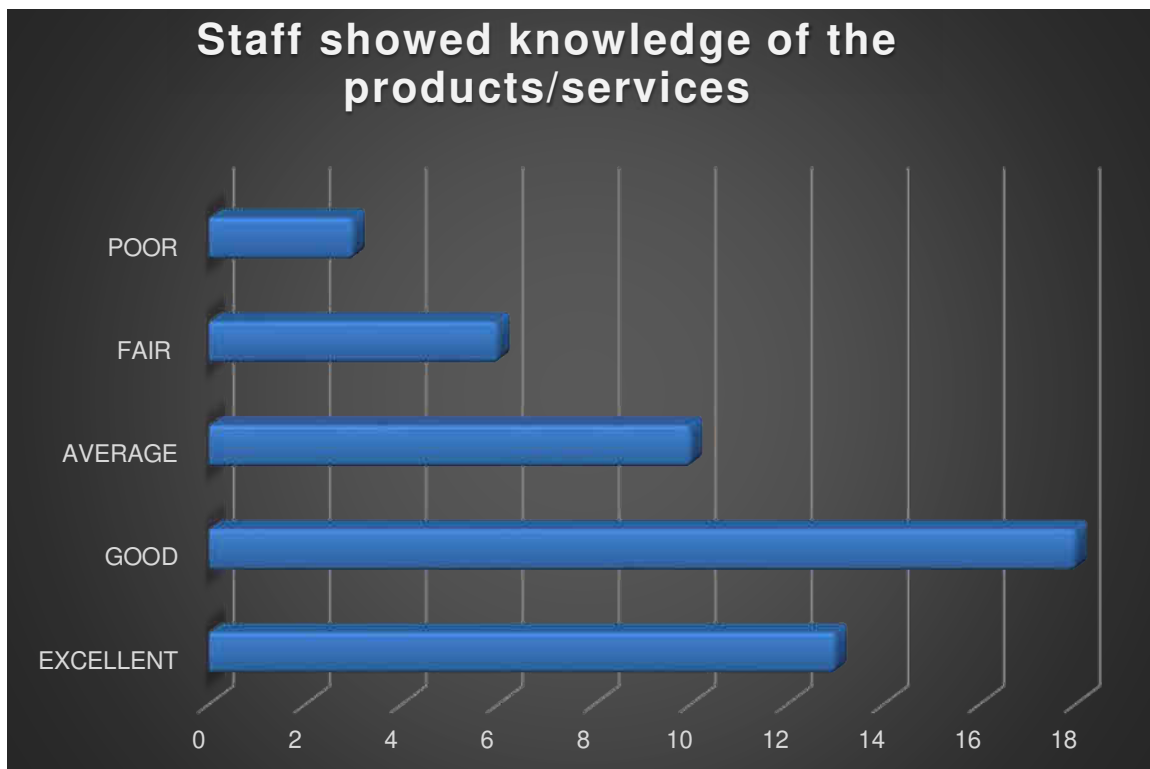
FINDINGS:

I found that 35 out of 50 customers are happy with the location of Spencer as compare to other 15 customers. It means that Spencer is available at most preferred places.



Ques. 4 Staff showed knowledge of the products/services?

Scale	FREQUENCY
Excellent	13
Good	18
Average	10
Fair	6
Poor	3



ANALYSIS:

Employees of Spencer understand specific needs and have great knowledge of all product & services.

FINDINGS:

With this statement most of the respondents were rate this statement good i.e.18 among the total respondents 10 respondents agreed with average and 13 for excellent, 6 for fair and 3 for poor.



Question. 5. Your shopping experience in Spencer is always-

Scale	Frequency
Outstanding	1
Excellent	12
Good	24
Average	10
Bad	3



ANALYSIS:

Out of 50 customers, 24 have good shopping experience in Spencer, 10 has average and 12 customers has excellent.

FINDINGS:

But 1 has an outstanding shopping experience and 3 have bad shopping experience. Maximum number of customers has a better experience of shopping in Spencer.



Quests.6 Discount and offers served in Spencer:

Scale	Frequency
Outstanding	3
Excellent	16
Good	17
Average	12
Bad	2



ANALYSIS:

Out of 50 customers, discount and offers served in Spencer is good by 17 customers, 16 feel it is excellent and only 3 feel outstanding.

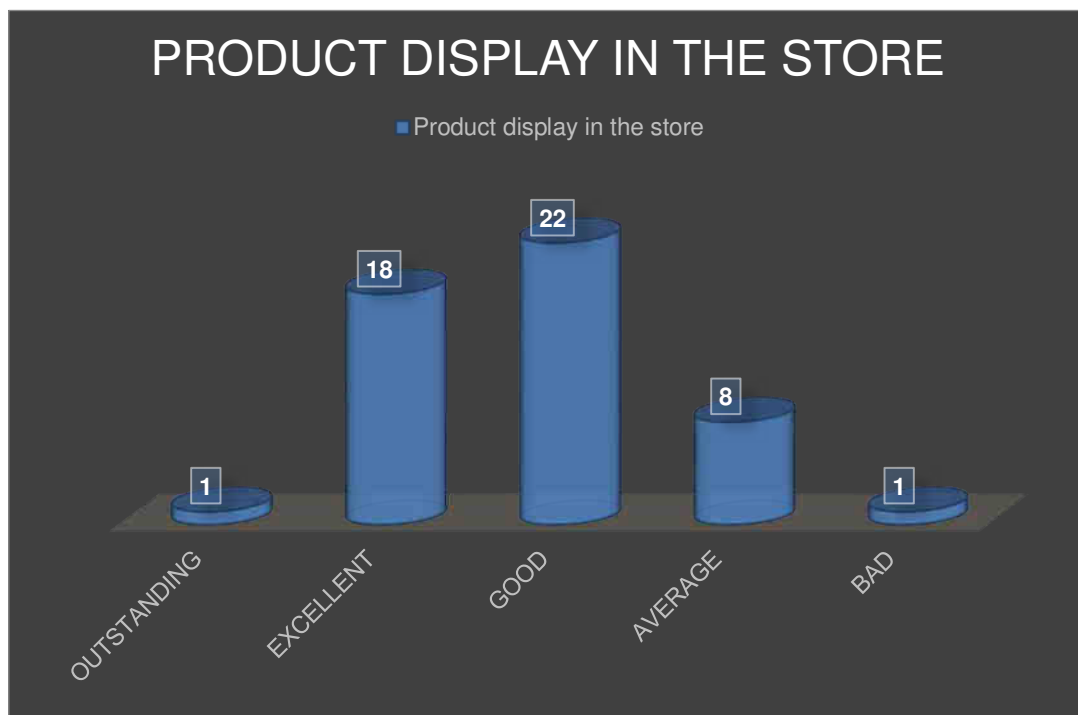
FINDINGS:

12 customers have an average satisfaction and 2 have a bad satisfaction by discounts and offers served in the Spencer.



Question.7 Product display in the store:

Scale	Frequency
Outstanding	1
Excellent	18
Good	22
Average	8
Bad	1



ANALYSIS:

Product display in the store is highly satisfactory according to 22 of the customers is good and 18 feel its excellent and 1 feel its product display is outstanding. But 8 customers feel its average and only 1 feel the product display is bad.

FINDINGS:

22 of the customers is good and 18 feel it's excellent and 1 feel its product display is outstanding. But 8 customers feel its average and only 1 feel the product display is bad.



Question.8 Your complaints are constructively handled?

Scale	Frequency
Outstanding	4
Excellent	12
Good	10
Average	16
Bad	8



ANALYSIS:

When you have a problem, Spencer shows little interest in solving it. They are solving the problems with much patience.

FINDINGS:

After analyzing this statement I found that 16 customers had an average rating and 10 good and 12 excellent. Also found that 8 customers rated it bad. But 4 of the customers feel it is outstanding. Hence Spencer needs little improvement.



Question .9 In offer days the shopping experience in the store:

Scale	Frequency
Outstanding	1
Excellent	15
Good	18
Average	15
Bad	1



ANALYSIS:

Out of 50 customers, 18 customers have good shopping experience in Spencer, 15 has average and 15 has excellent.

FINDINGS:

2 have outstanding shopping experience and 2 have bad shopping experience. Maximum number of people has a better experience of shopping in offers days.



Question. 10. The parking facility in Spencer:

Scale	Frequency
Outstanding	6
Excellent	16
Good	19
Average	6
Bad	3



INTERPRETATION

19 customers have good satisfaction with the parking facility of Spencer and 16 customers have excellent satisfaction and 6 have outstanding satisfaction.

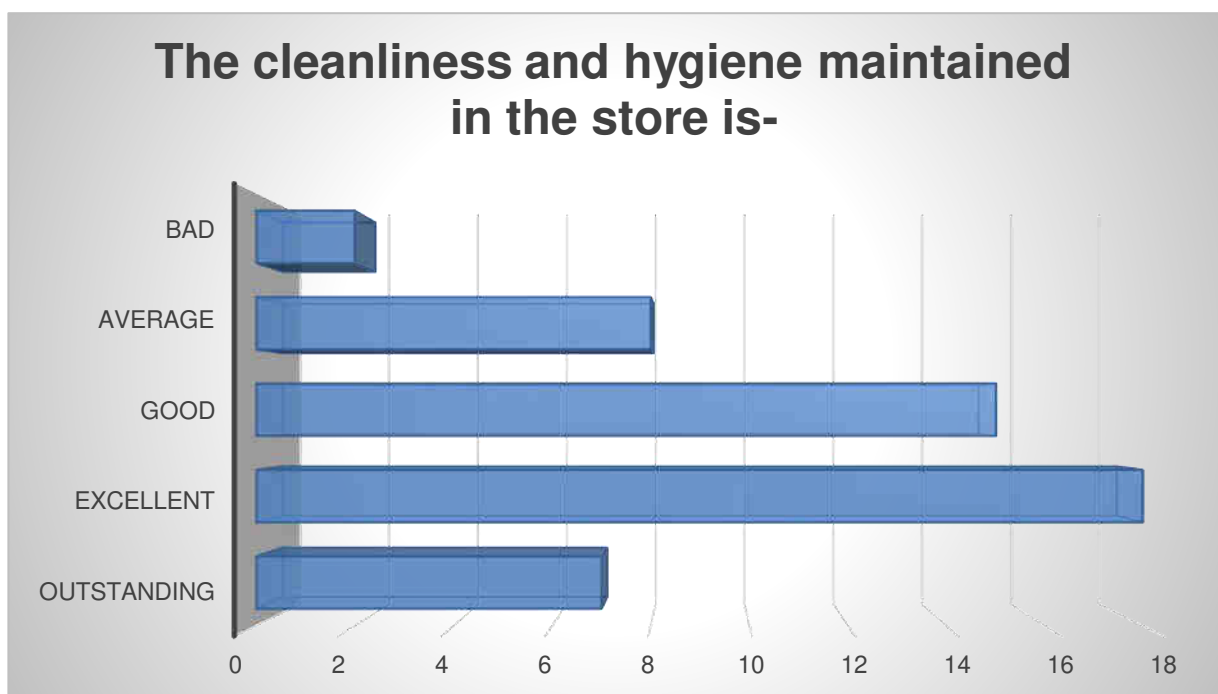
FINDINGS:

Customers have bad satisfaction and 6 have average satisfaction with the parking facility of Spencer. Maximum customers are satisfied with the parking facility in Spencer.



Question.11. The cleanliness and hygiene maintained in the store:

Scale	Frequency
Outstanding	7
Excellent	18
Good	15
Average	8
Bad	2



INTERPRETATION

According to maximum customers Spencer maintains cleanliness and hygiene in the store.

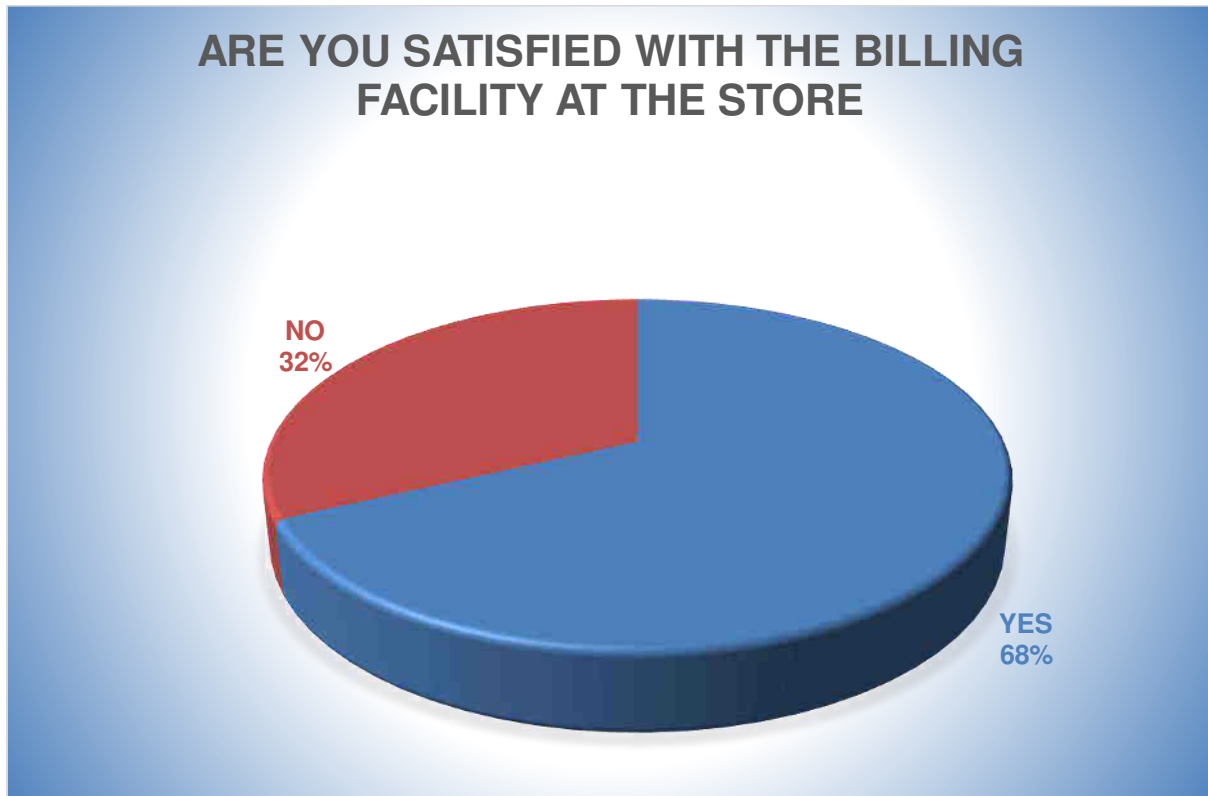
FINDINGS:

Out of 50 customers 15 rated it good and 18 rated it excellent and 7 have rated it outstanding. But 2 have rated it bad and 8 have rated it average.



Question. 12. Are you satisfied with the billing facility at the store?

Scale	Frequency	PERCENTAGE
Yes	34	68%
No	16	32%



ANALYSIS:

34 customers are satisfied by the billing facility in the store rest 16 customers are not satisfied.

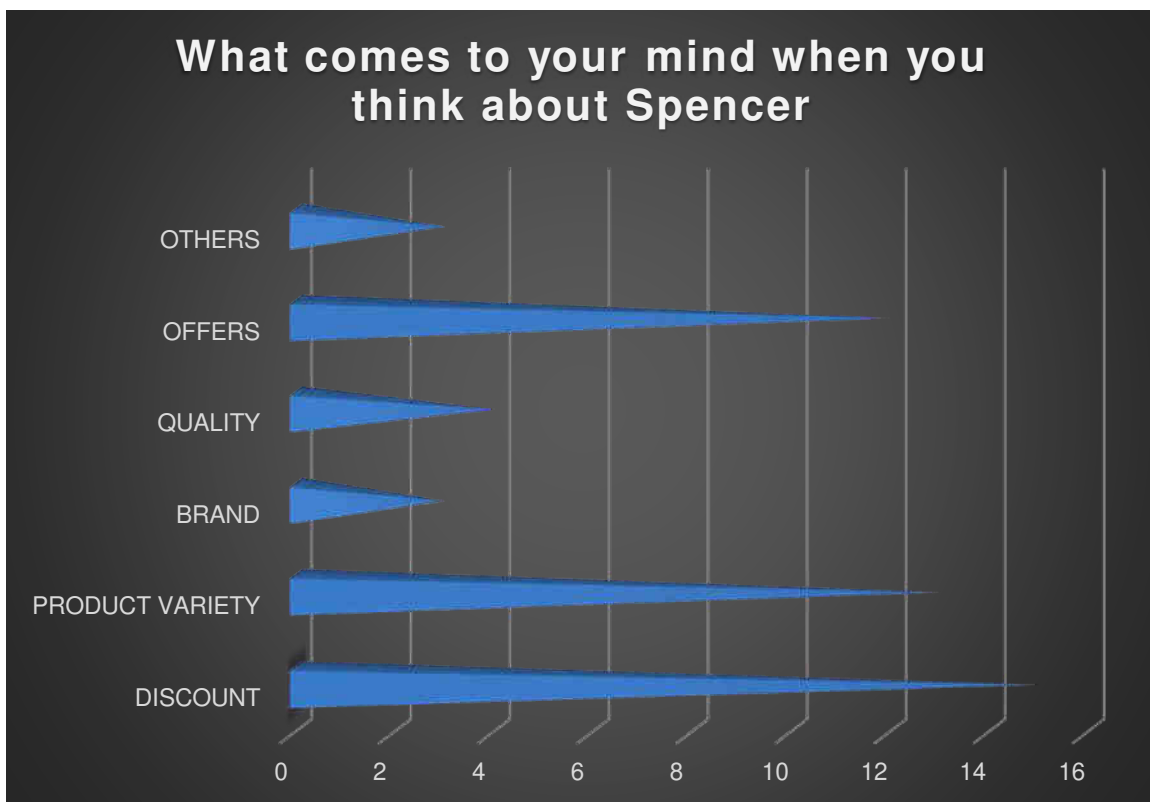
FINDINGS:

Some customers are not satisfied by the billing facility especially in offers day and rush hours.



Question.13. What comes to your mind when you think about Spencer?

Discount	15
Product Variety	13
Brand	3
Quality	4
Offers	12
Others	3



ANALYSIS:

From the above table we can analyze why consumers choose Spencer than other.

FINDINGS/:

Customers choose Spencer because of its discount, products variety and offers.



Question. 14. Is it easy to move with the trolley in the store?

Yes	34	68%
No	16	32%



ANALYSIS:

According to 34 of the customers it is easy to move in the store with the trolley.

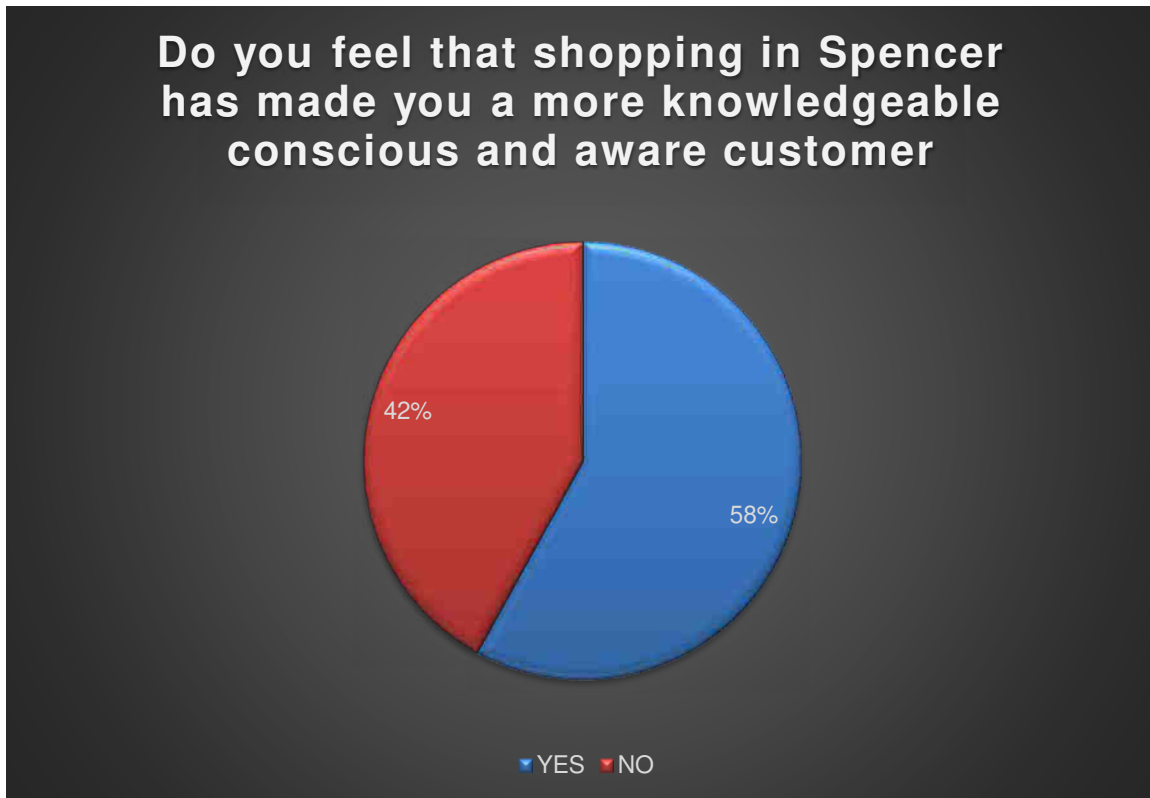
FINDINGS:

16 said it is not so convenient. The space management in the store is up to the mark.



Question. 15. Do you feel that shopping in Spencer has made you a more knowledgeable conscious and aware customer?

Yes	29	58%
No	21	42%



ANALYSIS:

According to 29 customers shopping in Spencer has made them a more knowledgeable conscious and aware customer. Out of which 21 customer do not agree with it.

FINDINGS:

Most of the people think shopping in Spencer has made customers a more knowledgeable conscious and aware customer.



CHAPTER : 4

CONCLUSION & RECOMMENDATIONS



4.1 CONCLUSION

- As most of the retail industries did market research before entering into market. Same thing was done by Spencer. Location, market, consumer perception analysis was done by Spencer. In one year, much more diversification was done in it. And to retain customers they use many loyalty programs & IT techniques. Spencer, a part of future group is a hypermarket offering a huge array of goods of good quality for all at affordable prices.
- Spencer with over 140 outlets in different part of India is present in both the metro cities as well as in small towns. Spencer can attract more customers by different variety and assortments. They can improve customer satisfaction by providing home delivery services.
- The study concludes that majority of the customers prefer shopping at big-bazaar, because of product variety, quality, service facility, reasonable prices which make the customers feel more comfortable in visiting the store again & again.
- Considering the fact that there are a lot middle class families in India, Spencer has had a huge impact on the middle class section of India, the prices, quality and sales strategy has helped in getting the middle income groups getting attracted towards Spencer.
- We can conclude that Spencer has one of the major retail industries in India. Working environment is good and also the various facilities is provided to increase the customer services. There exist a healthy & strong relationship between employees and managers. The employees accept their responsibility wholeheartedly and perform the services in well manner that satisfied the customers.



4.2 RECOMMENDATIONS

- Advertising is the basic and most prominent tool to increase the awareness of product. So, Spencer should use this tool to increase their share in the market. Retail business is successful only when they have a good customer services. Customer loyalty can only be gain by providing good or satisfied services to the customers.
- Most respondents take on the spot decision of buying different products because of the various attractive products displays. So pretty combination with good services should be done to retain customers. Quality plays a major role because most respondent said that they want a quality product and that's also the one of the reason for most of the respondents sticking to particular brand.
- Customers are very price conscious they are having many options in the market. The following steps should opted should follow more of high low pricing rather than everyday low pricing. Should go for a weekly coupon system as it holds more of the loyal customers. Should provide good customer services so that customer likes to visit again.
- There should be a proper assortment of various product categories. Proper training should be provided to the customer so that they can deal with customer efficiently. Various offers can be provided to them to attract new customers. Quality in product should be reached up to mark.



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**QUESTIONNAIRE ON CUSTOMER RELATIONSHIP MANAGEMENT
IN RETAIL SECTOR (SPENCER)**

CUSTOMER BASED SURVEY

Ques.1 How frequently do you visit Spencer?

Twice in a week Once in a week During Special offers
Whenever the need arises

Ques.2 How do you find the shopper assistant behavior?

Helping Not Helping Rude

Ques.3 Are you happy with the location of Spencer?

Yes No

Ques.4 Staff showed knowledge of the products/services?

Excellent Good Average Fair Poor

Ques.5 Your shopping experience in Spencer is always_____

Outstanding Excellent Good Average Bad

Ques.6 Discount and offers served in Spencer:

Outstanding Excellent Good Average Bad

Ques.7 Product display in the store:

Outstanding Excellent Good Average Bad

Ques.8 Your complaints are constructively handled?

Outstanding Excellent Good Average Bad

Ques.9 In offer days the shopping experience in the store:



Outstanding Excellent Good Average Bad

Ques.10 The parking facility in Spencer:

Outstanding Excellent Good Average Bad

Ques.11 The cleanliness and hygiene maintained in the store:

Outstanding Excellent Good Average Bad

Ques.12 Are you satisfied with the billing facility at the store?

Yes No

Ques.13 What comes to your mind when you think about Spencer?

Discount Product Variety Brand Quality Offers Others

Ques.14 Is it easy to move with the trolley in the store?

Yes No

Ques.15 Do you feel that shopping in Spencer has made you a more knowledgeable conscious and aware customer?

Yes No



SUPERVISOR'S CERTIFICATE

This is to certify that PRIYA SHAW a student of B.Com Honours of VIDYASAGAR METROPOLITAN COLLEGE under the University of Calcutta has worked under my supervision and guidance for her Project Work and prepared a Project Report with the title Customer Relationship Management with special reference to Spencer.

The project report, which she is submitting, is her genuine and original work to the best of my knowledge.

Place: Kolkata

Signature:

Date:

Designation:

Department of Commerce (Evening)

Name of the College: VIDYASAGAR METROPOLITAN COLLEGE



STUDENT'S DECLARATION

I hereby declare that the Project Work with the title “**CUSTOMER RELATIONSHIP MANAGMENT WITH SPECIAL REFERENCE TO SPENCER**” submitted by me for the partial fulfilment of the degree of B.Com. Honours in Accounting & Finance in Business under the University of Calcutta is my original work and has not been submitted earlier to any other University/Institution for the fulfilment of the requirement for any course of study.

I also declare that no chapter of this manuscript in whole or in part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the references.

Place: Kolkata

Date:

Signature:

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KOLKATA- 700061

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**UNIVERSITY OF CALCUTTA
ADMIT**

**B.Sc. SEMESTER - V (HONOURS) Examination-2021
(UNDER CBCS)**

Name of the Candidate :

SNEHA ADHIKARY

Father's/Guardian's Name :

MRITUNJOY ADHIKARY

Roll & No. :

193137-11-0009

Registration No.

137-1211-0170-19

Subjects Enrolled :

GEOA

Name of the College :

VIDYASAGAR EVENING COLLEGE



Sneha Adhikary

SCHEDULE FOR EXAMINATION IN THEORETICAL PAPERS **

Examination Day & Date	Examination Starting Time	Subject Code ++	Course Code	Course Name	Number of Answer book(s) to be used	Signature of the invigilator on receipt of the answer script's @	
Saturday	15-01-2022	2 P.M.	GEOA	CC11	RESEARCH METHODOLOGY AND FIELDWORK	1	
Sunday	16-01-2022	2 P.M.	GEOA	CC12	REMOTE SENSING, GIS AND GNSS	1	
Monday	17-01-2022	2 P.M.	GEOA	DSE-A1	FLUVIAL GEOMORPHOLOGY	1	
Tuesday	18-01-2022	2 P.M.	GEOA	DSE-B1	CULTURAL AND SETTLEMENT GEOGRAPHY	1	

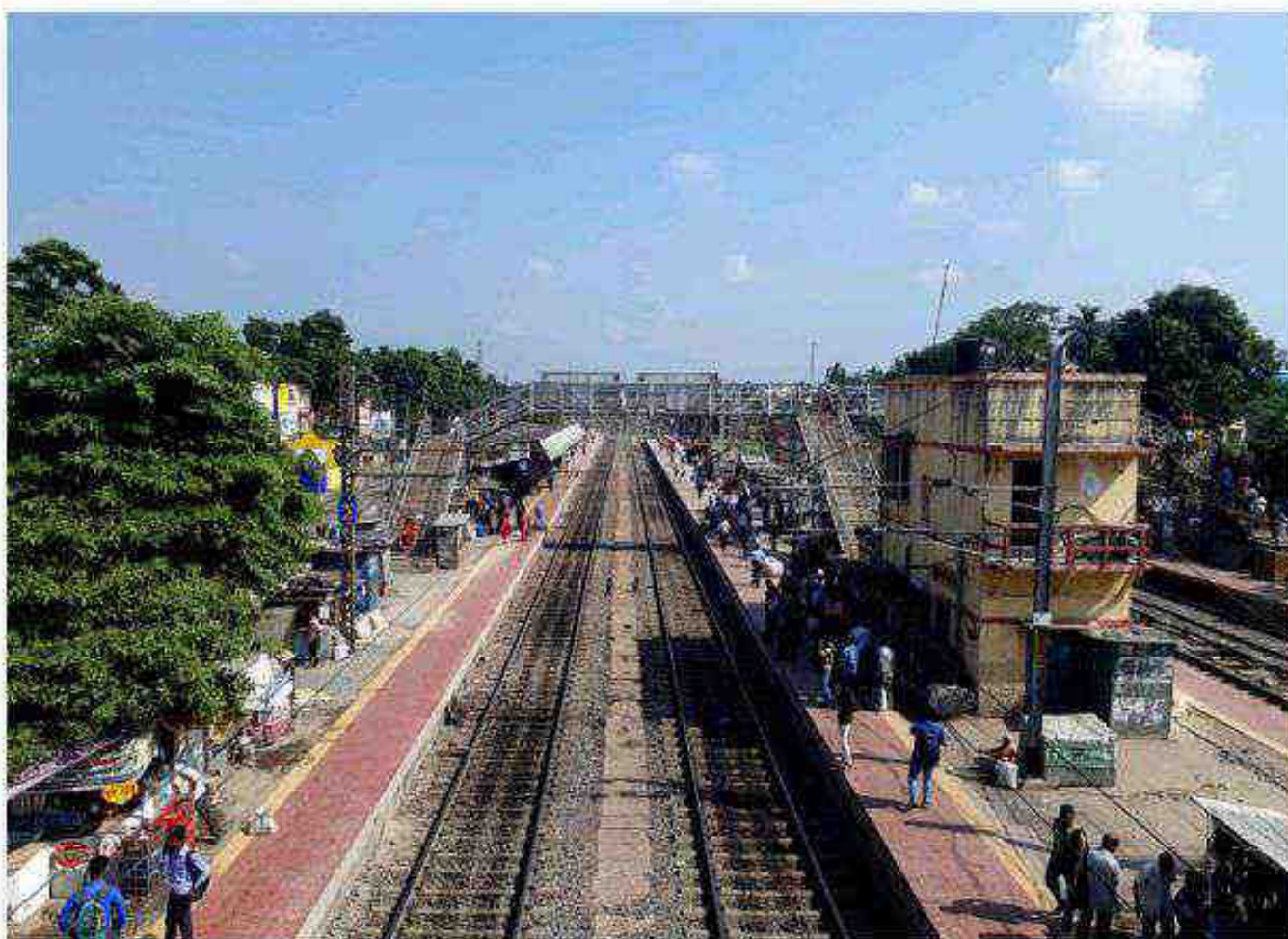
Signature of the Principal/TIC/OIC of the College with Seal


 Controller of Examinations (Actg.)

** Subject to unavoidable changes
++ In no circumstances subject/s to be altered

N.B. Please follow University Notification No. CE/ADM/18/229 Dated 04/12/2018 in www.cuexam.net for instruction of Examinee/Invigilator/Examination centre.

PHYSICAL AND CULTURAL CHARACTERISTICS OF SELECTED WARDS OF BARASAT MUNICIPALITY



FIELD REPORT

5TH, SEMESTER GEOGRAPHY HONOURS EXAMINATION, 2021

PAPER: CC-11 PRACTICAL

ROLL NO 193137 - 11-0067 REGISTRATION NO 137-1211-030-19

**VIDYASAGAR
DEPARTMENT OF**



**METROPOLITAN COLLEGE
GEOGRAPHY**

TO WHOM IT MAY CONCERN

This is to certify that

Roll No: 193137 - 11-0009 Registration No: ST-1941-095-19 of B.Sc. 5th. Semester Honours Examination, 2021, has actively participated in the compulsory Field Work conducted at selected wards of Barasat Municipality, North 24-Parganas, West Bengal and has prepared the "Field Report on Physical & Cultural Characteristics of selected wards of Barasat Municipality", as a group activity under my supervision, on the basis of secondary data for correlating Physical and Cultural features of the area.

The candidate has given significant effort during the field work as well as in completing the report, which can be presented now before the board of examiners for evaluation.

Prof. Arunabha Mishra

Associate Professor

A handwritten signature in black ink, appearing to be 'Arunabha Mishra', written over a light grey rectangular background.

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ACKNOWLEDGEMENT

While preparing my Field report and compiling the same I would like to express my gratitude and gratefulness for help, guidance, co-operation extended to me in my endeavors.

First of all I would like to express my indebtedness to Prof. Anunabha Mishra, Prof. Ramakrishna Sena for their valued guidance and help. I wish to thank principal, Vidyasagar Metropolitan College and office staff of the college, for their support and for providing us with all the facilities.

I would like to express my sincere gratitude to the staff of Barasat Municipality for providing us important information.

I also take this opportunity to thank the people of Barasat Town.

Last but not the least in this connection I would like to acknowledge my class friends and well-wishers to who are too numerous to mention individually for cooperation of various kinds in the different stages of the preparation of this report.

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(v) Concentration of S.C. population and total population.

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CHAPTER I

INTRODUCTION

The domain of the subject of geography precisely describes it as a natural science or an earth science or a regional science and/or a field science. Any segment of the earth's surface provides an open natural laboratory to a geographer who seeks to identify and explain the spatial organization of the surface of geographical features through a careful study of the patterns and processes. A field gives a scope to discover a set of geographical facts hitherto inexperienced. It involves the observation of landscape in minute details.

BASIC PRINCIPLES OF FIELD WORK

Field work is collecting information and a good field work is collecting information for a purpose (Gouarly, 1984). The sequence of steps to be followed in such an investigation suits on a fixed frame -

Step	Work theme
1	Correlation between physical and cultural landscape of Kaxa village.
2	To set the concept, several questions be framed following geographical logic.
3	For each question, postulate a geographically relevant hypothesis, i.e. there has been a sound and positive relationship between the physical and cultural elements of the study region.

Steps	Work Theme
4	It is now to be decided, what information is to be collected.
5	Process and analyze the results of field work.

1.1. INTRODUCTION

In India, besides the four metropolitan cities, there are several big towns as well as small towns. The big towns and metropolitan cities always enjoy the urban facilities as well as government aids. But the small towns are always neglected in the context of urbanization parameters. To uphold these towns to a high urbanized category an urban study is immensely needed which will help the academicians as well as professionals of this field.

Barasat, a district headquarters town lies within the jurisdiction of Kolkata Metropolitan Development Authority (KMDA) with an area of 28.62 sq.km and population of 102660 (1991 census) and 164634 (1995) as per data supplied by Barasat Municipality. In 1986, the erstwhile 24 parganas district was bifurcated into two districts - the North 24 parganas and the South 24 parganas. Barasat became the headquarters of North 24 Parganas district. Map 1.1 shows the position of Barasat town with its adjacent region. Barasat town is located between $88^{\circ}27'$ east to $88^{\circ}31'30''$ east longitude and $22^{\circ}40'58''$ north to $22^{\circ}44'44''$ north latitude. The town lies at

a distance of about 16 km from Bidhanagar, 21 km from Sealdah, 23 km from B.B.D. Bag, 14 km from Barrackpore, 45 km from Bongaon, 39 km from Bashihat and 47 km from Hasnabad. N.H. 35 are two main thoroughfares of North 24 Parganas district as well as of Barasat town and these connect Kolkata. One broad-gauge rail line starts from Sealdah, runs towards north to Nadia and North 24 Parganas district and towards south to south 24 Parganas. This railway is an important link between Barasat and Kolkata. Map-1.1

1.2. SELECTION BARASAT AS THE STUDY AREA :-

Barasat has been chosen as our study area due to some important factors. These factors are -

- ① The town, a district headquarters having a population more than 250000 is lacking the tempo of urbanization for sustainable development.
- ② Barasat is situated within the Kolkata Agglomeration belt.
- ③ It is located within the periphery of the Kolkata - Dhaka route of international significance.
- ④ After partition of India as well as after the war of 1971 in erstwhile East Pakistan a vast area of this town have been encroached by Bangladeshi refugees who have created huge burden on the civic amenities provided in the town.

LOCATION MAP



LOCATION MAP

WEST BENGAL IN INDIA



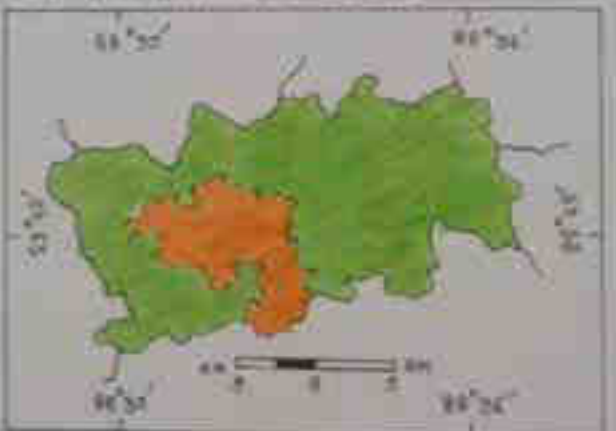
NORTH-24-PARGANAS DISTRICT - CT IN WEST BENGAL



BARASAT-I CD BLOCK IN NORTH-24-PARGANAS DISTRICT



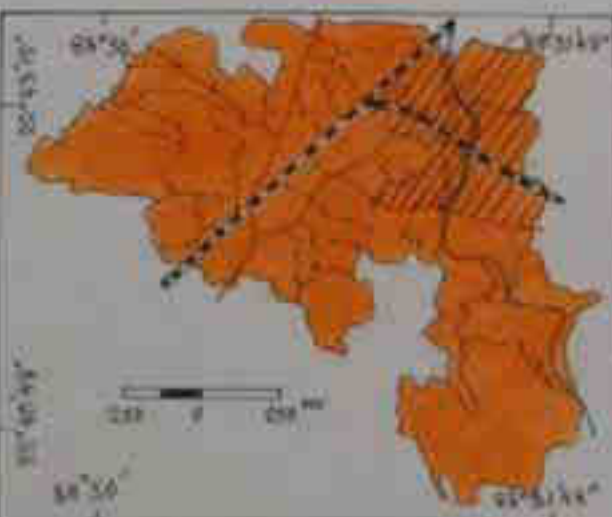
BARASAT MUNICIPALITY IN BARASAT CD BLOCK



LEGEND

- BARASAT I CD BLOCK
- BARASAT MUNICIPALITY

BARASAT MUNICIPALITY BY WARDS



INDEX

- STUDY AREA OF BARASAT MUNICIPALITY

To study the urban physical and cultural characteristics of Barasat Municipality we select five wards in the north-western part of this municipality where population pressure on land of migrated people is excessive, unplanned growth of human settlements exert immense pressure on urban planning and last, but not the least, green coverage and water bodies are serious concern of environmental planning. These wards are 1, 2, 13, 17, 18.

1.3 HISTORICAL EVOLUTION :-

There are different opinions about the naming of Barasat Town. It is gathered that the name came from Bengali word 'Bar' which means camp or cantonment of soldiers of the army chief of king Pratapaditya. According to opinion of local people years ago, most of the areas of Barasat and its adjoining places were dense jungle where the idol of Dakshinai seated upon a tiger was worshipped in an open place. This head was named as 'Bara' and the place where it was worshipped was called 'Sat'. Hence, the name is Barasat in the year 1757, Nawab Mirjafar handed over the Zamindari of 24 parganas to the British rulers. These vast 24 parganas were divided into two parts by the British ruler - Alipur and Barasat. The Barasat Government School was founded in the year 1846 temporarily in a part of the jail with the cooperation of Mr. Touvon and Sri Kabi Krishna Mitra. The first headmaster of the school was Baku Pyaricharan Sarker, the writer of 'First Book'. Then the

Government started a hospital in this district town in 1854. Lord Clive constructed a house in Kamardanga, 4 km south of Barasat. After Clive, the next Governor Vansittart made a two storied house in the central part of Barasat. The British army general of Bengal Colonel Champion's own house was near the 'Hasting's villa'. Many anglicised holkatans started to purchase lands here at that time. In 1802 Lord Wellesley had founded an army college in Barasat for illiterate vagabond British boys and for this college Barasat had been popularly municipality was 'Sandhanat of Bengal'. But this college was closed after ten years. In 1869, Barasat municipality was founded for the welfare of the people of this town. It was among the first ten municipalities of this country. The municipality was initially established with six wards. The oldest wards are 1, 6, 11, 17, 18 and 8. Bengal Central Railway started running train from Dum Dum to Duttapukur in 1883 and it was extended upto Goswaddanga in 1884.

1.4 : AIMS AND OBJECTIVES :-

The aim and objectives of this study are as follows :

- To sort out the causes and hindrances to growth and development of the town in regional set up.
- To make an intensive study to understand the functional status of the town in comparison to other towns of the district.

- To highlight the problems of development of Barasat town and its environs and suggest measures for solution.

1.5: METHODOLOGY :-

We have analyzed the urban morphology, socio-economic and environmental data in a correlative manner so as to overall character of Barasat town. We have collected a base map of Barasat and census data of 2011 from Barasat Municipal Office.

All the works have been done in three phases -

- (i) Pre-field work phases,
- (ii) Field work phases and
- (iii) Post-field work phases.

(i) Pre-field stage :- In the pre-field study relevant information, literatures, topographical and geological maps and statistical data relating to the study of physio-cultural analysis of the village, have been collected from the different sources and these materials have been analyzed to acquire sufficient knowledge for conducting the survey work conveniently.

(ii) Field-work stage :- Due to pandemic situation in the surrounding area and as per direction of the Undergraduate Board of Studies, we are compelled

to concentrate on secondary data sources from Barasat Municipality, Primary Census Abstract of Barasat District and different sources from internet.

(iii) Post field stage :- In the post field stage the collected data and information were analysed and different key maps were prepared with proper cartographic methods for the transmission of the data effectively.

CHAPTER II

PHYSICAL ASPECT

2.1 Physiography :-

From the geomorphological records it is proved that the district belongs to the well-known Ganga delta system. It is an alluvial fan land, which was a originally part of the Sunderbans. Most of the area was covered by bushes, marsh and mangrove swamps. Once jungle cleared the topography has been carved out. This area is a flat land with an elevation of 9-10 metres above mean sea level. The original surface features have been changed in course of time by human interference mostly by settlers and cultivators. A small part of Sunderbans is now seen in the southern tip of Hinglajanj from where the original Sunderbans starts and goes deep into the forested part of the district of South 24 Parganas upto the sea. Some micro features of the original marshy swamps are visible in the 'Bhesi' areas and also in the courses of rivers specially the Suti and the Noai rivers, which have been choked and silted at many place and cannot regain the normal flow of water all over the year. The Salinity of soil in many areas in the district also indicates the original land formation characters. According to Professor Dr. S. P. Chatterjee, it is an extreme low-lying tract traversed by distribution of the Ganga line from near Kolkata to Jessore (Bangladesh). The slope of drainage condition are found to be different in different parts of the district. The land slopes inland towards the center of the district from the strip of well-raised banks, which border the River Hugli and the River Jamuna.

2.2 Drainage :-

Suti is the main river which is actually turned into a canal) of the area. It is the tributary of Bidyadhari. This river flows from northern to south-eastern part of the area. The river Hugli flows along the western boundary of the district from north to south-west. Primarily it is known as Bhagirathi before it passes along the Hugli district in the north. The other most important distributary in Ganga Delta is river Ichhamati which flows along the eastern border of the district in a north-south direction. Sank Nadi, an boundary of Jamuna river in the north of the district and ultimately became beheaded in course of time. Hence the off takes of all these rivers have been silted up so that the river has lost their heads. In their lower portions they serve as River in its meandering course from some oxbow lakes which are locally known as Bills (marsh drainage channel, collecting the rainwater and passing it southwards in the northern part), such as Magura Bill, Balli Bill, Bhojra Bill, Kalshi Bill etc. Numerous Bills are scattered throughout the area from north to south. In the South, the Bills are widespread surrounding the Padma Nadi.

The Hugli distributary on the west is the only active stream and its distributary, the Jamuna on the east merely flowing from whatever water it receives from the Matharanga via the Ichhamati. The conditions are better in the area of the marshes because they never dry up, and they sometimes may be used as source of drinking water.

2.3 Soil :-

Alluvial soil is the main soil of this region. Baranāt is situated between Suti and Noni Khai, which were known as Subhannamati and Labanyamati respectively. So by the situation of these rivers the alluvial soil was covered the whole area.

2.4 Climate :-

Baranāt has a tropical climate similar to the rest West Bengal. The region experiences a monsoon from early June to mid-September. The climate is dry in winter (mid November to mid February) and humid in summer.

MONTH	Ja	F	M	A	May	Jun	Jul	Au	S	O	N	D	YEAR
RECORD HIGH °C (°F)	32.8 (91.0)	38.4 (101.1)	41.1 (106.0)	43.3 (107.9)	43.7 (110.7)	43.9 (111.0)	39.9 (103.8)	38.4 (101.1)	38.9 (102.0)	34.0 (93.2)	34.9 (94.8)	32.5 (90.5)	43.9 (111.0)
AVERAGE HIGH °C (°F)	26.4 (79.5)	29.1 (84.4)	33.5 (92.3)	35.5 (95.9)	35.4 (95.7)	34.0 (93.2)	32.3 (90.1)	32.1 (89.8)	32.4 (90.3)	32.3 (90.1)	30.3 (86.5)	27.0 (80.6)	31.7 (89.1)
DAILY MEAN °C (°F)	20.1 (68.2)	22.0 (72.4)	27.0 (81.2)	30.2 (86.4)	30.7 (87.3)	30.3 (86.5)	29.2 (84.6)	29.1 (84.4)	29.1 (84.4)	28.2 (82.8)	24.7 (76.5)	20.3 (67.4)	26.9 (80.4)
AVERAGE LOW °C (°F)	13.8 (56.8)	16.9 (62.4)	21.7 (71.1)	25.1 (77.2)	25.0 (78.3)	25.5 (79.7)	26.1 (79.0)	26.1 (79.0)	25.8 (78.4)	23.1 (73.6)	19.0 (66.2)	15.5 (60.1)	22.2 (72.0)
RECORD LOW °C (°F)	5.7 (44.1)	7.2 (45.0)	10.0 (50.0)	16.1 (61.0)	17.7 (64.2)	20.4 (68.7)	20.6 (69.1)	22.6 (72.7)	20.6 (69.1)	17.2 (63.0)	10.6 (51.1)	7.2 (45.0)	6.7 (44.1)
AVERAGE RAINFALL mm (inches)	11 (0.4)	30 (1.2)	35 (1.4)	60 (2.4)	142 (5.6)	298 (11.7)	411 (16.2)	349 (13.7)	294 (11.6)	143 (5.6)	26 (1.0)	17 (0.7)	1,800 (70.9)
AVERAGE RAINY DAYS (≥ 1.0mm)	1.2	2.2	3.0	4.3	8.7	14.7	20.5	20.2	15.7	8.1	1.5	0.9	101.5
AVERAGE RELATIVE HUMIDITY (%)	66	58	53	66	70	77	83	83	81	73	67	68	71

CHAPTER III

SOCIO-ECONOMIC ASPECTS

3.1 DEMOGRAPHIC ASPECTS :-

The population of Barasat in 1991 was 102660. It has increased to 231521 in 2021. After partition of India volume of population is increasing. Migrated people from the erstwhile East Pakistan were added to the population of Barasat town. Since then onwards the size of the town expanded from 6 wards to 35 wards. This district town experienced 125.52% of population growth in 1991-2001 whereas West Bengal and 19.88%, which was much less than this town. Barasat also had higher growth rate in comparison to that of all India rate of 32.60%. Sex ratio in Barasat town is 956 whereas it is 893 in West Bengal and 900 in the country. This figure is higher than that of all India and state sex ratio.

Migration has always been an important factor in the demographic composition of the district of 24 Parganas. In the initial stages of jungle clearance the landless labourers from outside the district even from the plateau of Chhotanagpur were allowed by the landlords to clear the jungles and to bring the virgin land under plough. The migrated people of the different caste and creed became settlers and formed the major part of the population.

However, a large number of refugees found out their own places in the urban areas of the then district of 24 Parganas. Northern part of 24 Parganas was an ideal place from them

Growth Rate And Growth Of Population, Barakat Municipality



Scale: 1:100000
 Source: Census

Male, Female Population Of The Study Area, Barakat Municipality



Scale: 1:100000
 Source: Census

Population Density Of The Study Area, Barakat Municipality



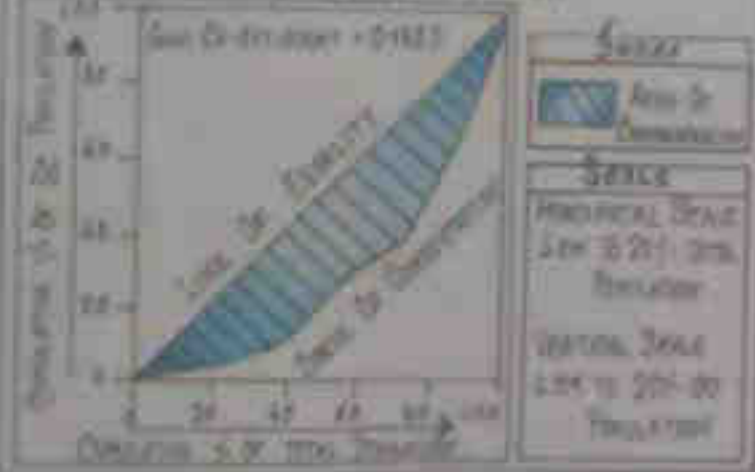
Scale: 1:100000
 Source: Census

Composition Of Sexes Of The Study Area, Barakat Municipality



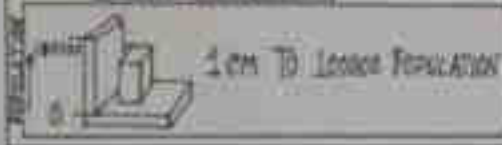
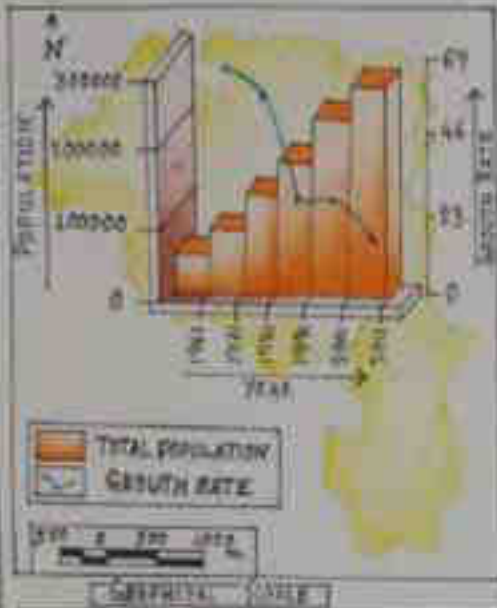
Scale: 1:100000
 Source: Census

Graph Curve Showing The Concentration Of S.D. Population And Sex Population

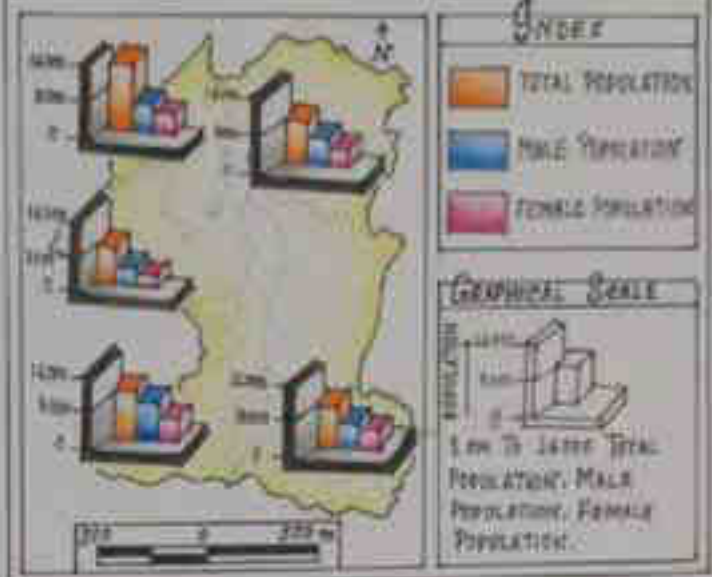


SOURCE
 PCA Primary Census Abstract North 25 P.S. District, 2011

GROWTH RATE AND GROWTH OF POPULATION, BARASAT MUNICIPALITY



MALE, FEMALE POPULATION OF THE STUDY AREA, BARASAT MUNICIPALITY



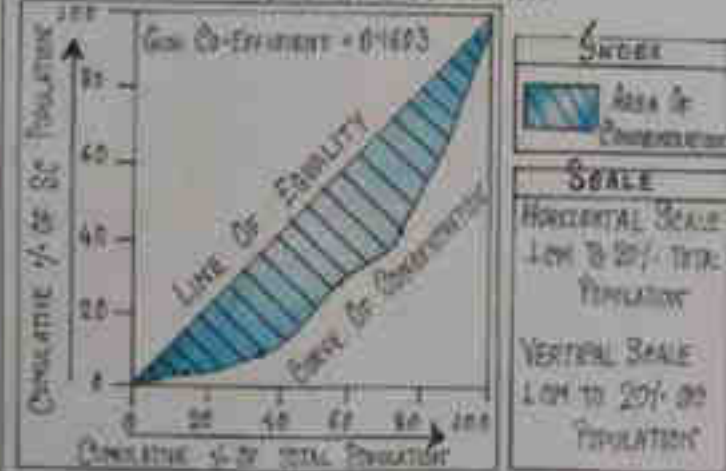
POPULATION DENSITY OF THE STUDY AREA, BARASAT MUNICIPALITY



CONCENTRATION OF CASTE OF THE STUDY AREA, BARASAT MUNICIPALITY



LORENZ CURVE SHOWING THE CONCENTRATION OF S.C. POPULATION AND TOTAL POPULATION



SOURCE

PCA PRIMARY CENSUS
ABSTRACT NORTH 24
PSS DISTRICT, 2011

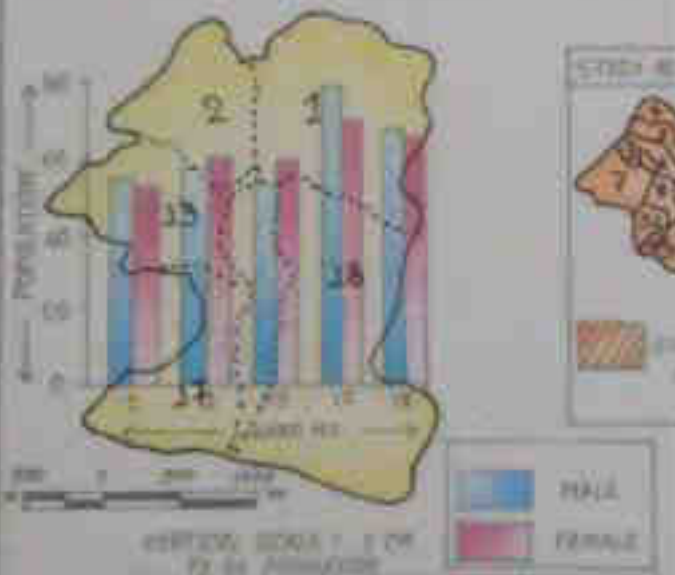
SEX-RATIO OF STUDY AREA
BARASAT MUNICIPALITY



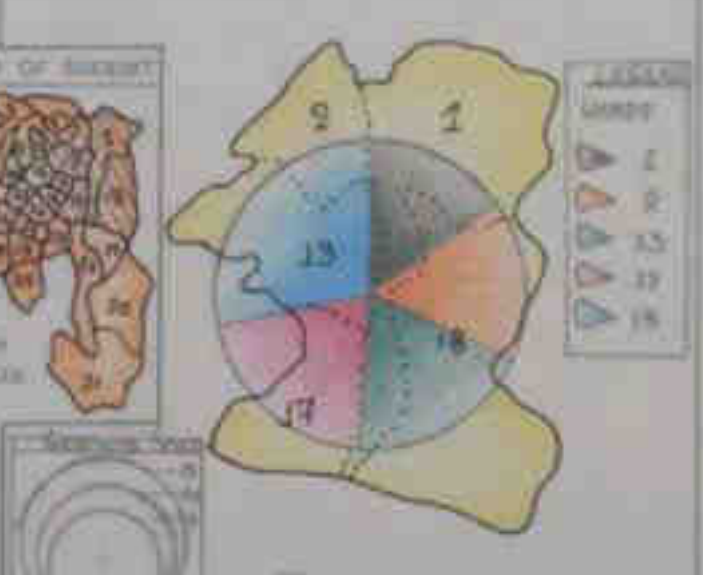
AGE-GROUP WISE MALE & FEMALE POPULATION OF STUDY AREA, BARASAT MUNICIPALITY



MALE & FEMALE POPULATION OF STUDY AREA, BARASAT MUNICIPALITY



HOUSEHOLD WISE MIGRANTS OF STUDY AREA, BARASAT MUNICIPALITY



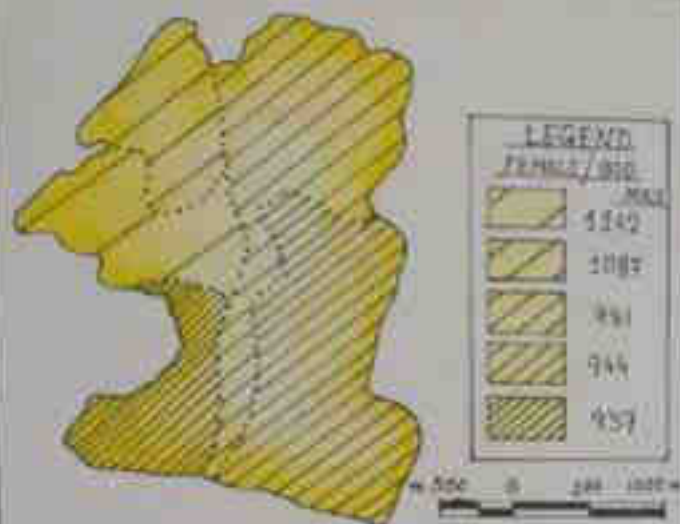
STATUS OF MIGRATION OF STUDY AREA, BARASAT MUNICIPALITY



RELIGIOUS COMPOSITION OF STUDY AREA, BARASAT MUNICIPALITY



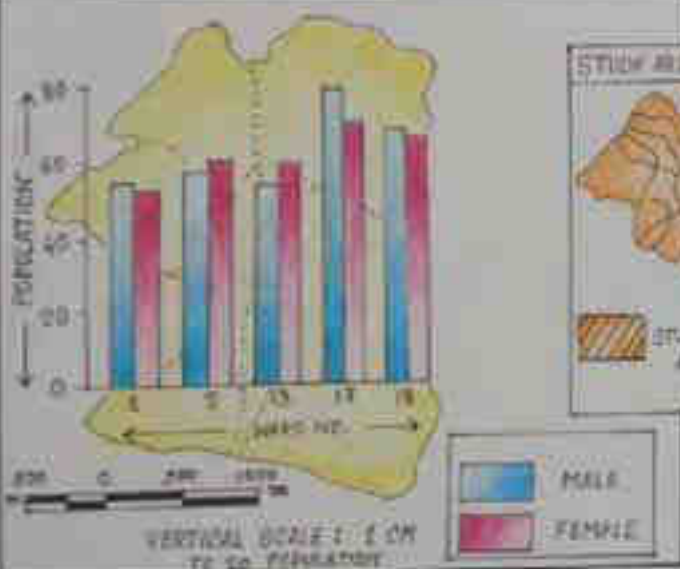
**SEX-RATIO OF STUDY AREA
BARASAT MUNICIPALITY**



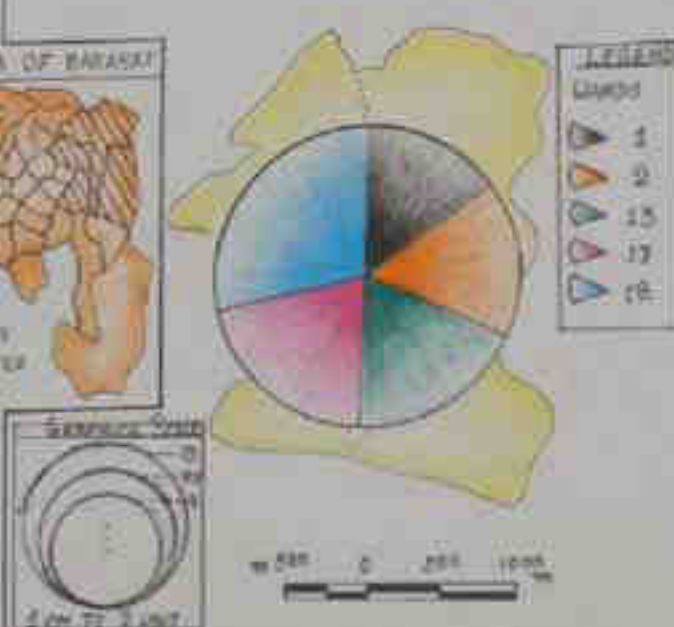
AGE-GROUP WISE MALE & FEMALE POPULATION OF STUDY AREA, BARASAT MUNICIPALITY



MALE & FEMALE POPULATION OF STUDY AREA, BARASAT MUNICIPALITY



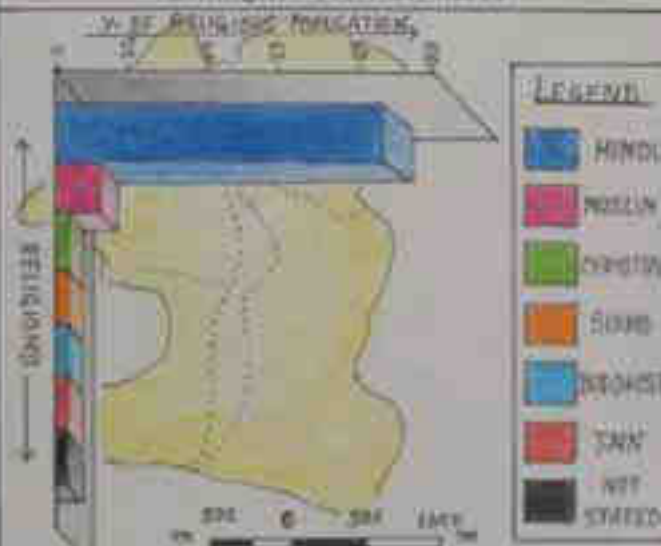
HOUSEHOLD WISE MIGRANTS OF STUDY AREA, BARASAT MUNICIPALITY



CAUSES OF MIGRATION OF STUDY AREA, BARASAT MUNICIPALITY



RELIGIOUS COMPOSITION OF STUDY AREA, BARASAT MUNICIPALITY



There was job opportunity in the industrial areas, with other facilities of education and medical treatment etc. The people of erstwhile East Pakistan began to migrate again in very large numbers during the war of independence for Bangladesh. Numbers of camps were opened in West Bengal with the help of the central government in 1971.

The town under study also attracted the refugees in a large number for its location at the junction of the National Highway and the Railways. There were also agricultural lands readily available at low costs for house construction, it is expected that except that old six municipal wards the other municipal wards are made up of 90% of migrated people.

People of various trades came to his locality. Many of them built their houses here and went out for jobs to Kolkata area. Barasat Town expanded on the lands of Barasat Block - I and II where dwelling houses were built under the Panchayats and were merged with the municipal Town at a later date. A large no. of migrated people found their jobs in the brick fields, fishery areas, masonry work etc.

3.2 LITERACY STATUS :-

Literacy rate of this town is 84.74% (2001). It is higher than the state of the state of 81.26%. This is also higher than the all India urban figure (79.92%).

NO. OF BURN HOUSES & SLUM POPULATION IN STUDY AREA OF BARKAT MUNICIPALITY



Scale 1:2000
 Scale 1:2000
 Scale 1:2000
 Scale 1:2000

Legend
 Burn House
 Slum Population



NO. OF HOUSES IN STUDY AREA OF BARKAT MUNICIPALITY



Legend
 NO. OF HOUSES

Scale 1:2000
 Scale 1:2000

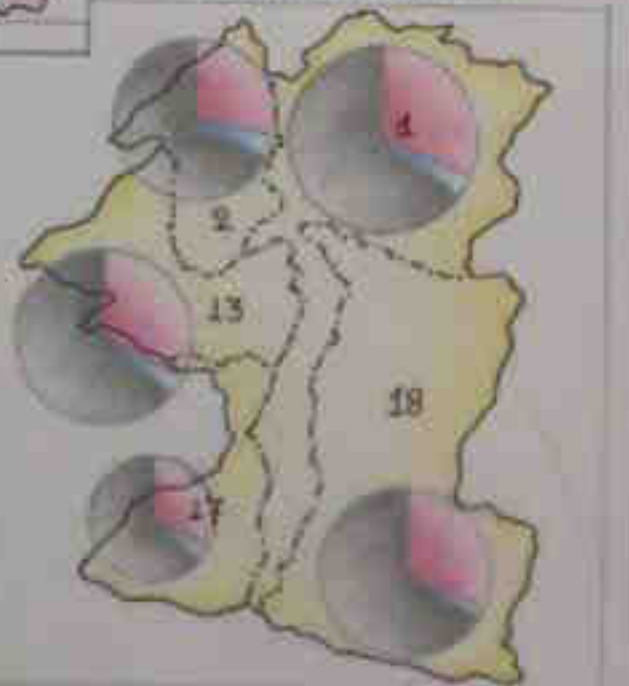
TOTAL, MALE & FEMALE WORKERS IN STUDY AREA OF BARKAT MUNICIPALITY



Scale 1:2000
 Scale 1:2000

Legend
 Total Workers
 Male Workers
 Female Workers

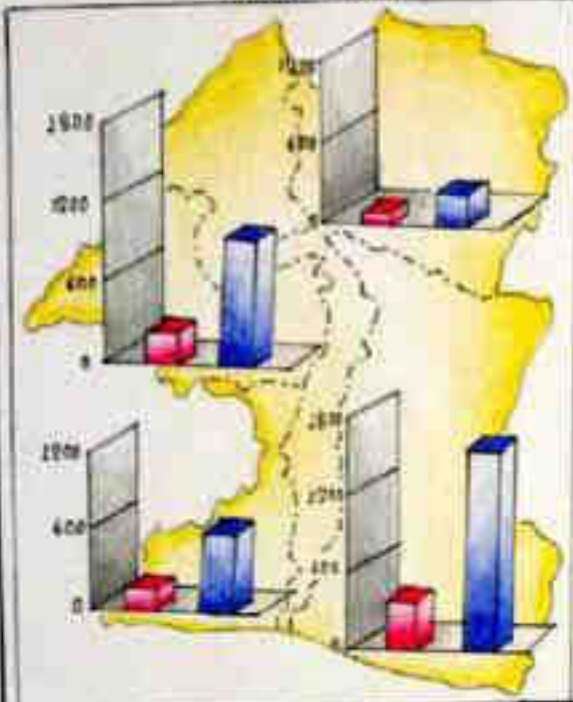
DIFFERENT TYPES OF WORKERS IN STUDY AREA OF BARKAT MUNICIPALITY



Scale 1:2000
 Scale 1:2000

Legend
 Total Workers
 Male Workers
 Female Workers

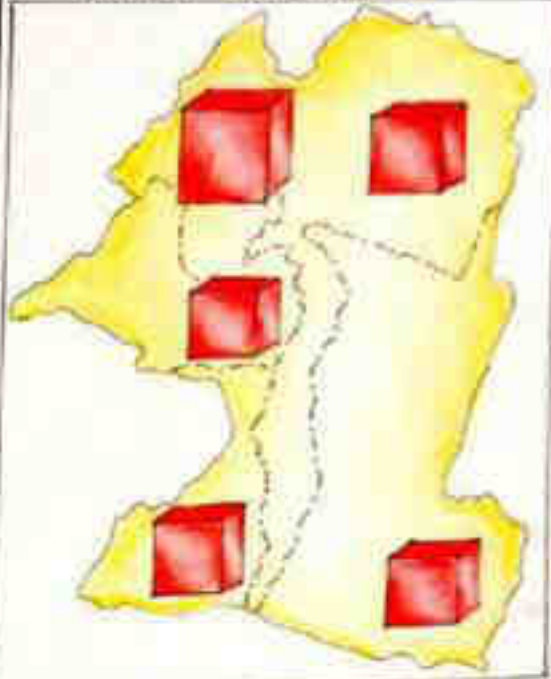
NO. OF SLUM HOUSEHOLDS & SLUM POPULATION IN STUDY AREA OF BARASAT MUNICIPALITY



NO. OF SLUM HOUSEHOLDS AND SLUM POPULATION
SCALE : 1 CM TO 400 HOUSEHOLDS & SLUM POPULATION

LEGEND
 [Red Box] HOUSEHOLDS
 [Blue Box] POPULATION
SOURCE
 BARASAT MUNICIPALITY, 2005

NO. OF HOUSE HOLDS IN STUDY AREA OF BARASAT MUNICIPALITY



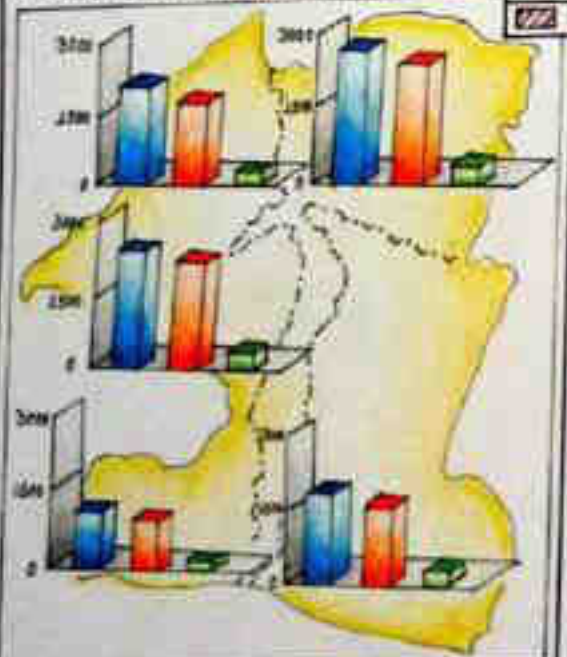
LEGEND
 [Red Cube] NO. OF HOUSEHOLD
SOURCE
 PRIMARY CENSUS ABSTRACT, N. 24 PARGANA DISTRICT, 2001

GRAPHICAL SCALE
 1 CM TO 50 HOUSEHOLD

STUDY AREA OF BARASAT



TOTAL, MALE & FEMALE WORKERS IN STUDY AREA OF BARASAT MUNICIPALITY

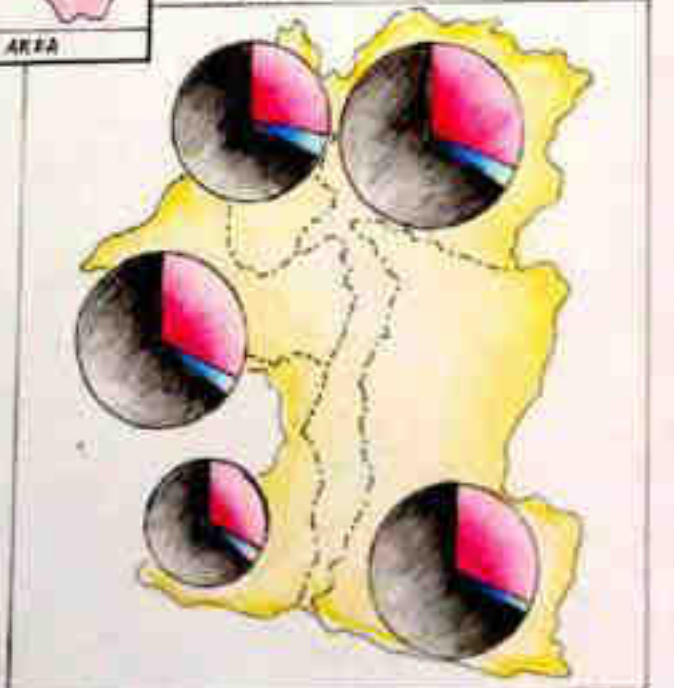


WORKERS
SCALE : 1 CM TO 1500 MALE, FEMALE & TOTAL WORKERS

LEGEND
 [Blue Box] TOTAL POPULATION
 [Orange Box] MALE POPULATION
 [Green Box] FEMALE POPULATION

SOURCE
 PCA NORTH 24 PARGANA DISTRICT, 2001

DIFFERENT TYPES OF WORKERS IN STUDY AREA OF BARASAT MUNICIPALITY

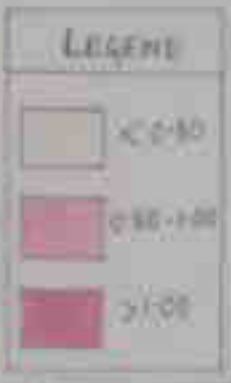


SOURCE
 PRIMARY CENSUS ABSTRACT, NORTH 24 PARGANA DISTRICT, 2001

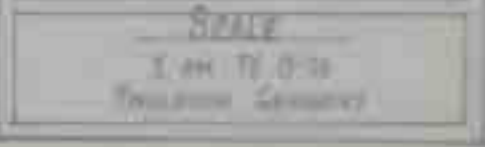
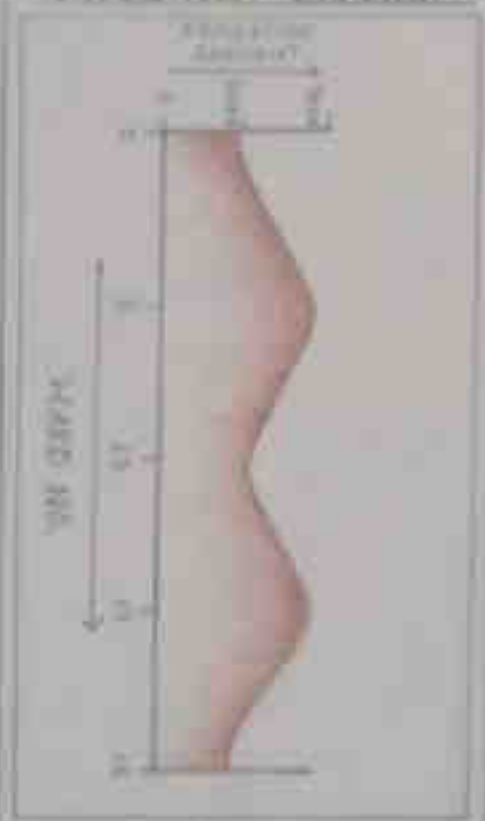
LEGEND
 [Pink Triangle] MAIN WORKERS
 [Blue Triangle] MARGINAL WORKERS
 [Grey Triangle] NON-WORKERS

SCALE
 1 CM TO 40 WORKERS

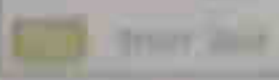
POPULATION GRADIENT ZONE
(AFTER COLLIER & CLARK, 1950)



TRAIL OF
POPULATION GRADIENT



STUDY AREA OF
BARRETT



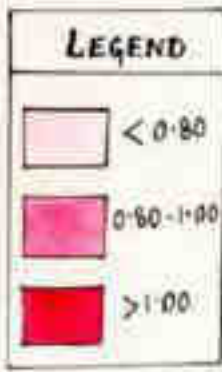
TRAIL OF
POPULATION DENSITY



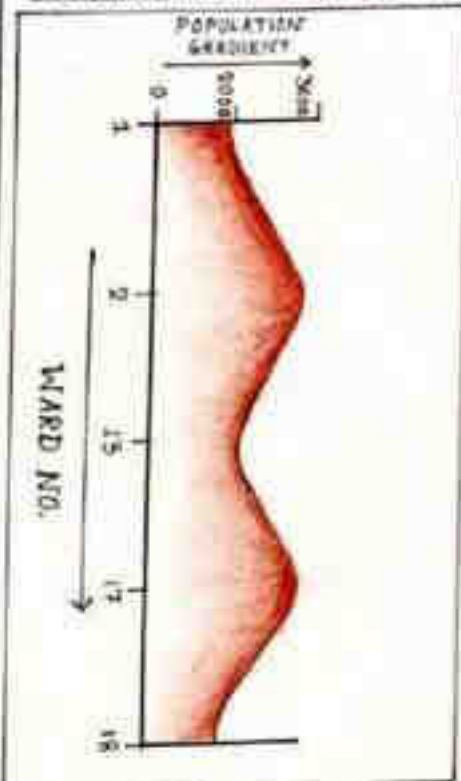
POPULATION DENSITY ZONE
(AFTER COLLIER & CLARK, 1950)



**POPULATION GRADIENT ZONE
(AFTER COLLIN & CLARK, 1950)**



**TREND OF
POPULATION GRADIENT**



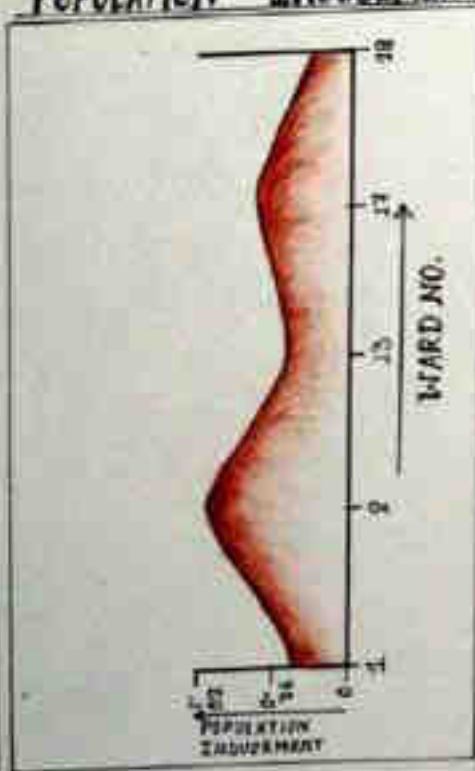
SCALE
1 cm TO 0.76
POPULATION GRADIENT

**STUDY AREA OF
BARASAT**



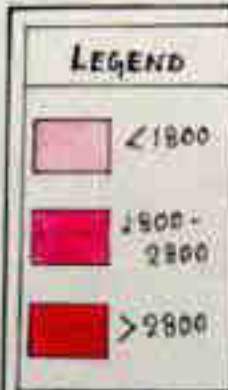
STUDY AREA

**TREND OF
POPULATION INDUCEMENT**



SCALE
1 cm TO 1000
POPULATION INDUCEMENT

**POPULATION INDUCEMENT ZONE
(AFTER COLLIN & CLARK, 1950)**



The bar graph shows the literate and illiterate population of the study area. Highest literacy was found in ward 13 (81.6%) followed by ward no. 2 and 7 (78.3% and 77.9%). The lowest literacy was found in ward no 1 (68.08%) followed by ward no. 18 (69%). However the male literacy rate of these ward was more or less than 52% to 53% whereas female literacy rate were 46% to 47%.

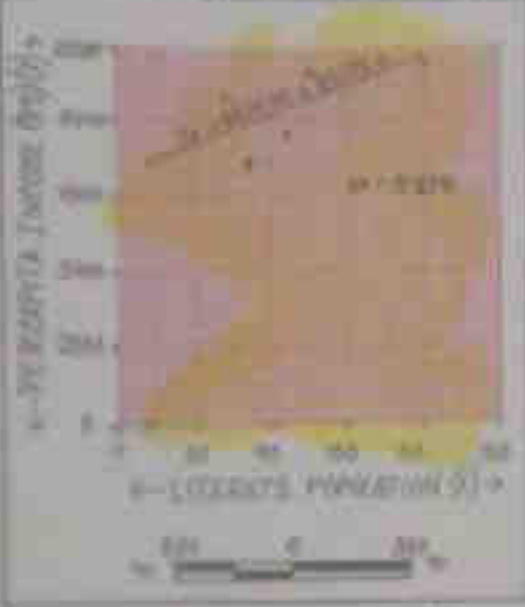
3.3 OCCUPATIONAL STRUCTURE AND CONCENTRATION OF INCOME :-

In terms of working force Barasat has 33.05% of her population enlisted as workers (2011). This figure is slightly higher than all India average of working force of 32.25%. This rate is slightly lower than the average figure of West Bengal which is 33.85%. The figure for classification of workers of Barasat Town is as follows -

- Agricultural Workers - 806
- Household Workers - 1638
- Other Workers - 74073

This statistical data shows that 'other workers' have the maximum strength of livelihood occupation. It is followed by occupation in household worker and agricultural workers.

RELATION BETWEEN LITERATE POPULATION & STREET VENDORS



LITERATE - ILLITERATE POPULATION OF STUDY AREA



MAPS AND DISTRICTS IN STUDY POPULATION BY S.D.



STUDY AREA IN ZONES



PERCEPTION OF SELLING ENVIRONMENT



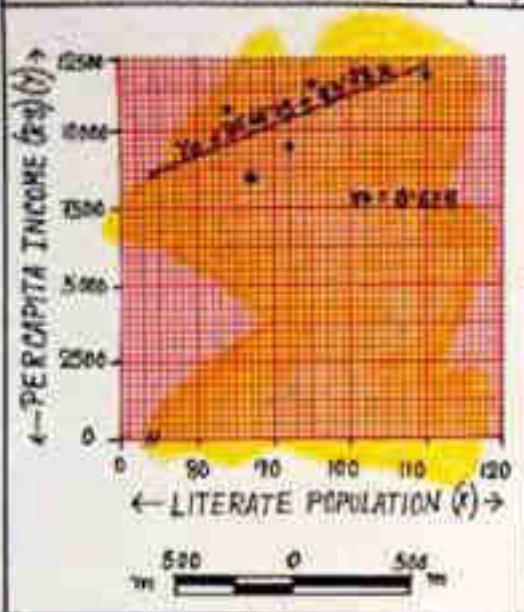
LITERACY HIERARCHY



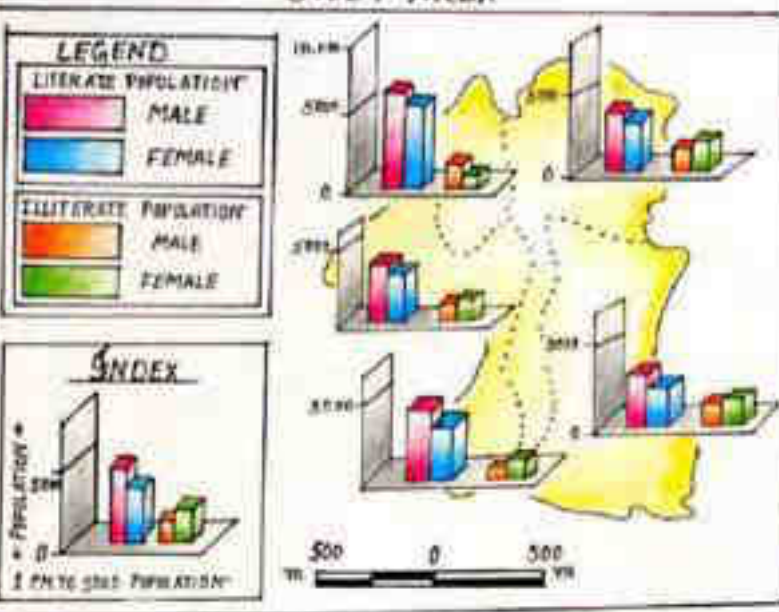
HARD WISE LEVEL OF EDUCATION



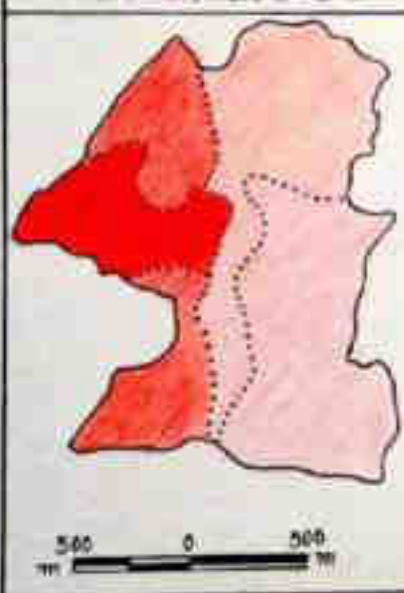
RELATION BETWEEN LITERATE POPULATION & PERCAPITA INCOME (RS.)



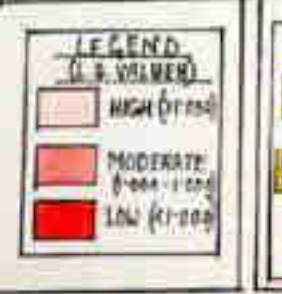
LITERATE - ILLITERATE POPULATION OF STUDY AREA



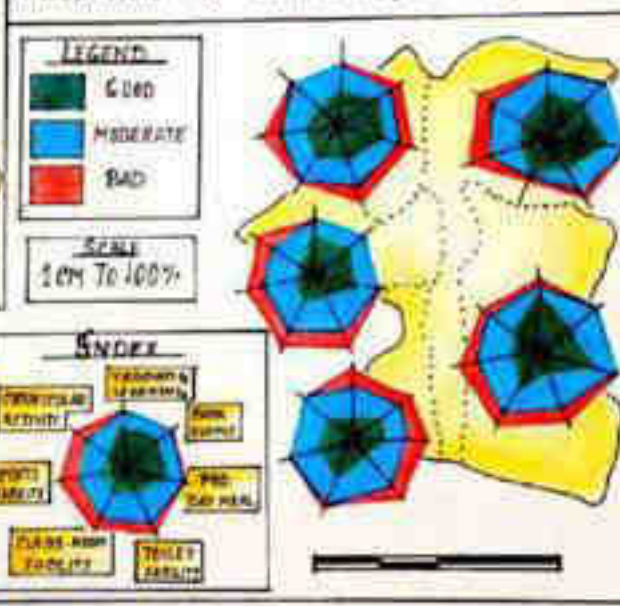
WARD WISE DISPARITY IN LITERATE POPULATION BY L.O.



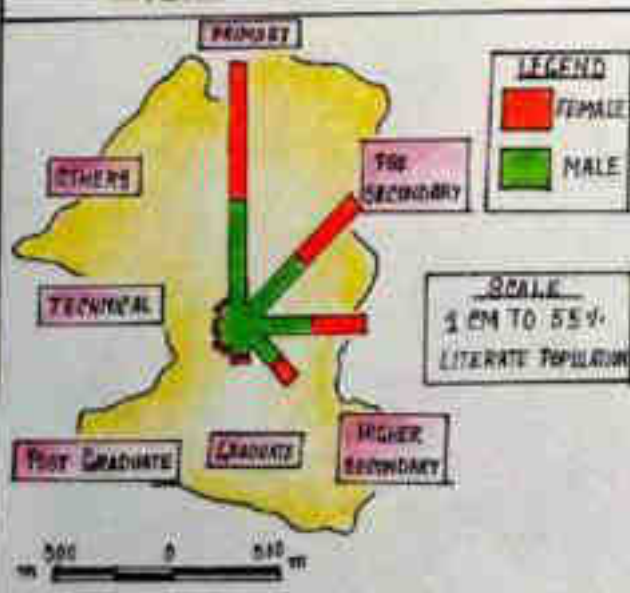
STUDY AREA OF BARRAKH



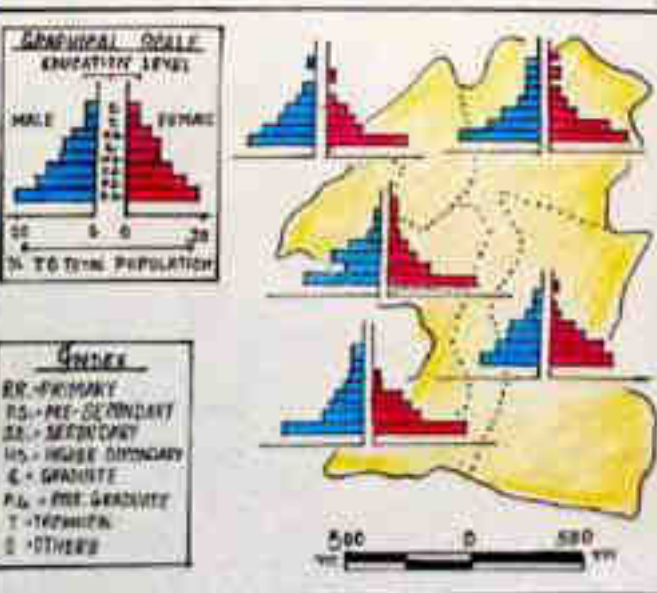
PERCEPTION OF SCHOOLING ENVIRONMENT



LITERACY HIERARCHY



WARD WISE LEVEL OF EDUCATION



CHRYSLER MAP

SHOWS THE DIVISIONS OF INDIA BY STATES

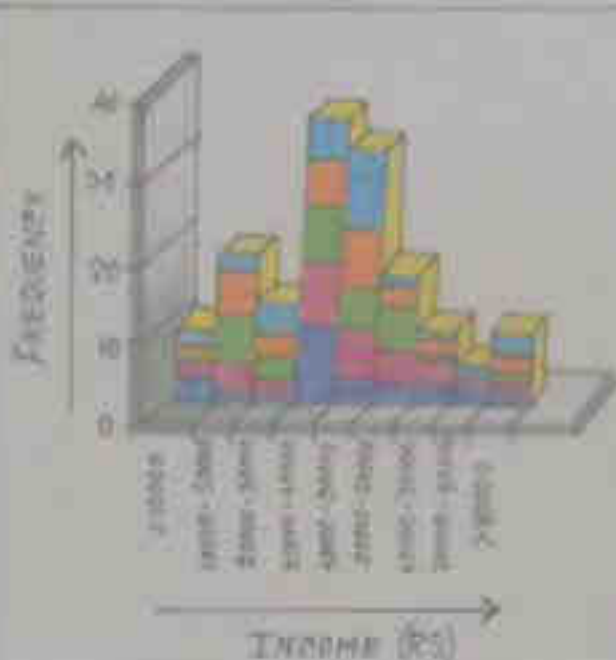


LEGEND
DIVISIONS OF INDIA

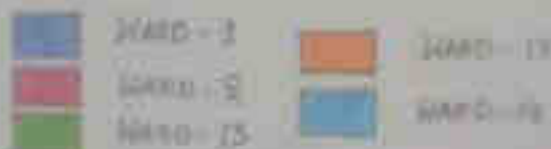


BAR DIAGRAM

SHOWING THE LEVEL OF INCOME

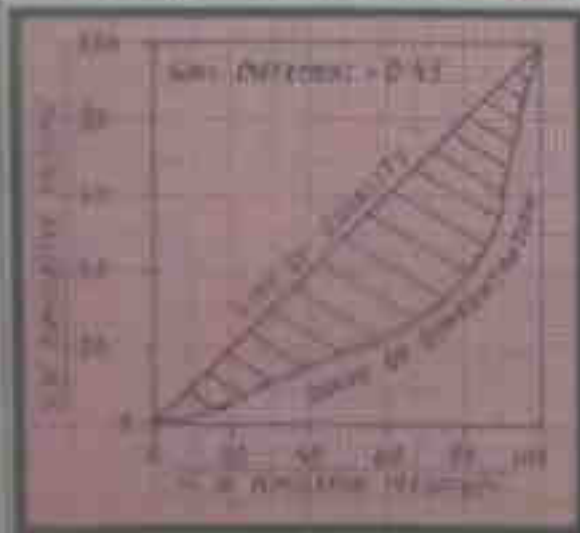


LEGEND



LORENZ CURVE

SHOWING THE CONCENTRATION OF INCOME



SCALE

VERTICAL SCALE 1 CM TO 20% POPULATION
HORIZONTAL SCALE 1 CM TO 20% POPULATION

TITLE



AREA OF CONCENTRATION

SCATTER DIAGRAM

SHOWING THE RELATIONSHIP BETWEEN INCOME & FAMILY SIZE



SCALE

VERTICAL SCALE 1 CM TO 10% FAMILY SIZE
HORIZONTAL SCALE 1 CM TO 20% MONTHLY INCOME

LEGEND



CHOROPLETH MAP

SHOWING THE PERCAPITA INCOME BY WARDS

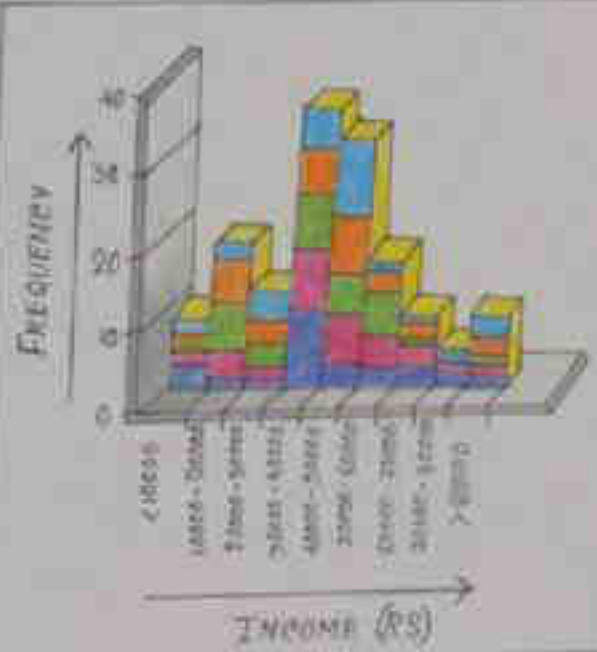


LEGEND
PERCAPITA INCOME (RUPEES)



BAR DIAGRAM

SHOWING THE LEVEL OF INCOME

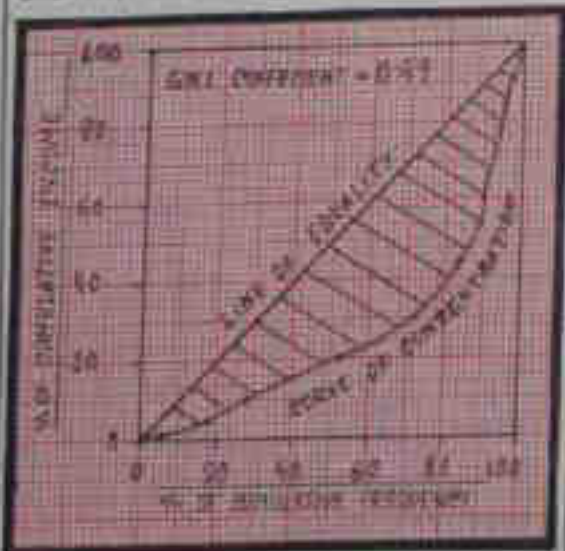


LEGEND



LORENZ CURVE

SHOWING THE CONCENTRATION OF INCOME



SCALE

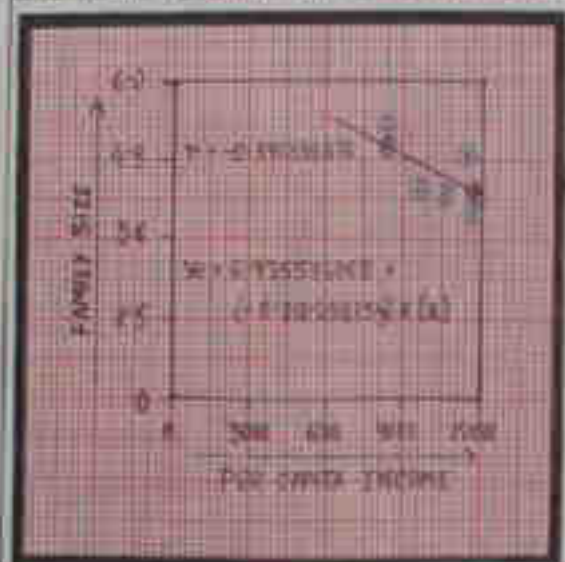
VERTICAL SCALE 1 CM TO 20% CUMULATIVE INCOME
HORIZONTAL SCALE 1 CM TO 20% CUMULATIVE FREQUENCY

INDEX



SCATTER DIAGRAM

SHOWING THE PERCAPITA INCOME & FAMILY SIZE



SCALE

VERTICAL SCALE 1 CM TO 15 FAMILY SIZE
HORIZONTAL SCALE 1 CM TO 300 PER CAPITA INCOME

LEGEND



SOURCE : SEN & GUPTA (2018). ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY INTERNATIONAL JOURNAL OF MANAGEMENT, - 5(2) 9-5-10 2

In these wards about 48.8% household earn below Rs. 10,000/- month and only 10.4% household earn above Rs. 50,000/month. There have tremendous income disparity in cultivation induced area and business and commerce induced area.

The workforce participation rate in these wards in 2011 is 56.73%. The male participation rate is 61.71% and the female rate is significantly lower at 38.29%.

3.4 HOUSEHOLD SOCIO-ECONOMIC CHARACTERISTICS :-

After partition of India in 1947 Kolkata, the capital of West Bengal, became very much overloaded with the influx of refugees population from erstwhile East Pakistan, now Bangladesh. Kolkata's agriculture-based hinterland suffered a lot.

Kolkata Metropolitan Development Authority's jurisdiction extends over 1500 sq. kms. It includes three Corporation 31 Municipalities (including Barasat, the study area), 2 Notified Area Authorities and 172 rural units. The population is around 11 million. KMDA as an area is meant of development of Kolkata and adjoining areas and hence is not an administrative area by itself. It covers entire Kolkata district, part of North 24 Parganas district and of South 24 Parganas district, part of Hugli district and of Haora District. The Hugli river bifurcates it in the middle.

The study reveals the continuous increase of decadal population in Barasat Town (1941-11230, 1951-16027, 1961-27281, 1971-42642, 1981-66504, 1991-102660). Most noteworthy thing is that this excessive population pressure on this town compelled the local municipality to extend its area and hence the numbers of the wards reached 30 from previous 6. This rapid population inflow is due to the partition of India in 1947. People from erstwhile East Pakistan started coming to the place where their relatives or acquaintances lived.

Lastly, the functional status of urban centres of the district will be discussed. Area of the district is 4094 sq km (rural 3658.11 sq. km. urban-435.89 sq. km). The district consists of 4 sub-divisions, 22 community development blocks, 33 police stations and 414 mouzas, 1 zila parishad, 22 panchayat samiti and 218 gram panchayats. There are 59 towns of different categories. Barasat town is the district head-quarter.

Household socio-economic characteristics of the study area show some peculiar characteristics. - These are -

- 1) The average household size is almost 4 and nearly 82% of the household are nuclear.
- 2) The sex ratio observed was 850/1000 male population and 38.29% females were in the working category.

3/ In terms of occupational pattern, 30% were engaged in Trade and Commerce and 42% were engaged in other services.

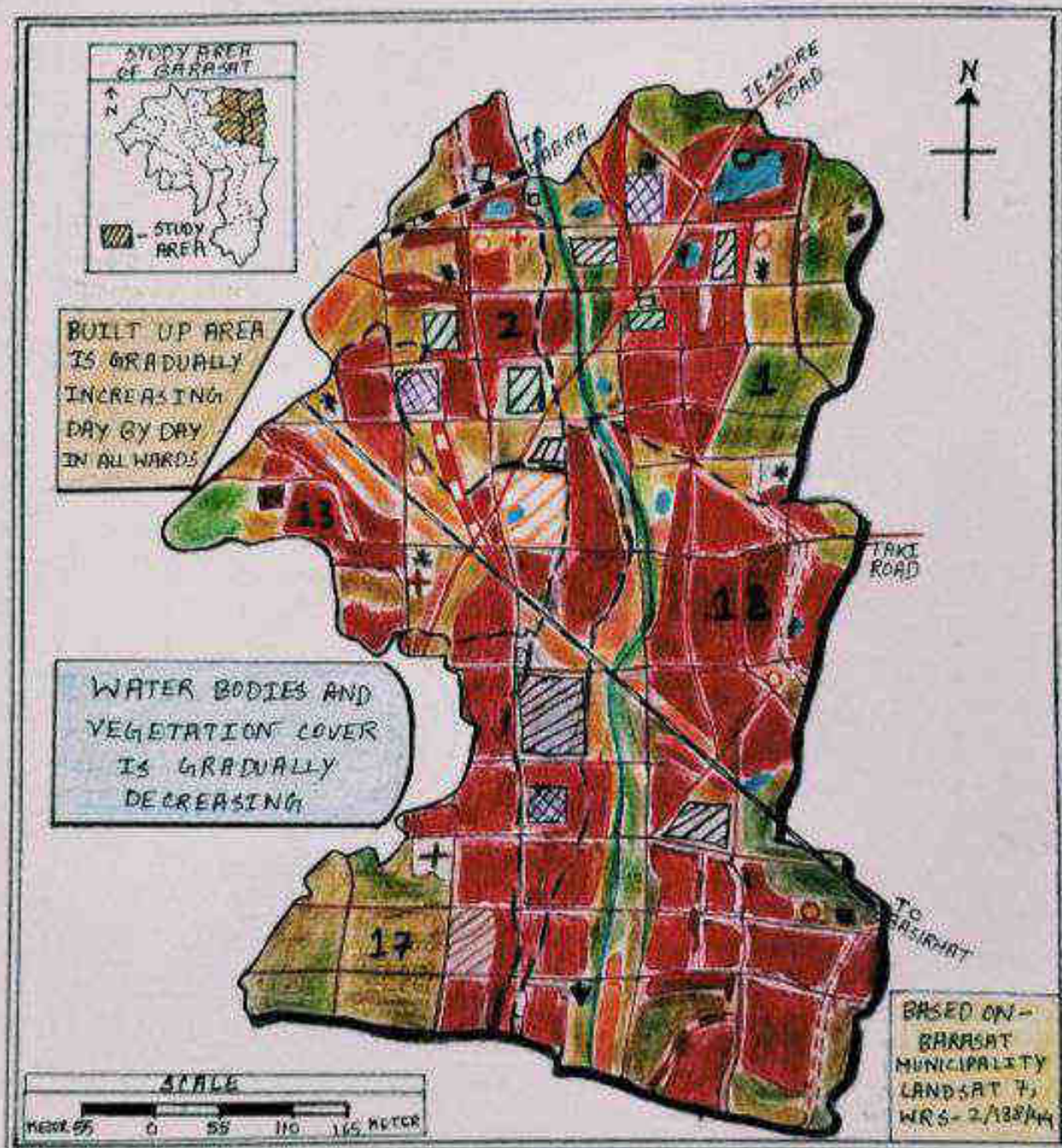
3.5 LAND USE AND LAND COVER :-

The land use pattern of a town / city is the functional interaction of human activities related to urbanised and other part of the town / city. To prepare master plans or revised plans it needs analysis and mapping of the whole land use for town and cities. Land use maps are, therefore, very important for any development project concerning the town.

Barasat is the non-industrial administrative headquarters town of the North 24 Parganas. Before 1995 there were only 15 wards in this town. Thus 15 more wards were added from Nabapalli Panchayat area, Ramkrishnapur and some other villages. After re-grouping of the 30 wards of Barasat municipal town it covers an area of 28.62 sq. km with a population size of 164634. The following use zone of the study area is classified and is shown in the map.

- (a) Residential
- (b) Recreation
- (c) Administrative
- (d) Agriculture / open space
- (e) Water bodies

LAND COVER AND LAND USE PART OF BARASAT MUNICIPALITY



LEGEND	
<p>LAND COVER</p> <ul style="list-style-type: none"> RIVER/NALA WATER BODY GREEN SPACE 	<p>LAND USE</p> <ul style="list-style-type: none"> STATE HIGHWAY OTHER METALLED ROADS UNMETALLED ROADS CONCRETE ROAD RAILWAY LINE (MAIN) RAILWAY LINE (BRANCH) HOMESTEAD AND BUILT UP AREA AGRICULTURAL LAND BUSTEE AREA OPEN SPACE
<p>URBAN SERVICE CENTRES</p> <ul style="list-style-type: none"> CLUB PARK PLAYGROUND PRIMARY SCHOOL SCHOOL / COLLEGE HEALTH CENTRE MARKET POST OFFICE BURIAL GROUND 	

(a) RESIDENTIAL :-

Maximum part of the selected ward consists of the residential areas. Previously Barasat town was exclusively in the eastern side of the Sealdah - Bongaon railway line. It was the main residential part of the town. The typical old type houses are found here. After partition of India people from erstwhile East Pakistan came to Barasat and settled mainly in the western part of the town along the Sealdah - Bongaon railway track. Gradually they grabbed the vacant lands away from the railway.

(b) RESIDENTIAL AND COMMERCIAL :-

Adjacent to the important roads a few residential - cum - commercial areas are found. It seems that some building owners rent one or two floors for commercial purpose and they live in another floor. In this town, such type of land use is found in ward number 2 and ward number 17.

(c) ADMINISTRATIVE :-

The main administrative buildings are located at ward no. 1. The criminal court, the civil court, zilloparishad office, D.M.'s office are located in this ward. Jail and District Library is also located in this ward.

(d) AGRICULTURAL / OPEN SPACE :-

Primarily before the expansion of the town, most of the area of the town was occupied by agricultural fields and the main economy was based on agriculture. Then Barabati was an agrarian town. After the partition of India, migratory refugees came here and settled on these agricultural fields and open spaces.

(e) WATER BODIES :-

Once upon a time the region was a part of the Sundarbans and was covered with marshes, swamps, and mangroves. Afterwards reclamation was done for settlement, Suti Nadi was an important channel. Due to misuse for this river its course became blocked in some places. Plan was taken to rejuvenate this river but no action has been taken till today.

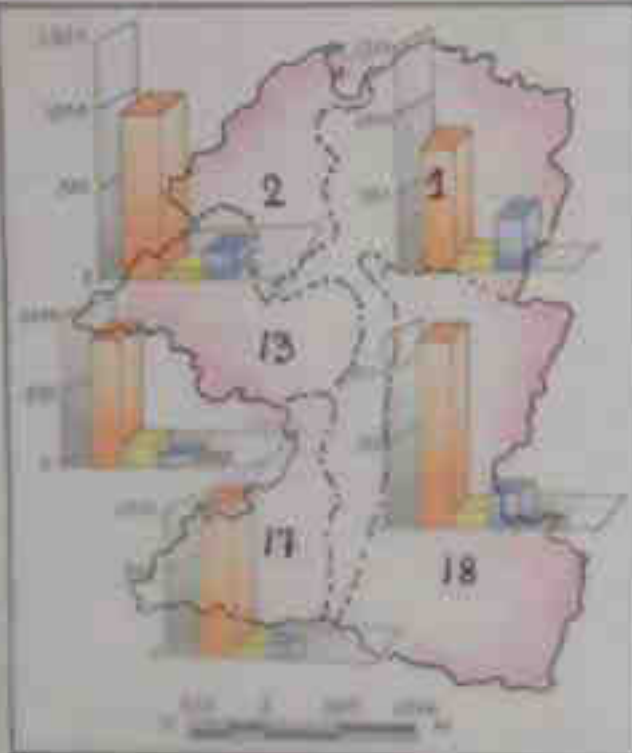
3.6 SOLID WASTE, DRAINAGE AND SEWERAGE :-

Municipal dumping ground for solid waste disposal is in north-eastern corner of the town.

The only municipal drain flowing through the core of the town has no outlet to the south, which causes

overflow of this drain water in the surrounding agricultural fields. Noida Basin and Suti Basin cover the

CATEGORICAL OF TUBEWELL DISTRIBUTION



HARD-USE CONCENTRATION OF WATER TAP CONNECTION



LEGEND

Orange	TUBEWELL
Yellow	DEEP TUBEWELL
Purple	SURFACE WELL
Red	WELLS



LEGEND

Green	WARD-2	Yellow	WARD-2
Pink	WARD-13	Blue	WARD-17
Orange	WARD-18		

HARD-USE CONCENTRATION OF TUBEWELLS



PIEZOMETRIC LAYER OF STUDY AREA



LEGEND

NO. OF TUBEWELLS

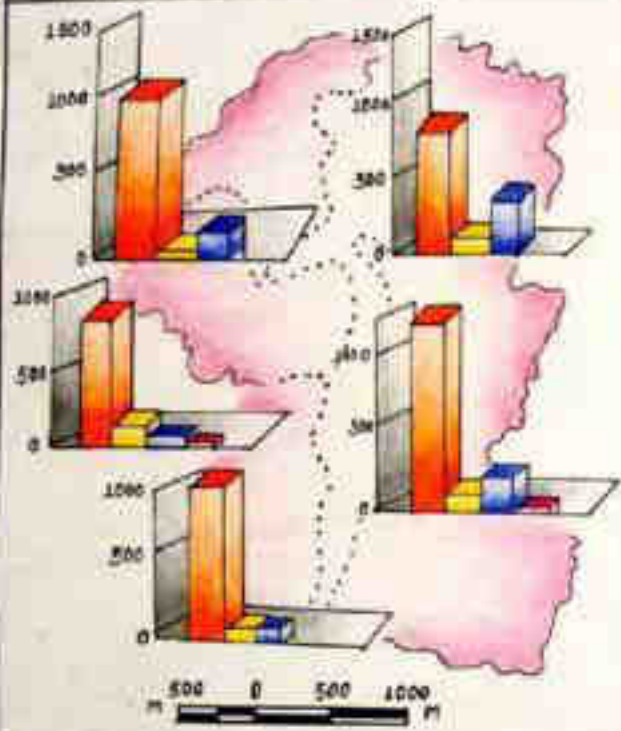
Light Blue	< 100
Medium Blue	100 - 150
Dark Blue	> 150

LEGEND

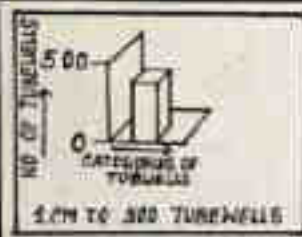
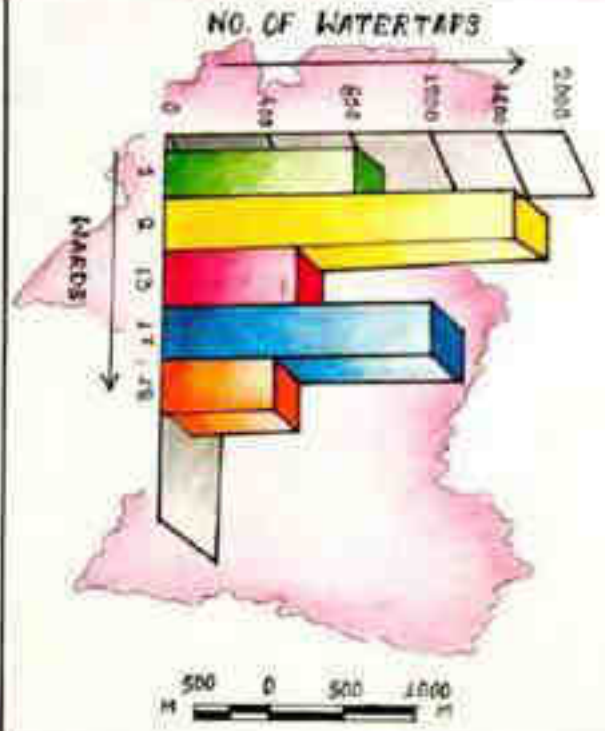
PIEZOMETRIC LAYER (METER)

Light Blue	500
Dark Blue	400

CATEGORIES OF TUBEWELL DISTRIBUTION



WARD-WISE CONCENTRATION OF WATER TAP CONNECTION



LEGEND

- TUBEWELL
- DEEP TUBEWELL
- SUBMERSIBLE PUMP
- WELL



LEGEND

- WARD-1
- WARD-2
- WARD-13
- WARD-17
- WARD-18

WARD-WISE CONCENTRATION OF TUBEWELLS

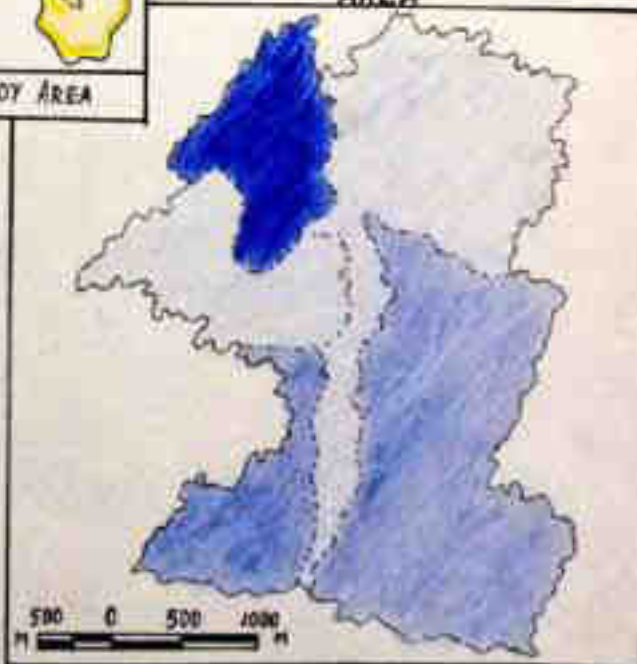


LEGEND

NO. OF TUBEWELLS

- <1265
- 1265 - 1600
- >1600

PIZOMETRIC LAYER OF STUDY AREA

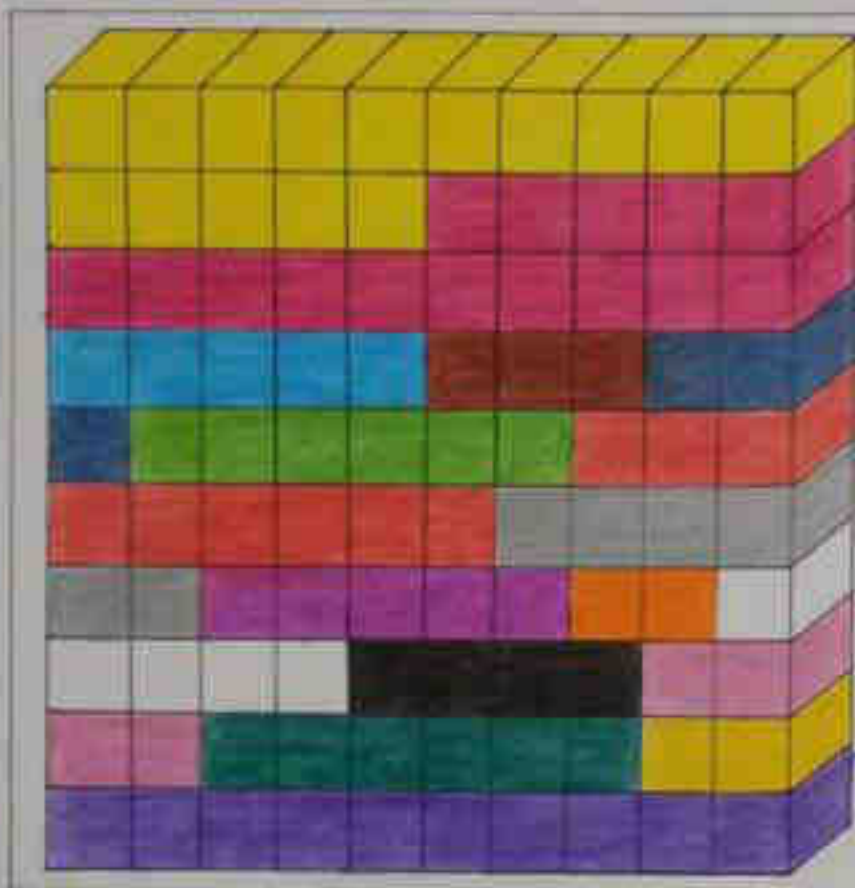


LEGEND

PIZOMETRIC LAYER (METER)

- 300
- 400

MAJOR SHOPS OF STUDY AREA, BARASAT MUNICIPALITY



- LEGEND**
1878 7 25 2008
- FOOD SHOP
 - GARMENTS
 - JEWELLERY
 - WATCH
 - OPTICAL
 - ELECTRONICS
 - PHOTOCOPY & PRINTING
 - PHARMACY
 - FURNITURE
 - BAG SHOP
 - APPAREL
 - HAIRDRESSING
 - MOBILE SHOP
 - GENERO
 - SHOE
 - OTHERS

SOURCE: SEN A. GUPTA (2010) FINDING EXISTENCE OF STREET VENDORS & THEIR ROLE IN URBAN ECONOMY. INTERNATIONAL JOURNAL OF MANAGEMENT, 2(10)-32-35

DOMINANCE OF AREA OF DIFFERENT TYPES OF SHOPS



wastewater and the eastern part of the study area and control the drainage system of the area. In the absence of any underground sewerage line the sanitary system consists mostly of service pipes, pit latrines and also few septic tank latrines.

3.7. MOVEMENT OF PEOPLE AND COMMODITIES BETWEEN BARASAT AND KOLKATA :-

Barasat is only 25 km away from Kolkata. Railway and roadways bring these two towns nearer. These two towns are easily approachable now a days, it is a daily picture that daily commuters travel in between these two points for various services, business and other purposes. Through Sealdah station by train people as well as commodities and goods come from Kolkata to Barasat and vice versa. Kolkata sends through roads and railways mineral oil, coal, iron and steel, machinery, households provisions, medicine food grain and sugar to Barasat. Kolkata in turn receives milk, "khana", "phanna", biscuit, building materials, vegetables, fish and fruits, jute etc. from Barasat. Thus, economically Barasat is to depend on Kolkata. Again Barasat, being the entry point from northeast of KMDA area, the agro products of hinterland of Bangladesh are collected at Barasat and subsequently supplied back to mult

the demands of Kolkata Market. According to eastern railway authority during 1995-96 a total no. of outwards passengers from Basant station to Kolkata was 4486345. It was 13682161 during 1996-97.



CONCENTRATION OF STREET VENDORS

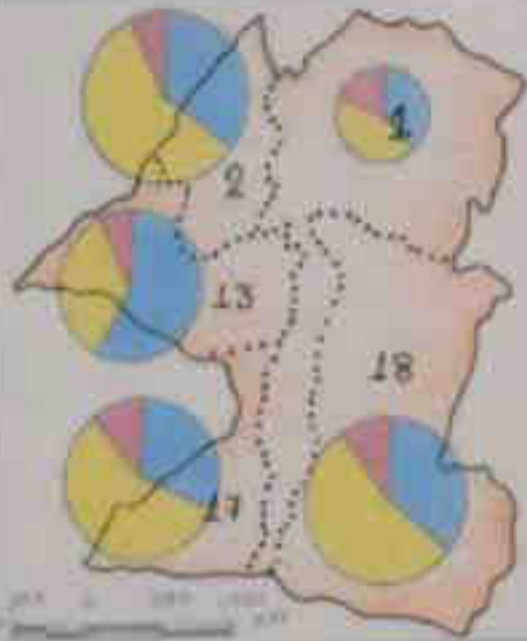


MAP SCALE

LEGEND



ECONOMIC STATUS OF CONCENTRATION OF STREET VENDORS



MAP SCALE

LEGEND



CONCENTRATION SCALE



STUDY AREA OF BANGKAT



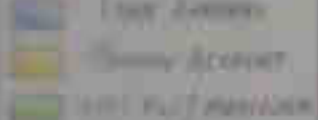
STUDY AREA

ECONOMIC STATUS OF INHABITANTS



MAP SCALE

LEGEND



SOCIAL SECURITY INDEX

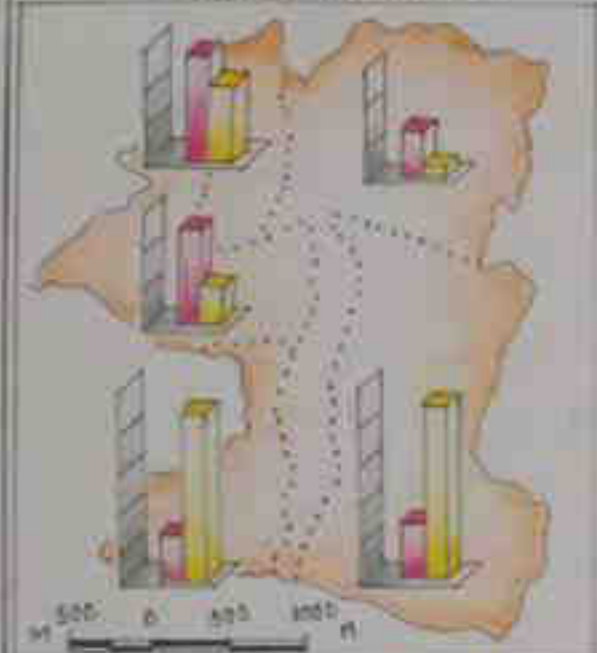


MAP SCALE

LEGEND



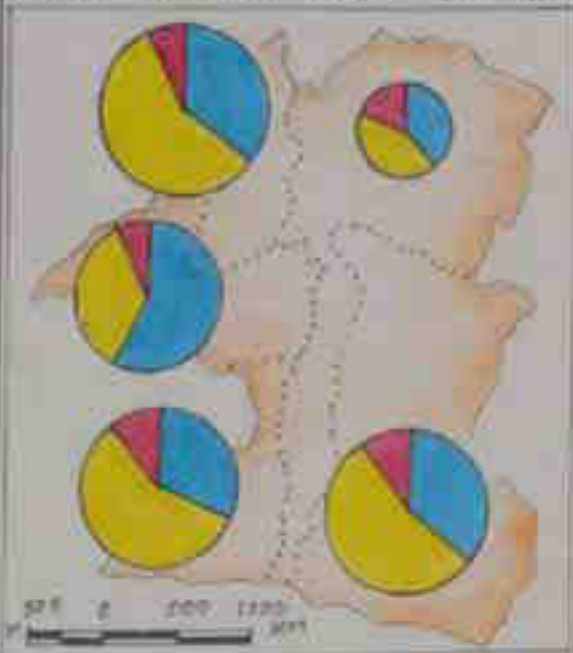
CONCENTRATION OF STREET VENDORS



GRAPHICAL SCALE
 No. of Street Vendors
 Scale: 1 cm = 10 vendors

LEGEND
 LOCAL VENDORS (pink)
 MIGRATED VENDORS (yellow)

ECONOMIC STATUS OF CONCENTRATION OF STREET VENDORS



LEGEND
 EDUCATION (blue)
 FRUGALITY (yellow)
 MONEY CUTS/WITH HOLD (pink)
 (light blue)

GRAPHICAL SCALE
 Scale: 1 cm = 50 UNIT



ECONOMIC STATUS OF INHABITANTS



GRAPHICAL SCALE
 No. of Inhabitants
 Scale: 1 cm = 1000

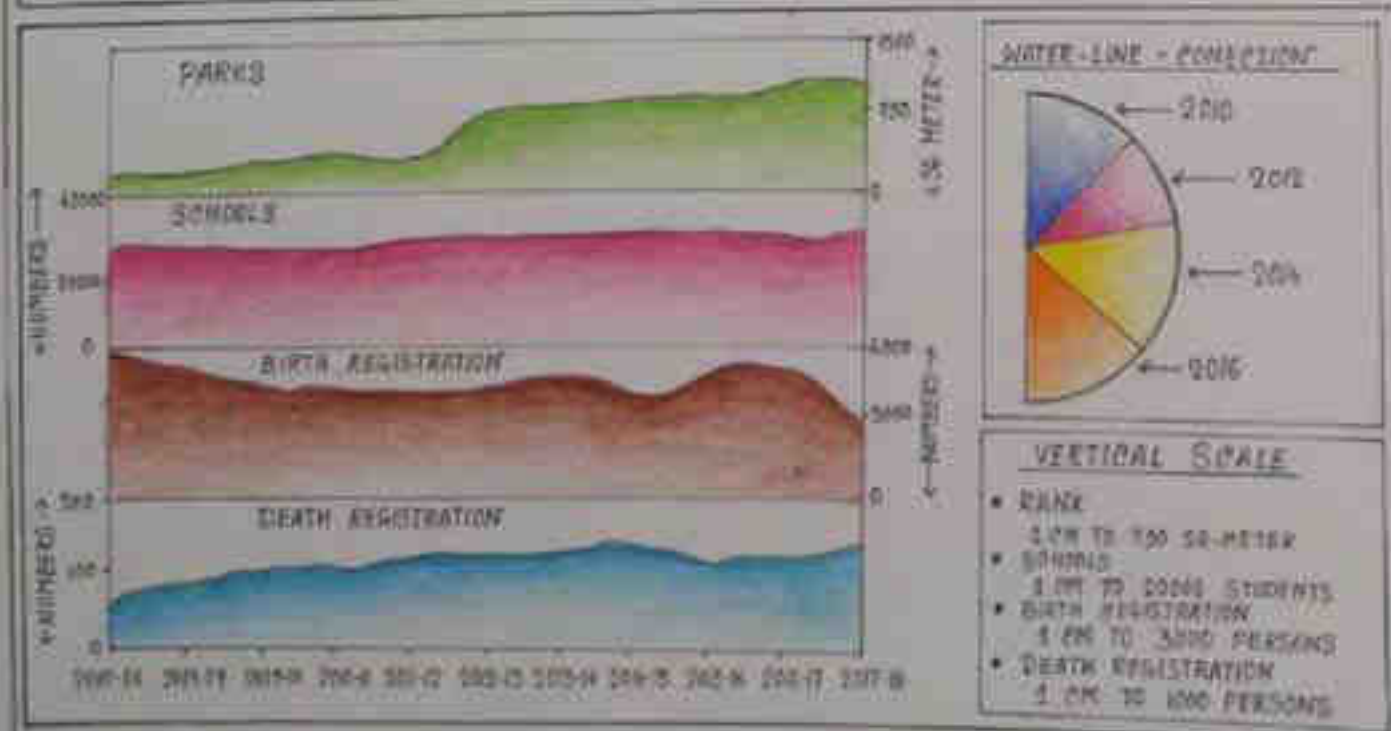
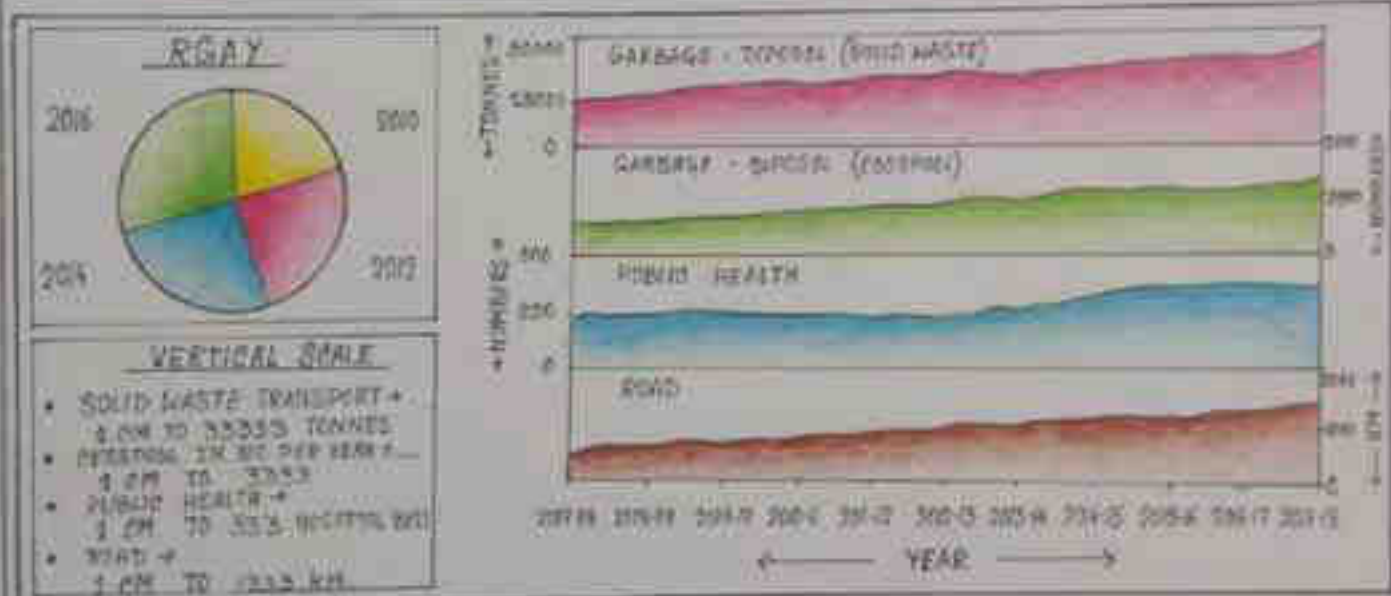
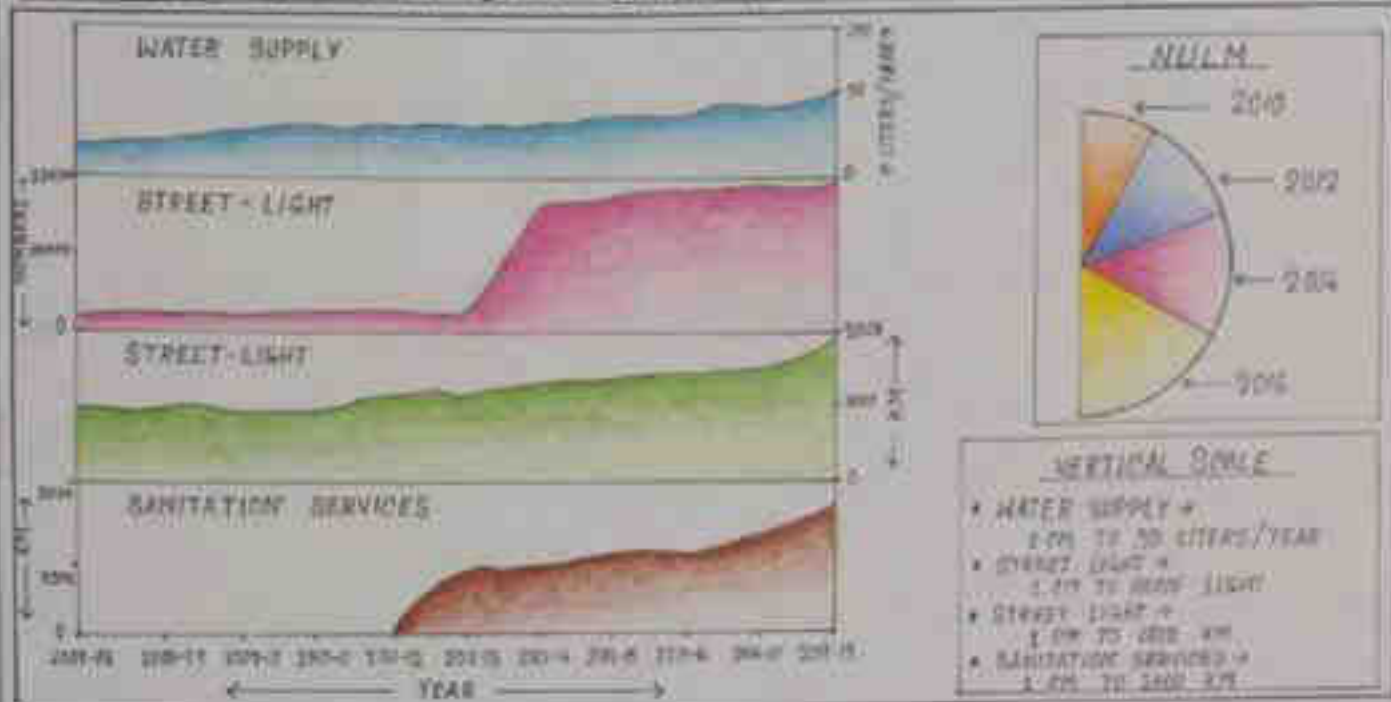
LEGEND
 LOAN EARNERS (blue)
 SAVINGS ACCOUNT (yellow)
 HIGH/LOW/MEDIUM (green)

SOCIAL SECURITY INDEX



LEGEND
 < 0.500
 0.510 - 0.600
 0.600 - 0.650
 > 0.650

DEVELOPMENT OF CIVIL & SOCIAL SERVICE FACILITY IN THE STUDY AREA



SOURCE : BARADAT MUNICIPALITY

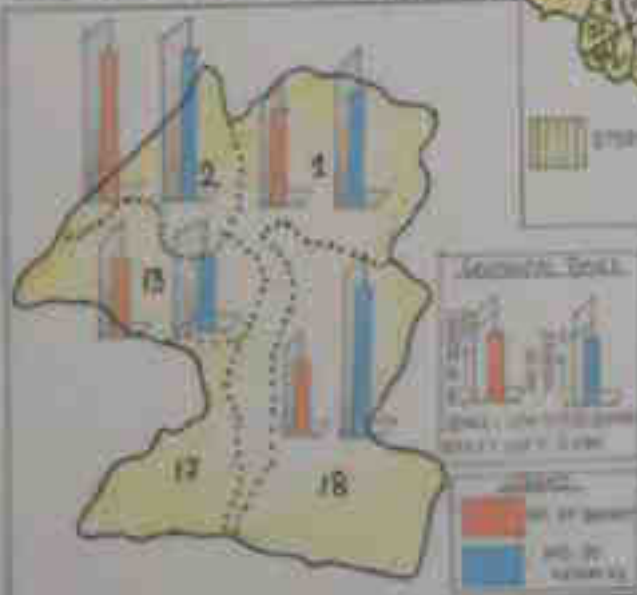
COMPOSITE INDEX OF DIFFERENT ENVIRONMENTAL PLANNING (AFTER FENDAL)



PERIODS ENVIRONMENTAL PLANNING



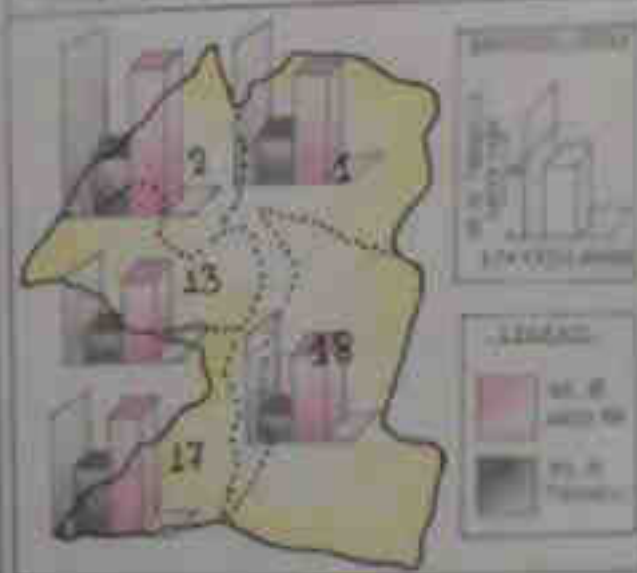
NO. OF TRUCKS & VEHICLES FOR TRASH WASTE, STUDY AREA, SARAGAT



GENERATION & COLLECTION OF SOLID WASTE COLLECTION STUDY AREA, SARAGAT



NO. OF HOUSEHOLD & WATER TAP CONNECTION OF STUDY AREA OF SARAGAT



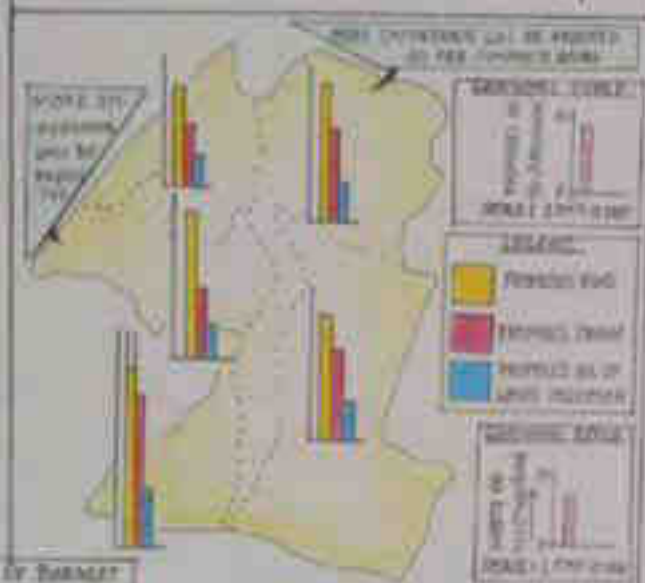
WATER DEMAND & WATER SUPPLY OF STUDY AREA OF SARAGAT



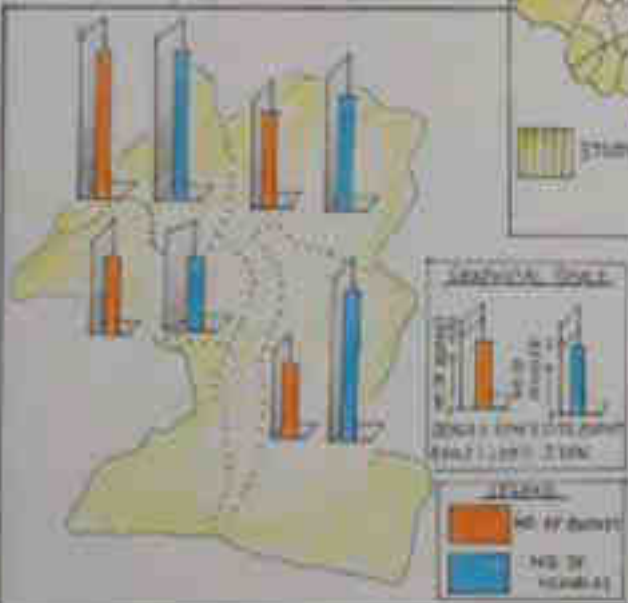
COMPOSITE INDEX OF DIFFERENT ENVIRONMENTAL PLANNING (AFTER KENDAL)



PROPOSED ENVIRONMENTAL PLANNING



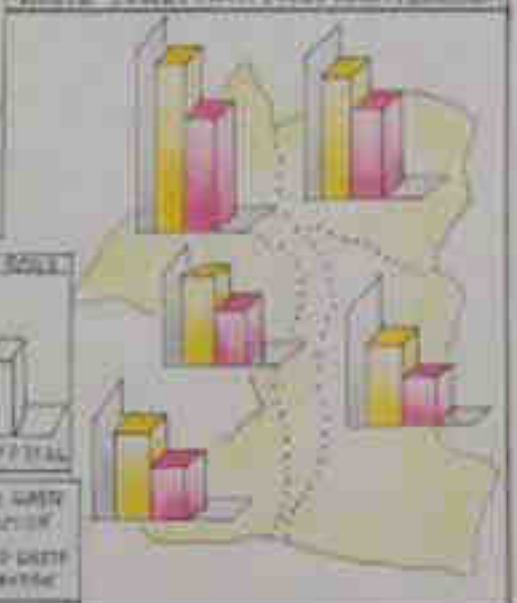
NO. OF BUCKET & VEHICLES FOR SOLID WASTE, STUDY AREA, BARASAT



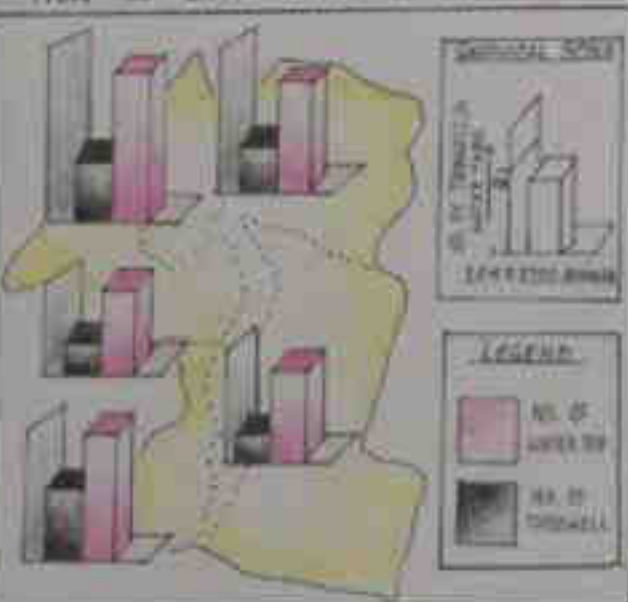
Study Area by Barasat



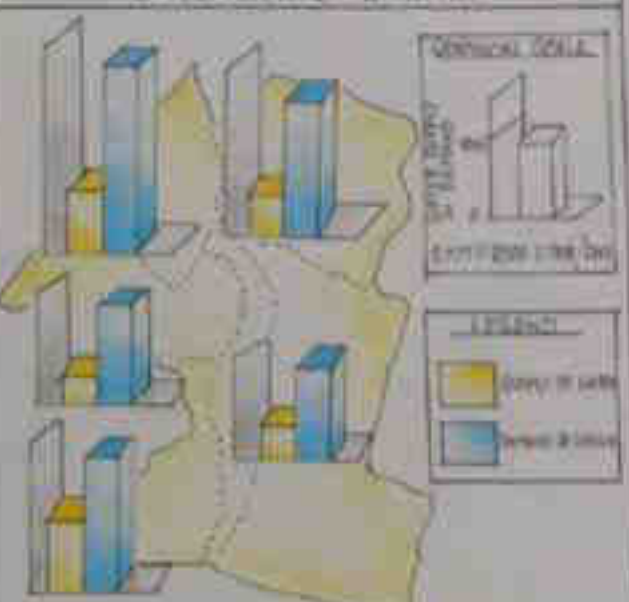
GENERATION & COLLECTION OF SOLID WASTE COLLECTION, STUDY AREA, BARASAT



NO. OF TUBEWELL & WATER TAP CONNECTION OF STUDY AREA OF BARASAT



WATER DEMAND & WATER SUPPLY OF STUDY AREA OF BARASAT



CHAPTER IV

CONCLUSION

The socio-economic as well as physical environmental aspect of Barasat needs attention to the planners. The availability of Urban civic amenities is in primary level and if we want to develop it as a prime tourist spot we should have to give much focus on it. Though the developmental activities create many problems which are localized, yet the interaction between these problems give them a region dimension. Thus the basic purpose of policies concerning environment and development must be concerned to enhance life quality along with satisfaction of human needs. In reality policies to promote anthropogenic ventures and designs to enact them are the former diverting impacts and consequence of anthropo-environmental interactive system, at the junction where far less is known about complexity of environmental system prevailing. In the present work, the measurement and simulation of efficiency has been done in a few geographical problems.

4.1 SWOT ANALYSIS :-

<u>STRENGTHS</u>	<u>WEAKNESS</u>
<ul style="list-style-type: none"> • Barasat is well known for its historical background. • Its pristine history attracts tourists from all over the country 	<ul style="list-style-type: none"> • Lack of developable land. • Lack of Tourism infrastructure.

STRENGTHS

- Good connectivity to neighbouring tourists destination by road.

WEAKNESS

- Increased Pressure on existing infrastructure services.

OPPORTUNITIES

- Potential to restore the built heritage and natural resources to tap high end tourism.
- Excellent potential to develop religious tourism, historical tourism etc.
- Potential for developing residential schools and institutions of higher studies.

THREATS

- Unauthorised construction activities.
- Surrounding areas are prone to land degradation.
- Ground water contamination and increasing water pollution.

The scenario of urbanisation of Barasat Town, began to change faster after declaration of this town as headquarters of the district to North 24 Parganas on March 1986 when the northern part of the then 24 Parganas district got a separate district entity. With this the demographic change also occurred.

4.2 PROBLEMS AND REMEDIES :-

Various problems related to the urban environment of Barasat Town and their possible remedies are as follows -

- (1) In a broader area of the town arsenic is found in the drinking water sample. Barasat I and Barasat II blocks are main arsenic prone areas. The drinking water in the areas around ward no. 18 is susceptible to arsenic contamination in ground water. Local administration admits this problem and the municipality is taking steps to prepare drinking water schemes so that high-grade drinking water can be supplied to the local people.
- (2) There is no underground drain in the municipal wards. Several drains or mallas have no outlet. The main drainage lines are the Sunti, the Noai canal and the Nilganj Canal. These two main canals are flowing by the side of the town. The Sunti River being choked by bhesias and silts, is unable to drain the excess water. Sometimes backflow occurs to create nuisance. The fishing owners obstruct the natural channel at many places for their use. So, water logging is the main problem of the town and till today no solution is found out.

- (3) According to local authority, sometimes communications gap is formed in the administrative work as most of the state government offices are placed in different areas in a scattered manner. These offices work mostly from rented houses which are in a pathetic state.
- (4) The only stadium of this headquarters town is incomplete. The construction started in 1982. During last year, only a portion of the gallery has been constructed which can accommodate nearly 10000 people. The state government and some organization had allotted ₹ 1.5 crore for the construction of this stadium. Despite that the construction work of the stadium stopped in the midway due to severe fund crunch, said the D.M. it was told that this stadium would be so designed that both athletics and outdoor games like football and cricket can be played.
- (5) Most of the 30 wards of 198 years old Banasat municipality get under the stagnant water during rainy season every year. Thousands of families have to live in water logged areas month after month. Lack of better sewage system helps this situation getting worsened more.
- (6) Road condition in the town is awfully bad. Big potholes are found in Champadali crossing, KP Basu Road, part of Jassow road and many other important roads. Thousands

of cars ply on these roads during day and night. Some heavy vehicles playing on these roads cause damage and these potholes filled up with rain water curable small ponds of tanks.

- (7) The waste water compounded with dangerous of one hand board factory situated in ward no. 14 mixes with water of the existing canal makes hazards to the local people.
- (8) The town has some open spaces and some agricultural space in its peripheral belt. These may be kept as green belt of this town. Alike china grass could have been grown in these spaces which can provide a certain part of required food products of the town. This green belt can balance the environmental level of the town.
- (9) The position of the national highway passing through the congested CBD area of the town creates problems of traffic congestion and accidents caused by the vehicles moving at high speed.
- (10) The various public / semi public institutions including school, college, hospital, health center, cinema, park, hotel etc and utility service e.g. water supply, drainage / sanitation, illumination, fire fighting etc. should be maintained and strengthened keeping in conformity with town planning norms.

for a better urban environment.

(ii) Further development of Barasat town could be taken up in three perspectives:

(a) Planning of the CBD area lying in ward no. 1 on a top priority basis,

(b) the intermediate zone planning in a proper phased way and

(c) the outlying zone planning including the agricultural/open areas with a policy approach.

(19) Since, Barasat is a district headquarters town, it is expected that the town should have proper functional interaction with the district as a whole, so that the economy of the town develops further in fruitful way.

(20) The further population of Barasat town was likely 2,78,435 in 2011. It means the town will attain a density of 19973 which is not alarming. However to accommodate the extra population, policies for housing and other infrastructures have to be formulated keeping in view the existing open spaces so that a balanced density is achieved within the wards of the municipality.

- (14) To keep pace with modern computer technology, it is suggested that a computer cell be developed at the Barasat Municipality to be equipped with GIS software's and hardware for creating computerized data bases with regard to property mapping of urban land uses along with details of supporting attribute data for scientific assessment of property taxes and for all round spatial development of Barasat town in the new millennium.
- (15) During monsoon there is often a mixing of septic tank effluent, night soil and industrial waste which find their way into the drainage system.
- (16) As regards the health facilities, the condition is quite warse. The existing sub divisional hospital at Barasat should be elevated to the hospital level.
- (17) A Vocational Training Center is proposed to be set up for the poor people of Barasat. This center can train people for various activities including earning on food stuff, different artwork, embroidery, mat making etc.
- (18) The existing Kora Beel could be preserved for drainage purpose. Also it should be development for pisciculture. A recreational spot is proposed to be developed by the side of Koral Beel.

PHOTOGRAPHS

PARKS



FOOTBALL STADIUM



BARASAT STADIUM



BARASAT STADIUM



VIDYASAGAR KHANDRA



BARASAT STADIUM

HOSPITALS



EMERGENCY BARASAT ZILLA HOSPITAL



FAIR PRICE MEDICINE SHOP



BARASAT ZILLA HOSPITAL

SCHOOLS



BARASAT PSC GOVERNMENT SCHOOL



BARASAT KALIBIGHNA GIRLS HIGH SCHOOL



BARASAT GOVERNMENT SCHOOL

COLLEGES & LIBRARIES



BARASAT COLLEGE



BARASAT GOVERNMENT COLLEGE



MAA SARADA GIRLS COLLEGE



WEST BENGAL STATE UNIVERSITY



ADAMAS UNIVERSITY



BRUHWARE UNIVERSITY



NORTH 24 PARGANA DISTRICT CENTRAL LIBRARY

HERITAGE BUILDING



HASTINGS HOUSE. IN THIS HOUSE LIVED WARREN HASTINGS

ADMINISTRATIVE BUILDINGS



BARASAT MUNICIPAL OFFICE



DISTRICT SESSION JUDGE'S COURT



D.M. OFFICE, NORTH 24 PARGANA



S.P. OFFICE, NORTH 24 PARGANA



ZILA PARISHAD BHAWAN, NORTH 24 PARGANA

VENDORS



Photo-G-3: Stationary Street Vending with Permanent Structures on Station Road in Baranasi Municipality



Photo-G-4: Street Food (Fast food) on Krishnanagar Road in Baranasi Municipality



Photo-G-5: Street Food (Snacks) Vendor on Baranasi, in Baranasi Municipality



Photo-G-6: Peripatetic Vendors in the Afternoon on NH-34 in Baranasi Municipality



Photo-G-7: Festive Vendor on Colony More Road in Baranasi Municipality



Photo-G-8: Peripatetic Flowers Vendor in Morning near Baranasi Station in Baranasi Municipality



Photo-G-9: Stationary Fruit Vendor on Semi-Permanent Structure on Colony More in Baranasi Municipality



Photo-G-10: A Young Street Vendor on Jeevan Road in Baranasi Municipality

APPENDIX

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15) Sen and Gupta (2018): Economic Existence of street vendors and their role in urban economy, International Journal of Management, 5(2), 95-102

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SECONDARY DATA

WEATHER DATA OF BARASAT MUNICIPALITY

MONTHS	AVERAGE TEMPERATURE °C (°F)	PRECIPITATION/ OR RAINFALL IN MM	HUMIDITY IN %	RAINY DAYS (d)	AVERAGE SUN HOURS (h)
JANUARY	19 (66.1)	11 (0.4)	65 ^o	2	9.0
FEBRUARY	22.7 (72.9)	24 (0.9)	61	2	9.0
MARCH	27 (80.7)	37 (1.5)	59	4	10.0
APRIL	29.8 (85.6)	77 (3)	67	8	10.0
MAY	30.4 (86.7)	146 (5.7)	74	10	9.0
JUNE	29.4 (84.9)	291 (11.5)	81	16	9.0
JULY	28.1 (82.6)	351 (13.8)	85	21	8.0
AUGUST	27.9 (82.3)	295 (11.6)	86	21	8.0
SEPTEMBER	27.6 (81.6)	249 (9.8)	86	18	8.0
OCTOBER	26.4 (79.5)	130 (5.1)	82	9	8.0
NOVEMBER	23.4 (74.1)	29 (1.1)	70	2	9.0
DECEMBER	20.1 (68.1)	10 (0.4)	66	1	9.0

SOURCE : EN. CLIMATIC ORG. 2020.

CALCULATION TABLE FOR STAR DIAGRAM :-

MONTHS	RAINFALL IN MM	SELECT-ED SCALE (CM)	RAINFALL ACCORDING TO SCALE (CM)	RAINY DAYS (D)	RAINY DAYS ACCORDING TO SCALE (CM)	SELECT-ED SCALE
January	11	1 CM = 130 MM	0.1	2	0.3	1 CM = 80
February	24		0.2	2	0.3	
March	37		0.3	4	0.5	
April	77		0.6	8	1	
May	146		1.1	10	1.3	
June	291		2.2	16	2	
July	351		2.7	21	2.6	
August	295		2.3	21	2.6	
September	249		1.9	18	2.3	
October	130		1	9	1.1	
November	99		0.2	2	0.3	
December	10		0.1	1	0.1	

CALCULATION TABLE FOR OMBROTHERMIC CHART :-

MONTHS	TEMPERATUR (°C) -E	SELECT-ED SCALE (CM)	TEMPERATURE ACCORDING TO SCALE (CM)	RAINFALL (MM)	SELECT-ED SCALE (CM)	RAINFALL ACCORDING TO SCALE (CM)
January	19.00	1 CM TO 30°C	0.6	11	1 CM TO 60 MM	0.2
February	22.7		0.8	24		0.4
March	27		0.9	37		0.6
April	29.8		1.0	77		1.3
May	30.4		1.0	146		2.4
June	29.4		1	291		4.9
July	28.1		0.9	351		5.9
August	27.9		0.9	295		4.9
September	27.6		0.9	249		4.2
October	26.4		0.9	130		2.7
November	23.4		0.8	99		0.5
December	20.1		0.7	10		0.2

SOURCE : EN. CLIMATIC ORG. 2020.

CALCULATION TABLE FOR HYTHERGRAPH :- :-

MONTHS	TEMPERATURE (°C)	SELECTED SCALE	TEMPERATURE ACCORDING TO SCALE (°C)	RAINFALL (MM)	SELECTED SCALE (CM)	RAINFALL ACCORDING TO SCALE (CM)
January	19	1 CM ≡ 6°C	3.2	11	1 CM ≡ 60 MM	0.2
February	22.7		3.8	24		0.4
March	27		4.5	37		0.5
April	29.8		5	77		1.3
May	30.4		5.1	146		2.4
June	29.4		4.9	291		4.9
July	28.1		4.7	351		5.9
August	27.9		4.7	295		4.9
September	27.6		4.6	249		4.2
October	26.4		4.4	130		2.7
November	23.4		3.9	29		0.5
December	20.1		3.4	10		0.2

CALCULATION FOR CLIMATIC CHART :-

MONTHS	TEMPERATURE (°C)	SELECTED SCALE	TEMPERATURE ACCORDING TO SCALE	RAINFALL (MM)	SELECTED SCALE	RAINFALL ACCORDING TO SCALE	HUMIDITY (%)	SELECTED SCALE	HUMIDITY ACCORDING TO SCALE
January	19	1 CM ≡ 6°C	3.2	11	1 CM ≡ 60 MM	0.2	65	1 CM ≡ 15%	4.3
February	22.7		3.8	24		0.4	61		4.1
March	27		4.5	37		0.6	54		3.9
April	29.8		5	77		1.3	67		4.5
May	30.4		5.1	146		2.4	74		4.9
June	29.4		4.9	291		4.9	81		5.4
July	28.1		4.7	351		5.9	85		5.7
August	27.9		4.7	295		4.9	86		5.7
September	27.6		4.6	249		4.2	86		5.7
October	26.4		4.4	130		2.7	82		5.5
November	23.4		3.9	29		0.5	70		4.7
December	20.1		3.4	10		0.2	60		4.4

CALCULATION TABLE FOR SCATTER DIAGRAM

MONTHS	RAINY DAYS (0) (x)	RAINFALL (MM) (y)	x^2	y^2	xy	$Y_c = a + bx$
JANUARY	2	11	4	121	22	16.23
FEBRUARY	2	24	4	576	48	16.23
MARCH	4	37	16	1376	148	48.57
APRIL	8	77	64	5929	616	113.2
MAY	10	146	100	21316	1460	145.89
JUNE	16	291	256	84681	4656	242.61
JULY	21	351	441	123201	7371	323.46
AUGUST	21	295	441	87025	6195	323.46
SEPTEMBER	18	249	324	62001	4482	274.95
OCTOBER	9	130	81	16900	1170	129.42
NOVEMBER	2	29	4	841	58	16.23
DECEMBER	1	10	1	1	10	0.06
	$\Sigma x = 114$	$\Sigma y = 1650$	$\Sigma x^2 = 1736$	$\Sigma y^2 = 403691$	$\Sigma xy = 26236$	

● We know,

Regression equation; $Y_c = a + bx$

$$b = \frac{\Sigma xy - \frac{\Sigma x \Sigma y}{n}}{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}$$

$$= \frac{26236 - \frac{114 \times 1650}{12}}{1736 - \frac{(114)^2}{12}}$$

$$= \frac{26236 - 15675}{1736 - 1083}$$

$$= 16.17$$

Example For January:

$$Y_c = a + bx$$

$$= -16.11 + 16.17 \times 2$$

$$= 16.23$$

∴ All the calculations have been done by this way.

$$a = \frac{\Sigma y}{n} - b \frac{\Sigma x}{n}$$

$$= \frac{1650}{12} - 16.17 \times \frac{114}{12}$$

$$= 137.5 - 16.17 \times 9.5$$

$$= 137.5 - 153.61$$

$$= -16.11$$

Where,
 Y_c = estimated value
 a = Intercept of y
 b = regression co-efficient
 x = definite value of 'x' variable

● We know. Correlation co-efficient by Pearson's Product moment method.

$$r = \frac{\Sigma xy - \frac{\Sigma x \Sigma y}{n}}{\sqrt{\left\{ \Sigma x^2 - \frac{(\Sigma x)^2}{n} \right\} \left\{ \Sigma y^2 - \frac{(\Sigma y)^2}{n} \right\}}}$$

$$= \frac{26236 - \frac{114 \times 1650}{12}}{\sqrt{\left\{ 1736 - \frac{(114)^2}{12} \right\} \left\{ 403691 - \frac{(1650)^2}{12} \right\}}}$$

$$= 0.092$$

POPULATION OF BARASAT MUNICIPALITY

YEAR	POPULATION
1961	52690
1972	88814
1981	135310
1991	177,092
2001	231521
2011	278435

SOURCE : BARASAT MUNICIPALITY

CALCULATION TABLE FOR GROWTH RATE OF BARASAT MUNICIPALITY

YEAR	POPULATION	GROWTH RATE (%)
1961	52690	—
1971	88814	69%
1981	135310	52%
1991	177092	31%
2001	231521	31%
2011	278435	19%

$$\text{Growth rate} = \frac{\text{Present Year of Population} - \text{Past Year of Population}}{\text{Past Year of Population}} \times 100$$

For example,

$$\begin{aligned} \text{Growth rate (1961-1971)} &= \\ &= \frac{88814 - 52690}{52690} \times 100 \\ &= \frac{36124}{52690} \times 100 \\ &= 0.68559 \times 100 \\ &= 69\% \end{aligned}$$

TOTAL POPULATION, MALE POPULATION & FEMALE POPULATION OF STUDY AREA BARASAT MUNICIPALITY

WARD NOS.	TOTAL POPULATION	MALE POPULATION	FEMALE POPULATION
1	11102	5672	5430
2	15058	7655	6403
13	7754	3934	3820
17	11140	5742	5398
18	8433	4324	4109

SOURCE :

PCA (Primary Census Abstract) NORTH 24-PGS DISTRICT, 2011

CALCULATION TABLE FOR POPULATION DENSITY

WARD NOS.	POPULATION	AREA (sq.km)	POPULATION DENSITY (PERSON/sq.km)
1	11102	2.30	4826.96
2	15058	0.55	27378.18
13	7754	1.95	3976.41
17	11140	1.52	7328.95
18	8433	0.66	12777.97

SOURCE - PCA (Primary Census Abstract)
NORTH 24 - PGS DISTRICT, 2011

Formula :-

$$\text{Population density} = \frac{\text{Population}}{\text{Area}}$$

For example -
 Population density of Ward - 1 :-

$$= \frac{11102}{2.30}$$

$$= 4826.96 \text{ person/sq.km}$$

CALCULATION TABLE FOR ZONE

VALUE (POPULATION DENSITY)	NO OF WARDS	TOTAL WARDS
<5000	1, 13	2
5000 - 10000	17	1
10000 - 15000	18	1
>15000	2	1

DATA TABLE

WARD NOS	TOTAL POPULATION	SCHEDULED CASTE (SC)	SCHEDULED TRIBE (S.T.)	GENERAL
1	11102	432	48	10622
2	15058	4963	66	10029
13	7754	1087	91	6576
17	11140	1454	28	9658
18	8433	322	36	8075

SOURCE : PCA (Primary Census Abstract) NORTH 24 PGS, 2011

CALCULATION TABLE FOR RADIUS OF CIRCLES

WARD NOS	TOTAL POPULATION	π	$r = \sqrt{\frac{P}{\pi}}$	REDUCED RADIUS IN CM (SCALE 1 CM TO 100 POPULATION)
1	11102	3.14	59.46	0.5946
2	15058	3.14	69.25	0.6925
13	7754	3.14	49.69	0.4969
17	11140	3.14	59.56	0.5956
18	8433	3.14	51.82	0.5182

CALCULATION TABLE FOR ANGULAR SEGMENTS

WARD NOS	SC	ST	GENERAL	TOTAL POPULATION
1	14°0'29.85"	1°35'23.31"	344°26'0.85"	360°0'0"
2	118°39'11.55"	1°34'40.44"	239°46'8.01"	360°0'0"
13	50°38'0.18"	4°15'29.7"	305°16'39.65"	360°0'0"
17	46°59'14.76"	0°54'17.45"	308°26'19.79"	360°0'0"
18	15°44'45.59"	1°35'12.55"	342°43'1.86"	360°0'0"

CALCULATION TABLE FOR GRAPHICAL SCALE

CATEGORY	TOTAL POPULATION	π	$r = \sqrt{\frac{P}{\pi}}$	REDUCED RADIUS IN CM (SCALE 1 CM TO 100 POPULATION)
Highest	16000	3.14	71.58	0.7158
Middle	11500	3.14	60.52	0.6052
Lowest	7000	3.14	47.22	0.4722

DATA TABLE

WARD NOS	TOTAL (T) POPULATION	SCHEDULED CASTE (SC) POPULATION
1	11102	432
2	15058	4963
13	7758	1087
17	11140	454
18	8433	322

SOURCE : PCA (Primary Census Abstract)
NORTH 24-PGS DISTRICT, 2011

RANK OF SCHEDULED CASTE POPULATION TO TOTAL POPULATION IN ASCENDING ORDER

WARD NOS.	% OF SC POPULATION	RANK
1	3.89	2
2	32.96	5
13	14.02	4
17	13.05	3
18	3.82	1

RANK WISE RE-ARRANGEMENT

WARD (as per ranking)	TOTAL POPULATION	S.C. POPULATION
18	8433	322
1	11102	432
17	11140	454
13	7754	1087
2	15058	4963

COMPOSITION OF CUMULATIVE % OF TOTAL POPULATION, SCHEDULED CASTE POPULATION & GINI CO-EFFICIENT

RANK	% OF TOTAL POPULATION	% OF SC POPULATION	CUMULATIVE % OF TOTAL POPULATION	CUMULATIVE % OF SC POPULATION (Yi)	$X_i(Y_{i+1})$	$Y_i(X_{i+1})$
1	15.77	3.90	15.77	3.90	—	142.467
2	20.76	5.93	36.53	9.13	143.9801	523.6968
3	20.83	17.61	57.36	26.74	976.8122	1901.267
4	14.47	13.16	71.85	39.9	2288.664	9610
5	28.15	60.10	100	100	7185	—

$\Sigma = 10594.4456$ $\Sigma = 12197.4328$

$$\begin{aligned}
 \text{GINI CO-EFFICIENT} &= \frac{\Sigma X_i(Y_{i+1}) - \Sigma Y_i(X_{i+1})}{10,000} \\
 &= \frac{10594.4456 - 12197.4328}{10,000} \\
 &= \frac{-1602.9872}{10,000} \\
 &= -0.1603 \text{ (Approx)}
 \end{aligned}$$

AGE-WISE MALE & FEMALE POPULATION OF BARASAT MUNICIPALITY
(WARD NO.: 1, 2, 13, 17, 18)

WARD NO	1		2		13		17		18	
	MALE POPULATION	FEMALE POPULATION	MALE POPULATION	FEMALE POPULATION	MALE POPULATION	FEMALE POPULATION	MALE POPULATION	FEMALE POPULATION	MALE POPULATION	FEMALE POPULATION
0-4	1	2	3	2	1	3	4	6	3	5
5-9	3	5	2	4	2	2	3	5	4	4
10-14	2	5	2	5	3	2	6	8	5	7
15-19	6	7	5	8	5	7	7	9	6	5
20-24	8	5	7	8	4	5	5	3	7	9
25-29	10	7	9	7	9	8	10	6	9	6
30-34	4	5	4	3	5	4	9	7	12	8
35-39	6	7	5	4	7	5	7	5	5	3
40-44	2	1	7	5	3	3	6	4	6	4
45-49	4	2	4	4	3	6	5	3	3	3
50-54	1	1	3	2	6	7	6	5	4	2
55-59	1	2	2	3	3	8	4	3	3	4
60-64	3	3	1	2	2	2	3	4	1	2
65-69	1	1	2	3	1	1	2	3	1	1
70-74	1	1	1	2	1	1	2	3	3	5
TOTAL	55	54	57	62	56	64	79	74	72	68

SOURCE : BARASAT MUNICIPALITY CENSUS, 2011

CALCULATION TABLE FOR SEX-RATIO :

WARDS	TOTAL MALE POPULATION	TOTAL FEMALE POPULATION	SEX-RATIO
1	55	54	981
2	57	62	1087
13	56	64	1142
17	79	74	937
18	72	68	944

Example :

SEX-RATIO OF WARD NO.: 1

$$= \frac{\text{NO. OF FEMALE POPULATION}}{\text{NO. OF MALE POPULATION}} \times 1000$$

$$= \frac{54}{55} \times 1000$$

$$= 981$$

∴ All the calculations have been done by this way.

DATA TABLE

WARD NO.	MIGRATION (NO. OF HOUSEHOLD)
1	9
2	9
13	11
17	10
18	12

CALCULATION TABLE FOR RADII OF CIRCLES

WARD NO.	MIGRATION (NO. OF HOUSEHOLD)	π	RADIUS (r)	REDUCED RADIUS (cm) 1cm TO 2 UNIT
1	9	3.14	$r = \sqrt{\frac{T}{\pi}}$ $= \sqrt{\frac{51}{3.14}}$ $= 4.03$	$4.03/2$ $= 2.02$
2	9	3.14		
13	11	3.14		
17	10	3.14		
18	12	3.14		
TOTAL	51	3.14		

SOURCE: SEN & GUPTA

(2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5-10.2

CALCULATION TABLE FOR ANGULAR SEGMENTS

WARD NO.	MIGRATION (NO. OF HOUSEHOLD)	ANGULAR SEGMENTS
1	9	63°31'45"
2	9	63°31'45"
13	11	77°38'49"
17	10	70°35'17"
18	12	84°42'21"
TOTAL	51	

CALCULATION TABLE FOR GRAPHICAL SCALE

CATEGORY	TOTAL MIGRANTS	RADIUS (r) $r = \sqrt{\frac{T}{\pi}}$	REDUCED RADIUS (cm) 1cm TO 2 UNIT
HIGHEST	13	2.03	1.015
MIDDLE	10.5	1.82	0.91
LOWEST	8	1.59	0.79

DATA TABLE FOR CAUSES OF MIGRATION

CAUSES OF MIGRATION	WARD 1	WARD 2	WARD 13	WARD 17	WARD 18
INSECURITY	2	2	3	2	-
JOB OPPORTUNITY	4	6	4	4	6
EDUCATIONAL FACILITY	2	-	2	2	4
OTHERS	1	1	2	2	2
TOTAL	9	9	11	10	12

SOURCE: SEN & GUPTA (2018) ECONOMIC EXISTENCE & STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5-10.2

RELIGION COMPOSITION OF BARASAT MUNICIPALITY (WARD-1, 2, 13, 17, 18)

RELIGION	POPULATION OF 2011	PERCENTAGE OF POPULATION (%)
HINDU	242878	87.24%
MUSLIM	33360	11.98%
CHRISTIAN	675	0.24%
SIKHS	145	0.05%
BUDDHIST	155	0.06%
JAIN	33	0.01%
NOT- STATED	1160	0.42%

SOURCE: SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5-10.2

A CALCULATION TABLE FOR AGE-SEX PYRAMID (WARD NO-1)

AGE GROUP	MALE	PERCENTAGE OF MALE POPULATION TO TOTAL POPULATION	FEMALE	PERCENTAGE OF FEMALE POPULATION TO TOTAL POPULATION	SCALE SELECTED	LENGTH OF BAR FOR PERCENTAGE OF MALE POPULATION	LENGTH OF BAR FOR PERCENTAGE OF FEMALE POPULATION	
0-4	1	1.82	2	3.70	1 CM TO 10 PERCENT POPULATION	0.2	0.4	
5-9	3	5.5	5	9.25		0.6	1.0	
10-14	4	7.3	5	9.25		0.7	1.0	
15-19	6	10.90	7	13		1.1	1.3	
20-24	8	14.54	5	9.25		1.5	1.0	
25-29	10	18.18	7	13		1.8	1.3	
30-34	4	7.27	5	9.25		0.7	1.0	
35-39	6	10.90	7	13		1.1	1.3	
40-44	2	3.63	1	1.9		0.4	0.2	
45-49	4	7.27	2	3.70		0.7	0.4	
50-54	1	1.82	1	1.9		1.1	0.2	
55-59	1	1.82	2	3.70		0.4	0.4	
60-64	3	5.5	3	5.6		0.7	0.6	
65-69	1	1.82	1	1.9		0.2	0.2	
70-74	1	1.82	1	1.9		0.2	0.2	
TOTAL	55		54					

SOURCE: SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5-10.2

B CALCULATION TABLE FOR AGE-SEX PYRAMID (WARD-2)

AGE GROUP	MALE	PERCENTAGE OF MALE POPULATION TO TOTAL POPULATION	FEMALE	PERCENTAGE OF FEMALE POPULATION TO TOTAL POPULATION	SCALE SELECTED	LENGTH OF BAR FOR PERCENTAGE OF MALE POPULATION	LENGTH OF BAR FOR PERCENTAGE OF FEMALE POPULATION	
0-4	3	5.26	2	3.23	1 CM TO 10 PERCENT POPULATION	0.5	0.3	
5-9	2	3.51	4	6.45		0.4	0.6	
10-14	2	3.51	5	8.1		0.4	0.8	
15-19	5	8.77	8	12.0		0.9	1.3	
20-24	7	12.3	8	12.9		1.2	1.3	
25-29	9	15.8	7	11.3		1.6	1.0	
30-34	4	7	3	4.84		0.7	0.5	
35-39	5	8.77	4	6.45		0.9	0.6	
40-44	7	12.3	5	8.1		1.2	0.8	
45-49	4	7	4	6.45		0.7	0.6	
50-54	3	5.26	2	3.23		0.5	0.3	
55-59	2	3.51	3	4.84		0.4	0.5	
60-64	1	1.75	2	3.23		0.2	0.3	
65-69	2	3.51	3	4.84		0.4	0.5	
70-74	1	1.75	2	3.23		0.2	0.3	
TOTAL	57		62					

SOURCE: SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5-10.2

II CALCULATION TABLE FOR AGE-SEX PYRAMID (WARD-13)

AGE GROUP	MALE	PERCENTAGE OF MALE POPULATION TO TOTAL POPULATION	FEMALE	PERCENTAGE OF FEMALE POPULATION TO TOTAL POPULATION	SCALE SELECTED	LENGTH OF BAR FOR PERCENTAGE OF MALE POPULATION	LENGTH OF BAR FOR PERCENTAGE OF FEMALE POPULATION
0-4	1	1.8	3	4.7	1 CM TO 10 PERCENT OF POPULATION	0.2	0.5
5-9	2	3.6	2	3.12		0.4	0.3
10-14	3	5.36	2	3.12		0.5	0.3
15-19	5	8.9	7	10.9		0.9	1.1
20-24	4	7.14	5	7.8		0.7	0.8
25-29	9	16.1	8	12.5		1.6	1.3
30-34	5	8.9	4	6.3		0.9	0.6
35-39	7	12.5	5	7.8		1.3	0.8
40-44	2	3.6	3	4.7		0.4	0.5
45-49	3	5.36	6	9.4		0.5	0.9
50-54	6	10.7	7	10.9		1.1	1.1
55-59	5	8.9	8	12.5		0.9	1.3
60-64	2	3.6	2	3.12		0.4	0.3
65-69	1	1.8	1	1.6		0.2	0.2
>=70	1	1.8	1	1.6		0.2	0.2
TOTAL	56		64				

SOURCE: SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5 - 10.2

II CALCULATION TABLE FOR AGE-SEX PYRAMID (WARD-12)

AGE GROUP	MALE	PERCENTAGE OF MALE POPULATION TO TOTAL POPULATION	FEMALE	PERCENTAGE OF FEMALE POPULATION TO TOTAL POPULATION	SCALE SELECTED	LENGTH OF BAR FOR PERCENTAGE OF MALE POPULATION	LENGTH OF BAR FOR PERCENTAGE OF FEMALE POPULATION
0-4	4	5.1	6	8.11	1 CM TO 10 PERCENT OF POPULATION	0.5	0.8
5-9	3	3.8	5	6.8		0.4	0.7
10-14	6	7.6	8	10.8		0.8	1.1
15-19	7	8.9	9	12.2		0.9	1.2
20-24	5	6.3	3	4.1		0.6	0.4
25-29	10	12.7	8	8.11		1.3	0.8
30-34	9	11.4	7	9.6		1.1	1.0
35-39	7	8.9	5	6.8		0.9	0.7
40-44	6	7.6	4	5.41		0.8	0.5
45-49	5	6.3	3	4.1		0.6	0.4
50-54	6	7.6	5	6.8		0.8	0.7
55-59	4	5.1	3	4.1		0.5	0.4
60-64	3	3.8	3	4.5		0.4	0.4
65-69	2	2.53	4	5.41		0.3	0.5
>=70	2	2.53	3	4.1		0.3	0.4
TOTAL	79		74				

SOURCE: SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5 - 10.2

CALCULATION TABLE FOR AGE-SEX PYRAMID (WARD-18)

AGE GROUP	MALE	PERCENTAGE OF MALE POP. TO TOTAL POPULATION (%)	FEMALE	PERCENTAGE OF FEMALE POP. (%) TO TOTAL POPULATION	SCALE SELECTED	LENGTH OF BAR FOR % OF MALE	LENGTH OF BAR FOR (%) OF FEMALE
0-4	3	4.2	5	7.4	SCALE SELECTED IS 1 CM TO 10 PERCENT OF POPULATION	0.4	0.7
5-9	4	5.6	4	5.9		0.6	0.6
10-14	5	6.9	7	10.3		0.7	1.0
15-19	4	8.3	5	7.4		0.8	0.7
20-24	7	9.7	9	13.2		1.0	1.3
25-29	9	12.5	6	8.8		1.3	0.9
30-34	12	17.6	8	11.8		1.8	1.2
35-39	5	6.9	3	4.4		0.7	0.4
40-44	6	8.3	4	5.9		0.8	0.6
45-49	3	4.2	3	4.4		0.4	0.4
50-54	4	5.6	2	2.9		0.6	0.3
55-59	3	4.2	4	5.9		0.4	0.6
60-64	1	1.4	2	2.9		0.1	0.3
64-69	1	1.4	1	1.5		0.1	0.2
70-74	3	4.2	5	7.4		0.4	0.7
TOTAL	72		68				

SOURCE: SEN & GUPTA (2010), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9) 9.5-10.2

NO. OF SIIM HOUSEHOLD & SIIM POPULATION

WARD	NO. OF HOUSEHOLD	POPULATION
1	60	235
2	-	-
13	234	937
17	173	608
18	381	1589

CALCULATION TABLE FOR BAR DIAGRAM

WARD	NO. OF HOUSEHOLD	SCALE 1cm to 600 household	POPULATION	SCALE 1cm to 500 population
1	60	0.1000	235	0.3916
2	-	-	-	-
13	234	0.3900	937	1.5650
17	173	0.2863	608	1.0133
18	381	0.6350	1589	2.6483

SOURCE - BARASAT MUNICIPALITY, 2005

NO. OF HOUSEHOLD

CALCULATION TABLE FOR SQUARE DIAGRAM

WARD	HOUSEHOLD	WARD	HOUSE HOLD	LENGTH OF THE SIDE OF THE SQUARE (1cm = 10)	SIDE OF THE SQUARE (1cm = 50)
1	2504	1	2504	50.0399	1.0007
2	3679	2	3679	60.6547	1.2130
13	1913	13	1913	43.7378	0.8747
17	2813	17	2813	53.0277	1.0607
18	1943	18	1943	44.0794	0.8815

GRAPHICAL SCALE

SL NO.	TOTAL HOUSY HOLD	LENGTH OF THE SQUARE SIDE (cm)	SIDE OF THE SQUARE (1cm = 50)
1	3700	60.8216	1.2165
2	2800	57.9150	1.0583
3	1700	43.5889	0.8717

SOURCE - PRIMARY CENSUS ABSTRACT, NORTH 24 P&S, District, 2011

WARD	TOTAL WORKERS	MALE WORKERS	FEMALE WORKERS
1	2404	262	4987
2	1651	251	2532
13	2204	190	4327
17	940	121	2049
18	1661	24	3563

CALCULATION TABLE FOR BAR DIAGRAM

WARD	TOTAL WORKERS	SCALE 1cm = 500 WORKERS	MALE WORKERS	SCALE 1cm = 500 WORKERS	FEMALE WORKERS	SCALE 1cm = 500 WORKERS
1	2664	1.7773	2352	1.0580	314	0.2092
2	1902	1.2680	1272	1.0073	135	0.1166
13	2394	1.3960	2063	1.3753	331	0.2206
17	1061	0.7072	945	0.6300	116	0.0773
18	1735	1.1700	1523	0.0153	252	0.1680

WARD	MAIN WORKERS	MARGINAL WORKERS	NON WORKERS
1	2404	262	4987
2	1651	251	3532
13	2204	190	4327
17	940	121	2049
18	1661	94	3063

CALCULATION TABLE FOR PIE DIAGRAM

WARD	TOTAL WORKERS	π	$\sigma = \sqrt{\frac{T}{\pi}}$	SCALE	REDUCED RADII (CM)
1	7653	3.14	49.3686		1.2342
2	5434	3.14	41.6001	1 CM	1.0400
13	6721	3.14	46.2649	Radious	1.1566
17	3110	3.14	31.4713	to	0.7867
18	5318	3.14	41.1537	40 cent	1.0288

ANGULAR DIVISIONS

WARD	TOTAL WORKERS	MAIN WORKERS	MARGINAL WORKERS	NON WORKERS
1	7653	113°05'	12°19'	239°35'
2	5434	103°02'	16°37'	233°59'
13	6721	118°03'	10°10'	231°46'
17	3110	108°48'	14°00'	237°10'
18	5318	112°26'	06°21'	241°11'

GRAPHICAL SCALE

SI. NO.	TOTAL WORKERS	$\sigma = \sqrt{\frac{T}{\pi}}$	RADII IN CM
1	8000	50.4626	1.2615
2	5500	41.8414	1.0460
3	3000	30.9019	0.7725

TABLE FOR POPULATION GRADIENT

WARD	POPULATION (2011) (P)	DISTANCE FROM CBD (KM) (D)
1	11102	7.92
2	15058	5.28
13	7754	4.18
17	11140	4.18
18	8433	6.82

SOURCE : CENSUS OF INDIA, 2011 & BARASAT MUNICIPALITY

CALCULATION TABLE FOR POPULATION GRADIENT

WARD	POPULATION (2011) (P)	DISTANCE FROM CBD (KM) (D)	P/D	$\Sigma P / \Sigma D$	POPULATION GRADIENT $P = \frac{P \div D}{\Sigma P \div \Sigma D}$	POPULATION INDUCEMENT $Zd = \frac{P}{D}$
1	11102	7.92	1401.77	\uparrow 1884.67 \downarrow	0.74	1401.77
2	15058	5.28	2851.87		1.51	2851.87
13	7754	4.18	2855.02		0.98	1856.02
17	11140	4.18	2665.07		1.41	2665.07
18	8433	6.82	1236.51		0.66	1236.31

CALCULATION TABLE FOR POPULATION GRADIENT ZONE

VALUE	NO. OF WARDS
<0.80	1, 13
0.80 - 1.00	17
>1.00	2, 17

CALCULATION TABLE FOR POPULATION INDUCEMENT

VALUE	NO. OF WARDS
<1800	1, 13
1800 - 2800	17, 13
>2800	2

LITERATE - ILLITERATE POPULATION

WARD NO.	Literate Population					Illiterate Population				
	MALE	FEMALE	SCALE	LENGTH OF BAR OF MALE	LENGTH OF BAR OF FEMALE	MALE	FEMALE	SCALE	LENGTH OF BAR OF MALE	LENGTH OF BAR OF FEMALE
1	3993	3566	1 CM	0.79	0.7	1670	1864	1 CM	0.34	0.37
2	6288	5497	70	1.96	1.09	1367	706	70	0.28	0.16
13	3246	2985	5000	0.67	0.60	588	835	5000	0.19	0.17
17	4659	4025	Literate Population	0.93	0.87	1083	1375	Illiterate Population	0.22	0.28
18	3095	2752	Literate Population	0.65	0.85	1229	1257	Illiterate Population	0.24	0.27

SCATTER DIAGRAM

RELATION BETWEEN LITERATE POPULATION & PER CAPITA INCOME

WARD NO.	LITERATE POPULATION	PER/CAPITA INCOME	WARD NO.	LITERATE POPULATION (X)	PER CAPITA INCOME (Y)	X ²	Y ²	XY	Y _c	
1	87	8429	1	87	8429	7569	71048041	733323	9830.66	
2	84	10697	2	84	10697	7056	114425809	898548		
13	92	9592	13	92	9592	8464	92006464	882464		
17	110	11697	17	110	11697	12100	139819809	1086670		
18	95	11500	18	95	11500	9025	132250000	1099500	10506.5	
						ΣX = 468	ΣY = 51915	ΣX ² = 44219	ΣY ² = 54655023	ΣXY = 4893505

SOURCE : SEN & GUPTA (2019), ECONOMIC EXISTANCE OF STREET VENDORS & THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT 5(2) 9.5-10.2

We know, Regression equation = $y = a + b$

$$\text{We know, } b = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sum x^2 - \left(\frac{\sum x}{n}\right)^2}$$

$$= \frac{4893505 - \frac{468 \times 51915}{5}}{44219 - \left(\frac{468}{5}\right)^2}$$

$$= \frac{4493505 - 4859944}{44219 - 43804.8}$$

$$= \frac{34261}{409.2}$$

$$= 89.727$$

$$a = \bar{y} - b\bar{x}$$

$$= \frac{\sum y}{n} - b \cdot \frac{\sum x}{5}$$

$$= \frac{51915}{5} - 83.73 \times \frac{468}{5} = 10383 - 83.73 \times 93.6$$

$$= 10383 - 7836.85$$

$$a = 2546.15$$

∴ Now the equation of straight line is $y = a + bx$

$$\therefore y = 2546.15 + 83.73x$$

For the estimated value of x and y .

$$\text{if } x = 87, \text{ then value of } y_0 = 2546.15 + 83.73 \times 87$$

$$= 2546.15 + 7284.51$$

$$= 9830.66$$

$$\text{Again, if } x = 95, \text{ then the value of } y_0 = 2546.15 + 83.73 \times 95$$

$$= 2546.15 + 7954.35$$

$$= 10500.5$$

CALCULATION FOR CORRELATION COEFFICIENT :-

$$r = \frac{\sum xy - \frac{\sum x \cdot \sum y}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right) \left(\sum y^2 - \frac{(\sum y)^2}{n}\right)}}$$

$$= \frac{4893505 - \frac{468 \times 51915}{5}}{\sqrt{\left(49214 - \frac{(468)^2}{5}\right) \left(576550193 - \frac{(51915)^2}{5}\right)}}$$

$$= \frac{4893505 - 4859244}{\sqrt{409.2 \times 7516698}} = \frac{34261}{65460.12}$$

$$= 0.618$$

PERCEPTION OF SCHOOLING ENVIRONMENT

ITEM	WARD-1			WARD-2			WARD-13			WARD-17			WARD-18		
	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD
Teaching Learning	18	11	1	15	13	2	20	9	1	20	9	1	20	6	1
Book Supply	24	9	-	20	7	3	13	10	2	16	12	2	16	12	2
Midday Meal	24	5	1	20	3	1	17	11	2	14	15	1	24	5	1
Toilet Facility	14	13	3	12	14	1	10	16	1	8	16	6	8	13	4
Class room Facility	18	11	1	16	13	1	12	15	3	14	11	5	15	12	3
Sports Facility	10	14	6	12	14	1	8	16	6	10	12	8	10	14	1
Co-curricular activity	12	15	3	6	13	2	11	15	1	8	16	6	12	14	1

CALCULATION TABLE FOR PERCENTAGES OF PERCEPTION OF SCHOOLING ENVIRONMENT

ITEM	WARD-1			WARD-2			WARD-13			WARD-17			WARD-18		
	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD	GOOD	MODERATE	BAD
Teaching Learning	60%	36.7%	3.3%	50%	43.3%	6.7%	66.7%	30%	23.3%	6.7%	30%	33.3%	66.7%	20%	13.3%
Book Supply	73.3%	36.7%	-	66.7%	23.3%	10%	60%	33.3%	6.7%	53.3%	40%	6.6%	53.3%	40%	6.7%
Midday Meal	80%	16.7%	3.3%	66.7%	20%	13.3%	56.7%	36.7%	6.7%	46.7%	50%	3.3%	80%	16.7%	3.3%
Toilet Facility	46.7%	43.3%	10%	40%	46.7%	13.3%	33.3%	53.3%	13.3%	26.7%	53.3%	20%	33.3%	60%	13.3%
Class room Facility	60%	36.7%	3.3%	53.3%	43.3%	3.3%	40%	50%	10%	46.7%	36.7%	16.7%	50%	40%	10%
Sports Facility	33.3%	46.7%	20%	36.7%	43.3%	20%	26.7%	53.3%	20%	33.3%	40%	26.7%	33.3%	53.3%	13.3%
Co-curricular activity	40%	50%	10%	60%	6.7%	33.3%	36.7%	50%	13.3%	26.7%	53.3%	20%	70%	26.7%	3.3%

SOURCES - SEN AND GUPTA (2012), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(9), 95-102.

LOCATION QUOTIENT

WARD NO.	TOTAL POPULATION (P _i)	LITERATE POPULATION (L _i)	L _i /P _i	ΣL _i / ΣP _i	LOCATION QUOTIENT (LQ)
1	1102	7559	0.681	0.752	0.906
2	15058	11786	0.783		1.041
13	7724	2331	0.316		1.041
17	11140	8684	0.780		1.037
18	8533	5847	0.693		0.923
ΣP _i = 58487		ΣL _i = 40206			

CLASS DISTRIBUTION FOR LQ CLASSES

LQ RANGE	WARD NO. OF STUDY AREA	REMARKS
> 1.050	13	HIGHER CONCENTRATION OF LITERACY
1.000-1.050	2, 17	BALANCED LITERATE POPULATION
< 1.000	1, 18	DISPERSED LITERATE POPULATION

WARD WISE LEVEL OF EDUCATION

EDUCATION LEVEL	WARD-1		WARD-2		WARD-13		WARD-17		WARD-18	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
Primary	17	20	10	15	18	22	22	27	16	15
Pre-Secondary	10	13	11	9	8	10	11	13	19	19
Secondary	8	6	7	8	10	6	10	9	10	8
Higher-Secondary	4	3	5	4	7	4	6	4	7	5
Graduate	2	1	1	1	2	1	3	1	3	2
Post-Graduate	1	0	1	0	1	1	2	1	1	1
Technical	1	0	0	1	1	0	1	0	1	0
Others	1	0	2	0	0	1	1	0	0	1

SOURCE: SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLL IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5 (2), 95-102

CALCULATION FOR LEVEL OF EDUCATION

WARD-1

EDUCATION LEVEL	MALE	% OF MALE TO TOTAL LITERATE POPULATION	FEMALE	% OF FEMALE TO TOTAL LITERATE POPULATION	SCALE SELECTED	LENGTH OF BAR OF % OF MALE (IN CM)	LENGTH OF BAR OF % OF FEMALE (IN CM)
Primary	17	19.54	20	22.99	1 cm to 20%	0.98	1.15
Pre-Secondary	10	11.99	13	14.94		0.57	0.78
Secondary	8	9.19	6	6.90		0.46	0.38
Higher-Secondary	1	1.60	3	3.45		0.23	0.17
Graduate	2	2.30	1	1.15		0.11	0.06
Post-Graduate	1	1.15	0	0		0.06	0
Technical	1	1.15	0	0		0.06	0
Others	1	1.15	0	0		0.06	0

WARD-2

EDUCATION LEVEL	MALE	% OF MALE TO TOTAL LITERATE POPULATION	FEMALE	% OF FEMALE TO TOTAL LITERATE POPULATION	SCALE SELECTED	LENGTH OF BAR OF % OF MALE (IN CM)	LENGTH OF BAR OF % OF FEMALE (IN CM)
Primary	16	19.05	19	21.13	1 cm to 20%	0.98	1.07
Pre-Secondary	11	13.10	9	10.31		0.66	0.51
Secondary	7	8.33	8	9.62		0.42	0.49
Higher-Secondary	5	5.95	4	4.72		0.24	0.24
Graduate	1	1.19	1	1.19		0.06	0.06
Post-Graduate	1	1.19	0	0		0.06	0
Technical	0	0	1	1.19		0	0.06
Others	2	2.38	0	0		0.12	0

WARD-19

EDUCATION LEVEL	MALE	% OF MALE TO TOTAL LITERATE POPULATION	FEMALE	% OF FEMALE TO TOTAL LITERATE POPULATION	SCALE SELECTED	LENGTH OF BAR OF % OF MALE (IN CM)	LENGTH OF BAR OF % OF FEMALE (IN CM)
Primary	19	11.56	22	23.91	1cm to 20:1	0.98	1.02
Pre-secondary	8	8.69	10	10.87		0.49	0.54
Secondary	10	10.90	6	6.52		0.55	0.33
Higher-secondary	7	7.61	1	1.35		0.38	0.22
Graduate	2	2.17	1	1.09		0.11	0.05
Post-graduate	1	1.09	1	1.09		0.05	0.05
Technical	1	1.09	0	0		0.05	0
Other	0	0	1	1.09		0	0.05

WARD-17

EDUCATION LEVEL	MALE	% OF MALE TO TOTAL LITERATE POPULATION	FEMALE	% OF FEMALE TO TOTAL LITERATE POPULATION	SCALE SELECTED	LENGTH OF BAR OF % OF MALE (IN CM)	LENGTH OF BAR OF % OF FEMALE (IN CM)
Primary	22	20	27	24.55	1cm to 20:1	1.0	1.23
Pre-secondary	11	10	15	11.82		0.5	0.59
Secondary	10	9.09	8	7.27		0.45	0.36
Higher-secondary	6	5.45	1	0.69		0.27	0.18
Graduate	3	2.72	1	0.91		0.14	0.05
Post-graduate	2	1.82	1	0.91		0.09	0.05
Technical	1	0.91	0	0		0.05	0
Other	1	0.91	0	0		0.05	0

WARD-18

EDUCATION LEVEL	MALE	% OF MALE TO TOTAL LITERATE POPULATION	FEMALE	% OF FEMALE TO TOTAL LITERATE POPULATION	SCALE SELECTED	LENGTH OF BAR OF % OF MALE (IN CM)	LENGTH OF BAR OF % OF FEMALE (IN CM)
Primary	16	16.84	15	15.74	1cm to 20:1	0.84	0.77
Pre-secondary	12	12.63	13	13.28		0.63	0.65
Secondary	10	10.53	8	8.12		0.53	0.42
Higher-secondary	7	7.37	5	5.26		0.37	0.26
Graduate	3	3.16	2	2.11		0.16	0.11
Post-graduate	1	1.05	1	1.05		0.05	0.05
Technical	1	1.05	0	0		0.05	0
Other	0	0	1	1.05		0	0.05

LITERACY HIERARCHY

ITEM	MALE	FEMALE	TOTAL
Primary	89	102	191
Pre-Secondary	52	58	110
Secondary	45	36	81
Highest-Secondary	29	20	49
Graduate	11	6	17
Post-Graduate	6	3	9
Technical	4	1	5
Other	4	2	6

SOURCE :- SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 7 (2), 95-102

① DATA TABLE FOR PER CAPITA INCOME BY WARD :-

WARD	PER CAPITA INCOME (RS)
1	11,697
2	10,597
13	9,592
17	8,420
18	11,600

Range = Highest Per capita Income - Lowest Per capita Income

$$= 11,697 - 8,420$$

$$= 3,277$$

No. of class = 4
 class Interval = $\frac{\text{Range}}{\text{No. of class}}$

$$= \frac{3,277}{4}$$

$$= 819.25$$

$$= 820 \text{ (considered)}$$

TABLE FOR CHOROPLETH CLASSES :-

CLASS (RS)	SHADING	WARD
< 9100		17
9100 - 9920		13
9920 - 10,740		2
> 10,740		1, 18

② TABLE FOR LEVEL OF INCOME :-

INCOME (RUPEES)	WARD-1 FREQUENCY	WARD-2 FREQUENCY	WARD-13 FREQUENCY	WARD-17 FREQUENCY	WARD-18 FREQUENCY	TOTAL
< 10000	3	2	1	1	2	9
10000 - 20000	2	4	7	4	2	19
20000 - 30000	1	2	3	4	3	13
30000 - 40000	10	8	7	6	5	36
40000 - 50000	4	6	5	8	9	32
50000 - 60000	3	4	5	3	2	17
60000 - 70000	4	2	1	2	1	10
70000 - 80000	2	1	-	-	2	5
> 80000	1	1	1	2	4	9

SOURCE : SEN & GUPTA (2018), ECONOMIC EXISTENCE OF STREET VENDORS & THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT - 5(2)
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DATA TABLE FOR LORENZ CURVE

INCOME (RS)	WARD-1 FREQUENCY	WARD-2 FREQUENCY	WARD-3 FREQUENCY	WARD-17 FREQUENCY	WARD-18 FREQUENCY	TOTAL
<10000	3	2	1	1	2	9
10000 - 20000	2	4	7	4	2	19
20000 - 30000	1	2	3	4	3	13
30000 - 40000	10	8	7	6	5	36
40000 - 50000	4	6	5	8	9	32
50000 - 60000	3	4	5	3	2	17
60000 - 70000	4	2	1	2	1	10
70000 - 80000	2	1	-	-	2	5
> 80000	1	1	1	2	4	9
	TOTAL-30	TOTAL-30	TOTAL-30	TOTAL-30	TOTAL-30	

SOURCE : SEX & GUPTA (2012), ECONOMIC EXISTANCE OF STREET VENDORS & THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT - 5 (2) 95-102

CALCULATION TABLE FOR LORENZ CURVE & GINI CO-EFFICIENT

INCOME (RUPEES)	MD-YA- -LIE (RS)	FREQUEN- -CY	CUMULATI- -VE INCOME	CUMULAT- -IVE FREQUEN- -CY	% CUMU- -LATIVE INCOME (X _i)	% CUMU- -LATIVE FREQUEN- -CY (Y _i)	X _i (Y _{i+1})	Y _i (X _{i+1})
<10000	5000	9	5000	9	1.23	6.00	22.9541	29.64
10000 - 20000	15000	19	25000	28	4.94	18.67	158.0102	207.423
20000 - 30000	25000	13	45000	41	11.11	27.32	470.2763	539.765
30000 - 40000	35000	36	80000	77	17.75	51.32	1438.23	1680.764
40000 - 50000	45000	32	125000	109	30.80	72.67	2887.2	3227.458
50000 - 60000	55000	17	180000	126	44.44	84.00	4087.574	4081.16
60000 - 70000	65000	10	245000	136	60.47	90.67	5686.06	3163.828
70000 - 80000	75000	5	320000	141	79.01	94.00	7901.00	9100.00
> 80000	85000	9	405000	150	100.00	100.00		

$$\text{GINI CO-EFFICIENT} = \frac{\sum X_i(Y_{i+1}) - \sum Y_i(X_{i+1})}{10000}$$

$$= \frac{20367.1179 - 27232.2467}{10000}$$

$$= \frac{4865.1288}{10000} = 0.48651288 = 0.49 \text{ (Approx)}$$

$$\sum X_i(Y_{i+1}) = 20367.1179$$

$$\sum Y_i(X_{i+1}) = 27232.2467$$

DATA TABLE FOR PER CAPITA INCOME & FAMILY SIZE

WARD	PER CAPITA INCOME (Rs)	FAMILY SIZE
1	8429	5.1
2	10,699	3.9
13	9592	4.0
17	11,697	3.6
18	11,600	4.6

CALCULATION TABLE FOR SCATTER DIAGRAM

WARD	PER CAPITA INCOME (Rs) (x)	FAMILY SIZE (y)	x^2	y^2	xy	$dy = a + bx$	
1	8429	5.1	7104801	26.01	42987.9	4.35	
2	10,697	3.9	11442809	15.21	41718.3	4.16	
13	9592	4.0	9200644	16.00	38368.0	4.46	
17	11,697	3.6	136819809	12.96	42109.2	3.91	
18	11,600	4.6	134560000	21.16	53260.0	3.93	
$\Sigma x =$	52015	$\Sigma y =$	21.2	$\Sigma x^2 =$	54886023	$\Sigma y^2 =$	91.34
					$\Sigma xy =$	213643.4	

• We know Regression equation, $y = a + bx$

$$b = \frac{\Sigma xy - \frac{\Sigma x \times \Sigma y}{n}}{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}$$

$$= \frac{218643.4 - \frac{52015 \times 21.2}{5}}{54886023 - \frac{(52015)^2}{5}}$$

$$= \frac{218643.4 - 220543.6}{54886023 - 54112045}$$

$$= \frac{-2000.2}{7748078}$$

$$= -0.000258154$$

$$a = \frac{\Sigma y}{n} - b \frac{\Sigma x}{n}$$

$$= \frac{21.2}{5} - (-0.000258154) \frac{52015}{5}$$

$$= 4.24 - (-0.000258154) \times 10403$$

$$= 4.24 - (-2.685576062)$$

$$= 6.925576062$$

∴ Now the equation of straight line is $y = a + bx$

$$\therefore \hat{y} = 6.925576062 + (-0.000258154) \times x$$

For the estimate value of 'y'

$$\begin{aligned} \text{If } x = 8429 \text{ then } \hat{y}_0 &= 6.925576062 + (-0.000258154) \times 8429 \\ &= 6.925576062 + (-2.175780066) \\ &= 4.749795996 \\ &= 4.75 \text{ (Approx)} \end{aligned}$$

All the calculations have been done by this way.

- We know, correlation coefficient by Pearson's product moment method.

$$\begin{aligned} r &= \frac{\sum xy - \frac{\sum x \times \sum y}{n}}{\sqrt{\left\{ \sum x^2 - \frac{(\sum x)^2}{n} \right\} \left\{ \sum y^2 - \frac{(\sum y)^2}{n} \right\}}} \\ &= \frac{218543.4 - \frac{52015 \times 21.2}{5}}{\sqrt{\left\{ 548860123 - \frac{(52015)^2}{5} \right\} \left\{ 91.34 - \frac{(21.2)^2}{5} \right\}}} \\ &= \frac{218543.4 - 220543.6}{\sqrt{\left\{ 548860123 - 541110045 \right\} \left\{ 91.34 - 89.888 \right\}}} \\ &= \frac{-2000.2}{\sqrt{7742078 \times 1.452}} \\ &= \frac{-2000.2}{3354.13316} \\ &= -0.596338876 \end{aligned}$$

CATEGORIES OF TUBEWELL DISTRIBUTION, 2018

WARD NO.	TUBEWELL	DEEP TUBE WELL	SUBMERSIBLE PUMP	WELL
1	932	122	535	-
2	1202	178	321	-
13	802	98	132	2
17	1207	106	328	-
18	907	96	109	2

CALCULATION TABLE FOR CATEGORIES OF TUBEWELL DISTRIBUTION

LENGTH OF THE BAR (CM)
SCALE : 1 CM = 500 TUBEWELLS

WARD NO.	TUBE WELL	DEEP TUBE WELL	SUBMERSIBLE PUMP	WELL
1	1.864	0.244	1.07	-
2	2.404	0.358	0.654	-
13	1.624	0.196	0.264	0.006
17	2.414	0.212	0.656	-
18	1.814	0.19	0.218	0.006

WARD-WISE CONCENTRATION OF WATER-TAP CONNECTION

WARD NO.	NUMBER OF WATER TAP	SCALE 1 CM = 400 WATER-TAP
1	1037	2.5925
2	1929	4.8225
13	712	1.78
17	1435	3.5875
18	720	1.825

• SOURCE : BARASAT MUNICIPALITY , 2018




3) WARD - WISE CONCENTRATION OF TUBEWELLS :-

WARD NO.	TUBEWELL	DEEP TUBE WELL	SUBMERSIBLE PUMP	WELL	TOTAL
1	932	122	535	-	1589
2	1202	178	397	-	1707
13	812	98	132	2	1044
17	1207	106	328	-	1641
18	907	95	109	2	1113

• CALCULATION FOR CHOROPLETH MAPPING

* NUMBER OF SELECTED CLASS = 3

• TABLE FOR CHOROPLETH CLASS :-

CLASSES (NO. OF TUBEWELL)	SHADES	WARDS
< 1265		13, 18
1265 - 1600		1
> 1600		2, 17




4) PIZOMETRIC LAYER OF THE STUDY AREA

WARD NO.	DEPTH (M) FROM THE GROUND
1	258
2	422
13	235
17	350
18	380

• CALCULATION FOR CHOROPLETH MAPPING :-

→ NUMBER OF SELECTED CLASS = 3

• TABLE FOR CHOROPLETH CLASSES :-

CLASS (METER)	SHADES	WARDS
< 300		1, 13
300 - 400		17, 18
> 400		2

• SOURCE : BARASAT MUNICIPALITY , 2018

MAJOR SHOPS OF STUDY AREA

WARD No. 1, 2, 13, 17, 18

NAME OF SHOPS	NUMBER	%	APPROX
FOOD SHOP	32	15.68	15
GARMENT	24	11.76	12
JEWELLERY	16	7.84	8
WATCH	6	2.94	3
OPTICAL	6	2.94	3
ELECTONICS	12	5.88	6
COSMETICS & STATIONARY	18	8.82	9
PHARMACY	12	5.88	6
FURNITURE	10	4.90	5
BAG SHOP	5	2.45	2
APPEREL	10	4.90	5
CONFECTIONERY	8	3.92	4
MOBILE STORE	8	3.92	4
GROCERY	12	5.88	6
SHOE	5	2.45	2
OTHERS	20	9.80	10
TOTAL	204	100	100

SOURCE : BARASAT MUNICIPALITY

DOMINANCE OF AREA OF DIFFERENT TYPES OF SHOPS

NAME OF SHOP	AREA (SQ. FT)	SCALE	LENTH OF BAR (CM)
APPAREL	15250		10.16
JWELLERY	8900		5.93
TAILORING	500		0.33
BAG	1050		0.7
GARMENTS	1500		1
BAKERY	250		0.16
UTENSIL	600		0.9
HOSIERY	300		0.2
FOOD SHOP	7800		5.2
SWEET	900		0.6
PAINT	800		0.53
TRAVEL AGENCY	600		0.4
WATCH SHOP	3200		2.13
OPTICAL	1560		1.09
STATIONARY	800		0.53
HARDWARE	1950		1.3
AUTO MOBILE	2200		1.46
MUSILE	900		0.6
PHARMACY	2800		1.86
FURNITURE	1600		1.06
SHOE	450		0.3
COSMETICS	1600		1.06
BEDDING STORE	500		0.3
BOOKS	450		0.3
PARTOUR	450		0.3
ELECTRONIC	2200		1.46
GROCERY	2200		1.46
GIFT STORE	200		0.13
WINE SHOP	650		0.43
COMPUTER	600		0.4

SOURCE : BARASAT MUNICIPALITY

CALCULATION OF STREET VENDORS :-

WARD NO.	NO. OF STREET VENDORS	LOCAL VENDORS	MIGRATED VENDORS
1	35	28	7
2	122	12	110
13	83	62	21
17	95	32	63
18	99	36	63

SOURCE : SAN & GUPTA (2019) ECONOMIC EXTENTSE OF STREET VENDORS AND THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT, 5(2) 95-102

CALCULATION TABLE FOR CONCENTRATION OF STREET VENDORS :-

WARD NO.	LOCAL VENDORS	MIGRATED VENDORS	SCALE	LOCAL VENDORS	MIGRATED VENDORS
1	28	7		0.56	0.14
2	12	110	1cm TO	1.44	1
13	62	21	50	1.24	0.52
17	32	63	VENDOR	0.64	1.26
18	36	63		0.72	1.26

ECONOMIC STATUS OF STREET VENDORS :-

WARD NO.	ABOVE PROVERTY LINE	BELOW PROVERTY LINE	NO. RATION CARD / WATER CARD
1	12	18	05
2	47	63	12
13	48	32	08
17	29	55	11
18	35	52	12

CALCULATION FOR ECONOMIC STATUS OF STREET VENDORS :-

WARD NO.	ABL	BPL	RATION CARD / WATER CARD	TOTAL NO. OF STREET VENDORS	RADIUS OF CIRCLES $\sqrt{\frac{A}{\pi}}$	1cm = 50m
1	12	18	05	35	3.33	0.66
2	47	63	12	122	6.23	1.24
13	48	32	08	83	5.27	1.05
17	29	55	11	95	5.49	1.09
18	35	52	12	99	5.67	1.12

ANGULAR DIVISIONS :-

WARD NO.	APL	BPL	NO. RATION CARD / WATER CARD
1	123°	185°	51
2	137°	185°	35
13	196°	130°	32
17	109°	208°	41
18	127°	182°	45

GRAPHICAL SCALE :-

SI NO.	VALUE	RADIUS OF CIRCLES $\sqrt{\frac{A}{\pi}}$	1cm = 50m
1	125	6.30	1.26
2	80	5.09	1.06
3	30	3.09	0.61

ECONOMIC STATUS OF INHABITANTS

WARD NO.	LOAN EARNERS	SAVINGS ACCOUNT	LIC/ PFI/ MEDICLAIM
1	12	25	12
2	62	117	47
13	30	81	11
17	26	92	16
18	24	91	18

SOURCE : SEN & GUPTA (2018) ECONOMIC EXISTANCE OF STREET VENDORS & THEIR ROLE IN URBAN ECONOMY, INTERNATIONAL JOURNAL OF MANAGEMENT 3(2) 9-5-10-2.

CALCULATION FOR ECONOMIC STATUS OF INHABITANTS

WARD NO.	LOAN EARNERS	SAVINGS ACCOUNT	LIC/ PFI/ MEDICLAIM	SCALE	LOAN EARNERS	SAVINGS ACCOUNT	LIC/ PFI/ MEDICLAIM
1	12	25	12		0.24	0.56	0.24
2	62	117	47	1 CM 70	1.24	2.34	0.94
13	30	81	11	50	0.66	1.62	0.22
17	26	92	16	INHABITANTS	0.52	1.84	0.32
18	24	91	18		0.48	1.82	0.36

DATA TABLE FOR SOCIAL SECURITY INDEX

WARD NO	SOCIAL SECURITY INDEX
1	0.413
2	0.632
13	0.379
17	0.692
18	0.311

CALCULATION TABLE FOR SOCIAL SECURITY INDEX

SOCIAL SECURITY INDEX	SHADING	WARD NO.
< 0.350		18
0.350 - 0.500		1, 13
0.500 - 0.650		2
> 0.650		17

QUANTITY OF CIVIC SERVICES :-

ITEMS [List of civic services being provided by the local body at present]	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
a) Water Supply (In liter/day)	15	19	26	21.8	29	30	35	37	42	45	52
b) Street light											
c) ① In Numbers	9956	11063	12591	13658	15175	15716	16220	16854	16920	17013	17305
② In KW	827.52	846.24	864.84	863.46	879.18	885.35	1068.12	1072.20	1265.19	1423.10	1864.32
d) Sanitation Services	0	0	0	0	0	2059	2152	2589	2483	3152	4162
e) Garbage disposal											
① Solid Waste Management	19240	22795	24785	25645	27965	31077	32125	35245	38321	37265	42302
② Compost in mt per year	1404	1550	1705	1875	2065	2269	2591	2682	2787	2974	3162
f) Public Health (No. of Hospital bed)	225	225	225	225	225	238	265	322	342	350	350
g) Road (km)	479	544	660	710	797	985	1012	1025	1125	1202	1303
h) Parks (sq. metre)	215	225	328	328	518	802	810	912	912	1045	1045
i) Schools (No. of students)	26580	27705	27661	27984	28770	28745	28602	29201	29105	27905	27301
j) Birth Registration	5770	5714	7801	4207	4337	4686	4885	4078	4702	5125	2922
k) Death Registration	711	405	1164	106	1314	1281	1322	1412	1125	1318	1402
l) Other public conveniences	-	-	-	-	-	-	-	-	-	-	-

DATA FOR SOCIAL SERVICE SCHEME :-

SOCIAL SERVICE ITEM	NO. OF RESIDENTS WHO GET FACILITIES			
	2010	2012	2014	2016
MULM	4255	6081	7081	8732
	29°12'39"	42°40'32"	49°41'29"	57°46'14"
RGAY	325	378	398	441
	79°52'32"	88°14'57"	92°55'59"	102°57'26"
WATER LINE CONNECTION (NO. OF Household)	2205	3545	5025	6048
	32°02'59"	25°48'34"	50°44'57"	61°4'51"

SOURCE : BARASAT MUNICIPALITY

COMPOSITE INDEX OF DIFFERENT ENVIRONMENTAL PLANNING (AFTER KENDAL)

WARD NO.	LENGTH OF ROAD (KM)	RANK	LENGTH OF DRAIN (KM)	RANK	NO. OF STREET LIGHT	RANK	NO. OF COLLECTION BUCKET	RANK	NO. OF WASTE COLLECTION VAN	RANK	NO. OF THE DOWNING WATER TAP	RANK	COMPOSITE SCORE
1	11.22	5	10.81	3	2145	3	2406	3	5	3	1037	3	2.0
2	18.23	1	17.62	1	3509	1	3601	1	6	1.5	1929	2	3.5
13	11.52	4	8.63	5	1768	5	1899	5	3	5	719	5	2.9
17	15.28	2	14.66	2	2932	2	2806	2	4	4	1435	1	13
18	11.85	3	10.77	4	2033	4	1911	4	6	1.5	130	4	20.3

VALUE OF COMPOSITE SCORE	WARDS	REMARKS
<15.0	2,17	COMPARATIVELY DEVELOPED
15.0 - 25.0	1, 18	DEVELOPING
>25.0	13	UNDER DEVELOPED

PROPOSED ENVIRONMENTAL PLANNING :-

WARD NO.	PROPOSED ROAD (KM)	SCALE 1CM = 15 KM	PROPOSED DRAIN (KM)	SCALE (1CM = 15 KM)	PROPOSED NO OF WASTE COLLECTION	SCALE 1CM = 15 VAN
1	18.52	1.23	12.66	0.84	5	0.33
2	13.19	0.87	11.09	0.75	6	0.40
13	19.23	1.28	9.73	0.64	4	0.26
17	27.12	1.80	20.84	1.39	8	0.53
18	17.21	1.14	12.98	0.86	5	0.33

SOLID WASTE COLLECTION :-

WARD NO.	NO OF BUS-KET DISTRI. OUTSIDE	LENGTH OF BAR 1CM = 1750 CM	NO OF VERTICIES OF WASTE COLLECTION	LENGTH OF BAR 1CM = 3 VAN	SOLID WASTE GENERATION (kg/day/house)	LENGTH OF BAR 1CM = 0.75 kg	COLLECTION OF SOLID WASTE	LENGTH OF BAR 1CM = 0.75 kg
1	2406	1.37	5	1.66	1.42	1.67	0.98	1.30
2	3601	2.03	6	2	1.89	2.45	1.27	1.69
13	1899	1.08	3	1	0.92	1.22	0.63	0.83
17	2806	1.60	3	1	0.92	1.22	0.63	0.83
18	1911	1.09	2	2	0.94	1.25	1.28	1.70

AVAILIBILITY OF DRINKING WATER :-

WARD NO.	NO. OF WATER TAP CONNECTION	LENGTH OF BAR 1CM = 1500 CM	NO. OF TUBEWELL	LENGTH OF BAR 1CM = 1500	WATER SUPPLY LITER/DAY	LENGTH OF BAR 1CM = 7500	DEMAND OF WATER (LITER/DAY)	LENGTH OF BAR 1CM = 7500
1	1037	0.69	2104	1.40	1037	0.69	3629	1.73
2	1929	0.90	2266	2.17	1929	0.81	4301	2.46
13	72	0.47	1723	1.14	719	0.40	2287	1.30
17	1435	0.95	2804	1.86	1435	0.82	2258	1.29
18	330	0.43	1834	1.22	330	0.42	2680	1.53

SOURCE : SEN AND GUPTA (2018). ECONOMIC EXISTANCE OF STREET VENDORS & THEIR ROLE IN URBAN ECONOMY INTERNATIONAL JOURNAL OF MANAGEMENT, 5(2) 9-5-10-2