RAINWATER HARVESTING – AN ALTERNATIVE TO INDUSTRIAL WATER NEED- A STUDY OF PIMPRI-CHINCHWAD MIDC INDUSTRIAL UNITS, (MAHARASHTRA, INDIA)

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Year 2018

DECLARATION

I hereby declare that the thesis entitled "RAINWATER HARVESTING – AN ALETERNATIVE TO INDUSTRIAL WATER NEED"-A STUDY OF PIMPRI-CHINCHWAD MIDC INDUSTRIAL UNITS. completed and written by me has not previously been formed as the basis for the award of any degree or other similar title upon me of this or any other Vidyapeeth or examining body.

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Research Student

Place: Pune
Date:. October - 2018

CERTIFICATE

Certified that the work incorporated in the thesis "RAINWATER HARVESTING – AN ALETERNATIVE TO INDUSTRIAL WATER NEED"-A STUDY OF PIMPRI-CHINCHWAD MIDC INDUSTRIAL UNITS. Submitted by MR. **DATTATRAY PANDURANG MANE** was carried out by the candidate under my supervision. Such material as has been obtained from other sources has been duly acknowledged in the thesis.

(DR. ARUN D.ANDHALE)
Research Guide

Place: Pune
Date: October 2018.

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Date: Dattatray Pandurang Mane

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Chapter I

INTRODUCTION.

1. Introduction.
2. Global water scenario
3. Water usage and industrial water use.
4. Concept of Rainwater Harvesting.
5. Historical Back Ground of Study Area
6. The Location of Study Area and geographical assessment with Maps.
7. The Location of Selected Zone in Pimpri Chinchwad MIDC.

INTRODUCTION

1. Introduction :

One of the measure elements of life is water. Life on earth cannot be imagined without water. Hence water is considered as one the most important element on the earth. It has been seen from past that all the measure and huge human settlement have been beside water resources. Even I today's advanced world human settlements are mainly dependent on the availability if the water. Water resource play main role in bring humans together as a family, city, state, nation. It plays vital role in bonding people together at international level too. India being a developing country one of the major city which has seen rapid growth in the industrial area is Pimpri Chinchwad located in Maharashtra.

Industrial growth in any area is totally dependent on the availability of water resource in the surrounding place. Pimpri Chinchwad industrial area can be considered luck in this sector as it receives water supply from Pawana Dam which is located in Maval Tahasil of Pune District.

One of the measure concern in Maharashtra is supply of water in rural and urban areas and that too bifurcation of water resources between industries and agriculture purpose. Currently the measure concern in Maharashtra is the to manage water resources and its accurate usage for the industrial areas, as Industries in Maharashtra are growing rapidly all around. Pimpri Chinchwad MIDC being one of the rapidly growing industrial area, we have focused on it to study water management. The research is based on filling up of questioners in the Pimpri-Chinchwad MIDC which was related to usage of industrial and domestic water and its management. The mains issues assessed in the study are excess water in industrial area process, domestic water use, its scarcity. The answers to these issues would provide further solutions to other alternative for water supply such as rain water harvesting techniques. The study would also help in seeking usefulness of rain water harvesting in the industrial area as the industrial areas are looking forward for alternative of water supply.

The study helps to find out measure issues in industrial areas as follows

a. Amount of water used per industrial unit
b. Proper utility of water
c. Problems related to water supply
d. Water management
e. Alternative of water supply

2. Global water scenario :

Water is major concern all over the world. Water is the measure issue which is being discussed on all international platforms. Issues such as shortage of drinking water, over flooded countries and on the other side drought prone areas and water pollution. Overall it can be seen that the world is heading over to war on the issues of water.

We all know that 71% of the earth surface is covered with water, but we need to know the bifurcation of it which is as follows

a. 97.30% is saline and only

b. 2.70% is Fresh water.

c. Out fresh water 77.20% is stored as ice caps and glaciers, 22.40% as ground water and soil moisture, 0.35% in lakes and swamps, 0.04% in atmosphere and less than 0.01% in streams. (Ref. - U.S. Geological Survey The Water Science School)

Both developed and developing countries are making equal efforts to save every bit of each water resource. Major tensions in the developing countries is to mange water for both domestic and industrial use. As Industrial water resource is must for developing countries. India being one of the developing countries is making major efforts of water managent specially in Industrial area. As the rapidly growing industries in India are making mark on the international platform, water supply for the same is being unmanageable in future. It is concern for today to check the water resocure management for the industrial areas in major cities in India as some cities are still getting water piped and pumped from long distance. Such shifting of water from one place to another bring major pressure on the local and domestic population in India.

World water use scenario			
Sector	**World (in %)**	**Countries having Low and Middle Income (in %)**	**High Income Countries. (in %)**
Agriculture	70	82	30
Industry	22	10	59
Domestic	8	8	11

Source: World Bank, 2001.

One of the major issues in Industrial areas are the conflicts between the local communities and the industrial areas on water resource. As the water resource being single in the areas it becomes huge difficulty to manage it between domestic and industrial use. Other issue such as water scarcity and water pollution as makes impact on Industrial area conflicts. Industries which are located in water scarcity area zone undergo double pressure both from local community and government too.

India being developing and industrial country, second highest consumption of water is done by Industries. Industries mainly use ground water and surface water. It can be said the water requirement of industries is mainly fulfilled by ground water. For water Industries are mainly dependent on availability of sufficient and regular supply of water and the cost of water from the source. Pricing of water are bifurcated in two different ways as per the resource i.e availability of sufficient and regular supply of water and the cost of water from the source. For industries all te basic elements such as water, electricity, and diesel and their pricing are regulated by the government hence the malpractice in usage of water is regular. As there conflict between the local bodies and government in regards to water supply and its usage there is insufficient supply water to the industrial areas by the government, hence the industries have to depend on the ground water. (Ref. - "Down To Earth" Magazine Supplements)

Increasing Demand of Industrial Water Use in India

(in billion cubic meters)

Category	1990	2010	2025	2025
Irrigation	460 (88.6%)	536 (77.3%)	688 (73%)	1008 (70.9%)
Domestic	25 (4.8%)	41.6 (6.1%)	52 (5.5%)	67 (4.7%)
Industries + Energy	34 (6.6%)	40.1 (6.0%)	80 (8.5%)	121 (8.5%) 141 (10.1%)
Total(including others)	519	693	942	1422

Source: National Commission for Integrated Water Resources Development Plan, Ministry of Water Resources, 1999.

3. Water usage and industrial water use :

With increasing industrial development all over the country the demand for water has been increasing rapidly. It can be seen that the water intensive industries are growing significantly, also putting pressure on other industrial water demand. Since 1990 the percentage growth in the industries are as follows

a. Chemical and Construction Industries 9%
b. Textile and Food Industries 6%
c. Paper and Paper Product Industries 5%

Sustainable, reliable and cost effective alternatives should be found for optimize usage of water. Rain water harvesting being one of the potential source of water it can used and can provide many answers to problems related to water scarcity in future.

(Ref. - Geography of water recourses- R.K.Gurjar, b.C.Jat, Rawat Pub)

4. Concept of Rainwater Harvesting.

Rainwater harvesting can be defined as activity of direct collection of rain water and storage of rainwater as well as other activities aimed at harvesting and conserving surface and ground water, prevention of loss through evaporation and seepage and other hydrological studies and engineering inventions aiming at most efficient utilization of the rainwater towards best use for the humanity (Source – Rainwater harvesting and conservation manual Gov of India 2002)

5. Historical Back Ground of Study Area:

Detroit of the east very well know worse for the best developed Indutrial area i.e Pimpri Chinchwad MIDC containing many international and multinational automobile companies in it. The Pimpri Chinchwad Urband area comprises of different small cities such as Pimpri, Chinchwad, Akurdi, Bhosari etc.

Around 160 kms south east of Mumbai is located one the best Industrials area which we all know as Pimpri Chinchwad Urban area. The nearest city to Pimpri Chincwad Urban area is Pune. Pimpri Chinchwad Urban area is not only one of the major industrial area in Pune but also has significant plan in India. The rapid and successful growth of Pimpri Chinchwad Urban area can be seen in last 4 decades. Pimpri Chinchwad basically was a refugee camp area for people from Pakistan, its conversion to industrial area is really significant. Industrialization in Pimpri area commenced with the establishment of Hindustan Antibiotics Limited (H.A.) in 1956. The establishment of the Maharashtra Industrial Development Corporation (MIDC) in 1961-62 considerably facilitated industrial development in the area. It also increased large scale and small scale industries in that area which increased the industrial belt all around. The significant increase also came along with changes in the landscape of the area. The place is home for world renowned companies like Bajaj-Auto, Bajaj Tempo, Telco and Kinetic. Three rivers Mula, Mutha and Pawana, cover the region in three directions and even meet here. (PCMC Website)

6. The Location of Study Area and geographical assessment:

Pimpri-Chinchwad area covers 177.3 km2 composed of 105 general electoral wards According to 1997 which come under 4 divisional offices of Pimpri Chinchwad Municipal Corporation. The city of Pimpri-Chinchwad is situated near the western margin of the Deccan Plateau on the leeward side of the Sahyadri ranges and Western Ghats, 570 mt. (1,870 ft) above sea level, on the banks of the rivers Mula, Pawana and Indrayani. The city is located 18037'0"N Latitude and 73048'0" E Longitude. Out of major settlement of Pimpri Chinchwad urban area, Pimpri, Chinchwad, Dapodi, and Nigadi are located on the bank of Pawana river and also located on the old Pune Mumbai highway trade and are also connected with electrified Pune Mumbai railway line track. And other urban area in PCUA is located on hillock and small plateau areas. (Ref. - City Development Plan Report of PCMC, 2006-2012)

The city of Pimpri-Chinchwad is situated near the western margin of the Deccan Plateau on the leeward side of the Sahyadri ranges and Western Ghats, 560 m above sea level, on the banks of the rivers Mula, Pawana and Indrayani.

Establishment of Hindustan Antibiotics in the year 1954 in this region was the major step in the industrialization of this area. It can be said that it triggered the rapid growth of industries in Pimpri Chinchwad in next few years. In the year 1956 Maharashtra Industrial Development Corporation acquiring (MIDC) procured huge tracts of land in this region in anticipation and it was not long before multinationals started shifting to this newly developed Industrial world. IT was mainly considered to be engineering sector area in starting phase, but later on it become home for variety of industries such as pharmaceuticals, chemicals, telecommunications and even Information Technology companies. The mst amazing part is that Pimpri Chinchwad Urban area contains multinational companies as well as small scale industries which go hand in hand and support each other for their mutual growth.

With over 4,000 industrial units in the large, medium and small sectors dotting its landscape, the sprawling Pimpri-Chinchwad Industrial belt is one of the largest of its kind in this part of the country and certainly boasts of some of the biggest

names in the industry. Take a look at the names that it is home to — Tata Engineering, Bajaj Auto, Hindustan Antibiotic, the Finolex group of Industries and a clutch of Swedish companies that made this twin city their home in the mid-sixties including Sandvik Asia and Atlas Copco. More than 50 per cent of the small-scale units in the region at one point depended on and grew with the business provided to them by the erstwhile Telco, Bajaj Tempo, Bajaj Auto and others(Ref. - http://www.wikipedia.org. , MIDC office , MIDC Industrial Directory.)

GEOGRAPHICAL FACT OF PIMPRI CHINCHWAD MIDC	
AREA	1224.02 Hector.
Longitude	18° 37° North
Latitude	73° 50° East
Altitude	621 m. Above MSL
Rock Available	Hard Rock available at 1.5 m depth
Rain Fall	1170 mm per year
Temperature:	Summer- 15° C to 40° C
	Winter- 05° C to 20° C
Source of Water	Pawana River
Water Capacity(MLD)	144 MLD
Water Utilization(MLD)	98.5 MLD
Capacity of Water Treatment Plant	120 MLD at Ravet

(Source- R&D MIDC Pub.)

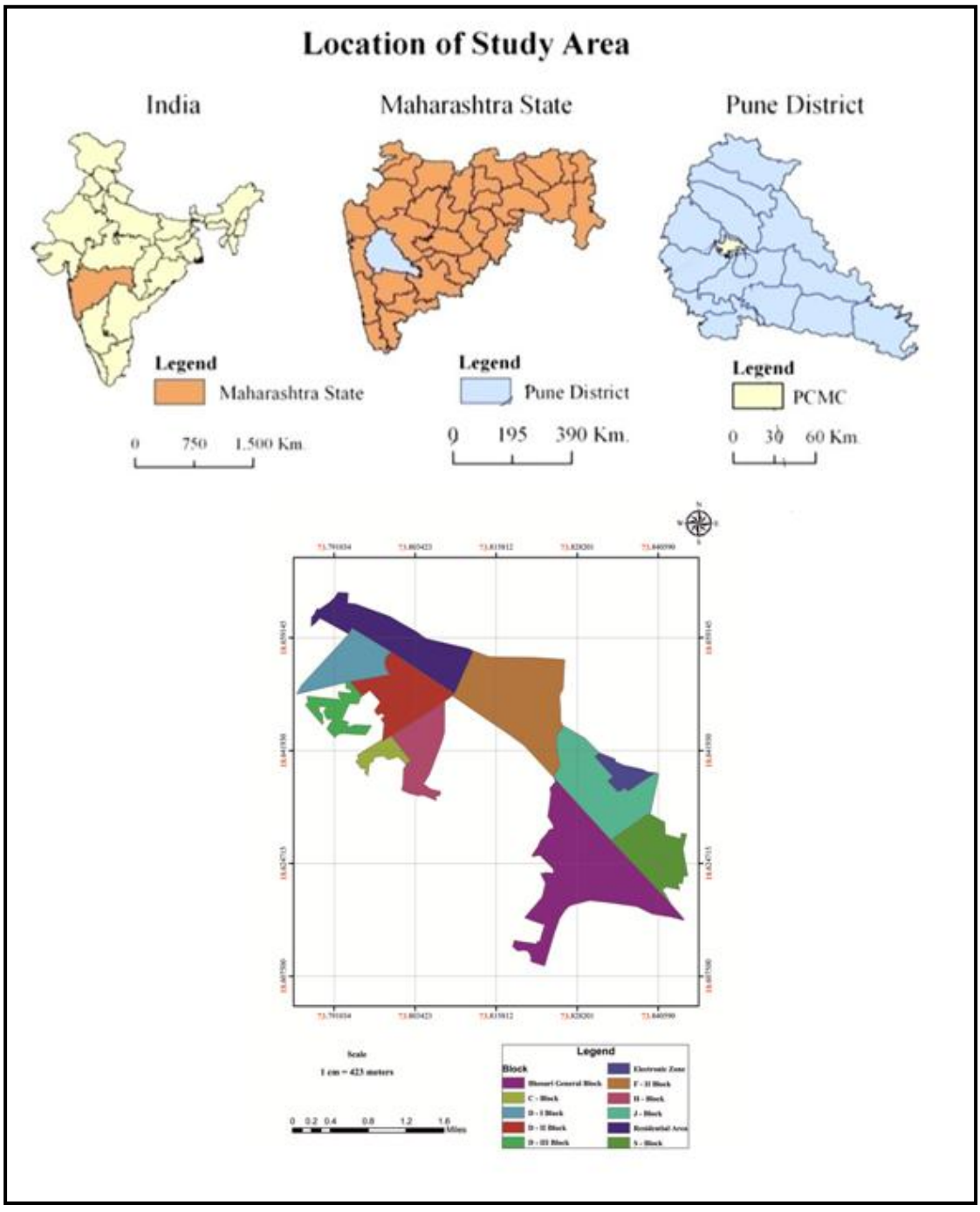
Location of Study Area
India
Maharashtra State
Pune District
Legend
Maharashtra State
0 750 1,500 Km.
Legend
Pune District
0 195 390 Km.
Legend
PCMC
0 30 60 Km.
Legend
Block
Scale
1 cm = 423 meters
0 0.2 0.4 0.8 1.2 1.6
Miles

Figure no. 2.1

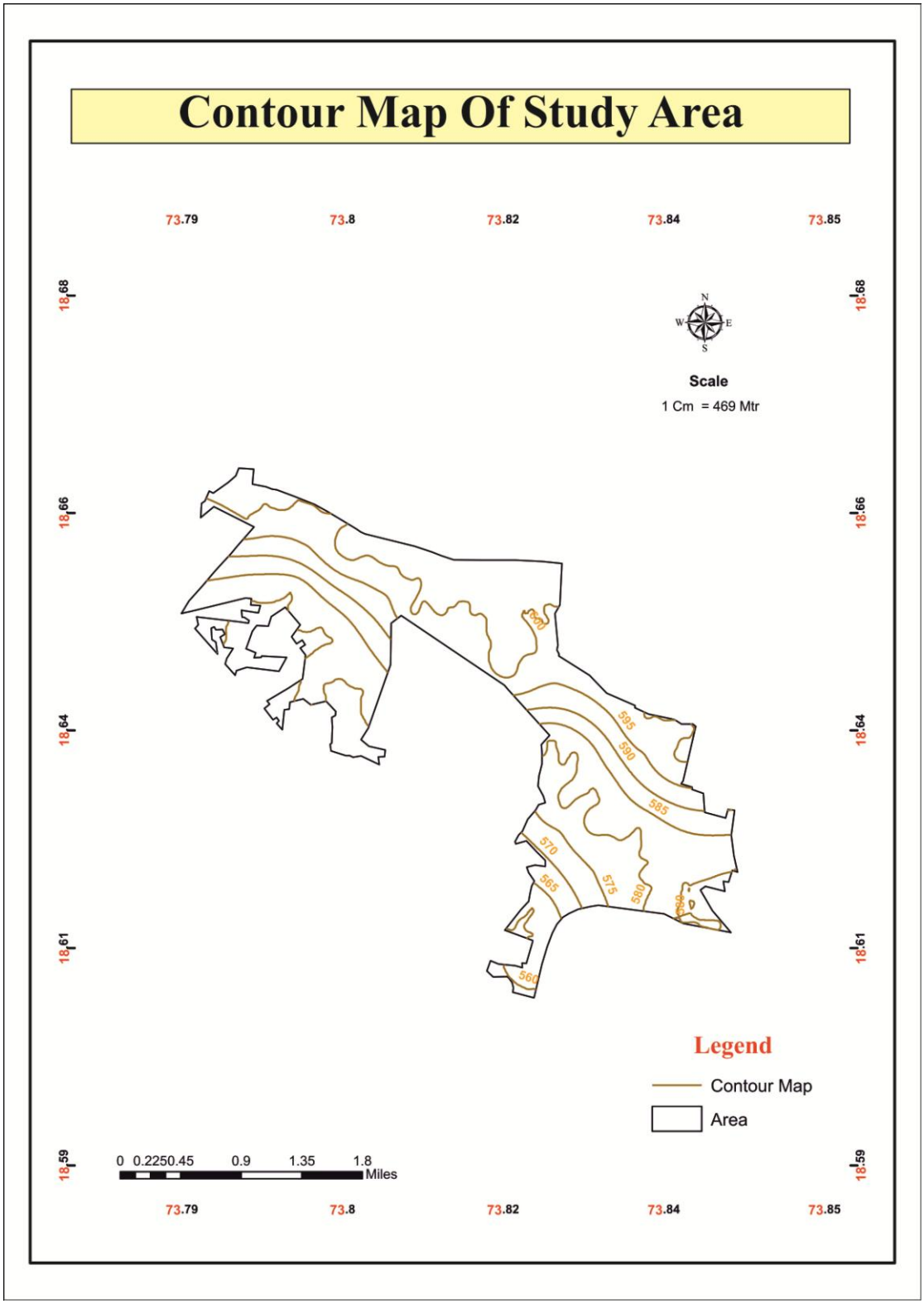

Figure No. 2.2

The contour is represented by the semi plateau area. The maximum height of the contour is 600 mtr. And minimum height is 560 mtr. Contour interval is 5 mtr. The slope of the area is north to south. Contour shows the actual height of the area or surface.

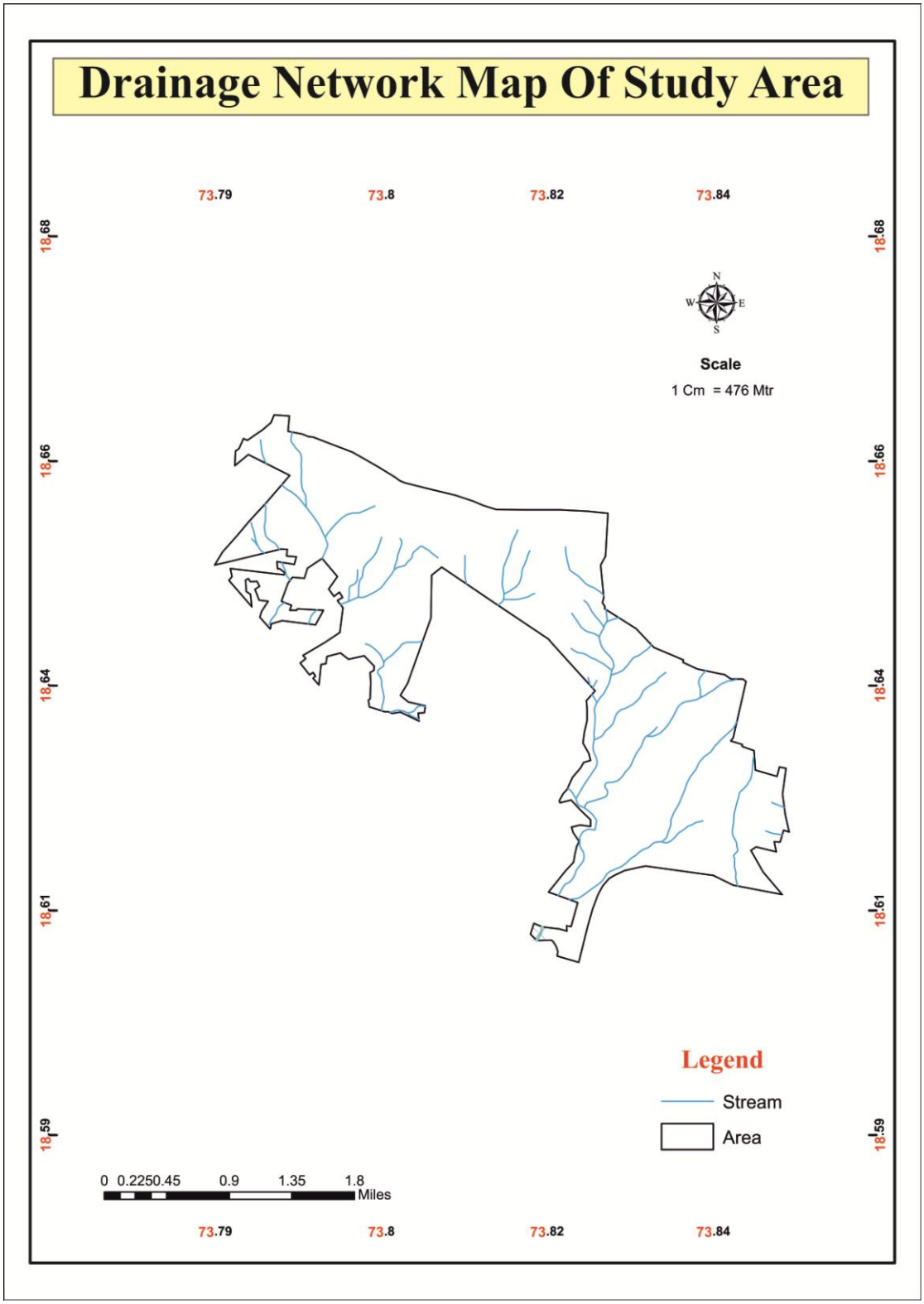

Figure No. 2.3

The drainage network or pattern is based on the slope of the area. Dendritic and parallel drainage pattern are seen in study area. Small tributaries are connecting to each other and this flows from north to south.

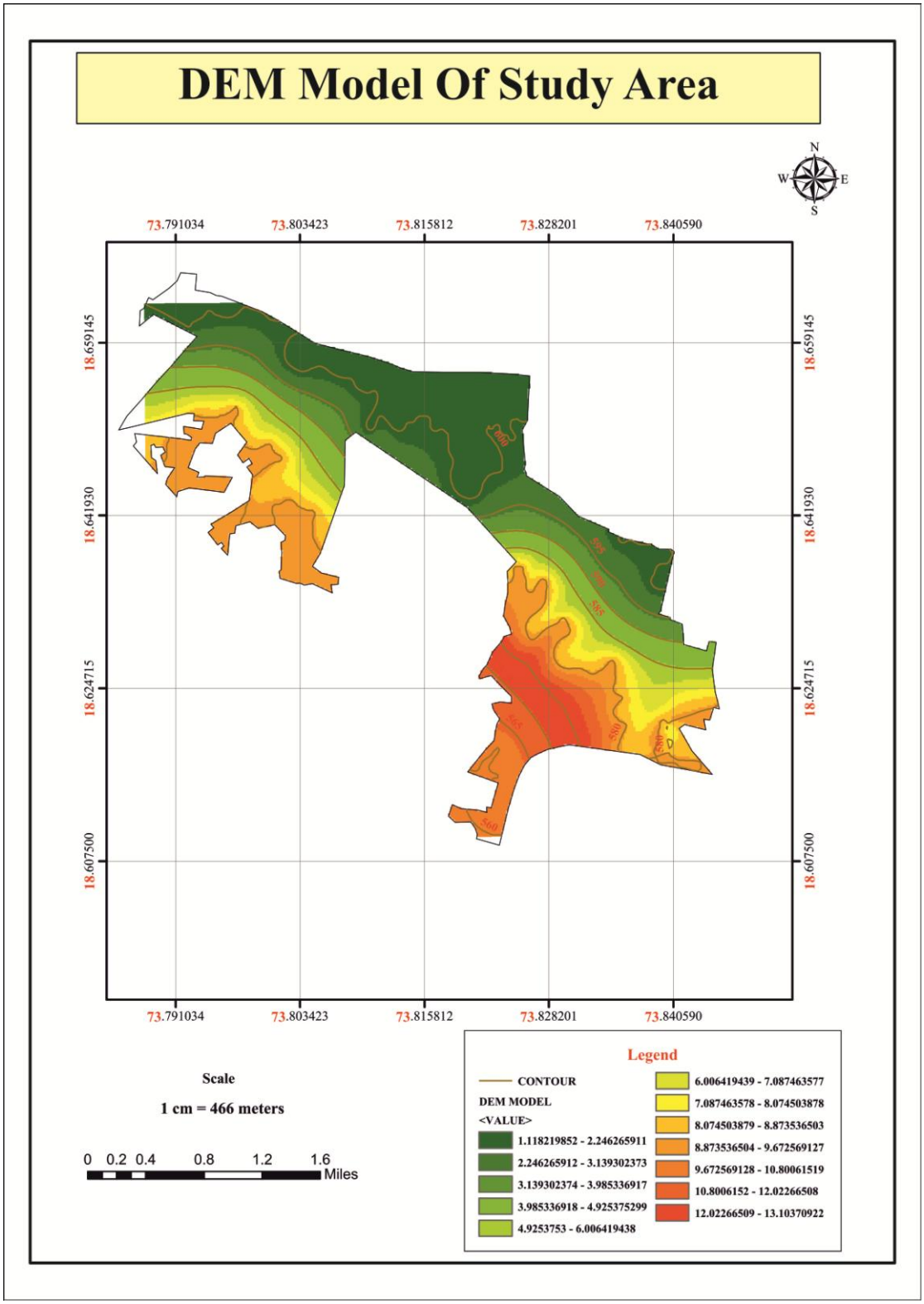

Figure No. 2.4

Digital elevation model (DEM) shows the digital elevation (3D) representation of a terrains surface of the study area. The maximum height of the arear is 600 mtr. And minimum height is 560 mtr. respectively. The slope of the area is north to south.

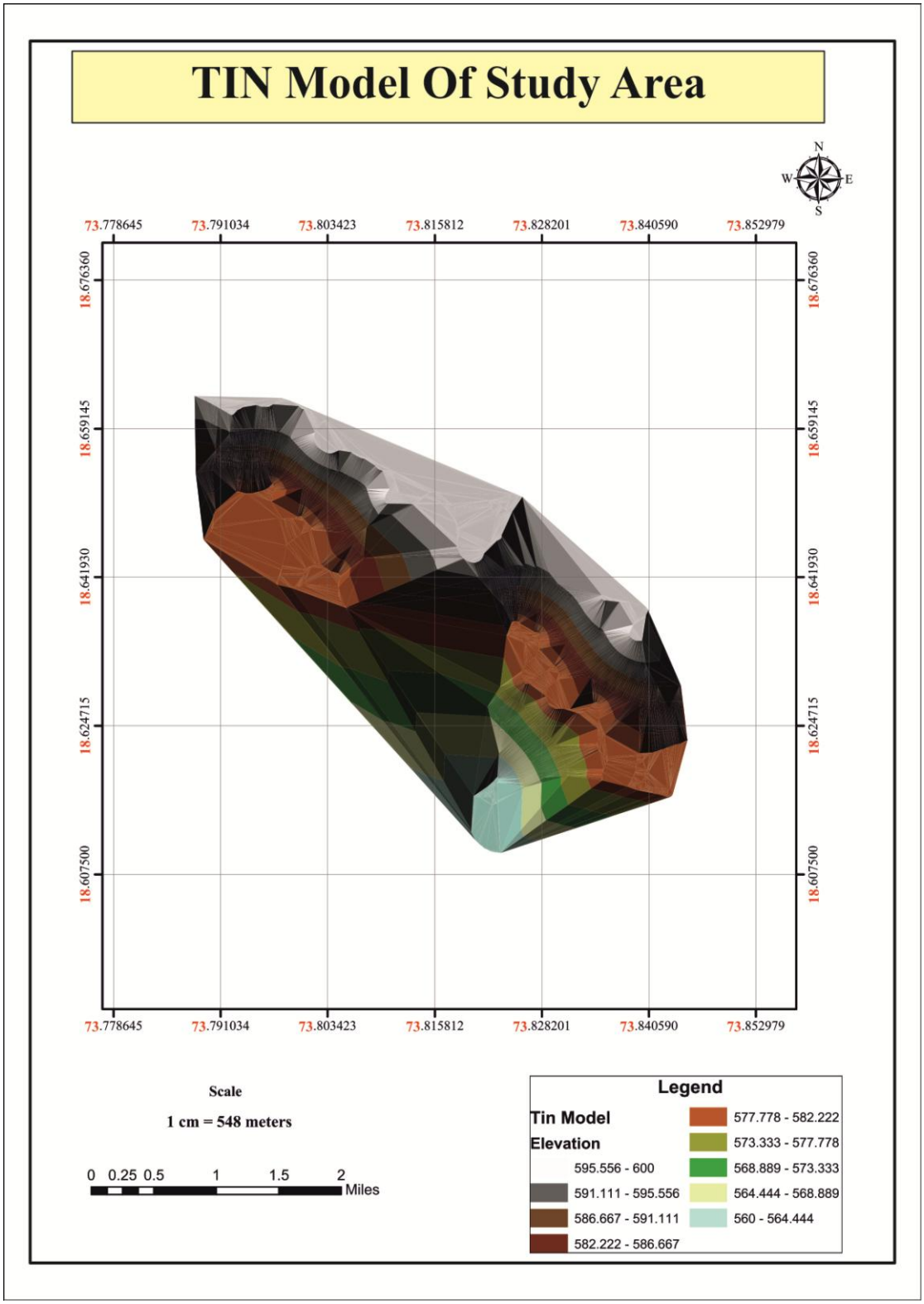

Figure No. 2.5

Triangulated irregular network (TIN) model is a representation of a continuous surface of triangular facets used mainly as discrete global grid in primary elevation modeling. This map shows the surface network or slope of the area.

7. The Location of Selected Block in Pimpri Chinchwad MIDC :

To get the clear understanding of every selected block was shown with Map of respective industrial block in MIDC. Following information clears the location of selected industrial block

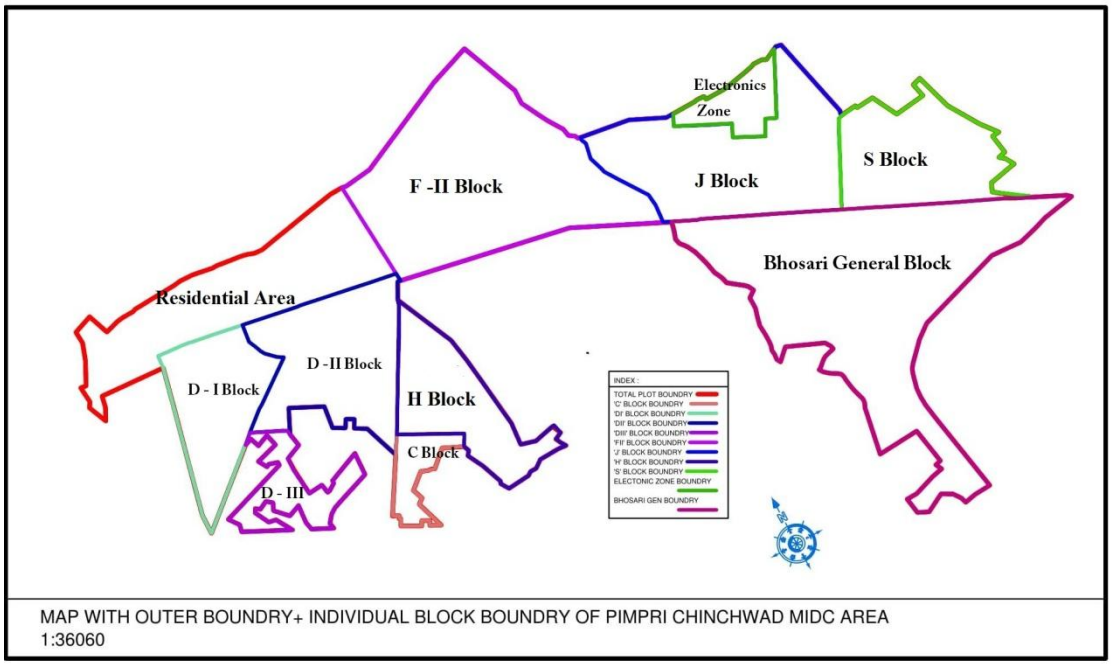

Figure No. 2.6

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Chapter – II

Review of literature

1. Introduction
2. Review of literature

Review of literature

1. Introduction:

The basic foundation of research work is based on the review of literature. It is a pre-supposition of research work to be carried out on a particular problem. The systematic study of the present problem will be carried out on the basis of following literature. Literature is very helpful to analysis the research problem and support to systematic thesis writing.

2. Review of literature:

1) "Water Harvesting Is A Critical Issue In India Given The Existing Scarcity And Water Quality Problems Experienced Practically All Over The Country. The Pattern Of Endowment Of Water Resources And The Long Term Predictions Of Deficits On Per Capita Availability In Different Rainfall Zones Point To The Need To Create New Resources*" Water harvesting and sustainable supply in India - R. N. Athavale,Centre for Environment Education.*

2) "A 'Manual on Artificial Recharge of Ground Water', providing detailed guidelines oninvestigative techniques for selection of sites, planning and design of artificial recharge structures, monitoring and economic evaluation of artificial recharge schemes was brought out by Central Ground Water Board in 1994." - Manual on artificial recharge of ground water, CGWA Sept- 2007.

3) "As an alternative paradigm for more sustainable water availability harvesting rainwater, storing it in tanks, and recharging groundwater may be put in place. On the civil society becoming more aware and sensitized regarding its potential, rainwater harvesting can perhaps be scaled up to neighborhood and micro-watershed levels. Armed with complete information, it has been seen that people naturally would have a tendency to conserve their own resources." *Measures for Ensuring Sustainability of Rainwater Harvesting By Prepared by Water for Asian Cities Programme, India – UN-HABITAT & Directorate of Urban Administration & Development Government of Madhya Pradesh.*

4) "The paper seeks to address the issue of rainwater harvesting for houses, apartments, industries and institutions especially in an urban context. It does not specifically exclude peri- urban and semi rural area as land use restriction in many cities push industries to peripheries and fringes." *Rainater harvesting in urban areas- industries By – S.Vishwnath, Bangalore.*

5) "Demand on water resources has increase day by day due to the population growth and expansion in urbanization, industrialization and irrigated agricultural. Adopting the concept of sustainability and conservation of water resources can help to cope with the global water shortage. Rainwater harvesting system is one of the concepts that can be implemented to meet the water shortage problem". *Rainwater Harvesting as an Alternative Water Supply in the Future By – Che-Ani A.I, Shaari N, M.F.M. Zain,European Journal of Scientific Research ISSN 1450-216X Vol.34 No.1 (2009), pp.132-140.*

6) The paper discuss the physical—hydrological and meteorological— and socioeconomic and purely economic considerations that need to be involved in decision - making with regard to water harvesting investments or analyzing the impact of RWH systems, and how these considerations limit the scope of water harvesting; and make practical suggestions for improving the effectiveness of rainwater harvesting.- Rainwater Harvesting in the Water-scarce Regions of India: Potential and Pitfalls By- Mr. *Dinesh Kumar, Ankit Patel1 and O.P. Singh IWMI-TATA Water Policy Program, Hyderabad, India, Benaras Hindu University, Varenasi, India.*

7) "In case of insufficient water or absence of individual access to water, the rainwaterharvesting system is an alternative solution for the households, both in urban and rural areas. This rainwater can complement the existing water supply system and reduce the pressure on a system which is over solicitated. In this regard, the individual rainwater harvesting cisterns located in the Old city of Ahmedabad constitute an additional system to have access to water." *RAINWATER HARVESTING, ALTERNATIVE TO THE WATER SUPPLY IN INDIAN URBAN AREAS: THE CASE OF AHMEDABAD IN GUJARAT By - Akil AMIRALY, Nathalie PRIME, Joginder P. SINGH*

8) "These will lead to high rate of consumption of most valuable natural resource Water resulting in augmentation of pressures on the permitted freshwater resources. Ancient method of damming river and transporting water to urban area has its own issues of eternal troubles of social and political. In order to conserve and meet our daily demand of water requirement, we need to think for alternative cost effective and relatively easier technological methods of conserving water. Rain water harvesting is one of the best methods fulfilling those requirements. The technical aspects of this paper are rainwater harvesting collected from rooftop which is considered to be catchment areas from all hostels and Institutes departmental building at N.I.T. Rourkela Campus. Gutter design, its analysis, first flush and filtration mechanism are also dealt with in detail." *Rainwater Harvesting at N.I.T. Rurkela, By – Ranjit Kumar Sharma , Department of civil engineering- 2010.*

9) "The water level depletion during summer is very common problem throughout the country specially the mega cities with rapid urbanization like New Delhi, the capital city of India. With encouraging results from the present experimentation, it is recommended that the scheme be extended for implementation in Group Housing Societies where large rooftop surface area will be available to conserve rain water so that it could be tapped judiciously when needed. It is need of the hour as well as the Government before we reach the last drop of the water." *Roof – top rainwater harvesting technique in an urban area – a case study from India. By- Dr. S. K. Sharma, Geological Research Institute 24 National Road, Dehradun 248001, India.*

10) In this paper, it covers the components that can be taken under the rain water harvesting structure, geographical area, availability of the water quantity, its quality and water demand. It also covered about the design parameters in which the flexibility and community management can promote and accordingly the design was modified. The main conclusion of this paper was the acceptance of the community about the technology, its design considerations and about the promotion of this technology in the water scarcity and pollutant regions. - *Roof top rain water harvesting system in deccan plateau region, andhra pradesh, india By - R. Amarnath Babu (M.Tech in Environmental Management)*

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Chapter – III

RESEARCH METHODOLOGY

1. Introduction.
2. Significance and importance of study.
3. Hypothesis.
4. Objective of study.
5. Limitation of study.
6. Methodology –
    - 6.1 Coverage and sample industrial blocks and sample size.
    - 6.2 Reference work.
    - 6.3 Primary data source.
    - 6.4 Secondary data source.
    - 6.5 Laboratory component.
    - 6.6 Analysis of data.
    - 6.7 Arrangement of text.

1. Introduction:

Research methodology is the process used to collect information, data and its analysis for the purpose of problem solving decisions. The methodology may include interviews, surveys and other research techniques, and historical information. Research in common parlance refers to a search for knowledge. Once can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. In research methodology covers so many thing significance of study, hypotheses testing, research problems, sampling size, methods of data collection, analysis of data, data tabulation and representation through qualitative and quantitative Techniques , report writing etc.

Ref, Research methodology – methods and techniques, C. R. Kothari, New Age International (P) Ltd., Publishers, 2004, ISBN (13): 978-81-224-2488-1

Following research methodology are using in work.

2. Significance and importance of study:

1) Water is precious resource. Conservation of water resource is need of time.
2) To sort out water use in industries and understanding of water use efficiency to industrial communities.
3) Rainwater conservation will provide an alternative for traditional water use in the industry.
4) To divert focus of industrialist towards the potential of rainwater harvesting within the campus of industry.
5) Rainwater harvesting is support for local ground water recharge.
6) Study will try to analyses rate of infiltration at industrial area.
7) Study will try to analyses of industrial water audit and water budget of water use.

3. Hypothesis:

The basic foundation of research work is based on the hypothesis. It is a pre-supposition of research work to be carried out on a particular problem. The

systematic study of the present problem will be carried out on the basis of following hypothesis.

The rainwater harvesting in the industrial units of Pimpri – Chichwad MIDC will prove an alternative to the water need of industrial units.

The Hypotheses focuses on aspects related to industrial water use by analyzing the water resource and the alternative support for water need.

4 . Objectives of study:

The present study of Rainwater harvesting potential an alternative to industrial water need – A study of Pimpri-Chinchwad MIDC industrial units will be based on following objective –

1) To analysis and asses the industrial units in Pimpri-Chinchwad MIDC on the basis of area occupied and its water requirement for the various purpose.
2) To analysis the area covered under mottled road concreted spaces the rooftop areas and open land available for natural infiltration with in the industrial campuses.
3) To analysis study the all attribute of rainwater harvesting in Pimpri-Chinchwad MIDC.
4) To suggest measures to industrial units for enhancement of rainwater harvesting as important supportive alternative for industrial water need.
5) To workout of infiltration of over rainwater harvesting.
6) To workout rainwater potential for various industries in Pimpri-Chinchwad MIDC.
7) To suggest water audit of industrial water use and its efficiency for particular industrial units.

5. Limitation of study:

1. The study is limited to the Pimpri Chinchwad MIDC geographical area.

2. The study deals mainly with the present scenario MIDC industrial units water use and rainwater harvesting potential.

6. Methodology:

The study focused on Rainwater harvesting an alternative to industrial water need in pimpri-chinchwad midc industrial units.

6.01 Coverage and Sample Industrial blocks and Sample Size:

Many case studies have been made of the specific industries but studies were not carried by considering the total industrial units in any industrial region. It is much true that there is much type of surfaces (eg. Open space, garden, parking, roads and rooftop etc) involved in an one industrial unit. To driven at total potential and try to generalize the formulation put forth it was very essential to study the industrial region or block as a whole but it was very difficult task or exercise to go through all the industries in the region or block. It was again difficult systematic sapling of the industries for the study; therefore stratified random sampling method was used to study the same.

Pimpri Chinchwad MIDC		
Sr. No.	**Name Of Industrial Block**	**Industrial Units**
1	Bhosari General Block	159
2	D - I Block	30
3	D- II Block	70
4	D -III Block	30
5	F - II Block	50
6	J Block	224
7	H Block	72
8	S Block	120
9	Electronic Zone	28
	Total	783

6.02 Reference Works:

Books and Journals, Article, Reports, various website and News papers, Google and Wikimapia are the references used to the get information and the basics of the selected topic.

6.03 Primary Data Sources:

The field visits, Observations, filling up the questionnaires, interviews, field survey of industrial blocks by surveying instruments for zone demarcation and Photographs are the basic source of primary data.
The details of methodology of these primary data sources are as follows.

Questionnaire:

This questionnaire includes the questions for gathering information of industry.

A) Name and address of industrial unit.
B) Campus area in square meter-
C) Roof area in square meter-
D) Source of water-
E) Water use in industrial process in liter-
F) Water use in domestic process in liter -
G) Observation of water management-

The data was collected by the researcher on the pre decided schedule which includes by the personal interviews responsible person from each industrial unit. Each interview was taken 30 to 40 minutes of time. The total process of collecting primary data was completed within 10 months of time.

The focus of getting the primary data was on the objectives and hypothesis of the reach problem. Most of the industrial member of industrial blocks helped us for the interview and provided the good response for all questions but somewhere little problem are faced with their local organizations.

6.04 Secondary Data Sources:

S.O.I. Toposheet, MIDC office, MIDC directory, Paper cutting and MIDC,PCMC web sites are the secondary data sources for this study.

6.05 Laboratory Component:

The laboratory work includes preparation of base map, statistical, cartographic techniques & other required maps with the help of Arc- GIS, Auto cad, Adobe Photoshop software for determined the area of industrial blocks.

6.06 Analysis of Data:

The data collected through primary and secondary data sources has been analyzed with the help of statistical tools.

Some of the formulas/ mathematical equation which were used for this statistical analysis were given bellow.

To calculate the harvestable rainwater potential of roof-top rainwater following method is used Manual of rainwater harvesting and conservation By Govt. Of India, Consultancy services organization central public works department, Nirman Bhavan, New Delhi. In 2002.

Rainwater Harvesting Potential (In Cum) =

Area (in Sq.meter) X Annual Rainfall (m) X Co-efficient X Constant Co-eff.

Runoff Co-efficient:

The collection efficiency accounts for the facts that all the rain water falling over an area cannot be effectively harvested because of evaporation, spillage etc. factor like runoff coefficient as stated for various types of roof and land surface etc. as shown in below table and the first flush wastage i.e. first spell of rain is flushed out, evaporation and spillage does not enter the systems so a constant co-efficient of 0.80 may be adopted for all situations. This is done because the first spell of rain carries with it a relatively larger amount of pollutenants from the air and catchment surface.

A) Campus Area-

Campus Area	Parking	Open Space	Garden	Road
Ground Surface Covering	Aspheltic or concrete Pavement	Unimproved land area	Parks	Aspheltic or concrete Pavement
Co- efficient	0.70 - 0.85	0.10 - 0.30	0.10 -0.25	0.70 - 0.85
Consider Co - Efficient	0.77	0.20	0.17	0.77

B) Roof Area-

Roof Area	Slab	Cross Metal Sheet	Go down
Roof Catchment	Tiles	Corrugated metal sheets	Corrugated metal sheets
Co- efficient	0.8 -0.9	0.7 -0.9	0.7 - 0.9
Consider Co - Efficient	0.8.5	0.8	0.8

Source - Pacey, Arnold and Cullis, Adrian 1989, Rainwater Harvesting: The collection of rainfall and runoff, Intermediate Technology publication, London

C) Constant Co-eff. – 0.80

D) Annual Rainfall –

Pimpari Chinchwad MIDC annual rainfall In mm = 700 - 800 mm,
consider rainfall - 750 mm,
Rainfall In meter = 0.75

6.07 Arrangement of Text:

The first chapter introduces the concept of rainwater harvesting, historical background of study area, location of study area, the location of selected industrial blocks with the help of Google images in Pimpri Chinchwad MIDC,

The second chapter covers the review of literature

The third chapter studies, hypothesis, aims and objectives of the study and methodology..

The fourth chapter is the water management and associated problems of industrial blocks with the help of water use in industrial process and domestic water

use. Classification of industrial units on the basis of water use in industrial process calculation of rainwater harvesting potential and its status in industrial groups

The fifth chapter deals with the summary, finding, conclusion base on the hypothesis and objectives of study area.

Finally the photographs of various industrial units in Pimpri Chinchwad MIDC area, bibliography, webliography, abbreviation, glossary and appendix for the study

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Chapter – IV

ANALYSIS AND INTERPRATION

1. Introduction.
2. Concept of water management.
3. Classification of industrial units.
4. Water management and associated problems and rainwater harvesting potential calculation in pimpri-chinchwad midc industrial units.

4.1 A) Without water use in industrial process:

a) Service industries.
b) Manufacturing Industries.
c) Packing industries

B) Water use in industrial process:

a) Manufacturing industries.
b) Tool manufacturing industries.
c) Plastic and rubber, fiber industries.
d) Metal and forge industries.
e) Chemical industries
f) Water base industries.
g) Automotive industries.
h) Pharmaceutical industries.

A) Industrial water management and associated problems in Pimpri-Chinchwad MIDC industrial units.

1. Introduction :

Regional urbanization and industrial development require water that may put additional pressure on available water resources and threaten water quality in developing countries. Water sector today faces major challenges with declining per capita water availability in many Asian countries and stands stressed with rising water demand mainly from the competing agriculture, domestic and industrial sectors. The freshwater withdrawals are expected to rise the world over (by 2025), by around 50% in developing countries and by 18% in developed countries. Domestic and industrial water demands in Asia are growing rapidly at rates projected to range from 70 to 345 % between 1995 and 2025. During the past 50 years, per capita availability has declined by 60% in North Asia and 55% in Southeast Asia3 . Worldwide, the volume of water used by industries is estimated to rise significantly from 752 km3/ year (1995) to 1170 km3/year by 2025. Besides, the low & middle income countries expected to follow the growth pattern of high income industries increasing their industrial water use over agricultural use.

(Source - Integrated water management framework for industries CSO forum2013-14)

Water use across various sectors in India is on the rise. Various estimates and projections indicate an increasing trend in water demand for agriculture, industrial and domestic uses in the coming decades. India is also projected to move into the category of water stressed nation by 2020. The water demand for the industrial sector is on a rise and will account for 8.5 and 10.1 percent of the total freshwater abstraction in 2025 and 2050 respectively. This is a 4 per centuries from the current level of 6 per cent of the total freshwater abstraction by the industries in 2010.

Availability of water is becoming an area of concern for the industries. This is true for industries across the sectors surveyed. With regard to the current availability of water, while 60% of the respondents agree that availability of water is impacting their business today, the figure rises to 87% after 10 years. Member industries have acknowledged the fact that over the past few years, access to water has become difficult and the problem is likely to increase in the coming years. This is a major worry for industries belonging to the sectors like thermal power plants, chemicals,

textiles, cement and manufacturing. (Source – Water use in Indian industry survey FICCI Water Mission, New Delhi, September, 2011).

Industrial locations in cities and towns in India is one of major factor which attract abundant population. The water reservoirs nearby these cities were supplying the water to growing population in these cities and towns. This water is also to be supplied to increasing needs of industries. The surrounding agriculture practices also to be waiting to this water for their farming practices. This is how the growing water requirement is raising pressures on the water reservoir.

These signals of water crises are now at our doorsteps. It is the need of time to go for micro planning of water management, water conservation and rainwater harvesting etc.

2. Concept of Water Management :

As water moves in time and space consistent with the hydrological cycle, the term ‘water management’ covers a variety of activities and disciplines. Broadly speaking, these can be divided into three categories: managing the resource, managing water services, and managing the trade-offs needed to balance supply and demand. Water resource management is the activity of planning, developing, distributing and managing the optimum use of water resources. It is a sub-set of water cycle management. Ideally, water resource management planning has regard to all the competing demands for water and seeks to allocate water on an equitable basis to satisfy all uses and demands. As with other resource management, this is rarely possible in practice. IWRM is defined as a process that ‘promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. It implies that all the different uses of water resources are considered together. Though important developments have been made around the world, the preparation by governments of national IWRM plans and the actual implementation rates of these plans remain unsatisfactory and well behind targets. (Source: World Water Development Report 2012, http://www.unwater.org)

3. Classification of industries :

Industries can be classified in a variety of ways. Generally sector wise, product wise and economic scale wise industries are classified. The industries are classified on the basis of industries not using the water in the industrial process and the industries those uses the water in their industrial process.

A) Without water use in industrial process :

In this group we found three type of industries which is does not use water in there industrial process.

a) Service industries - Service industries includes industrial equipments, transport facility suppliers, testing, coating and marketing services etc.

b) Manufacturing industries - Manufacturing industries includes fabrication, furniture, and oil and air pressure, electronic base manufacturing industries which were not using water in there industrial process.

c) Packing industries – Industrial product packing industries are included in these industries.

B) Water use in industrial process: -

In this group we found eight type of industries which were using water in there industrial process.

a) Manufacturing industries.

b) Tool manufacturing industries.

c) Plastic and rubber, fiber industries.

d) Metal and forge industries.

e) Chemical industries

f) Water base industries.

g) Automotive industries.

h) Pharmaceutical industries.

4. Water management and associated problems:

Water management and associated problems is again a issue which must focused on the basis of problems related to the water management in the industries. The domestic use of water and water use in industrial process must be well managed to save the water. On the basis prior classification of industries we have tried analyzed the problems found in water use management.

As per the Government of India ministry of housing and urban affairs norms per day per capita 135 liter water consummations is require for domestic purpose in urban area.

Generally person working in industry perform his duty for eight hours and the per day per capita use of water in urban area of our country is 135 liters. The working staff stays in units for 1/3 of day therefore they may use water 1/3 of it that is near about to 45 liters, and this is to be considered as an optimum water use. To analyze and to get suitable interpretation of water use we have defined the limits for that, which is as follow:

Table no. 3 - Water usage per person per day in Industry

Sr. No.	Water use in Lit.	Water use Remark
1	0 – 45	Optimum
2	46 – 90	Optimum to excess
3	91 - Above	More than excess

4.1 Without water use in industrial process (A Group) :

Here in this category we have taken in to consideration the industries which are not using water in the industrial process and the water only used for the domestic purposes. The domestic use is considered on the basis of the water used by working staff in the industries. On this basis every industrial unit in particular sector is studied to get the per person water use.

a) Service Industries:

Table no. 3.1 - a) Service Industries - 1) Bhosari Gen. Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	PBJ Associates	328500	20	900	45	Optimum
2	TUN	730000	35	2000	57	Optimum to excess
3	A V Fargtul Ltd.	255500	15	700	47	Optimum to excess
4	Sachin Industries	255500	8	700	88	Optimum to excess
5	Darekar grinding Industry	328500	3	900	300	More than excess
6	Standred Industry	365000	18	1000	56	Optimum to excess
7	Fluid Cantrols	912500	40	2500	63	Optimum to excess
8	Foy Okam Pvt. Ltd.	1277500	28	3500	125	More than excess
9	Das Thinbak	730000	30	2000	67	Optimum to excess
10	Refaetory Sheps Pvt. Ltd.	365000	12	1000	83	Optimum to excess
11	Shree Govind	730000	50	2000	40	Optimum
12	Dharia Engineers	912500	23	2500	109	More than excess
13	Nirmity Automotive P . Ltd .	547500	20	1500	75	Optimum to excess
14	Amiso Good P. Ltd.	547500	25	1500	60	Optimum to excess
15	Mask Seals Company	365000	12	1000	83	Optimum to excess
16	Esbee Electrotech LLP	1095000	35	3000	86	Optimum to excess
17	Ashtech Tooling And Stampings Pvt. Ltd.	912500	50	2500	50	Optimum to excess
18	Alfa Enterprises	730000	30	2000	67	Optimum to excess
19	Yash Enterprises	547500	20	150	75	Optimum

				0		to excess
20	Mahindra C/E automotive Ltd	730000	40	2000	50	Optimum to excess
21	Electronics Sadn	1825000	150	5000	33	Optimum
22	Shree Stamping	912500	40	2500	63	Optimum to excess
23	Rajasthan 2 Stock	255500	18	700	39	Optimum
24	Danchal Steel	255500	15	700	47	Optimum to excess

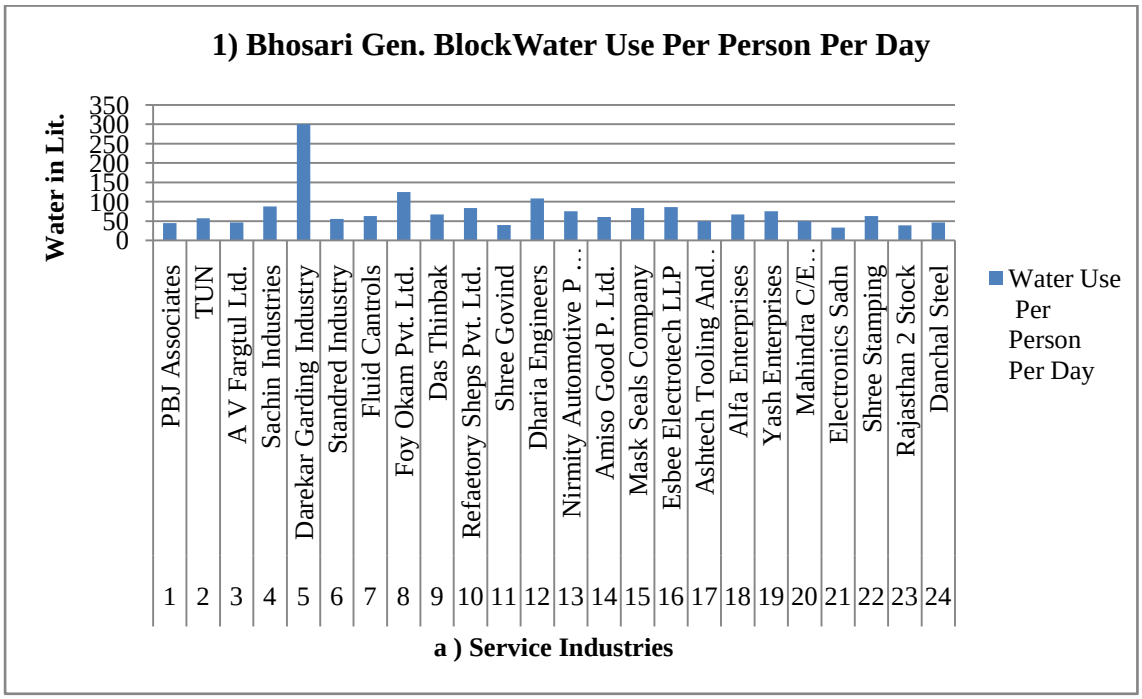

Figure no. 3.1

In the service industries of Bhosari general block the 4 industrial units are using optimum water, 17 units have their use optimum to excess and only 3 units were using more than excess amount of water for domestic purposes.

The PBJ associates, Shree govind, Electronic sadan and Rajasthan 2 stock industries has minimum per person per day use of water ie 45, 40, 33 and 39 respectively, where as Darekar grinding industry, Foy okam Pvt. Ltd and dhariya engineers industries has maximum per day per person use of water is 300, 125 and 109 liters. This industry is using maximum water because its product is Precision Grinding Services, Cylindrical Grinding and other industrial services.

Table no. – 3.2 - a) Service Industries - 2) D-I Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Amol Auto Parts	730000	25	2000	80	Optimum to excess
2	Jay Auto Parts	803000	25	2200	88	Optimum to excess
3	Hegade accessories And Components	255500	15	700	47	Optimum to excess
4	Magnum machine technologies Ltd.	1095000	35	3000	86	Optimum to excess
5	Sava Helthcare Ltd.	912500	25	2500	100	More than excess

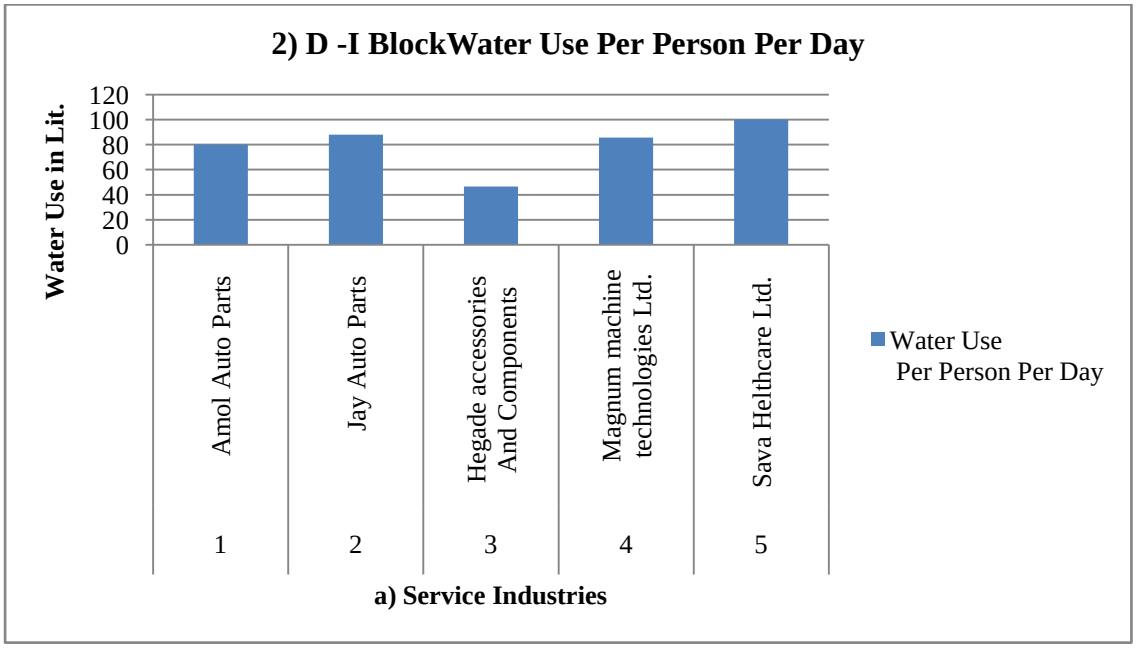

Figure no. 3.2

In the service industries of D -I no one any industrial units are using optimum water, 3 units have their use optimum to excess and only 1 units were using more than excess amount of water for domestic purposes.

Table no. 3.3 - a) Service Industries - 3) D- II Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	M E Cranes	730000	25	2000	80	Optimum to excess
2	Aman Stamping, Toolings Pvt. Ltd.	730000	25	2000	80	Optimum to excess
3	Freedom Steels	547500	12	1500	125	More than excess
4	Alfa Enterprises	255500	10	700	70	Optimum to excess
5	Daoll	730000	19	2000	105	More than excess
6	Bhandur Carane And Transport	730000	20	2000	100	More than excess
7	Metro Lab	912500	20	2500	125	More than excess
8	Spectra Electronics P. Ltd.	547500	15	1500	100	More than excess
9	Nirmal	730000	15	2000	133	More than excess
10	Kaweri Electronics	730000	24	2000	83	Optimum to excess
11	Shree Trimurti Mudrika	912500	20	2500	125	More than excess
12	Autometic Products	730000	15	2000	133	More than excess
13	Virher Engineering	730000	21	2000	95	More than excess
14	Safe Auto India	912500	44	2500	57	Optimum to excess
15	Rahul Industries	730000	20	2000	100	More than excess
16	Kwality Flexi	912500	44	2500	57	Optimum to excess
17	Poljmauls Polymer Pvt. Ltd.	912500	47	2500	53	Optimum to excess

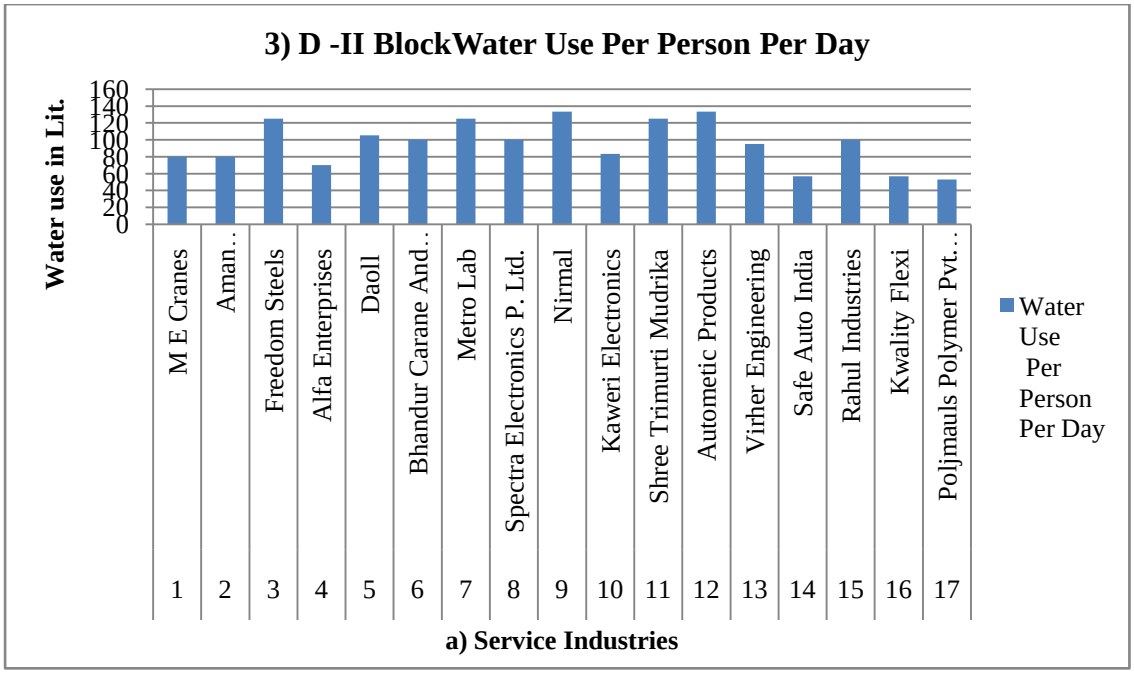

Figure no. 3.3

In the service industries of D - II block no one any units are using optimum water, 7 units have their use optimum to excess and only 10 units were using more than excess amount of water for domestic purposes.

The Freedom steel, Daoll, Bhandur crane and transport, Metro lab, spectra electronics P. Ltd, Nirmal, Shree Trimurti Mudriaka, Automatic product, Virher engineering and Rahul industry these industries has maximum per day per person use of water is 125, 105, 100, 125, 100, 133, 125, 133, 95 and 100 liters. This industry is using maximum water because its product and services is providing transport and crane systems, engineering laboratory and plastic and rubber, steel testing services and commercial printing and other industries provide industrial services.

Table no. 3.4 - a) Service Industries - 4) D - III Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Laminate gallery	1095000	25	3000	120	More than excess
2	Saki Auto Products Pvt. Ltd.	803000	15	2200	147	More than excess
3	Jayhind Playwood	730000	10	2000	200	More than

						excess
4	Ansari Kens Pvt. Ltd.	985500	15	2700	180	More than excess
5	Credene	912500	15	2500	167	More than excess
6	Cosmic Automotions Pvt. Ltd.	547500	15	1500	100	More than excess
7	Raghuwanshi Trading Company	438000	12	1200	100	More than excess
8	Shalimar Steel Treadrs	255500	15	700	47	Optimum to excess
9	M Product Catings	547500	25	1500	60	Optimum to excess
10	Paras Naturment Pvt. Ltd.	547500	24	1500	63	Optimum to excess
11	Hajtech Saports	328500	12	900	75	Optimum to excess
12	Vimiya Marketing Timber Merchants	365000	8	1000	125	More than excess

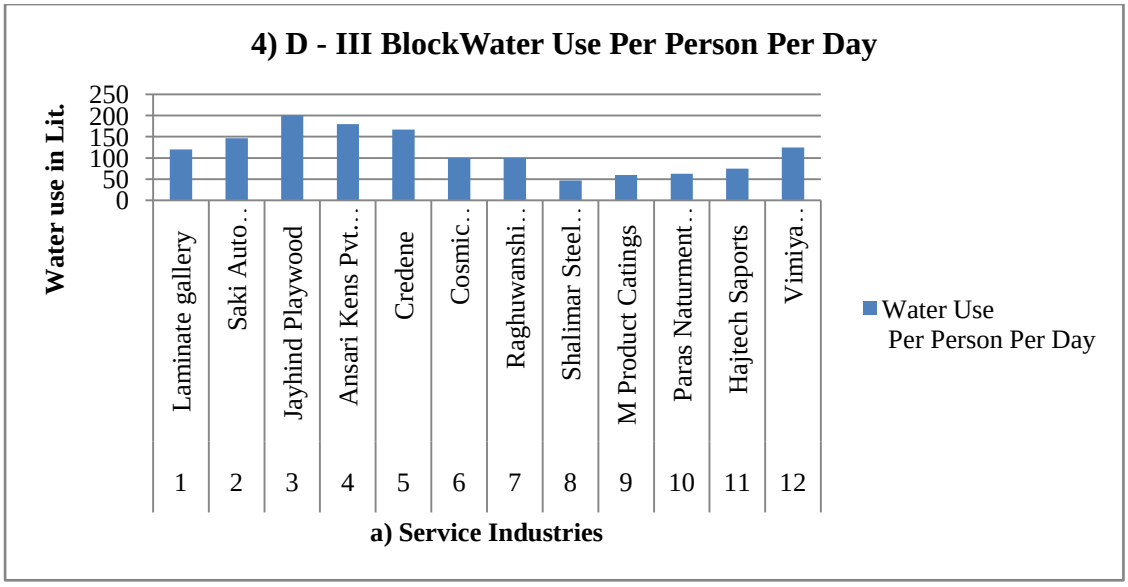

Figure no. 3.4

In the service industries of D-III block no one any industrial units are using optimum water, 4 units have their use optimum to excess and only 8 units were using more than excess amount of water for domestic purposes.

The Laminate gallery, Saki auto products Pvt. Ltd. , Jayhind Plywood, Ansari kens Pvt. Ltd. , Credene, Cosmic automotions Pvt. Ltd. , Raghuwanshi trading company and Vimiya marketing timber merchants these industries has maximum per day per person use of water is 120, 147, 200, 167, 100, 100 and 125 liters

respectively. This industry is using maximum water because its product and services is plywood pasting and lamination of industrial product and automotive parts.

Table no. 3.5 - a) Service Industries - 5) F- II Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Agarwal Containers Pvt. Ltd.	985500	30	2700	90	Optimum to excess
2	Classic Automotive Industries	803000	30	2200	73	Optimum to excess

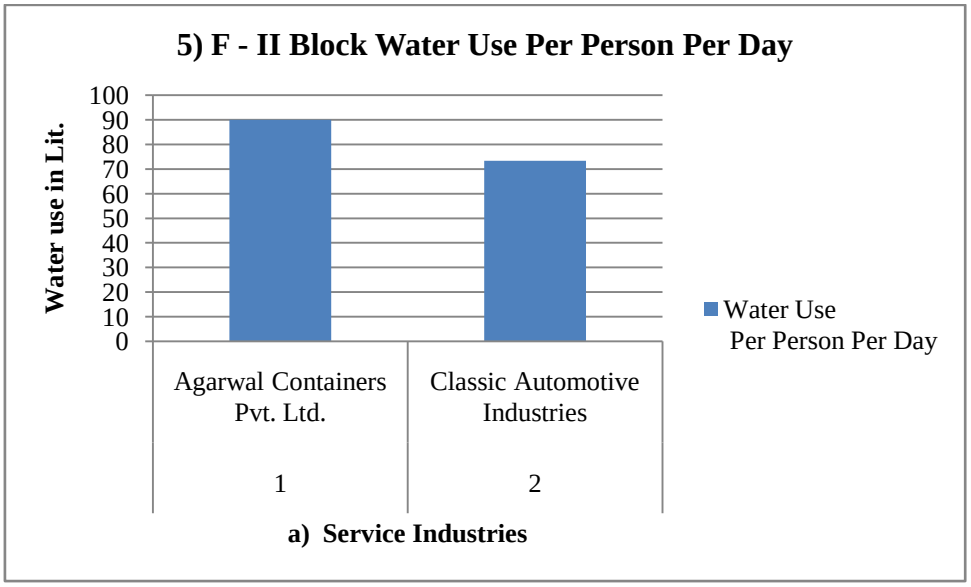

Figure no. 3.5

In the service industries of F-II block no one any industrial units are using optimum water, 2 units have their use optimum to excess and no one any units were using more than excess amount of water for domestic purposes.

Table no. 3.6 - a) Service Industries - 6) J Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Energy Equipment And Systems	255500	10	700	70	Optimum to excess
2	Raj Surface Treatment	255500	15	700	47	Optimum to excess
3	Nat Steel Entriprises	328500	18	900	50	Optimum to excess
4	Ambika Steel Corpration	438000	18	1200	67	Optimum to excess
5	Shri Ram Transmissions	547500	18	1500	83	Optimum to excess
6	Suprabha Protective Products Pvt. Ltd.	730000	20	2000	100	More than excess
7	Arora Refreataries P. Ltd.	182500	8	500	63	Optimum to excess
8	Mugnuplal Test Technologies Pvt. Ltd.	547500	25	1500	60	Optimum to excess

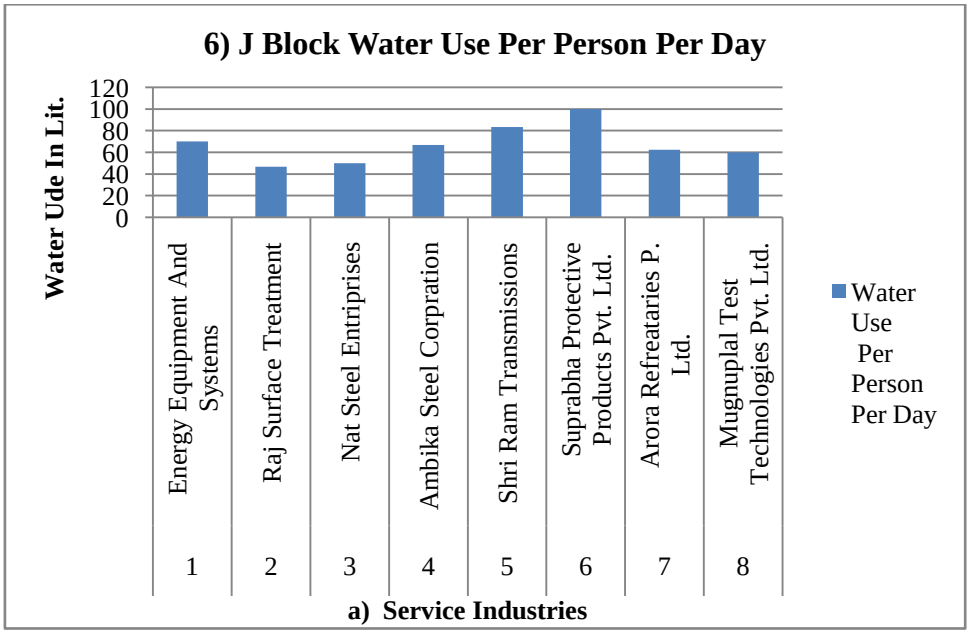

Figure no. 3.6

In the service industries of J block no one any industrial units are using optimum water, 7 units have their use optimum to excess and only 1 units were using more than excess amount of water for domestic purposes.

The Surybrabha protective products Pvt. Ltd. This industry is using maximum water because its product and service is to provide protective covering for industrial goods and to provide protective solutions for industrial manufacturing products.

Table no. 3.7 - a) Service Industries - 7) H Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	G R Construction	1277500	24	3500	146	More than excess
2	Veldate Equpment (Ind) Ltd	657000	18	1800	100	More than excess
3	Shamlal Aytun And Steel company	1277500	20	3500	175	More than excess
4	Deepjyoti Assocaiates	730000	15	2000	133	More than excess

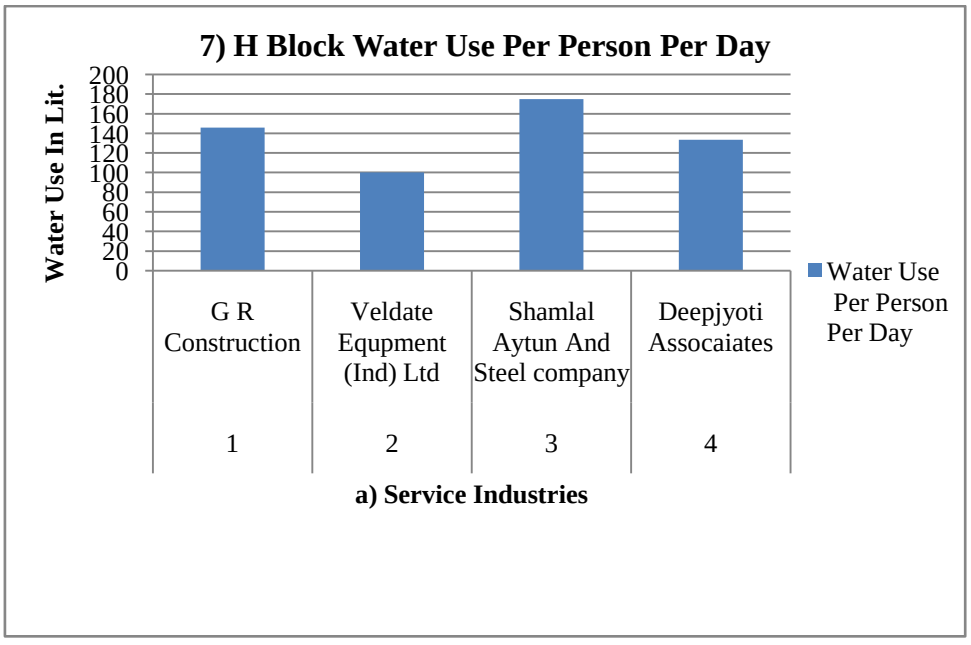

Figure no. 3.7

In the service industries of H block no one any industrial units are using optimum water, no one any units have their use optimum to excess and total 4 units were using more than excess amount of water for domestic purposes.

In this H blocks all industries using maximum water because its product and services is steel distributions and x- ray systems maintenance.

Table no. 3.8 - a) Service Industries - 8) S Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Jangid Furnitures	803000	15	2200	147	More than excess
2	Surya Furnitech Pvt. Ltd	730000	20	2000	100	More than excess
3	Wlmade Locking Systems Pvt. Ltd.	730000	12	2000	167	More than excess
4	Galaxy Industrial Equipment	1095000	30	3000	100	More than excess
5	Accurate Electro Industries	1460000	25	4000	160	More than excess
6	Lectra Tools CNC Wire Cuttings	1350500	15	3700	247	More than excess
7	SR Electro Systems	912500	8	2500	313	More than excess
8	Raja Sysytems Pvt. Ltd	1095000	20	3000	150	More than excess
9	S S Technology	912500	20	2500	125	More than excess
10	Neha Enterprises	730000	8	2000	250	More than excess
11	Arihant Enterprises	547500	20	1500	75	Optimum to excess

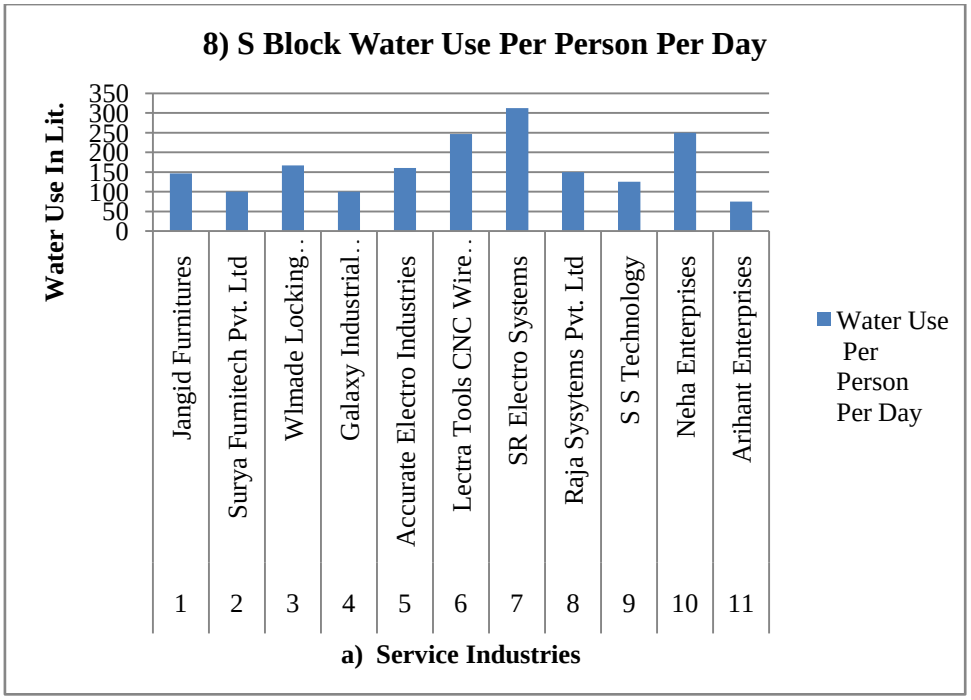

Figure no. 3.8

In the service industries of S block no one any industrial units are using optimum water, only 1 unit have their use optimum to excess and only 10 units were using more than excess amount of water for domestic purposes.

In this S blocks service industries only 1 industry using optimum to excess water remaining 10 industrial units using maximum water because its product is furniture polishing, coating of wooden and steel furniture, some industries are engaged in electronics systems, and CNC wire cutting services.

b) Manufacturing Industries:

Table no. 3.9 - b) manufacturing Industries - 1) Bhosari Gen. Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Taniohq Engineering	547500	20	1500	75	Optimum to excess

2	Shree Ganesh Engineering	547500	30	1500	50	Optimum to excess
3	Ajio Asso Pvt. Ltd.	365000	20	1000	50	Optimum to excess
4	President P. Ltd	547500	25	1500	60	Optimum to excess
5	Bhushan Engineering	438000	28	1200	43	Optimum
6	Jwala Sagar Industries	730000	20	2000	100	More than excess
7	Anand Industries	438000	17	1200	71	Optimum to excess
8	Shree Ganesh Forge	730000	15	2000	133	More than excess
9	EMC Enterprises	730000	12	2000	167	More than excess
10	N.C. Precision Pvt. Ltd.	730000	40	2000	50	Optimum to excess
11	Industrial Entrprises	547500	20	1500	75	Optimum to excess
12	Pravara	547500	22	1500	68	Optimum to excess
13	SSV Engineers Pvt. Ltd.	730000	25	2000	80	Optimum to excess
14	Disigen Steel Pvt. Ltd.	328500	20	900	45	Optimum
15	Thermax Lmted	5475000	400	15000	38	Optimum
16	A L Duse Maniufacturs	547500	30	1500	50	Optimum to excess
17	Shirodkar Engineeing	547500	20	1500	75	Optimum to excess
18	Shirodkar Precicom P. Ltd.	1095000	70	3000	43	Optimum
19	ARM	1277500	126	3500	28	Optimum
20	Rajguru Pan	255500	20	700	35	Optimum
21	Hitech Metal Process	255500	10	700	70	Optimum to excess
22	K K Enterprises	365000	24	1000	42	Optimum
23	Yashodhan Engineering	730000	40	2000	50	Optimum to excess
24	S A Engineering	730000	38	2000	53	Optimum to excess
25	AGSA Springs	365000	20	1000	50	Optimum to excess
26	Precise Cutting Tools	1460000	15	4000	267	More than excess
27	Pravin Industries	730000	50	200	40	Optimum

				0		
28	Sneha Berings Pvt. Ltd.	438000	15	1200	80	Optimum to excess
29	Asha Springs And Plastic Works	730000	20	2000	100	More than excess
30	Hill Man Forging Pvt. Ltd.	730000	40	2000	50	Optimum to excess
31	Saet Group Induction Equipment India Pvt. Ltd.	2920000	100	8000	80	Optimum to excess
32	Solidus Hightech Products Pvt. Ltd.	1460000	120	4000	33	Optimum
33	Igm Polysoude	730000	40	2000	50	Optimum to excess
34	Compex Engineering Systems P. Ltd.	912500	22	2500	114	More than excess
35	Rajdeep Industrial Product	255500	17	700	41	Optimum
36	Standred Machine Tools P.Ltd.	255500	11	700	64	Optimum to excess
37	Rajesh Engineering Works	328500	30	900	30	Optimum
38	MoJ Engineering	255500	28	700	25	Optimum

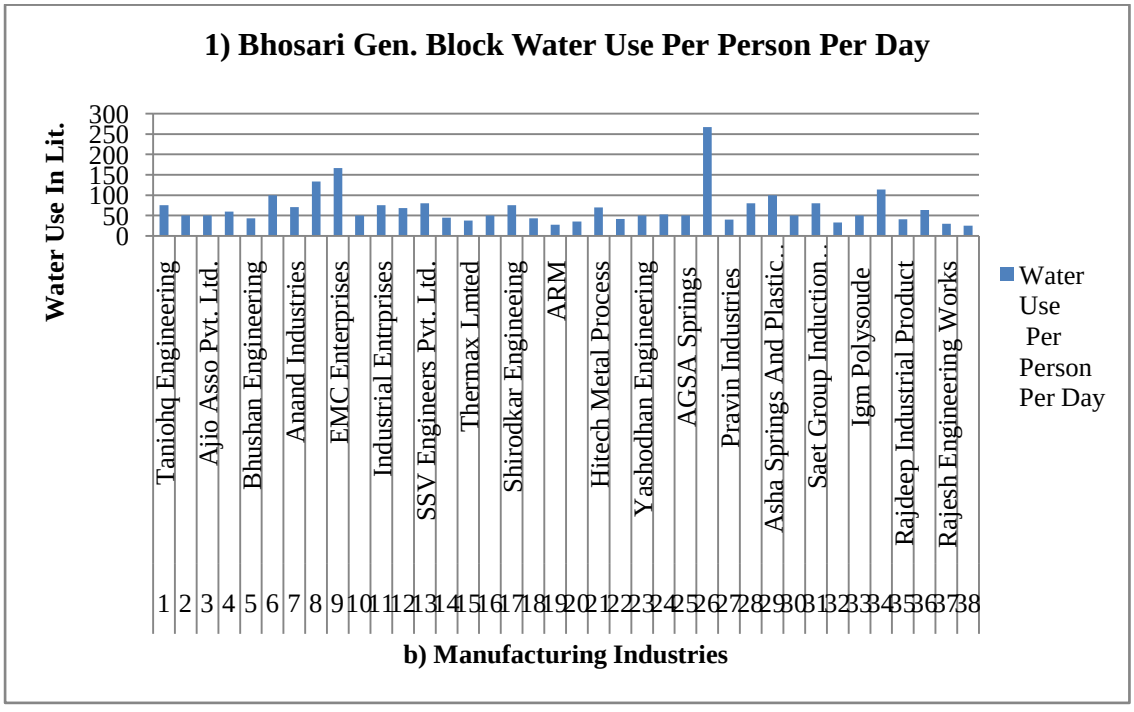

Figure no. 3.9

In the manufacturing industries of Bhosari general block the 12 industrial units are using optimum water, 20 units have their use optimum to excess and only 6 units were using more than excess amount of water for domestic purposes.

The Bhushan Engineering, disigen steel Pvt. Ltd. , Thermax Limited, Shirodkar precicom P. Ltd. , ARM, Rajguru Pan, KK enterprises, Pravin industries, Solidus high-tech products, pvt. Ltd., Rajdeep industrial products, Rajesh enginerring works and Moj engineering these industries has minimum per person per day use of water ie 43, 45, 38, 43, 28, 35, 42, 33, 41, 30,and 25 respectively, where as Jwala sagar industries, Shree ganesh forge, EMC enterprises, Precise cutting tools, Asha spring and plastic works copex engineering systems P. Ltd. Industries has maximum per day per person use of water is 100,133,167,267,100,114 liters. This industry using maximum water because its products is assembling machine components, tool cutting and plastic mold and spring products.

Table no. 3.10 - b) manufacturing Industries - 2) D -I Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Relience Engineers	730000	21	2000	95	More than excess
2	Trani box lit.	547500	21	1500	71	Optimum to excess
3	N-Pro P. Ltd	730000	19	2000	105	More than excess

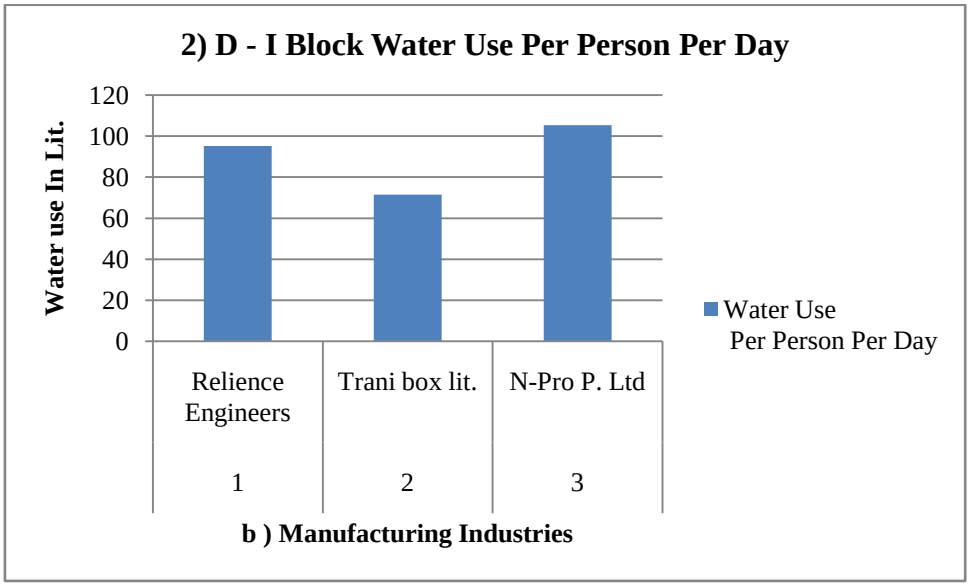

Figure no. 3.10

In the manufacturing industries of D -I block no one any industrial units are using optimum water, 1 units have their use optimum to excess and only 2 units were using more than excess amount of water for domestic purposes.

The Relience engineers and N- pro P. Ltd Industries has maximum per day per person use of water is 95 and 105 liters.

Table no. 3.11 - b) manufacturing Industries - 3) D -II Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Rajdeep Industries	730000	15	2000	133	More than excess
2	Hyt Engineering Company Pvt. Ltd. Unit II	730000	21	2000	95	More than excess
3	Advent Tool Tech	730000	18	2000	111	More than excess
4	Anand Techwen P. Ltd.	730000	21	2000	95	More than excess
5	Machine Reconditioners Pvt. Ltd.	547500	20	1500	75	Optimum to excess
6	Nachi Electronics	766500	20	2100	105	More than excess
7	S A Tools	547500	10	1500	150	More than excess
8	Sai Enterprises	1168000	40	3200	80	Optimum to excess
9	Kalpataru Patterns	839500	20	2300	115	More than excess
10	Maestratech Systems Pvt. Ltd.	803000	22	2200	100	More than excess
11	Spectra Trading Company	803000	10	2200	220	More than excess

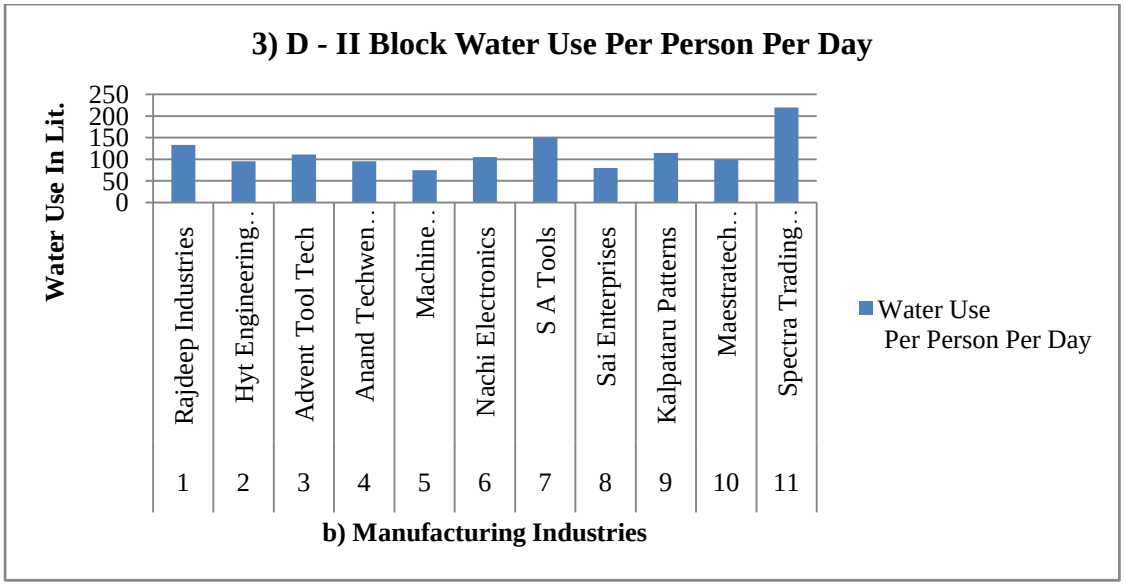

Figure no. 3.11

In the manufacturing industries of D-II block no one any industrial units are using optimum water, 2 units have their use optimum to excess and only 9 units were using more than excess amount of water for domestic purposes.

The Rajdeep Industries, Hyt Engineering Company Pvt. Ltd. Unit II, Advent Tool Tech, Anand Techwen P. Ltd., Nachi Electronics, S A Tools, Kalpataru Patterns, Maestratech Systems Pvt. Ltd. and Spectra Trading Company Industries has maximum per day per person use of water is 133, 95, 111, 95, 105, 150, 115, 100 and 220 liters respectively. This industry using maximum water because their product is CNC cutting, wheel pressing, dies making, tool manufacturing and pattern making.

Table no. 3.12 - b) manufacturing Industries - 4) F - II Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	R S Enterprises	547500	20	1500	75	Optimum to excess
2	Phonex	730000	18	2000	111	More than excess
3	Viduyt Plast	730000	15	2000	133	More than excess
4	Mayur Hevey	547500	12	1500	125	More than excess
5	Precisian	730000	15	2000	133	More than excess

6	PPM P. Ltd.	547500	18	1500	83	Optimum to excess
7	Universal Tools Ltd	730000	17	2000	118	More than excess
8	Kap Engineers	730000	23	2000	87	Optimum to excess
9	Avishkar	438000	15	1200	80	Optimum to excess
10	M Process Moter	328500	15	900	60	Optimum to excess
11	Pasrma Industries	255500	17	700	41	Optimum
12	Sonwin Engineering P. Ltd.	803000	20	2200	110	More than excess
13	Grap Fire Industries	803000	20	2200	110	More than excess
14	Sabari Enterprises	511000	20	1400	70	Optimum to excess
15	Bhansali Ispat	803000	20	2200	110	More than excess
16	Accumeesure Tools	620500	20	1700	85	Optimum to excess
17	Rinder Industries Pvt.Ltd.	803000	20	2200	110	More than excess
18	Four Felin	620500	15	1700	113	More than excess
19	Damodar Hard	328500	14	900	64	Optimum to excess
20	Sharada Industries	912500	40	2500	63	Optimum to excess
21	Mudra Engineering	554800	17	1520	89	Optimum to excess
22	Balaji Industries	730000	18	2000	111	More than excess

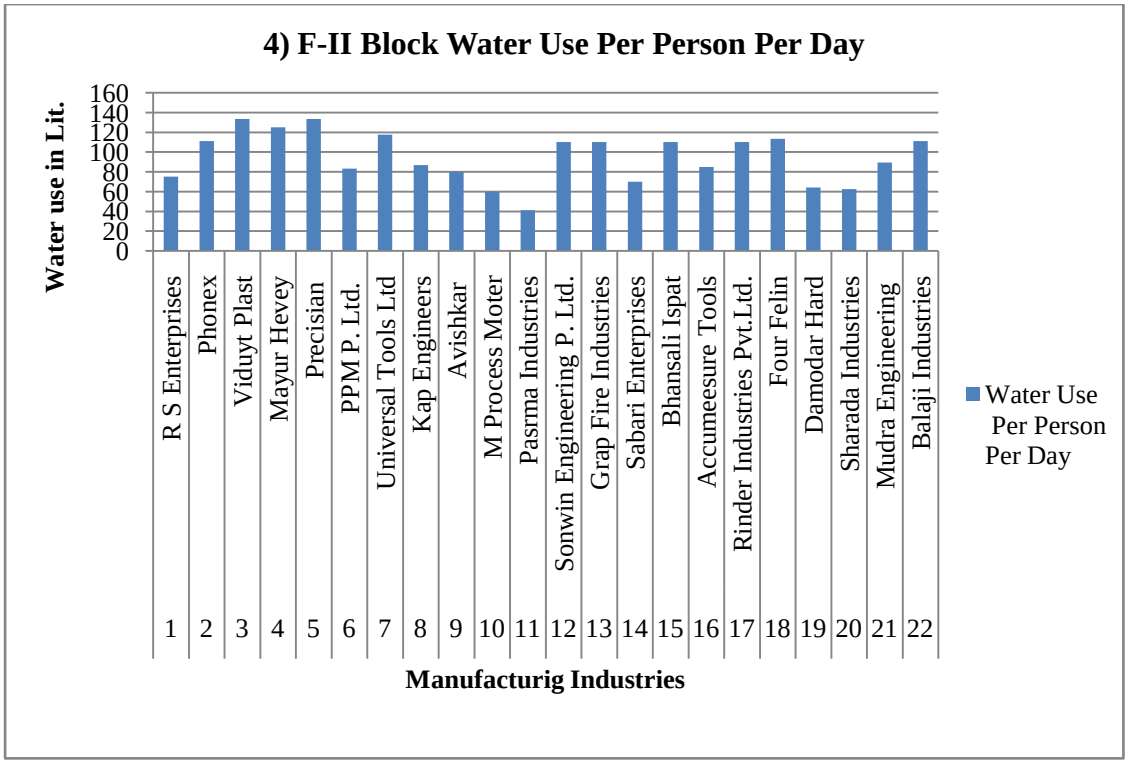

Figure no. 3.12

In the manufacturing industries of F-II block the 1 industrial units are using optimum water, 10 units have their use optimum to excess and only 11 units were using more than excess amount of water for domestic purposes.

The Pasrma industries has minimum per person per day use of water ie 41 respectively, where as Phonex, Viduyt Plast, Mayur Hevey, Precisian, Universal tools ltd., Snowin engineering P. Ltd., Grap fire industries, Bhansali ispat, Rinder industries, Four felin and Balaji industries these Industries has maximum per day per person use of water is111,133,125, 133, 118, 110,110, 110, 110, 113 and 111 liters respectively. This industry using maximum water because their product is assembling metal sheets, metal sheets pressing, electrical stamping and plastic mold .

Table no. 3.13 - b) manufacturing Industries - 5) J Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Quility Engineering	438000	11	1200	109	More than excess
2	Pargee Placstics Pvt. Ltd.	255500	12	700	58	Optimum

						to excess
3	Patson Engineering	255500	13	700	54	Optimum to excess
4	Siddhivinayak Agri P. Ltd.	730000	17	2000	118	More than excess
5	Vee Bee Industries	255500	11	700	64	Optimum to excess
6	A K Steel	547500	21	1500	71	Optimum to excess
7	Jriveny Industries	146000	9	400	44	Optimum
8	Shree Nivas Industries	109500	12	300	25	Optimum
9	Divin Tooling	255500	18	700	39	Optimum
10	Ulka Industries	255500	12	700	58	Optimum to excess
11	Turakhia Metals Pvt. Ltd.	146000	9	400	44	Optimum
12	EliteK	474500	18	1300	72	Optimum to excess
13	Mova Buik Hand Ltd.	547500	21	1500	71	Optimum to excess
14	Jyoti	547500	20	1500	75	Optimum to excess
15	A B Engineers	255500	12	700	58	Optimum to excess
16	Kualits Engineers	620500	12	1700	142	More than excess
17	G M Tools	620500	13	1700	131	More than excess
18	Visitor Parve	255500	13	700	54	Optimum to excess
19	Fine Sheet Metal Works	255500	13	700	54	Optimum to excess
20	Revin Industries	255500	11	700	64	Optimum to excess
21	Omkara	620500	14	1700	121	More than excess
22	Google Engineering	328500	13	900	69	Optimum to excess
23	M J Engineering	438000	12	1200	100	More than excess
24	Yogi Engineering Ltd.	328500	12	900	75	Optimum to excess
25	S S Engineering	109500	8	300	38	Optimum
26	Shrimahavir P. Ltd.	255500	20	700	35	Optimum
27	Cut Art Fabrication	255500	18	700	39	Optimum
28	Ghalsasi Works P. Ltd.	438000	13	1200	92	More than excess
29	Parth Enterprises	182500	13	500	38	Optimum
30	Target Engineers	146000	10	400	40	Optimum

31	Jayashree p. Ltd.	219000	12	600	50	Optimum to excess
32	Royal Fabricators	146000	10	400	40	Optimum
33	Sayaji Entrprises	438000	17	1200	71	Optimum to excess
34	Jeena Enterprises	620500	18	1700	94	More than excess
35	Devdatta Industries	620500	20	1700	85	Optimum to excess
36	Najan Electronic	438000	28	1200	43	Optimum
37	Autotrans Systems	365000	21	1000	48	Optimum to excess
38	Saiprit Enterprises	365000	22	1000	45	Optimum
39	Auto Partas	365000	30	1000	33	Optimum
40	Auto Parts Engineers	365000	40	1000	25	Optimum
41	Evole Technologies And Services Pvt. Ltd.	912500	40	2500	63	Optimum to excess
42	Mehata Presing	365000	20	1000	50	Optimum to excess
43	Ram Entrerprises	584000	25	1600	64	Optimum to excess
44	Jabbal Aut	584000	28	1600	57	Optimum to excess
45	D M Engineering	401500	18	1100	61	Optimum to excess
46	Shakti Electronic	146000	8	400	50	Optimum to excess
47	Varun Enterprises	292000	14	800	57	Optimum to excess
48	Laxmi Engineering	255500	11	700	64	Optimum to excess
49	Savan Tools P.Ltd.	255500	10	700	70	Optimum to excess
50	S S Technoservises P. Ltd.	182500	12	500	42	Optimum
51	Jectram Pvt. Ltd.	255500	13	700	54	Optimum to excess
52	Onkar Dies P. Ltd.	401500	18	1100	61	Optimum to excess
53	Ganga Ato-M P. Ltd.	365000	14	1000	71	Optimum to excess
54	Glab Engineers	182500	12	500	42	Optimum
55	Jay Industries	182500	8	500	63	Optimum to excess
56	Robey P. Ltd.	547500	22	1500	68	Optimum to excess
57	Deepdrsha Meseer	182500	12	500	42	Optimum
58	Sent Jorge Industries	292000	15	800	53	Optimum to excess

59	Nsg Industries	328500	12	900	75	Optimum to excess
60	Applied Power Industries	547500	20	1500	75	Optimum to excess
61	Sai Electric Company	547500	20	1500	75	Optimum to excess
62	S S Technoservises P. Ltd.	255500	12	700	58	Optimum to excess
63	Electronica Automation Pvt. Ltd.	547500	25	1500	60	Optimum to excess
64	Carmac Technologies Pvt. Ltd.	730000	50	2000	40	Optimum
65	Teknik Plant Machinery	365000	20	1000	50	Optimum to excess
66	Olikara Enterprises	401500	20	1100	55	Optimum to excess

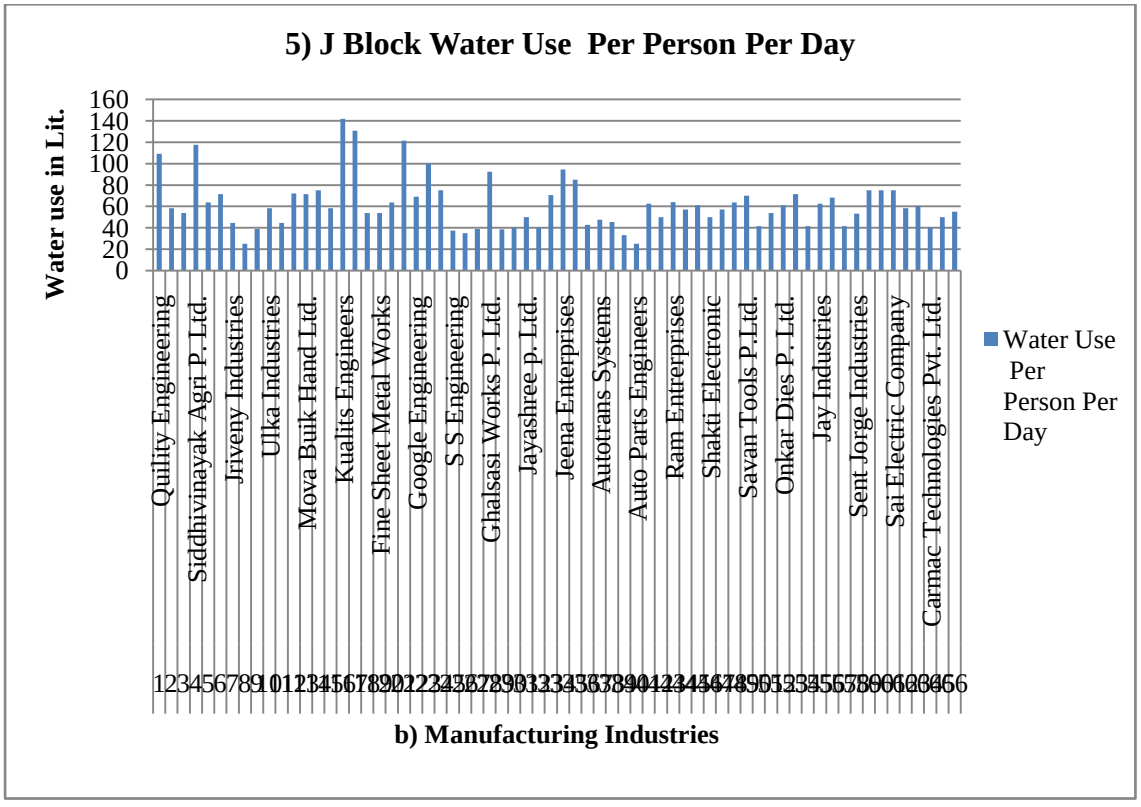

Figure no. 3.13

In the manufacturing industries of J block the 18 industrial units are using optimum water, 40 units have their use optimum to excess and only 8 units were using more than excess amount of water for domestic purposes.

The Jriveny industries, Shree nivas industries, Divin tooling, Turakhia metals Pvt. Ltd. , S S engineering's, Shrimahavir P. Ltd., Cut art fabrication, Royal fabricators, Najan electronic, Saiprit enterprises, Auto parts, Auto parts engineers, SS

technoservises Pvt. Ltd., Glab engineers, Deepdarsh meseer and carmac technologies Pvt. Ltd. has minimum per person per day use of water ie 44, 25, 39, 44, 38, 35, 39, 38, 40, 40, 43, 45, 33, 25, 42, 42, 42, and 40 respectively, where as Quality engineering, Siddhivinayak agri P. Ltd., Kulatits engineers, G M tools, Omkara, M J engineering, Ghalsasi works P. Ltd. And Jeena enterprises these Industries has maximum per day per person use of water is 109, 118, 142, 131, 121, 100, 92, and 94 liters respectively. This industry using maximum water because their product is assembling agriculture process machinery and jig and fixture manufacturing, and spare parts manufacturing.

Table no. 3.14 - b) manufacturing Industries - 6) H Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Avmato Compresr	1095000	25	3000	120	More than excess
2	Starling	1095000	20	3000	150	More than excess
3	New Generation Tools	1095000	21	3000	143	More than excess
4	Flcab Condactors	1277500	21	3500	167	More than excess
5	Four M Technologies	1277500	34	3500	103	More than excess
6	Universal Engineers	1095000	28	3000	107	More than excess
7	G K Cumstr	985500	18	2700	150	More than excess
8	Abhinav Enterprises	547500	20	1500	75	Optimum to excess
9	J K Udyog	1277500	18	3500	194	More than excess
10	Shree Electronics	1277500	30	3500	117	More than excess
11	Bharat Fritz Werher Ltd	1460000	15	4000	267	More than excess
12	Keje Electric Company	1277500	20	3500	175	More than excess
13	Shingania Services	1277500	20	3500	175	More than excess
14	Vishnu Enterprises	803000	12	2200	183	More than excess
15	Excel Enlosure	1095000	20	3000	150	More than

						excess
16	Mesm Li B Technorial	1277500	15	3500	233	More than excess
17	Sparkonix India Pvt. Ltd.	1095000	15	3000	200	More than excess
18	Jekuma Tools And Gavges Pvt. Ltd.	1460000	25	4000	160	More than excess
19	Quaility Engineers	730000	15	2000	133	More than excess
20	K D Joshi	730000	15	2000	133	More than excess
21	Sparko Imax	1277500	12	3500	292	More than excess
22	Rohit Engineers	2920000	18	8000	444	More than excess
23	Archana Industries	365000	20	1000	50	Optimum to excess
24	Ashutor Enterprises Pvt. Ltd.	1095000	30	3000	100	More than excess

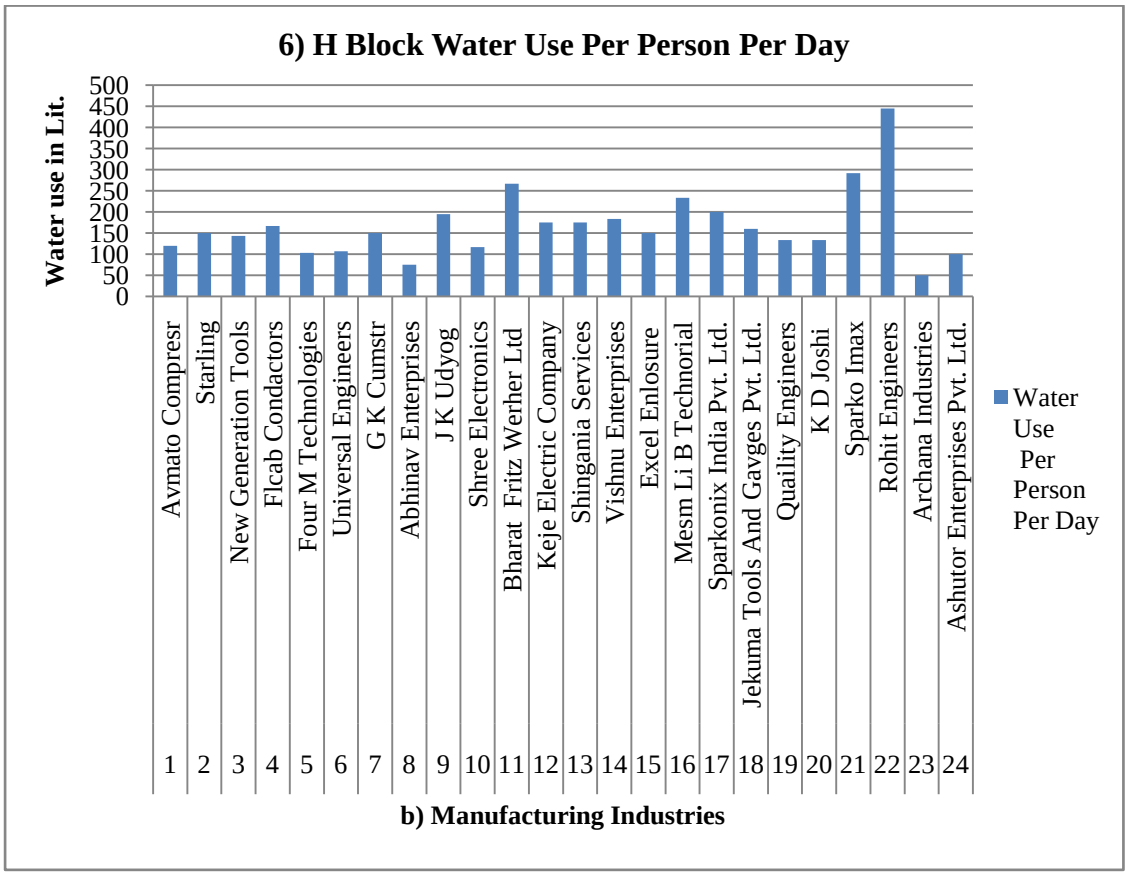

Figure no. 3.14

In the manufacturing industries of H block no one any industrial units are using optimum water, 2 units have their use optimum to excess and 22 units were using more than excess amount of water for domestic purposes.

The Avmato Compressor, Starling, New Generation Tools, Flcab Condactors, Four M Technologies, Universal Engineers, G K Cumstr, J K Udyog , Shree Electronics, Bharat Fritz Werher Ltd , Keje Electric Company, Shingania Services, Vishnu Enterprises, Excel Enlosure , Mesm Li B Technorial, Sparkonix India Pvt. Ltd., Jekuma Tools And Gavges Pvt. Ltd., Quality Engineers, K D Joshi , Sparko Imax, Rohit Engineers and Ashutor Enterprises Pvt. Ltd. these Industries has maximum per day per person use of water is 120, 150, 143, 167, 103, 107, 150, 194, 117, 267, 175, 175, 183, 150, 233, 200, 160, 133,133, 292, 444, and 100 liters respectively. This industry using maximum water because their product is carbide cutting tool, Precision components and assembly, HMC and VMC multitasking machine, Welding machine, component casting, modular flore standing, metal Arc disintegrators, rubber module etc.

Table no. 3.15 - b) manufacturing Industries 7) S Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Super Precirian	1423500	18	3900	217	More than excess
2	Anand Industries	1168000	30	3200	107	More than excess
3	Mane Industries	730000	11	2000	182	More than excess
4	Mahiya Enterprises	912500	12	2500	208	More than excess
5	Surya Company	1460000	45	4000	89	Optimum to excess
6	Envar Electronidyne Ltd.	2190000	35	6000	171	More than excess
7	Sound Ancillary Industries	1642500	22	4500	205	More than excess
8	Magicl Fusion Technologies Pvt. Ltd.	1825000	32	5000	156	More than excess
9	H C And Company	547500	18	1500	83	Optimum to excess
10	AK Auto Electric Systems IndiaPvt. Ltd	1460000	40	4000	100	More than excess

11	Electro Tools	1460000	20	4000	200	More than excess
12	Quility Industries	730000	18	2000	111	More than excess
13	Sanjay T A Pvt. Ltd	730000	18	2000	111	More than excess
14	Fitwel Gaskit Company	2920000	70	8000	114	More than excess
15	Shitole Enterprises	730000	18	2000	111	More than excess
16	Cotmack Electronics	1277500	40	3500	88	Optimum to excess
17	Mega Fabric	1861500	55	5100	93	More than excess
18	Eficiency Engineering	2190000	50	6000	120	More than excess
19	Emersan Process	1825000	50	5000	100	More than excess
20	Poonam Design	730000	13	2000	154	More than excess
21	G B Rubber Product	1095000	30	3000	100	More than excess
22	Park Palastimart Pvt. Ltd.	1460000	40	4000	100	More than excess
23	Maruti Globle Industries	1277500	30	3500	117	More than excess
24	Trinity Services	547500	9	1500	167	More than excess
25	Uniq Engineers	547500	15	1500	100	More than excess
26	San	365000	5	1000	200	More than excess
27	Max Engineers	1095000	28	3000	107	More than excess
28	Serview Enterprises	1460000	46	4000	87	Optimum to excess
29	Shree Enterprises	547500	24	1500	63	Optimum to excess
30	Mehul Enterprises	1277500	37	3500	95	Optimum to excess
31	Warwing Enterprises	1095000	17	3000	176	More than excess
32	J J Enterprises	1095000	21	3000	143	More than excess
33	Evoleve IX	2190000	80	6000	75	Optimum to excess
34	S E Enterprises	547500	12	1500	125	More than excess
35	Varada Enterprises	547500	12	1500	125	More than

						excess

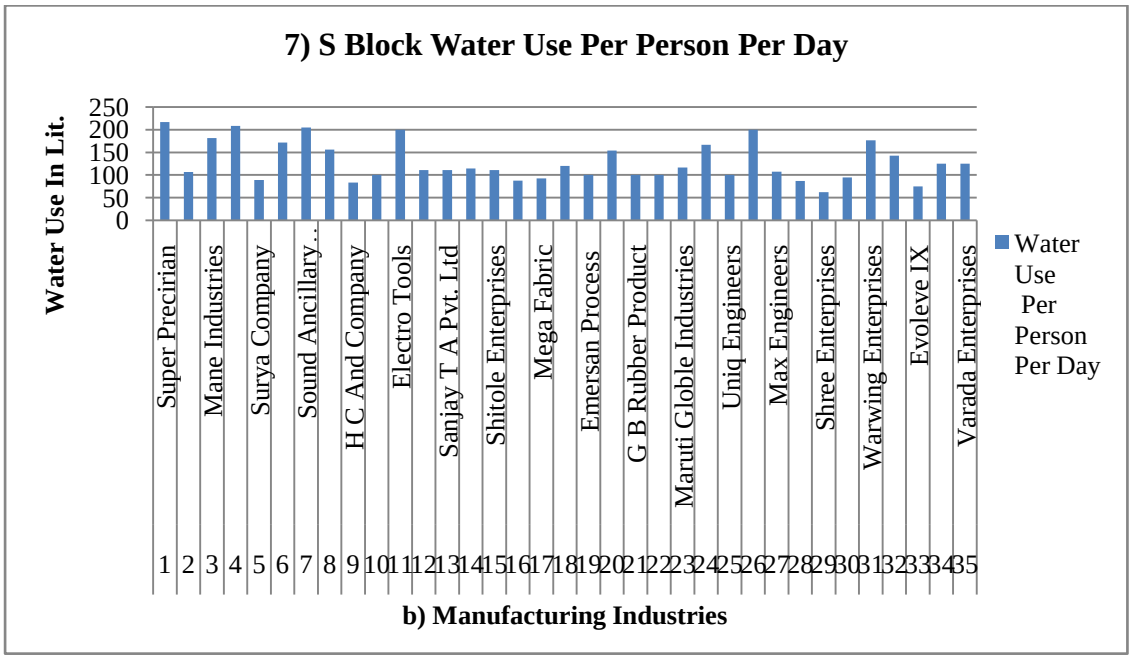

Figure no. 3.15

In the manufacturing industries of S block no one any industrial units are using optimum water, 7 units have their use optimum to excess and 28 units were using more than excess amount of water for domestic purposes.

The Super Precirian, Anand Industries, Mane Industries, Mahiya Enterprises, Surya Company, Sound Ancillary Industries, Magicl Fusion Technologies Pvt. Ltd., AK Auto Electric Systems India Pvt. Ltd, Electro Tools, Quality Industries, Sanjay T A Pvt. Ltd, Fitwel Gaskit Company, Shitole Enterprises, Mega Fabric, Eficiency Engineering, Emersan Process , Poonam Design, G B Rubber Product,Park Palastimart Pvt. Ltd. , Maruti Globle Industries, Trinity Services, Uniq Engineers,San, Max Engineers, Warwing Enterprises, J J Enterprises, S E Enterprises and Varada Enterprises these Industries has maximum per day per person use of water is 217, 107, 182, 208, 171, 205, 156, 100, 200, 111, 111, 114, 111, 93, 120, 100, 154, 100, 100, 117, 167, 100, 200, 107, 176, 143, 125 and 125 liters respectively. This industry using maximum water because their product is kitchen modular, industrial spare parts, electrical equipments, auto electrical equipments, gaskit, fabrication, plastic module, tool manufacturing etc.

Table no. 3.16 - b) manufacturing Industries - 8) Electronics Zone						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Jayashree Electron	1825000	130	5000	38	Optimum
2	Power Formers Eng.	1095000	70	3000	43	Optimum
3	Tri-o Enterprises	547500	40	1500	38	Optimum
4	Savm Electronics P. Ltd	912500	30	2500	83	Optimum to excess
5	Asain Power system P. Ltd	730000	60	2000	33	Optimum
6	Svs Industries	547500	20	1500	75	Optimum to excess
7	Mithsagar Electronic P. Ltd	730000	30	2000	67	Optimum to excess
8	Power Win House	912500	25	2500	100	More than excess
9	Jayashree Electricle P. Ltd	1460000	100	4000	40	Optimum
10	Frontline Electronics	1460000	130	4000	31	Optimum
11	Mitoubhi Electricle	547500	28	1500	54	Optimum to excess
12	Cpgemini	730000	28	2000	71	Optimum to excess
13	Shree Industries	730000	17	2000	118	More than excess
14	Scope T and M Ltd	1642500	35	4500	129	More than excess
15	Fablectiani Engineers	255500	9	700	78	Optimum to excess
16	Try Engineers	912500	22	2500	114	More than excess
17	Sru Tech Engineering	255500	18	700	39	Optimum

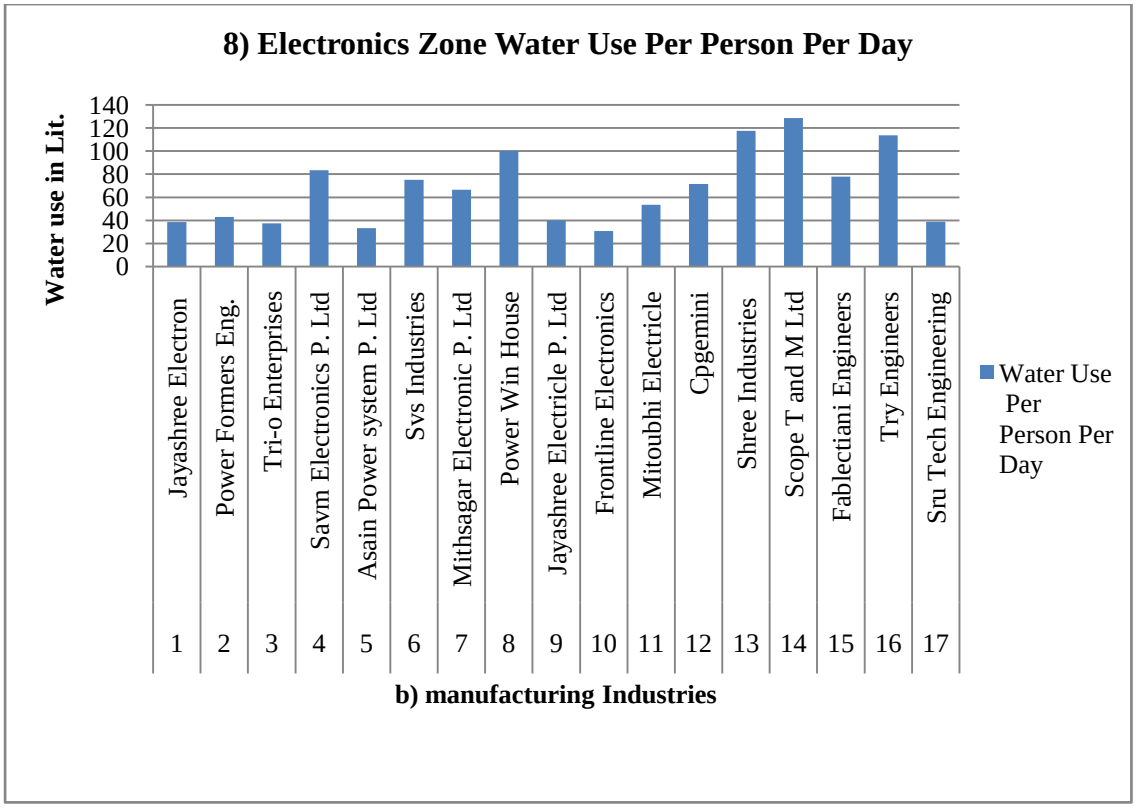

Figure no. 3.16

In the manufacturing industries of Electronics zone block the 7 industrial units are using optimum water, 6 units have their use optimum to excess and only 4 units were using more than excess amount of water for domestic purposes.

The jayshree electron, power formers eng, Asian power systems P. Ltd, Jayshree electrical, Frontline electronics and Saru tech engineering industries has minimum water per person per day use of water ie. 38, 43, 38, 33, 40, 31, and 39 respectively, where as Power win house, Shree industries, Scope T and M ltd. And Try engineers industry has maximum per day per person use of water ie. 100, 118, 129, and 114 Liters. This industry is using maximum water because its product is dia casting, testing and measurement solutions.

c) Packing Industries:

Table no. 3.17 - c) Packing Industries - 1) Bhosari Gen. Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Spiro Pack Pvt. Ltd.	730000	40	2000	50	Optimum to excess
2	Umiya Pckers Pvt. Ltd.	730000	37	2000	54	Optimum to excess
3	Jyoti Packing	803000	45	2200	49	Optimum to excess
4	B R Packing	730000	32	2000	63	Optimum to excess
5	Jay Enterprises	547500	28	1500	54	Optimum to excess

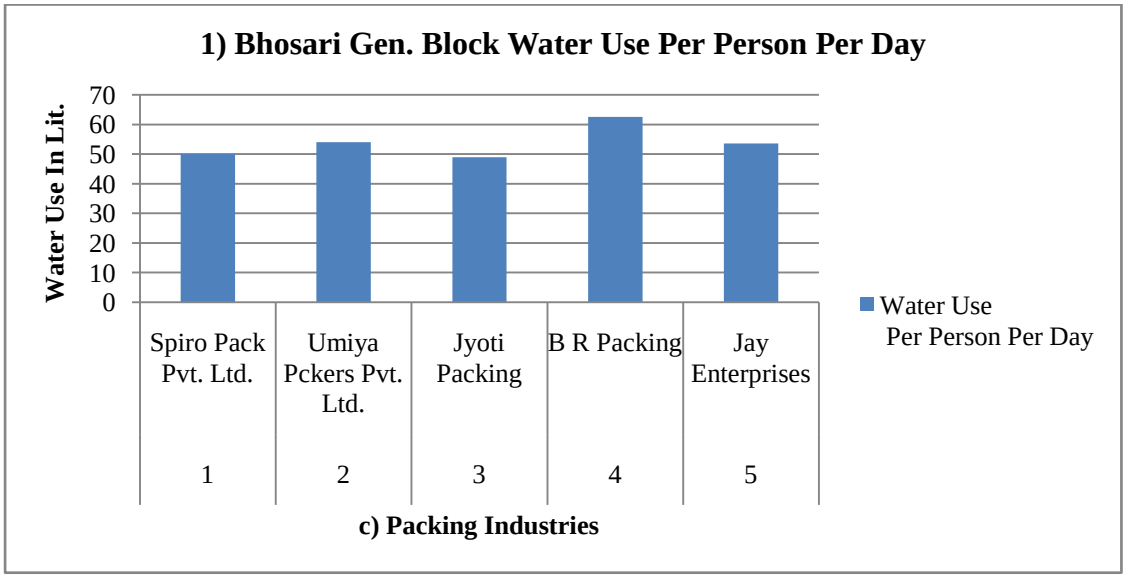

Figure no. 3.17

In the packing industries of Bhosari general block no one any industrial units are using optimum water, 5 units have their use optimum to excess and no one any units were using more than excess amount of water for domestic purposes.

Table no. 3.18 - c) Packing Industries 2) D - I Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Enterprise	255500	20	700	35	Optimum.
2	Surekha Packers	730000	25	2000	80	Optimum to excess
3	Abros Enterprises	547500	18	1500	83	Optimum to excess

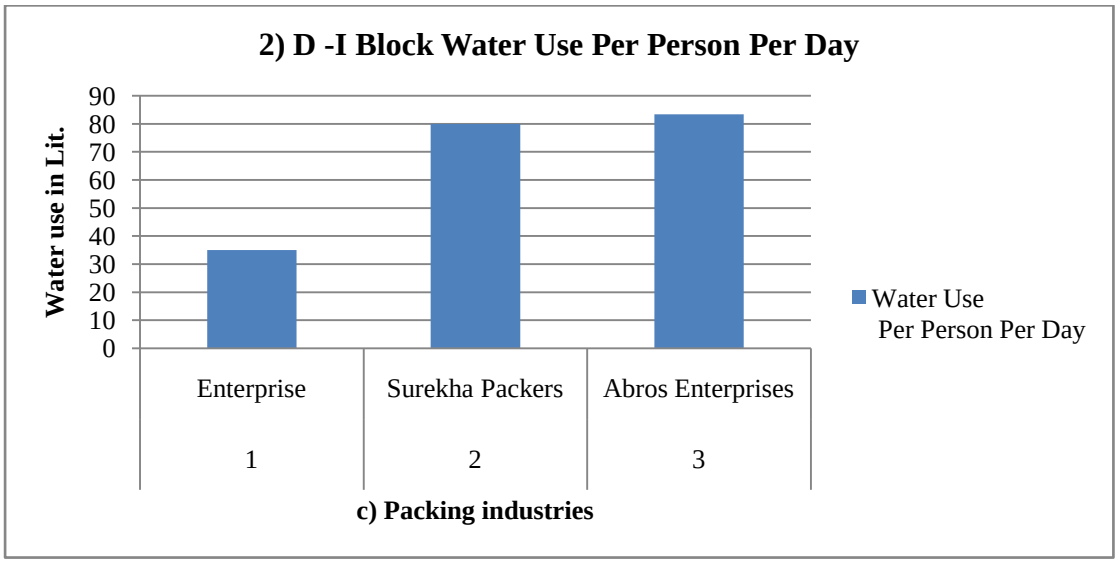

Figure no. 3.18

In the Packing industries of D-I block the 1 industrial units are using optimum water, 2 units have their use optimum to excess and no one any units were using more than excess amount of water for domestic purposes.

Table no. 3.19 - c) Packing Industries							
Block	**Sr. No**	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
3) D - III Block	1	Balaji Packing Industries	1277500	40	3500	88	Optimum to excess
4) J Block	1	Jyoti Polypack	365000	9	1000	111	More than excess
5) H Block	1	Sunil Packers	1095000	12	3000	250	More than excess

In the packing industries of D-II blocks units have their use optimum to excess and J block and H blocks units were using more than excess amount of water for domestic purposes. No one any industrial units are using optimum water,

The Jyoti polypack and Sunil packers industry has maximum per day per person use of water ie. 111 and 250 Liters.

4.2 Water use in industrial process (B Group) :

a) Industrial manufacturing and service industries.

Table no. 3.20 - a) manufacturing industries. - 1) Bhosari Gen. Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Sedmack	730000	40	2000	50	Optimum to excess
2	Satandred Profile Pissine	730000	28	2000	71	Optimum to excess
3	Pareect C P Ltd.	547500	20	1500	75	Optimum to excess
4	Manoj Industry	730000	20	2000	100	More than excess
5	Nama Enterprises	547500	25	1500	60	Optimum

						to excess
6	E M Cure Pvt. Ltd.	912500	30	2500	83	Optimum to excess
7	Naween H P Ltd.	328500	21	900	43	Optimum
8	Rolex Engineers	547500	19	1500	79	Optimum to excess
9	S B llp p. Ltd.	912500	28	2500	89	Optimum to excess
10	Cosmos Engineers	547500	20	1500	75	Optimum to excess
11	Anurlri Mechf P. Ltd.	547500	20	1500	75	Optimum to excess
12	OSG India P. Ltd.	730000	18	2000	111	More than excess
13	Ucco Mechfilters Pvt. Ltd.	365000	10	1000	100	More than excess
14	Apex Ecotech Pvt. Ltd.	365000	10	1000	100	More than excess
15	J J Vertex	730000	20	2000	100	More than excess
16	Mechnocret Engineering Pvt.Ltd.	730000	15	2000	133	More than excess
17	Anubhav Enterprises	730000	10	2000	200	More than excess
18	Ashok Leyland Creative Auto Services	1460000	38	4000	105	More than excess
19	Transprecision Gears Pvt. Ltd.	730000	20	2000	100	More than excess
20	D D Enterprises	730000	30	2000	67	Optimum to excess
21	Sathyam Fasterners Pvt. Ltd.	912500	20	2500	125	More than excess
22	Sharp Engineering	912500	25	2500	100	More than excess
23	Mojj Engineering Systems Ltd.	912500	15	2500	167	More than excess
24	Five Spark	730000	30	2000	67	Optimum to excess
25	N. D. Gupta Enterprises	730000	18	2000	111	More than excess
26	Arihant Alloys And Engineers	730000	25	2000	80	Optimum to excess
27	Indo Group	730000	25	2000	80	Optimum to excess
28	Spin India	912500	28	2500	89	Optimum to excess
29	Prma Pvt. Ltd.	1095000	40	3000	75	Optimum to excess
30	Anant Enterprises	730000	65	2000	31	Optimum

31	Sona Pvt. Ltd.	1460000	130	4000	31	Optimum
32	Kedar Coating And Engineering P. Ltd.	438000	7	1200	171	More than excess
33	IndoSwe Engineers Pvt. Ltd.	1460000	70	4000	57	Optimum to excess
34	Kartos Engineering & IT Solutions Pvt. Ltd.	1095000	50	3000	60	Optimum to excess
35	KTR Capling Pvt. Ltd.	547500	25	1500	60	Optimum to excess
36	Suyog Engineers	547500	25	1500	60	Optimum to excess
37	Units Gauge and Co. Pvt . Ltd.	1095000	30	3000	100	More than excess
38	Rajasthan Cromax India	255500	20	700	35	Optimum
39	Vats	1095000	40	3000	75	Optimum to excess
40	Met Paw	730000	50	2000	40	Optimum
41	Suaan	547500	30	1500	50	Optimum to excess
42	Arjunwadkar Consolidated Engineers Pvt. Ltd.	255500	25	700	28	Optimum
43	Demech	1095000	80	3000	38	Optimum
44	Mikron Engineering	620500	35	1700	49	Optimum to excess
45	Auto Mile And Company	365000	33	1000	30	Optimum
46	Neuman And Esser Compressor	1460000	35	4000	114	More than excess
47	Emulsichem Lubricants Pvt. Ltd.	3650000	57	10000	175	More than excess
48	Kesh Kent Wear Pvt. Ltd.	365000	30	1000	33	Optimum
49	ARM Welers P. Ltd.	912500	26	2500	96	More than excess
50	Perfect Oil Sills Acr.	1095000	80	3000	38	Optimum
51	Laxmi Pvt. Ltd.	730000	30	2000	67	Optimum to excess
52	CPS Pvt. Ltd.	547500	20	1500	75	Optimum to excess
53	Unique Engineers	255500	13	700	54	Optimum to excess
54	Pune Tectol P. Ltd.	1460000	80	4000	50	Optimum to excess

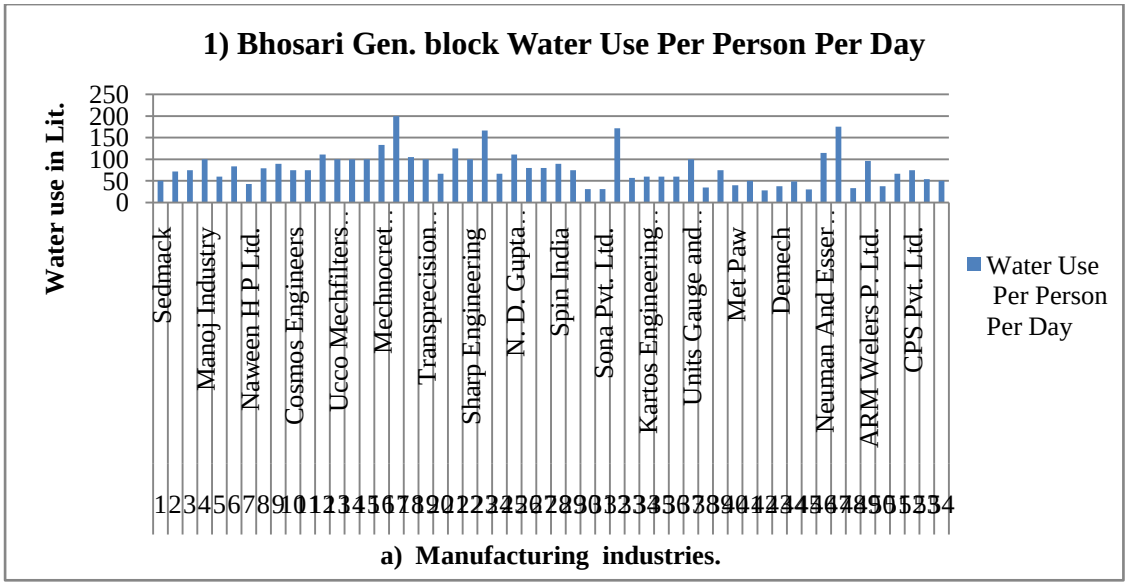

Figure no. 3.19

In the manufacturing industries of Bhosari general block the 10 industrial units are using optimum water, 26 units have their use optimum to excess and 18 units were using more than excess amount of water for domestic purposes.

The Naween H P Ltd., Ananat enterprises, Sona Pvt. Ltd., Rajasthan Cromax india, Met paw, Arjunwadkar consolidated engineers, Pvt. Ltd, Demch, auto mile and company, Kesh kent wear Pvt. Ltd., and Prfect oil sills acr industries has minimum water per person per day use of water ie. 43, 31, 31, 35, 28, 38, 30, 33 and 38 respectively, where as Manoj industry, OSG India P. Ltd., Ucco Mechfilters Pvt. Ltd., Apex Ecotech Pvt. Ltd, J J Vertex , Mechnocret Engineering Pvt.Ltd., Anubhav Enterprises, Ashok Leyland Creative Auto Services, Transprecision Gears Pvt. Ltd, Sathyam fasterners Pvt. Ltd, Sharp engineers, Mouj engineering systems Ltd., n . D. gupta enterprises, Kedar coating and engineers P. ltd., Units gauge and co P. Ltd., Neuman And Esser Compressor, Emulsichem Lubricants Pvt. Ltd. And ARM Welers P. Ltd. industry has maximum per day per person use of water ie. 100, 111, 100, 100, 100, 133, 200, 105, 100, 125, 100, 111, 171, 100, 114, 175 and 96 liters. This industry is using maximum water because its product is tool manufacturing, air filter and water treatment machinery

. Table no. 3.21 - a) manufacturing industries. - 2) D -I Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Autoshine Coaters	547500	20	1500	75	Optimum to excess

2	Shree Ganesh Industry	255500	15	700	47	Optimum to excess
3	A P Industries	730000	12	2000	167	More than excess
4	Technovision Industries	255500	15	700	47	Optimum to excess
5	Shivshakti Industries	438000	15	1200	80	Optimum to excess
6	Precision	912500	20	2500	125	More than excess
7	Tecil Engineering	730000	25	2000	80	Optimum to excess
8	Avadhut Paper Product	912500	20	2500	125	More than excess
9	Shanaz Engineers	730000	15	2000	133	More than excess
10	Repute Engineers P. Ltd.	1460000	35	4000	114	More than excess
11	Scan Tech	730000	30	2000	67	Optimum to excess
12	Ima Technology	912500	40	2500	63	Optimum to excess
13	Glorla Engineer co.	730000	20	2000	100	More than excess
14	Unique Industries	912500	10	2500	250	More than excess
15	Esdss Enterprises	1168000	50	3200	64	Optimum to excess

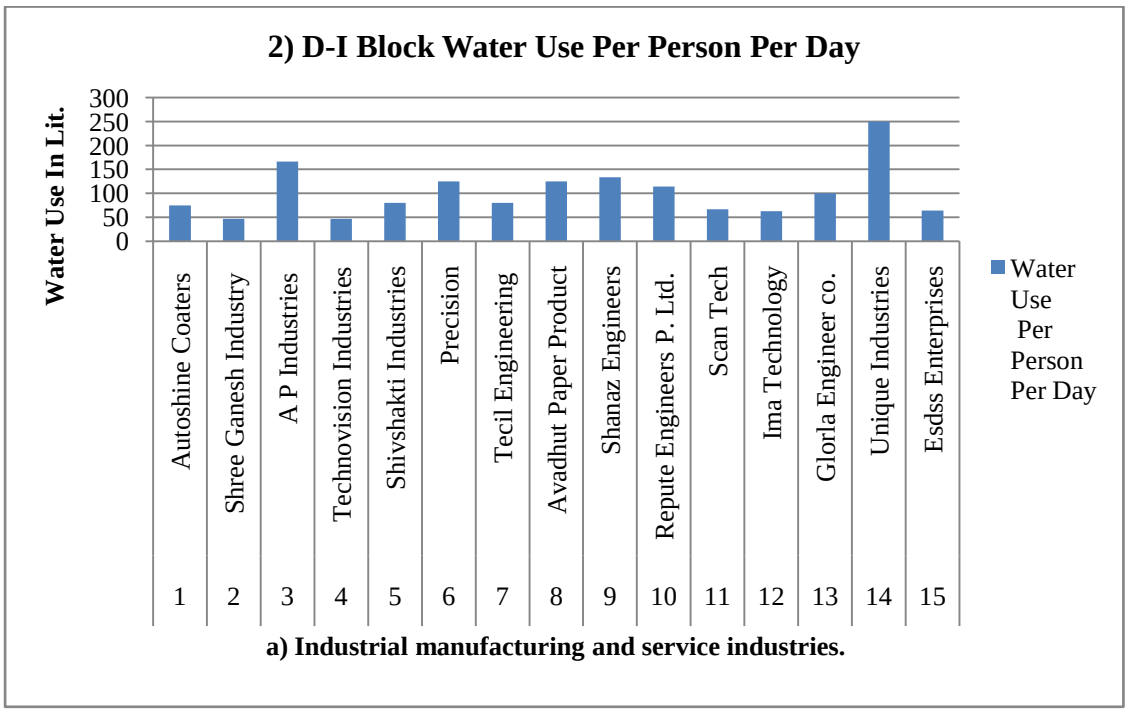

Figure no. 3.20

In the manufacturing industries of D-I block no one any industrial units are using optimum water, 8 units have their use optimum to excess and 7 units were using more than excess amount of water for domestic purposes.

The A P Industries, Precision, Avadhut Paper Product, Shanaz Engineers, Repute Engineers P. Ltd. , Glorla Engineer co. and Unique Industries. industry has maximum per day per person use of water ie. 167, 125, 125, 133, 100 and 250 liters. This industry is using maximum water because its product is ups, stabilizer, sheet metal fabrication, auto parts, paper production, front bumper manufacturing, lesser cutting and welding, panel manufacturing,

Table no. 3.22 - a) manufacturing industries. - 3) D - II Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Dhanlaxmi Industries	365000	10	1000	100	More than excess
2	Eddycanes Engineers P. Ltd	730000	25	2000	80	Optimum to excess
3	Vivek Engineering	730000	30	2000	67	Optimum to excess
4	Amit Engineering Pvt.Ltd.	547500	27	1500	56	Optimum to excess
5	Sparc Engineering Pvt. Ltd	730000	15	2000	133	More than excess
6	Vijay Engineering	547500	20	1500	75	Optimum to excess
7	Dinesh Industries	365000	12	1000	83	Optimum to excess
8	Mehata Engineering Works	912500	25	2500	100	More than excess
9	Lensel Optics Pvt. Ltd.	985500	30	2700	90	Optimum to excess
10	Ravi Industries	730000	20	2000	100	More than excess
11	Shree Gurukrupa Engineering Works	730000	30	2000	67	Optimum to excess
12	Tirupati automobiles	328500	10	900	90	Optimum to excess

13	Lokesh Industries	730000	20	2000	100	More than excess
14	Fair Teeth Engineers	912500	23	2500	109	More than excess
15	Samsa Auto Engineering P. Ltd.	730000	21	2000	95	More than excess
16	Hyt Engineering Company Pvt. Ltd.	730000	16	2000	125	More than excess
17	Creative Combience .	730000	15	2000	133	More than excess
18	Gopal Enterprises	912500	38	2500	66	Optimum to excess
19	Hydrotech Engineering Company	730000	30	2000	67	Optimum to excess
20	Miracle Engineering Pvt. Ltd.	912500	25	2500	100	More than excess
21	NeelKamal Industries	730000	20	2000	100	More than excess
22	Aseptic thrmoprocess Pvt. Ltd.	547500	25	1500	60	Optimum to excess
23	Omkar Industries	766500	16	2100	131	More than excess
24	Walujkar Engineering	839500	15	2300	153	More than excess
25	Fab-O-Wed Engineers	912500	27	2500	93	More than excess
26	Indo Bioactive lawhs Ltd	912500	30	2500	83	Optimum to excess

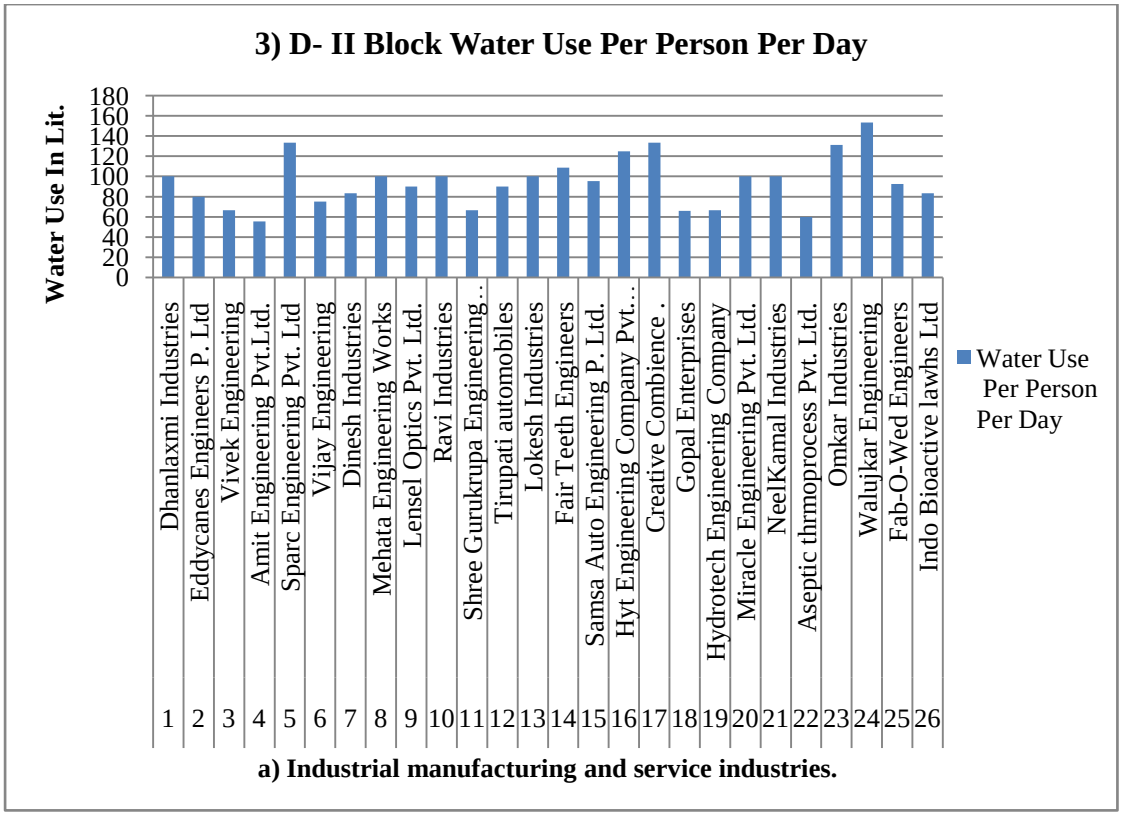

Figure no. 3.21

In the manufacturing industries of D -II block no one any industrial units are using optimum water, 12 units have their use optimum to excess and 14 units were using more than excess amount of water for domestic purposes.

The Dhanlaxmi industries, Sparc Engineering Pvt. Ltd,Mehata Engineering Works, Ravi Industries, Lokesh Industries, Fair Teeth Engineers, Hyt Engineering Company Pvt. Ltd., Creative Combience, Miracle Engineering Pvt. Ltd., NeelKamal Industries, Omkar Industries, Walujkar Engineering and Fab-O-Wed Engineers industry has maximum per day per person use of water ie. 100, 133, 100, 100, 100, 109, 125, 133, 100, 100, 131, and 153 liters. This industry is using maximum water because its product is bamboo and wooden handicraft, fabrication, perforated sheet manufacturing and press components manufacturing, machine manufacturing, heavy engineering job work, auger screw manufacturing.

Table no. 3.23 - a) manufacturing industries. - 4) D - III Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	TcIpl	803000	25	2200	88	Optimum to excess
2	Gloria Engineering Company Unit II	912500	25	2500	100	More than excess
3	Yash Marbels	255500	10	700	70	Optimum to excess
4	Laxmi Engineering Works	547500	25	1500	60	Optimum to excess
5	Msl Product Casting	803000	25	2200	88	Optimum to excess
6	Vmar Engineering	803000	20	2200	110	More than excess
7	Manish Industries	912500	20	2500	125	More than excess
8	SAR Industries	1095000	20	3000	150	More than excess
9	Jetline Corrugated Boxes	255500	10	700	70	Optimum to excess
10	Yash Engineering And Industrial Suppliers	730000	25	2000	80	Optimum to excess
11	Bestall Engineering Works	1095000	40	3000	75	Optimum to excess
12	Prince Industry	730000	25	2000	80	Optimum to excess
13	Kohinoor Industry	547500	17	1500	88	Optimum to excess

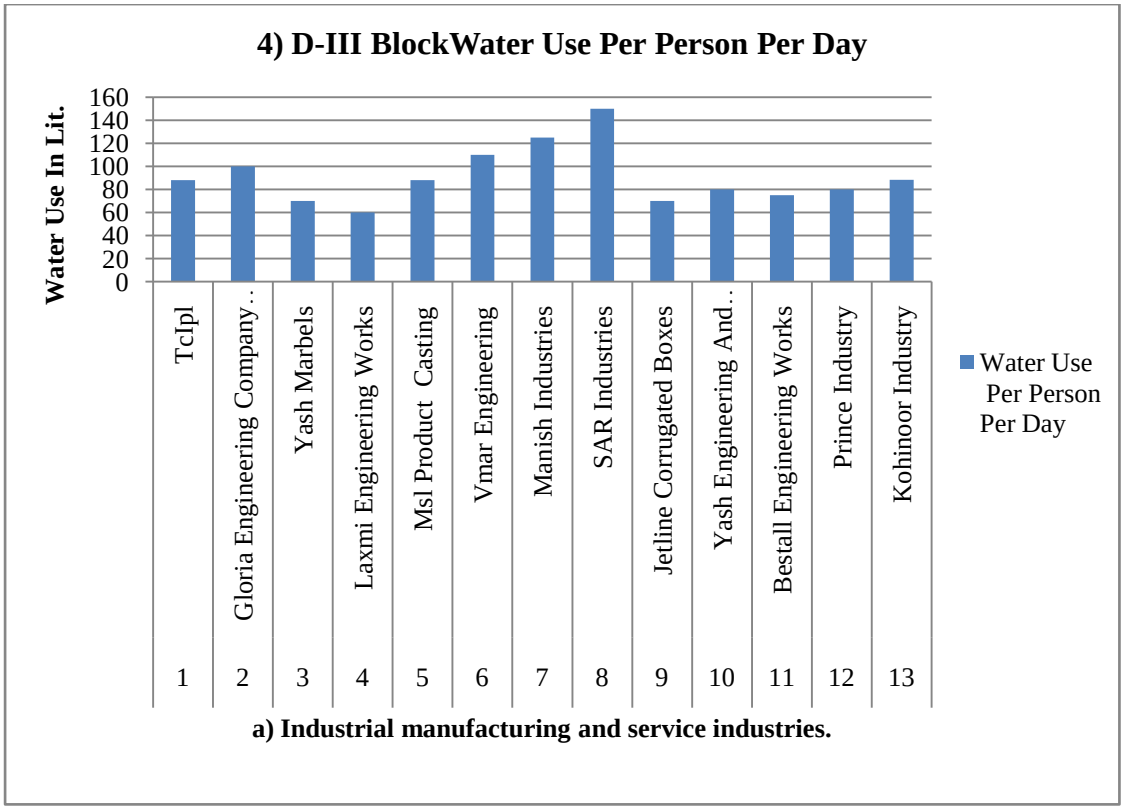

Figure no. 3.22

In the manufacturing industries of D -III block no one any industrial units are using optimum water, 9 units have their use optimum to excess and 4 units were using more than excess amount of water for domestic purposes.

The Gloria Engineering Company Unit II, Vmar Engineering, Manish Industries and SAR Industries these industry has maximum per day per person use of water ie. 100, 110, 125 and 125 liters. This industry is using maximum water because its product is front bumper manufacturing and end shield and stator plate manufacturing.

Table no. 3.24 - a) manufacturing industries. - 5) F - II Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Turened Engineers P Ltd	730000	21	2000	95	More than excess
2	LGD Composite	730000	21	2000	95	More than excess

3	Dalmec Industry	730000	24	2000	83	Optimum to excess
4	Jyoti Die	1095000	30	3000	100	More than excess
5	Spark Line Care	730000	27	2000	74	Optimum to excess
6	Ekadant Enterprises	547500	20	1500	75	Optimum to excess
7	Mempor India	730000	18	2000	111	More than excess
8	Jayshree	912500	80	2500	31	Optimum
9	Micron Pvt. Ltd.	730000	20	2000	100	More than excess
10	Micron Industries	730000	15	2000	133	More than excess
11	Himalaya Udyog	547500	2	1500	750	More than excess

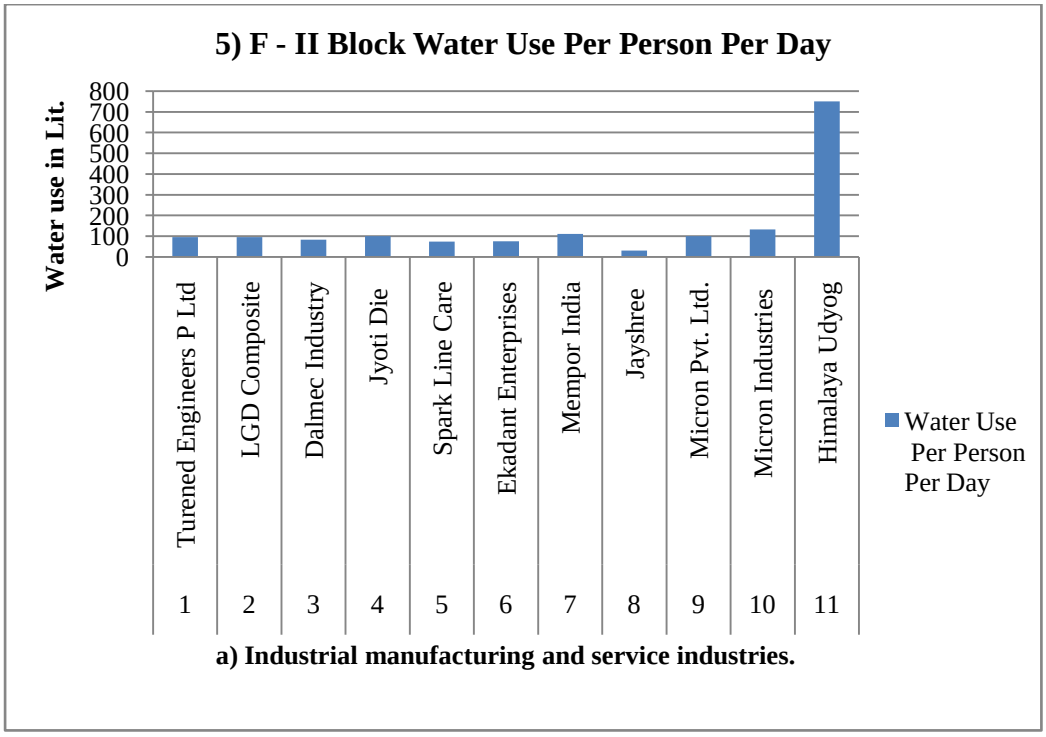

Figure no. 3.23

In the manufacturing industries of F -II block the 1 industrial units are using optimum water, 3 units have their use optimum to excess and 7 units were using more than excess amount of water for domestic purposes.

The Jayashree industries has minimum water per person per day use of water ie. 31 respectively, where as Turened Engineers P Ltd, LGD Composite, Jyoti Die , Mempor India, Micron Pvt. Ltd, Micron Industries and Himalaya Udyog industry has

maximum per day per person use of water ie 95, 95, 100, 111, 100, 133 and 750 liters. This industry is using maximum water because its product is die manufacturing, grinding job work, shot blasting machine.

Table no. 3.25 - a) manufacturing industries. - 6) J Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	National Engineering Company	1095000	33	3000	91	More than excess
2	Swami Samarth Engineering	255500	12	700	58	Optimum to excess
3	Ebhd dar Engineers	255500	11	700	64	Optimum to excess
4	Dynamic Industries	438000	24	1200	50	Optimum to excess
5	Poona Engineering Pvt.Ltd.	255500	12	700	58	Optimum to excess
6	Naramax Whahara Industries	1095000	30	3000	100	More than excess
7	Nirmitee Engineering	438000	20	1200	60	Optimum to excess
8	D D Engineering	255500	11	700	64	Optimum to excess
9	Shweta Enterprises	912500	11	2500	227	More than excess
10	Richs	292000	25	800	32	Optimum
11	Hindustan Pressing Pvt. Ltd.	584000	25	1600	64	Optimum to excess
12	Capulm Engineering Pvt. Ltd.	255500	15	700	47	Optimum to excess
13	Shubham Udyog	730000	25	2000	80	Optimum to excess
14	Mahavir Enterprises	547500	15	1500	100	More than excess
15	Corrdyne Coating Pvt. Ltd.	657000	18	1800	100	More than excess
16	Indark Formtech Pvt. Ltd.	803000	20	2200	110	More than excess
17	Gurukrupa Engineers Pvt. Ltd.	730000	45	2000	44	Optimum
18	Surabhi Industries	438000	35	1200	34	Optimum
19	Sai Engineering	365000	20	1000	50	Optimum to excess

20	Utkarsh Engineers	547500	13	1500	115	More than excess
21	OHM Polytech Ltd.	365000	20	1000	50	Optimum to excess
22	Priya Capacitors Pvt. Ltd.	365000	20	1000	50	Optimum to excess
23	Shree Krushna	365000	15	1000	67	Optimum to excess
24	M M Engineering	365000	10	1000	100	More than excess
25	Bharat Industries	365000	15	1000	67	Optimum to excess
26	Shakti Industries	766500	25	2100	84	Optimum to excess
27	Darekar Heat Treat	766500	20	2100	105	More than excess
28	Dinesh Enterprises	547500	24	1500	63	Optimum to excess
29	Supreem Profiles Pvt. Ltd.	365000	15	1000	67	Optimum to excess
30	Divyang Ingineering Pvt. Ltd.	365000	20	1000	50	Optimum to excess
31	Nikul Engineers P. Ltd.	547500	20	1500	75	Optimum to excess
32	Autopress Engineering Pvt. Ltd.	292000	18	800	44	Optimum
33	Shriram Engineering	255500	13	700	54	Optimum to excess
34	S S Industries	401500	14	1100	79	Optimum to excess
35	Prescomp Engineers	255500	15	700	47	Optimum to excess
36	Suri Industries	255500	12	700	58	Optimum to excess
37	Productive Aid Pvt. Ltd.	547500	13	1500	115	More than excess
38	Shree Precision	255500	12	700	58	Optimum to excess
39	Audhyogik Stamping	255500	10	700	70	Optimum to excess
40	Jayhind Atomation P. Ltd.	255500	17	700	41	Optimum
41	CSK Engineers	182500	8	500	63	Optimum to excess
42	S R Auto Parts	547500	20	1500	75	Optimum to excess
43	K C Rooms P. Ltd.	219000	12	600	50	Optimum to excess
44	Menar Camp. P. Ltd.	365000	12	1000	83	Optimum to

						excess
45	V R Coating P. Ltd.	547500	15	1500	100	More than excess
46	Dyna -K Auto	547500	20	1500	75	Optimum to excess
47	Rayan Enterprises	365000	12	1000	83	Optimum to excess
48	Spark Engineers	620500	21	1700	81	Optimum to excess
49	Tech-Well Engineering Pvt. Ltd.	547500	20	1500	75	Optimum to excess
50	Emerson	401500	25	1100	44	Optimum
51	Sher SPC	730000	40	2000	50	Optimum to excess
52	Laxmi Engineers	255500	17	700	41	Optimum
53	Applied Power Industries	547500	22	1500	68	Optimum to excess
54	Hind Udyog	328500	20	900	45	Optimum
55	A C K Engineers	292000	20	800	40	Optimum
56	Alwn Union	255500	10	700	70	Optimum to excess
57	A One Electonech Pvt. Ltd.	255500	12	700	58	Optimum to excess
58	Amrit Enterprises	547500	20	1500	75	Optimum to excess
59	BMC Enterprises	547500	25	1500	60	Optimum to excess
60	Jyoti Polyclip	547500	20	1500	75	Optimum to excess
61	Arora Refreataries P. Ltd.	547500	18	1500	83	Optimum to excess
62	Hexagon Industries	547500	22	1500	68	Optimum to excess
63	Gurumdas Engineers	620500	25	1700	68	Optimum to excess
64	Mass Engineers	584000	25	1600	64	Optimum to excess
65	Bharat Dairy Eqp. P. Ltd.	912500	60	2500	42	Optimum to excess
66	Inovative Automotions	803000	30	2200	73	Optimum to excess
67	S S Engineering	292000	10	800	80	Optimum to excess
68	Kalyani Enterprises	255500	10	700	70	Optimum to excess
69	Alfa Heat Tech	438000	25	1200	48	Optimum to excess
70	Sayali Engineering Pvt.	657000	35	1800	51	Optimum to

	Ltd.					excess
71	Om Sai Engineers Pvt. Ltd	365000	25	1000	40	Optimum
72	Doright Engineering	438000	20	1200	60	Optimum to excess
73	Varun Company	547500	45	1500	33	Optimum
74	Bharati Industries	365000	30	1000	33	Optimum
75	Metapow Pvt. Ltd.	365000	15	1000	67	Optimum to excess
76	S P Engineers	657000	20	1800	90	Optimum to excess
77	Universial Eneressing	401500	15	1100	73	Optimum to excess
78	Modern Engineers	401500	20	1100	55	Optimum to excess
79	Natras Enterprises	365000	20	1000	50	Optimum to excess
80	Nikho Engineers	401500	20	1100	55	Optimum to excess
81	Raj-Deep Industries	365000	20	1000	50	Optimum to excess
82	Siddheshwar Engineering	365000	20	1000	50	Optimum to excess
83	D Tech Engineers	547500	15	1500	100	More than excess
84	Aror Engineers	365000	20	1000	50	Optimum to excess
85	Sai Tee Industries	438000	20	1200	60	Optimum to excess
86	Vrlv Enerprises	401500	20	1100	55	Optimum to excess
87	Dhanlaxmi Engineering Enterprises	365000	15	1000	67	Optimum to excess
88	Prasad Medi Tech	365000	35	1000	29	Optimum
89	Laxmi Industries	547500	30	1500	50	Optimum to excess
90	Jyoti Heat Treat Indestries	365000	25	1000	40	Optimum
91	Gress Engineering	365000	15	1000	67	Optimum to excess
92	Sai Industries	365000	15	1000	67	Optimum to excess
93	Madhav Industries	547500	10	1500	150	Optimum to excess
94	Dhanashree Engineering Pvt. Ltd.	365000	25	1000	40	Optimum

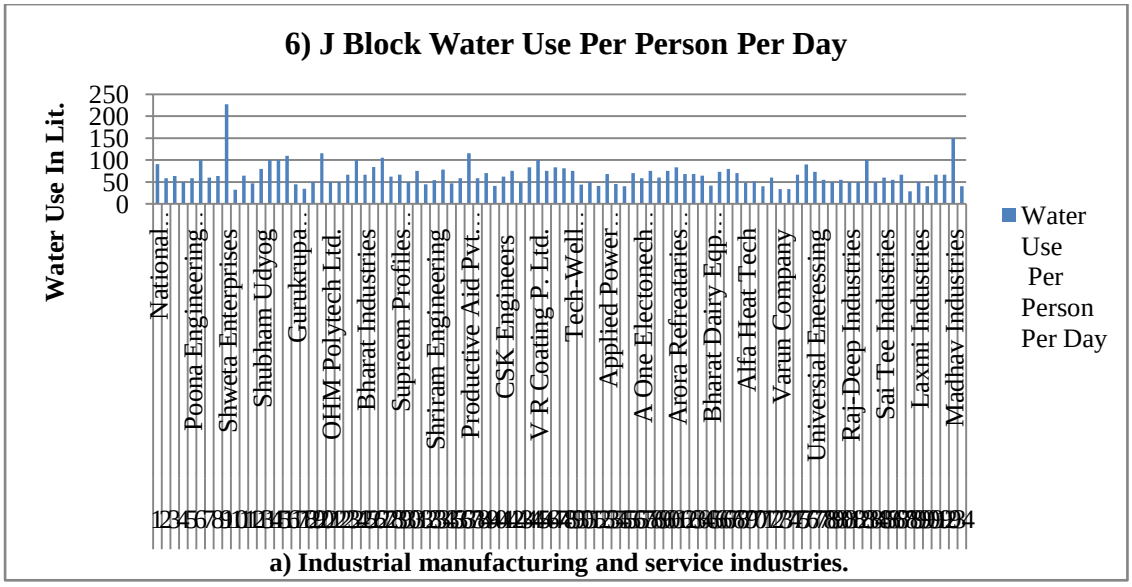

Figure no. 3.24

In the manufacturing industries of J block the 14 industrial units are using optimum water, 68 units have their use optimum to excess and 12 units were using more than excess amount of water for domestic purposes.

The National Engineering Company, Poona Engineering Pvt.Ltd., Naramax Whahara Industries, Shweta Enterprises, Mahavir Enterprises, Corrdyne Coating Pvt. Ltd., Indark Formtech Pvt. Ltd., Utkarsh Engineers, M M Engineering, Darekar Heat Treat, Productive Aid Pvt. Ltd., V R coating P. ltd., and D tech engineers industry has maximum per day per person use of water ie 91, 100, 227, 100, 100,110, 115, 100, 105,115, 100 and 100 liters. This industry is using maximum water because its product is die manufacturing, grinding job work, shot blasting machine.

Table no. 3.26 - a) manufacturing industries. - 7) H Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Sulshane Aplices	1277500	23	3500	152	More than excess
2	Faleo And Fear	1168000	18	3200	178	More than excess
3	Ador Welding Accdemy	1095000	20	3000	150	More than

	Pvt. Ltd					excess
4	Kulpak Engineering	1095000	20	3000	150	More than excess
5	Shri Samrtha Industries	1277500	15	3500	233	More than excess
6	Elemec Industries	1277500	30	3500	117	More than excess
7	Siddhalaxmi Engineering Industries P. Ltd	1350500	20	3700	185	More than excess
8	Premier Ferrocast And Engineers Pvt. Ltd.	1241000	35	3400	97	More than excess
9	Sudarshan Shakti	1277500	20	3500	175	More than excess
10	Globle Packing	1168000	30	3200	107	More than excess
11	S M Auto Engineering Pvt. Ltd.	1168000	40	3200	80	Optimum to excess
12	Amar Enterprises	803000	10	2200	220	More than excess
13	Precision Industries	1277500	21	3500	167	More than excess
14	Klmgelnbere Pvt. Ltd	1277500	20	3500	175	More than excess
15	Yashwant Udyog	1314000	20	3600	180	More than excess
16	Indlab Industries	1095000	20	3000	150	More than excess
17	United Industries	547500	10	1500	150	More than excess
18	Santherm Engineering Pvt. Ltd	547500	15	1500	100	More than excess
19	Kamatisu India Pvt. Ltd.	1277500	25	3500	140	More than excess
20	Associated Equipment Rentals Pvt. Ltd.	1277500	38	3500	92	More than excess
21	Hary Rock	1095000	25	3000	120	More than excess
22	Precision Industries	1277500	22	3500	159	More than excess
23	Prajyo	912500	12	2500	208	More than excess
24	Forbes Marshall	1460000	50	4000	80	Optimum to excess
25	Dayal Associates	1314000	30	3600	120	More than excess
26	Falam	1277500	15	3500	233	More than excess
27	Enpro Industry Pvt.Ltd.	912500	15	2500	167	More than excess

28	Devi Industries	1277500	120	3500	29	Optimum

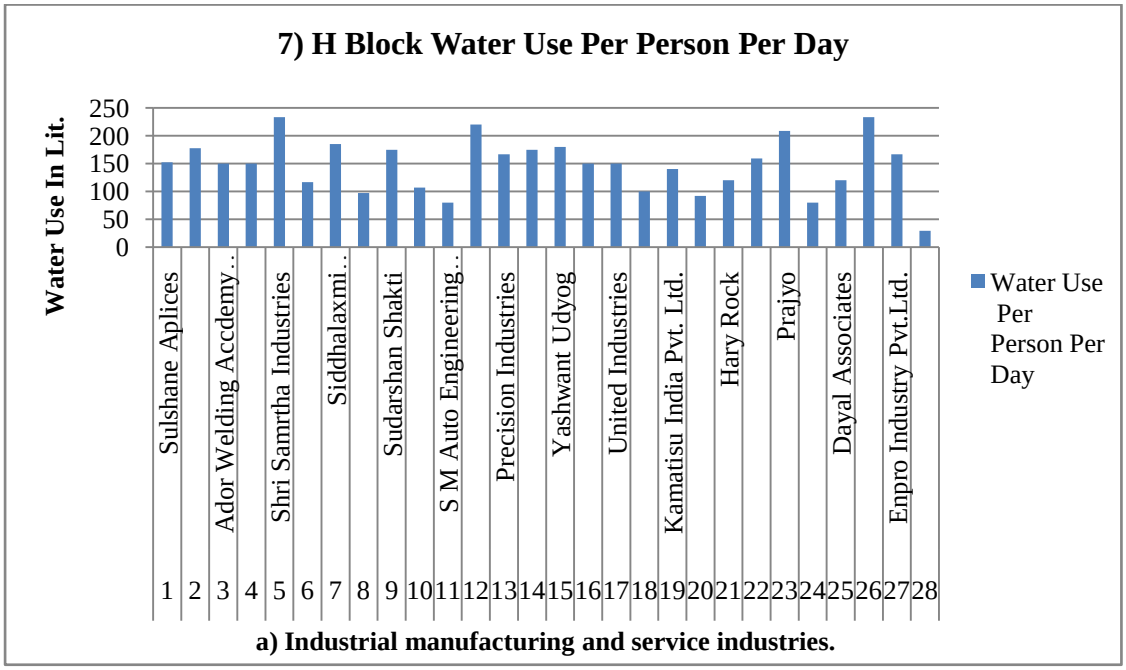

Figure no. 3.25

In the manufacturing industries of H block the 1 industrial units are using optimum water, 2 units have their use optimum to excess and 25 units were using more than excess amount of water for domestic purposes.

The devi industries has minimum water per person per day use of water ie. 29 respectively, where as Sulshane Aplices, Faleo And Fear, Ador Welding Accdemy Pvt. Ltd, Kulpak Engineering, Shri Samrtha Industries, Elemec Industries, Siddhalaxmi Engineering Industries P. Ltd, Premier Ferrocast And Engineers Pvt. Ltd., Sudarshan Shakti, Globle Packing, Amar Enterprises, Precision Industries, Klmgelnbere Pvt. Ltd, Yashwant Udyog, Indlab Industries, United Industries, Santherm Engineering Pvt. Ltd, Kamatisu India Pvt. Ltd., Associated Equipment Rentals Pvt. Ltd., Hary Rock, Precision Industries, Prajyo, Dayal Associates, Falam and Enpro Industry Pvt.Ltd. industry has maximum per day per person use of water ie 152, 178, 150, 150, 233, 117, 185, 97, 175, 107, 220, 167, 175, 180, 150, 150, 100, 140, 92, 120, 159, 208, 120, 233 and 167 liters. These industry is using maximum water because its product is Automotive Switch Gear, Small arms, Mining instrument, Electronics, Compressors, Crimping Tools, Textile Machine, Packing Machine, Pumps & Valves, Sewing Machine, Instrumentation, Aerospace, General Engineering, Cutting Tools, Medical Body Parts, Petrochemical, Special Purpose Machine, die manufacturing, and welding.

Table no. 3.27 a) manufacturing and servce industries. - 8) S Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Pune Heat	1168000	35	3200	91	More than excess
2	J K Engineers	839500	20	2300	115	More than excess
3	Angel Bright	255500	15	700	47	Optimum to excess
4	Rajdeep Engineering	547500	15	1500	100	More than excess
5	Ralex Engineers	620500	18	1700	94	More than excess
6	Amol Engineering Works	1095000	35	3000	86	Optimum to excess
7	Sankalp Engineering	1095000	35	3000	86	Optimum to excess
8	R P Industries	1095000	20	3000	150	More than excess
9	Hexa Tech Engineers	657000	18	1800	100	More than excess
10	Lano Engineering	912500	20	2500	125	More than excess
11	Shrinivas Engineering	985500	25	2700	108	More than excess
12	Mechatronic Systems	1277500	20	3500	175	More than excess
13	Rajesh Engineering Works	1277500	20	3500	175	More than excess
14	Worth Engineering Pvt. Ltd	1095000	15	3000	200	More than excess
15	Nikhil Industries	1131500	18	3100	172	More than excess
16	Desai Engineering Works	1095000	20	3000	150	More than excess
17	Dilip Industries	1095000	25	3000	120	More than excess
18	Prasho Engineers	730000	10	2000	200	More than excess
19	Pinacle Dies Modul	547500	15	1500	100	More than excess

20	Vyankateshwar Engineers	730000	25	2000	80	Optimum to excess
21	Harshad Industries	985500	20	2700	135	More than excess
22	Sankalp Engineering	730000	10	2000	200	More than excess
23	Sailaxmi Industries	730000	20	2000	100	More than excess
24	Dynomerk Controls	2190000	35	6000	171	More than excess
25	Systems Technologies	1460000	25	4000	160	More than excess
26	Jay Suprabha Protative Product Pvt. Ltd	1277500	25	3500	140	More than excess
27	Divya Engineering Projects	1460000	30	4000	133	More than excess
28	Leo Enterprises	1277500	35	3500	100	More than excess
29	Aravind Vishnu Govande And Company	547500	12	1500	125	More than excess
30	Sai Hari Enterprises	1277500	25	3500	140	More than excess
31	Rushi Engineering Pvt. Ltd.	1277500	25	3500	140	More than excess
32	Burhani Industries	1095000	19	3000	158	More than excess
33	Kumar Industries	1642500	30	4500	150	More than excess
34	Elcher Engineers Pvt. Ltd.	1095000	20	3000	150	More than excess
35	Harshada Industries	1095000	32	3000	94	More than excess
36	Nand Composites Pvt. Ltd	1314000	30	3600	120	More than excess
37	B J Perfect Work	1277500	25	3500	140	More than excess
38	Jyoti Heatsinks Pvt. Ltd	1277500	22	3500	159	More than excess
39	Ferroform Engineering Pvt. Ltd	1095000	25	3000	120	More than excess
40	Shree Parshwa Ind.	1460000	20	4000	200	More than excess
41	Akshay Organies Pvt. Ltd.	1277500	20	3500	175	More than excess
42	Bax Industries	547500	12	1500	125	More than excess
43	Anand Trans	1460000	25	4000	160	More than excess
44	Lunar Enterprises Pvt.	547500	15	1500	100	More than

	Ltd.					excess
45	Sunil Engineers	1277500	20	3500	175	More than excess
46	Crasling	2372500	44	6500	148	More than excess

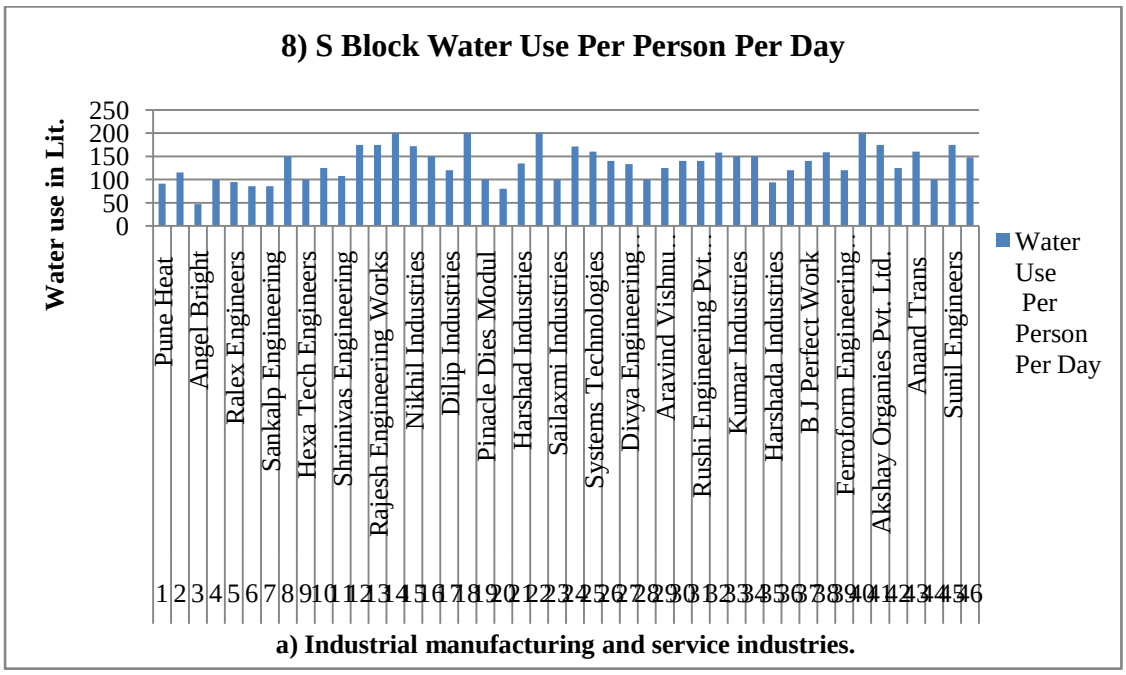

Figure no. 3.26

In the manufacturing industries of S block no one any industrial units are using optimum water, 4 units have their use optimum to excess and 42 units were using more than excess amount of water for domestic purposes.

The Pune Heat, J K Engineers, Rajdeep Engineering, Ralex Engineers, R P Industries, Hexa Tech Engineers, Lano Engineering, Shrinivas Engineering, Mechatronic Systems, Rajesh Engineering Works, Worth Engineering Pvt. Ltd, Nikhil Industries, Desai Engineering Works, Dilip Industries, Prasho Engineers, Pinacle Dies Modul, Harshad Industries, Sankalp Engineering, Sailaxmi Industries, Dynomerk Controls, Systems Technologies, Jay Suprabha Protative Product Pvt. Ltd, Divya Engineering Projects, Leo Enterprises, Aravind Vishnu Govande And Company, Sai Hari Enterprises, Rushi Engineering Pvt. Ltd., Burhani Industries, Kumar Industries, Elcher Engineers Pvt. Ltd., Harshada Industries, Nand Composites Pvt. Ltd, B J Perfect Work, Jyoti Heatsinks Pvt. Ltd, Ferroform Engineering Pvt. Ltd, Shree Parshwa Ind., Akshay Organies Pvt. Ltd., Bax Industries, Anand Trans , Lunar Enterprises Pvt. Ltd., Sunil Engineers and Crasling industry has maximum per day per person use of water ie 91, 115, 100, 150, 100, 125, 108, 175, 175, 200, 172, 150, 150, 120, 200, 100, 135, 200, 100, 171, 160, 140, 133, 100, 125, 140, 140, 158, 150, 150, 94, 120, 140, 159, 120, 200, 175, 125, 160, 100, 175 and 148 liters. These industry is using maximum water because its product is heat treatment, induction Harding

manufacturing, manufacturing and Supplying high quality Automotive Components like Thread Rolling, Spline Rolling, CNC Machining, engineering job work, agriculture machining products & automotive passenger machine products, machining manufacturer, CNC Components, Cylinder Damper Assembly, Damper Assembly Piston, Drive Gear Blank, Gear Drive, Gear Crank Shaft, Hub Sleeve, Shift Rail, Speedo Body Adapter, Ungrouped Products etc.

Table no. 3.28 - a) manufacturing industries. - 9) Electronics Zone						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Rasco Industry	547500	25	1500	60	Optimum to excess
2	Mogora Cosmic Ltd	1460000	120	4000	33	Optimum
3	S H Pithkar Ortho tools	1095000	130	3000	23	Optimum
4	Lonlife Sciences Ltd.	1095000	40	3000	75	Optimum to excess
5	Prasad Mcab p Ltd.	1095000	50	3000	60	Optimum to excess
6	Zeutch Engineers P. Ltd	547500	18	1500	83	Optimum to excess
7	Jabro Engineers	547500	22	1500	68	Optimum to excess
8	Jaldoot material and handling P. Ltd	1095000	80	3000	38	Optimum
9	Deairj Tech India	730000	21	2000	95	More than excess

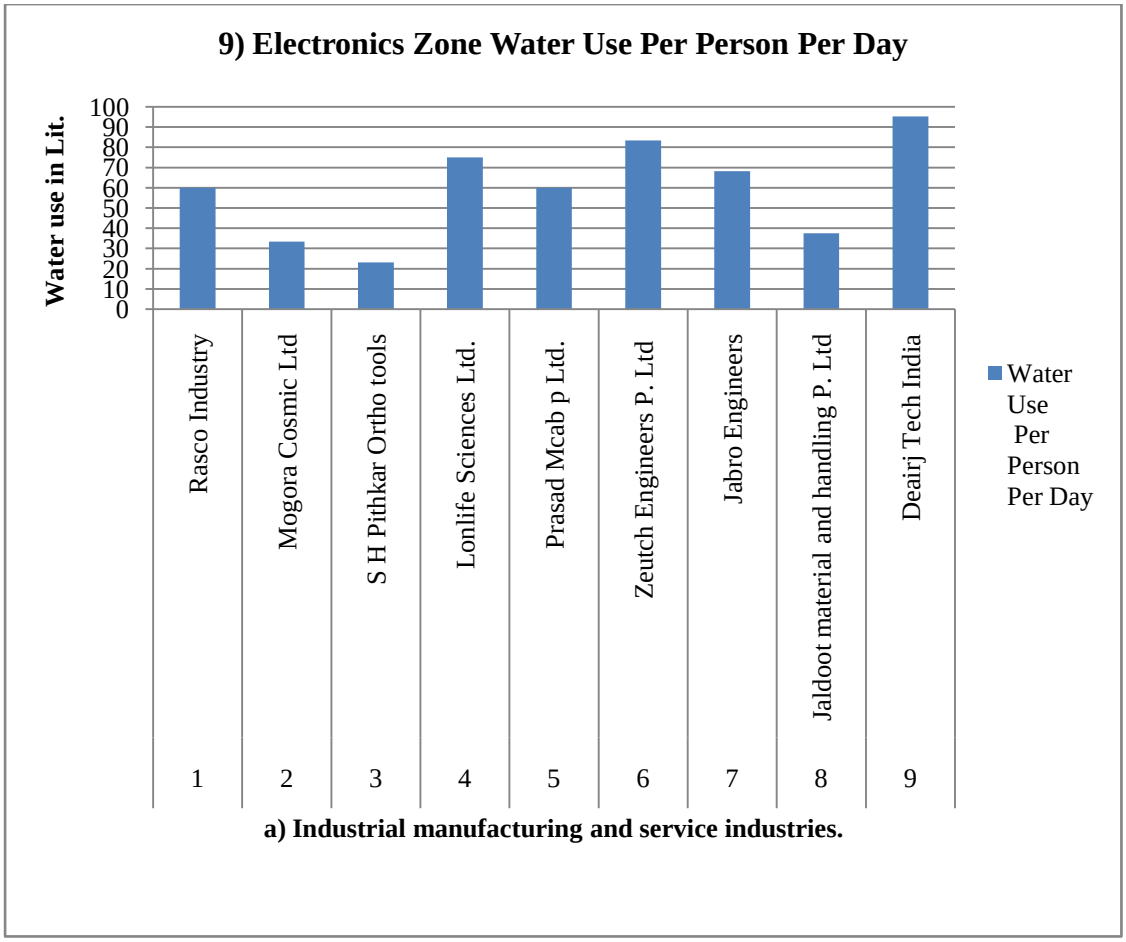

Figure no. 3.27

In the manufacturing industries of Electronics Zone block the 3 industrial units are using optimum water, 5 units have their use optimum to excess and only 1 units were using more than excess amount of water for domestic purposes.

The Mogora Cosmic Ltd, S H Pithkar Ortho tools and Jaldoot material and handling P. Ltd. industries has minimum water per person per day use of water ie. 33, 23 and 38 liters respectively, where as Deairj tech India industry has maximum per day per person use of water ie 95 liters. This industry is using maximum water because its product is industrial spare manufacturing.

b) Tool Manufacturing Industries:

Table no. 3.29 b) Tool Manufacturing Industries - 1) Bhosari Gen. Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Kumar Tools	547500	20	1500	75	Optimum to excess
2	Carbtools India Pvt.Ltd.	730000	35	2000	57	Optimum to excess
3	Truthread Gauges And Tools Pvt. Ltd	1642500	150	4500	30	Optimum
4	Sharp_Ex Enterprises	438000	18	1200	67	Optimum to excess
5	Kishor Industries	255500	26	700	27	Optimum
6	Jivan Profile	547500	26	1500	58	Optimum to excess
7	Malti Engineering Works	255500	12	700	58	Optimum to excess
8	AMP Technologies	912500	30	2500	83	Optimum to excess
9	Mouj Engineering	1095000	30	3000	100	More than excess
10	Bodymaster Engineering	547500	28	1500	54	Optimum to excess
11	Arihant Engineers	730000	20	2000	100	More than excess
12	Redint Engineering	511000	22	1400	64	Optimum to excess

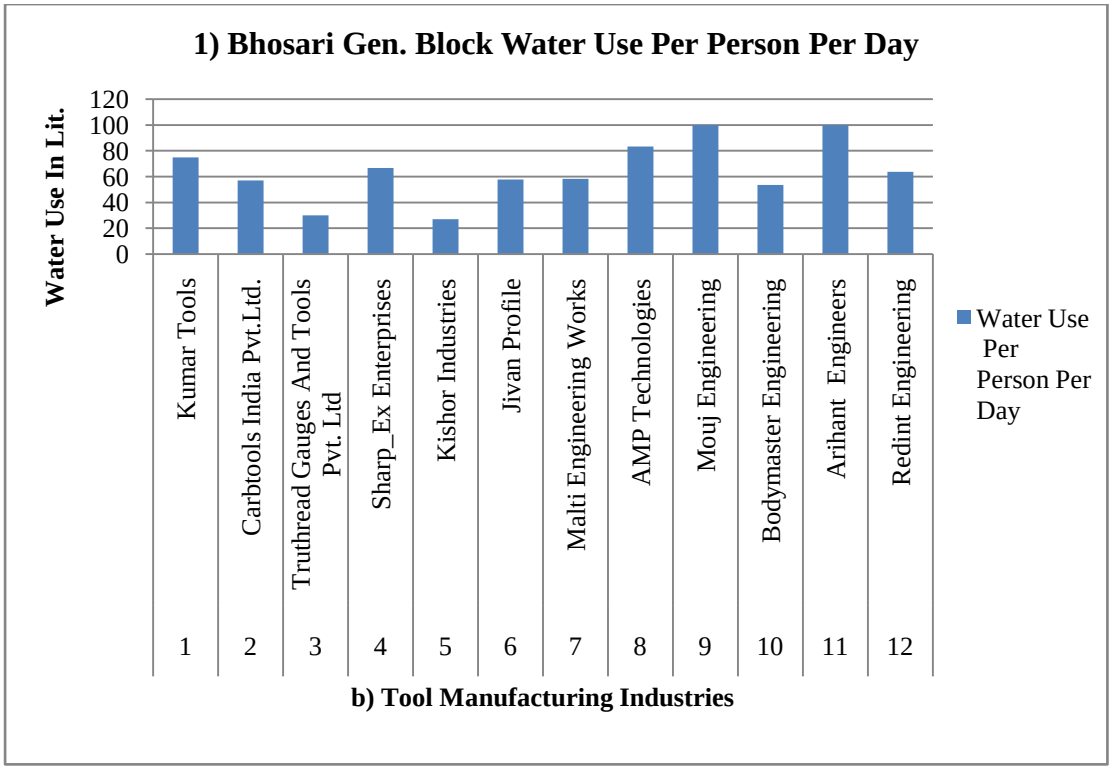

Figure no. 3.28

In the Tool manufacturing industries of Bhosari Genral block the 2 industrial units are using optimum water, 8 units have their use optimum to excess and only 2 units were using more than excess amount of water for domestic purposes.

The Truthread Gauges And Tools Pvt. Ltd and Kishor Industries has minimum water per person per day use of water ie. 30 and 27 liters respectively, where as mouj engineering industry has maximum per day per person use of water ie 100 liters. This industry is using maximum water because its product is tool manufacturing.

Table no. 3.30 - b) Tool Manufacturing Industries - 2) J Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Parvati Machine Tools	292000	18	800	44	Optimum
2	Biltz Cutting Tools Company	365000	10	1000	100	More than excess
3	Bright Metals And Tools	547500	10	1500	150	More than excess

4	Mision Tools And Technology	547500	30	1500	50	Optimum to excess
5	Suman Engineering	292000	12	800	67	Optimum to excess
6	Accurate Laser Cutting	547500	15	1500	100	More than excess
7	A D M Engineering	438000	12	1200	100	More than excess
8	Super Engineers	547500	15	1500	100	More than excess
9	Aksons Engineering	657000	20	1800	90	Optimum to excess
10	Prashant Engineering	474500	20	1300	65	Optimum to excess
11	Raviras Components	401500	20	1100	55	Optimum to excess
12	Shreeyash Industries	657000	20	1800	90	Optimum to excess
13	Taoovan Tools & Proto Tech. LLP	365000	35	1000	29	Optimum
14	Mona Engineering	730000	28	2000	71	Optimum to excess
15	Accu-Size Gauges & Tools Pvt. Ltd.	474500	20	1300	65	Optimum to excess

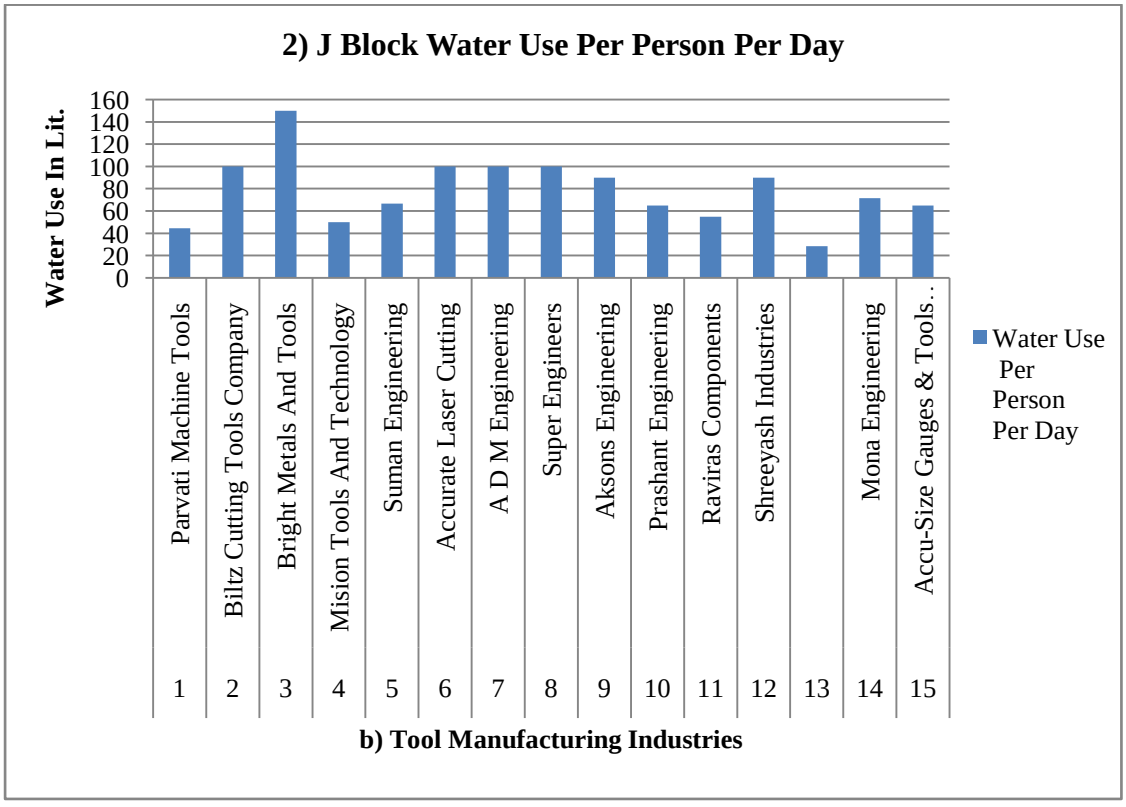

Figure no. 3.29

In the Tool manufacturing industries of J block the 2 industrial units are using optimum water, 8 units have their use optimum to excess and only 5 units were using more than excess amount of water for domestic purposes.

The Parvati Machine Tools and Taovan Tools & Proto Tech. LLP has minimum water per person per day use of water ie. 44 and 29 liters respectively, where as Biltz Cutting Tools Company,Bright Metals And Tools,Accurate Laser Cutting,A D M Engineering and Super Engineers industry has maximum per day per person use of water ie 100, 150, 100,100 and 100 liters respectively. These industries are using maximum water because its product is tool manufacturing and industrial component manufacturing, tool casting job work etc.

Table no. 3.31 - b) Tool Manufacturing Industries - 3) H Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Industrial Products	912500	10	2500	250	More than excess
2	Iec air Tools Pvt. Ltd.	1350500	25	3700	148	More than excess
3	Jyoti Tooling And Press Components P. Ltd	1277500	24	3500	146	More than excess

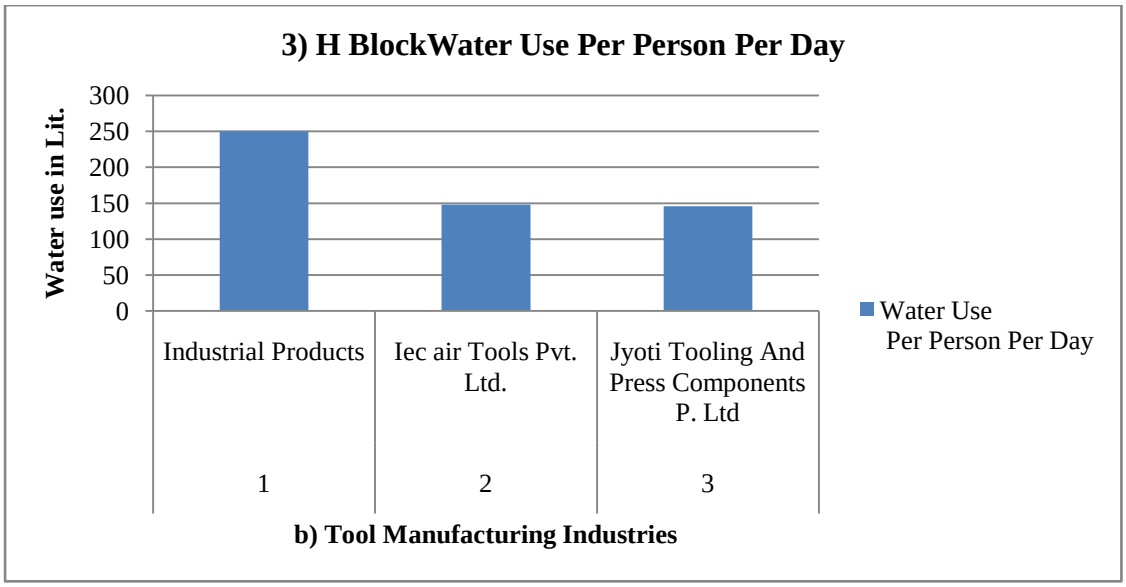

Figure no. 3.30

In the Tool manufacturing industries of H block no one any industrial units are using optimum water, no one any units have their use optimum to excess and total 3 units were using more than excess amount of water for domestic purposes.

Industrial Products, Iec air Tools Pvt. Ltd and Jyoti Tooling And Press Components P. Ltd industry has maximum per day per person use of water ie 250, 148 and 146 liters. These industries ares using maximum water because its product is Accura Oil Pulse Shut Off Wrenches (ST+), Cycle Monitoring System – CMS (NS), Accura Oil Pulse Wrenches, Accura Pulse 'N' Series Wrenches, Oil Filler IAP-OF-300, + Series Light Weight Impact Wrenches, N Series Light Weight Impact Wrenches, Impact Wrenches, Torque Controlled Shut Off Screw Drivers, Slip Clutch Screw Drivers, Impact Screw Drivers, Ratchet Wrenches, Air Tapper and other industrial tools and press components etc.

Table no. 3.32 - b) Tool Manufacturing Industries - 4) S Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Jis Tools Company	1642500	32	4500	141	More than excess
2	Jose Brother Industries	547500	12	1500	125	More than excess
3	Ganesh Engineering work	912500	15	2500	167	More than excess
4	Delpro Equipments Pvt. Ltd	1095000	15	3000	200	More than excess

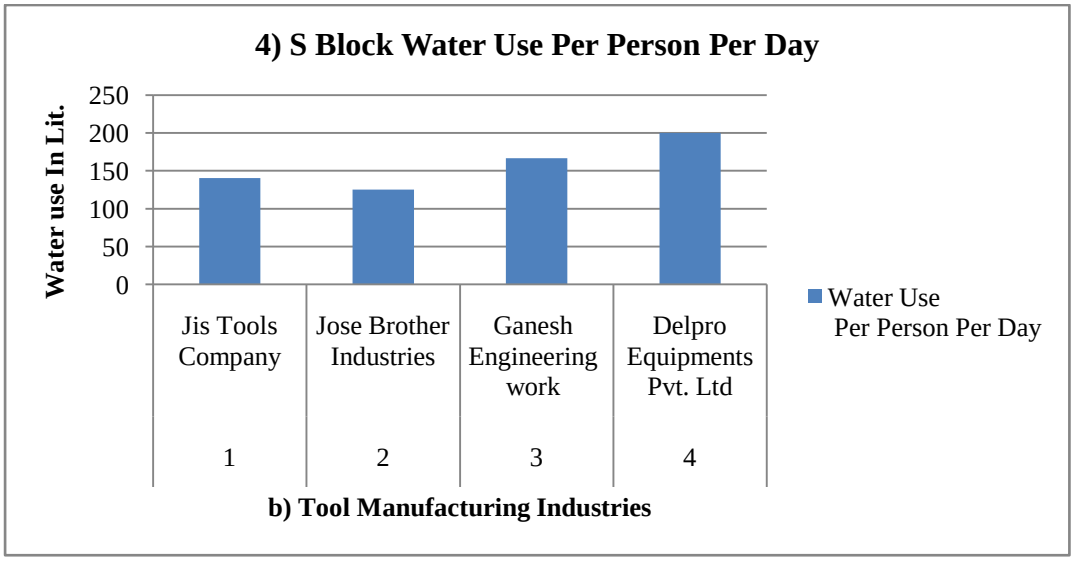

Figure no. 3.31

In the Tool manufacturing industries of S block no one any industrial units are using optimum water, no one any units have their use optimum to excess and total 4 units were using more than excess amount of water for domestic purposes.

The Jis Tools Company, Jose Brother Industries, Ganesh Engineering work and Delpro Equipments Pvt. Ltd industry has maximum per day per person use of water ie 141, 125, 167 and 200 liters. These industry is using maximum water because its product is Form releaved cutters, taps, end mils, miling cutters, T- slot cutters, reamers, serration cutters, drill cum reamers, Sheet Metal Pressed Components, Sheet Metal Stamping, Precision Machined Components, Metal Mouldings, Metal Die and Moulds, Press Tools, Automotive Spare Parts, VMC in Makino and Wire Cutting in Makino, Process Equipments, Pressure Vessels, Process Vessels, Shell & Tube Heat exchangers, Accumulator Vessels, Mechanical Seal Support System etc.

Table no. 3.33 - b) Tool Manufacturing Industries - 5) Electronics Zone

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Sakshi metal and tools P. Ltd	1095000	130	3000	23	Optimum

In the Tool manufacturing industries of Electronics Zone block the 1 industrial units are using optimum water.

c) Plastic And Rubber industries:

Table no. 3.34 - c) Plastic And Rubber industries - 1) Bhosari Gen. Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Multi Crafts	912500	20	2500	125	More than excess
2	Elite Plastic Industries	730000	23	2000	87	Optimum to excess

3	Tanbe Enterprises	730000	43	2000	47	Optimum to excess
4	Lala Rubber Products	730000	26	2000	77	Optimum to excess
5	Tharma Fab	730000	20	2000	100	More than excess
6	Suvarna Fibo Tech Pvt. Ltd.	730000	40	2000	50	Optimum to excess
7	Shriram Rubber Product Pvt. Ltd.	730000	30	2000	67	Optimum to excess
8	Ardfine Plymers Pvt. Ltd.	912500	30	2500	83	Optimum to excess
9	Arofine Polymers Pvt. Ltd.	1533000	40	4200	105	More than excess
10	Cipy Polymers	730000	30	2000	67	Optimum to excess
11	Agio Polymer Ltd.	730000	32	2000	63	Optimum to excess

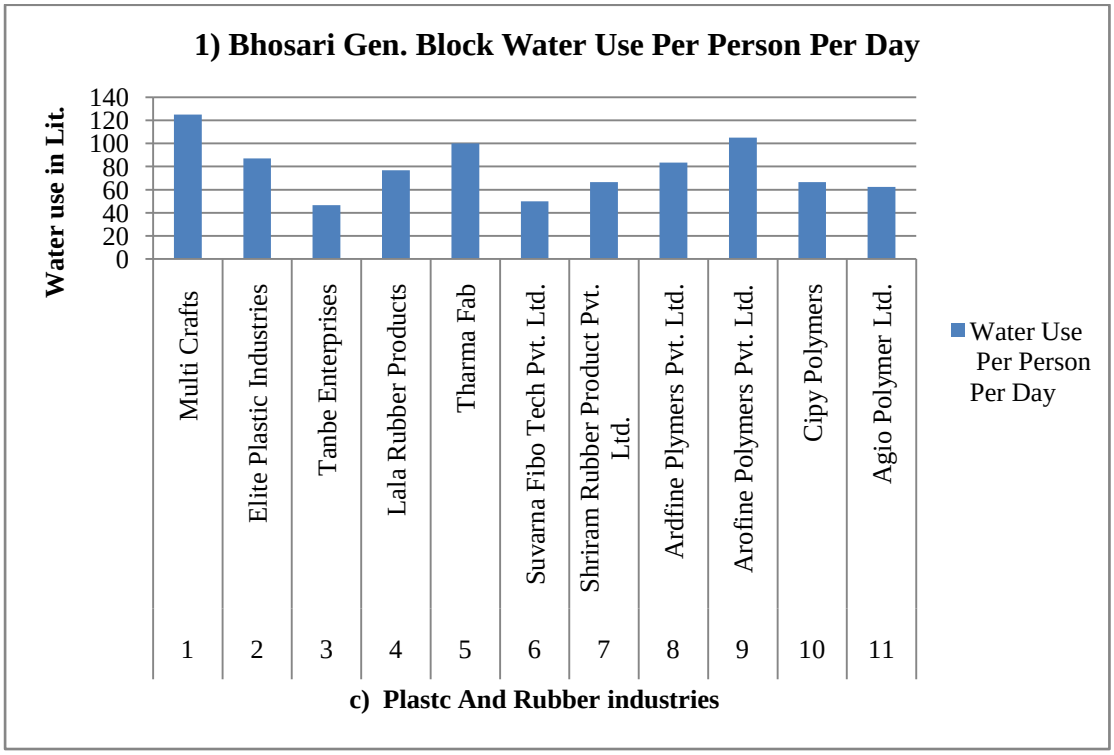

Figure no. 3.32

In the plastic and rubber industries of Bhosari Genral block no one any industrial units are using optimum water, 8 units have their use optimum to excess and only 3 units were using more than excess amount of water for domestic purposes.

The Multi Crafts , Tharma Fab and Arofine Polymers Pvt. Ltd. industry has maximum per day per person use of water ie 125,100 and 105 liters respectively.

These industries are using maximum water because its product is Fibre glass Product Manufacturers, also known for Optical Fibre Cable Dealers, Moulded Fibreglass Product Dealers, Optical Fibre Dealers, Fibreglass Products, Electrical Insulation etc.

Table no. 3.35 - c) Plastic And Rubber industries - 2) D -I Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	venus Fabica	547500	15	1500	100	More than excess
2	Jayashree Plymer Pvt. Ltd	1825000	28	5000	179	More than excess
3	Auto Fibre Works P. Ltd.	803000	20	2200	110	More than excess

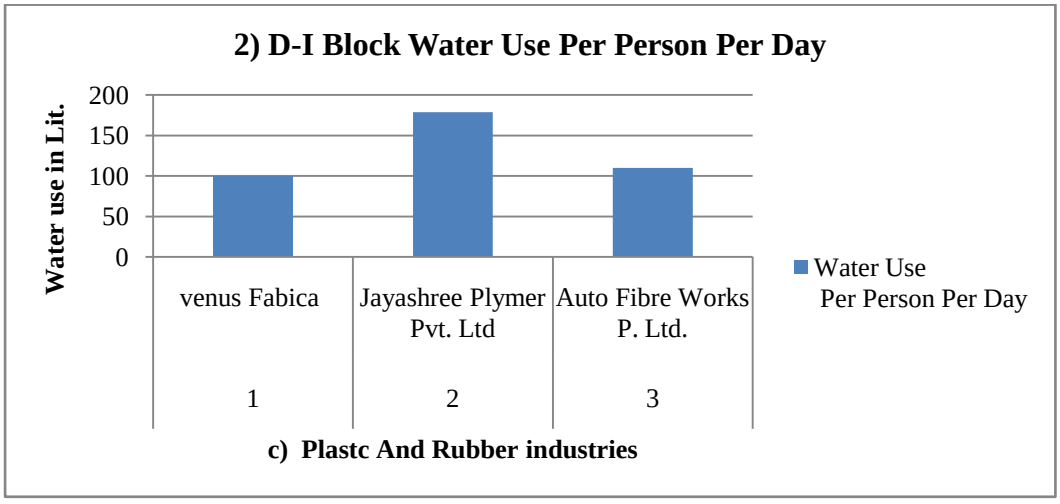

Figure no. 3.33

In the plastic and rubber industries of D-I block no one any industrial units are using optimum water, no one any units have their use optimum to excess and only 3 units were using more than excess amount of water for domestic purposes.

The venus Fabica, Jayashree Plymer Pvt. Ltd and Auto Fibre Works P. Ltd. industry has maximum per day per person use of water ie 100, 179 and 110 liters. These industry is using maximum water because its product is Metal to Rubber Bonded Rubber Hoses Rubber Profiles Moulded Rubber Parts Fuel Tubes Sub Assemblies and fiber works etc..

Table no. 3.36 c) Plastic And Rubber industries - 3) D-II Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Bhavika Plastics	438000	15	1200	80	Optimum to excess
2	Rubber Linings	912500	25	2500	100	More than excess
3	Shridhar Rubber Products Pvt. Ltd.	912500	25	2500	100	More than excess
4	Sunny FRP Products	1168000	30	3200	107	More than excess
5	Pradip Plastic Molders P. Ltd.	547500	15	1500	100	More than excess
6	Pradip Plastic Molders P. Ltd.	730000	35	2000	57	Optimum to excess
7	Electro Fab	730000	30	2000	67	Optimum to excess
8	Hitch Plast Pvt. Ltd.	839500	25	2300	92	More than excess
9	Hirkesh Rubber Products	803000	20	2200	110	More than excess

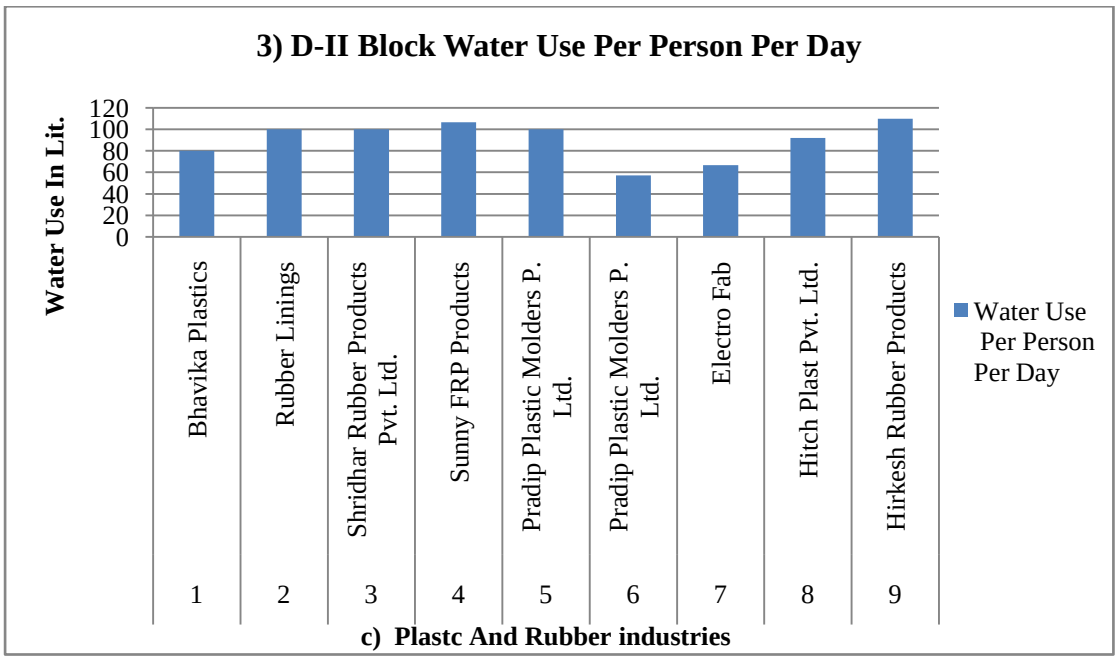

Figure no. 3.34

In the plastic and rubber industries of D-III block no one any industrial units are using optimum water, 3 units have their use optimum to excess and only 6 units were using more than excess amount of water for domestic purposes.

The Rubber Linings, Shridhar Rubber Products Pvt. Ltd., Sunny FRP Products, Pradip Plastic Molders P. Ltd., Hitch Plast Pvt. Ltd. And Hirkesh Rubber Products industry has maximum per day per person use of water ie 100, 100, 107, 100,92 and 110 liters. These industries are using maximum water because it's product is plastic modules, rubber modules, FRP sheets manufacturing, plastic product, and fiber product manufacturing etc.

Table no. 3.37 - c) Plastic And Rubber industries - 4) D -III Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Premier Plastics	730000	15	2000	133	More than excess
2	Plastc Moduls	912500	30	2500	83	Optimum to excess

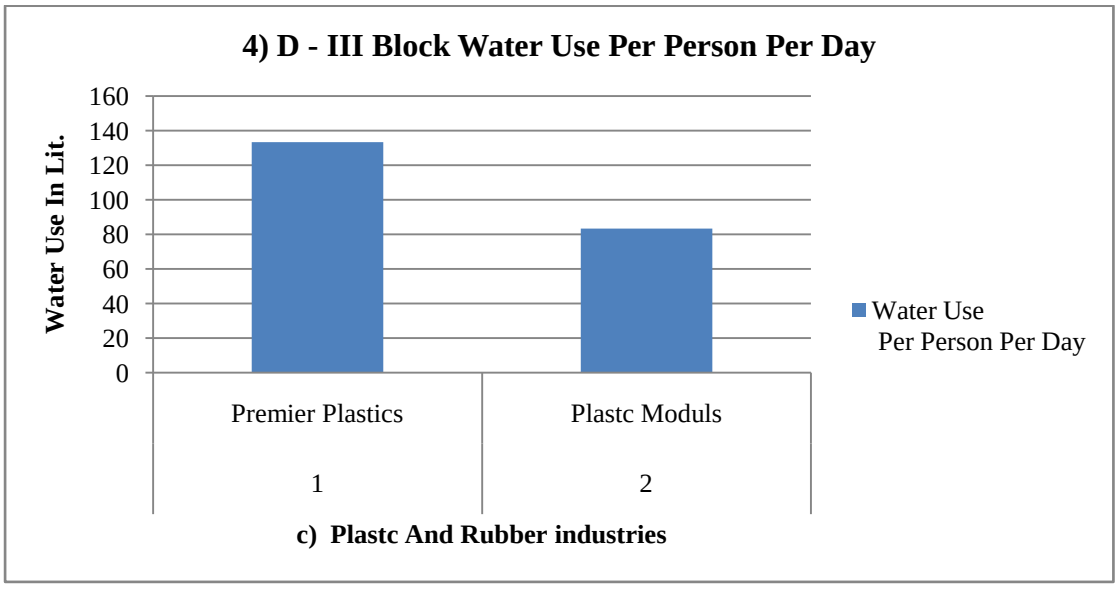

Figure no. 3.35

In the plastic and rubber industries of D-III block no one any industrial units are using optimum water, 1 units have their use optimum to excess and only 1 units were using more than excess amount of water for domestic purposes.

The premier plastics industry has maximum per day per person use of water ie 133 liters. This industry is using maximum water because its product is plastic manufacturing and molding.

Table no. 3.38 - c) Plastic And Rubber industries - 5) F - II Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Bhagat Plastics	1204500	20	3300	165	More than excess
2	Pioneek Rubber	803000	20	2200	110	More than excess

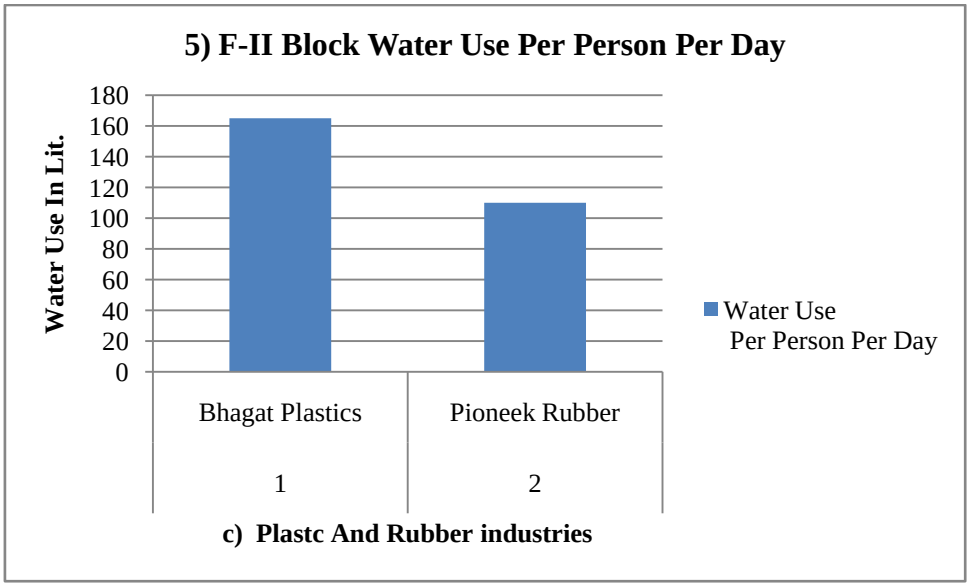

Figure no. 3.36

In the plastic and rubber industries of F-II block no one any industrial units are using optimum water, no one any units have their use optimum to excess and total 2 units were using more than excess amount of water for domestic purposes.

The bhagat plastics and Pioneek rubber industry has maximum per day per person use of water ie 165 and 110 liters respectively. This industry is using maximum water because its product is plastic manufacturing and molding and rubber products.

Table no. 3.39 - c) Plastic And Rubber industries - 6) J Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Crown Rubber Product	547500	20	1500	75	Optimum to excess
2	Policemical Fabi	620500	18	1700	94	More than excess
3	Tej Plastics	730000	25	2000	80	Optimum to excess
4	Multi Plast	730000	15	2000	133	More than excess
5	Abhi Tech Fab P. Ltd.	365000	20	1000	50	Optimum to excess
6	Heramb Thermoplastics Pvt. Ltd.	730000	32	2000	63	Optimum to excess
7	Imperial Rubber Products	730000	15	2000	133	More than excess
8	Polymers And Adhesves	693500	15	1900	127	More than excess

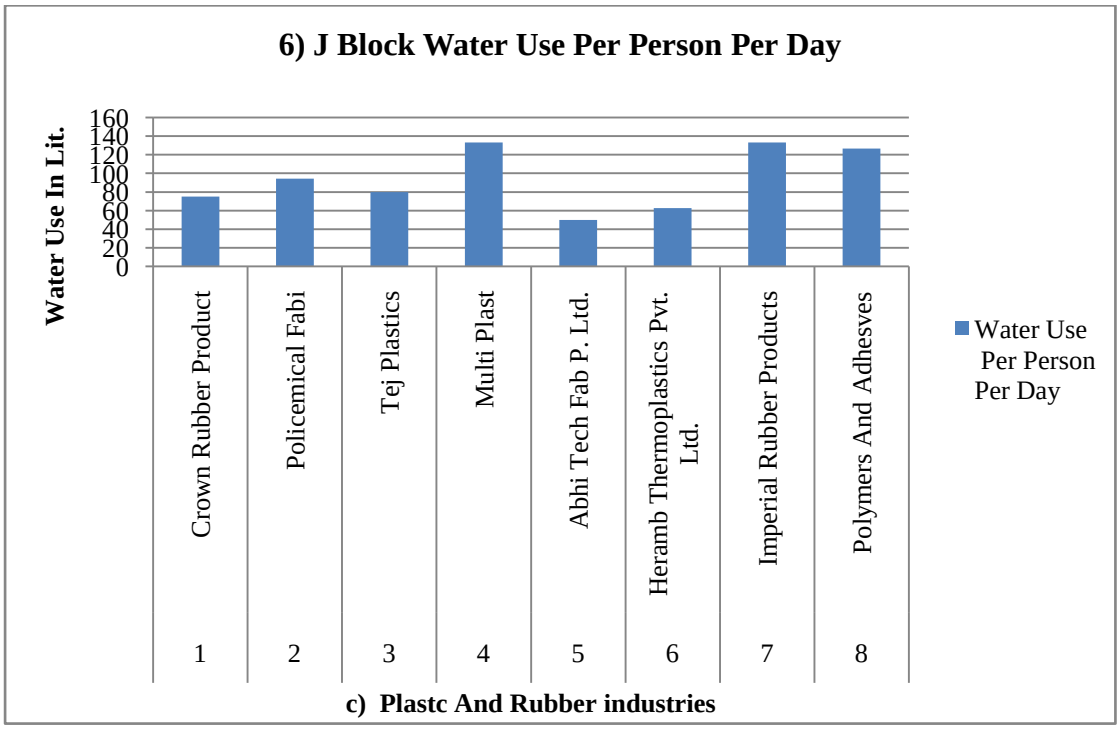

Figure no. 3.37

In the plastic and rubber industries of J block no one any industrial units are using optimum water, 4 units have their use optimum to excess and only 4 units were using more than excess amount of water for domestic purposes.

The Policemical Fabi, Multi Plast, Imperial Rubber Products and Polymers And Adhesves industry has maximum per day per person use of water ie 94, 133, 133 and 127 liters respectively. These industries are using maximum water because its product is fiber works, fiber glass manufacturing, fiber modules and plastic manufacturing etc.

Table no. 3.40 - c) Plastic And Rubber industries - 7) H Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Anupama Rubber	1095000	20	3000	150	More than excess
2	Rohan Plastic Industries	1095000	23	3000	130	More than excess
3	Uma Plast Wark Pvt. Ltd.	1460000	20	4000	200	More than excess

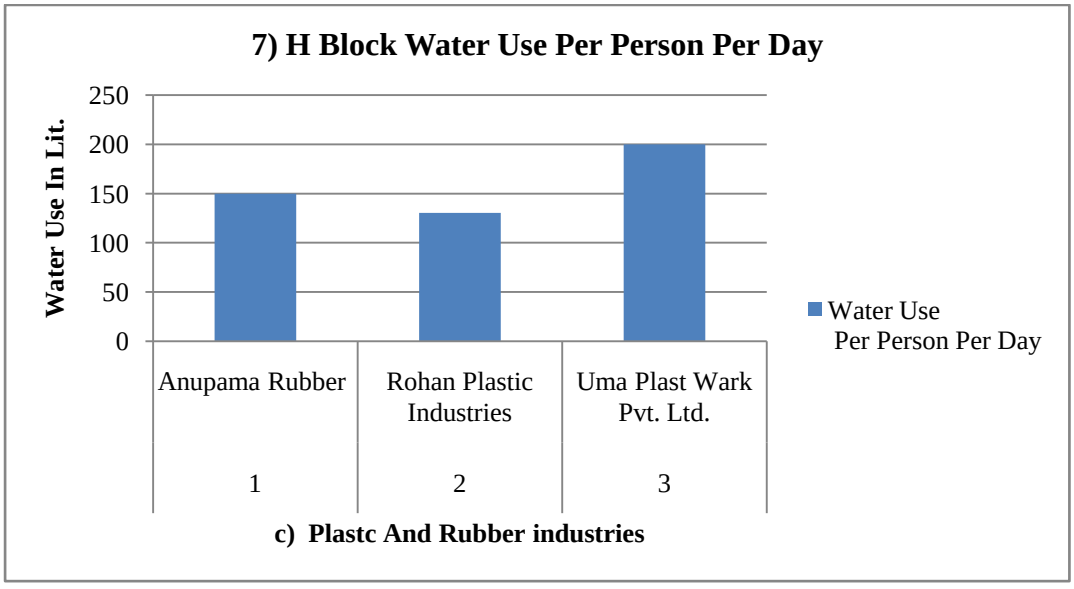

Figure no. 3.38

In the plastic and rubber industries of H block no one any industrial units are using optimum water, no one any units have their use optimum to excess and total 3 units were using more than excess amount of water for domestic purposes.

The Anupama Rubber , Rohan Plastic Industries and Uma Plast Wark Pvt. Ltd. industry has maximum per day per person use of water ie 150, 130 and 200 liters. These industries are using maximum water because its product is fiber works, fiber glass manufacturing, fiber modules and plastic manufacturing etc.

Table no. 3.41 - c) Plastic And Rubber industries - 8) S Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Nest Fab	511000	15	1400	93	More than excess
2	Harshal Fibereglass	255500	12	700	58	Optimum to excess
3	Criative Polymers Pvt. Ltd	1642500	40	4500	113	More than excess
4	Rohit Rubber Product	803000	15	2200	147	More than excess
5	Vinayak Plastic	2190000	20	6000	300	More than excess
6	Fabri Tech Engineering	1277500	20	3500	175	More than excess

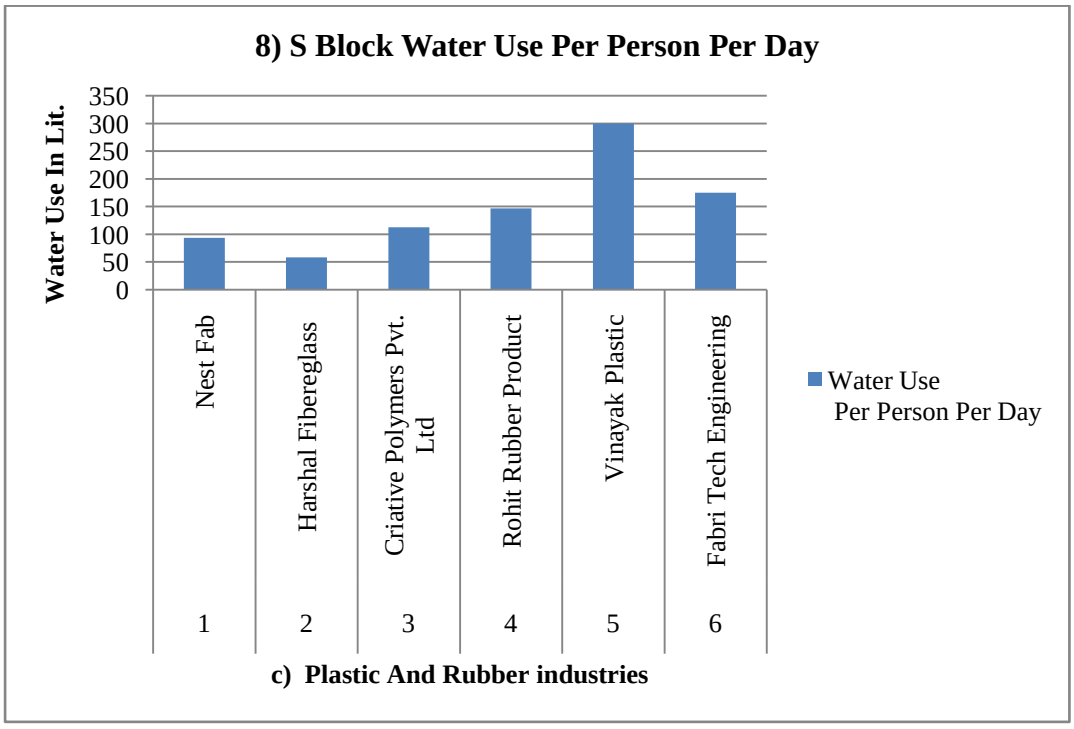

Figure no. 3.39

In the plastic and rubber industries of S block no one any industrial units are using optimum water, 1 units have their use optimum to excess and only 5 units were using more than excess amount of water for domestic purposes.

The Nest Fab, Criative Polymers Pvt. Ltd, Rohit Rubber Product, Vinayak Plastic and Fabri Tech Engineering. industry has maximum per day per person use of water ie 93, 113, 147, 300 and 175 liters. These industries are using maximum water because its product is Fiber glass Product Manufacturers, also known for Optical Fibre Cable Dealers, Moulded Fibreglass Product Dealers, Optical Fibre Dealers, Fibreglass Products etc.

d) Metal And Forge Industries:

Table no. 3.42 - d) Metal And Forge Industries - 1) Bhosari Gen. Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Amol Engineers P. Ltd.	620500	17	1700	100	More than excess
2	Pyramid Engineering	803000	15	2200	147	More than excess
3	Shree Industries	730000	10	2000	200	More than excess
4	Poona Udyog	730000	12	2000	167	More than excess
5	Krupa Metal	547500	20	1500	75	Optimum to excess
6	Metal King	547500	20	1500	75	Optimum to excess
7	Mahavir Steel	730000	40	2000	50	Optimum to excess
8	India Forge And Drop Stamping Ltd.	1095000	150	3000	20	Optimum
9	Forge Auto Engineering P. Ltd.	730000	28	2000	71	Optimum to excess

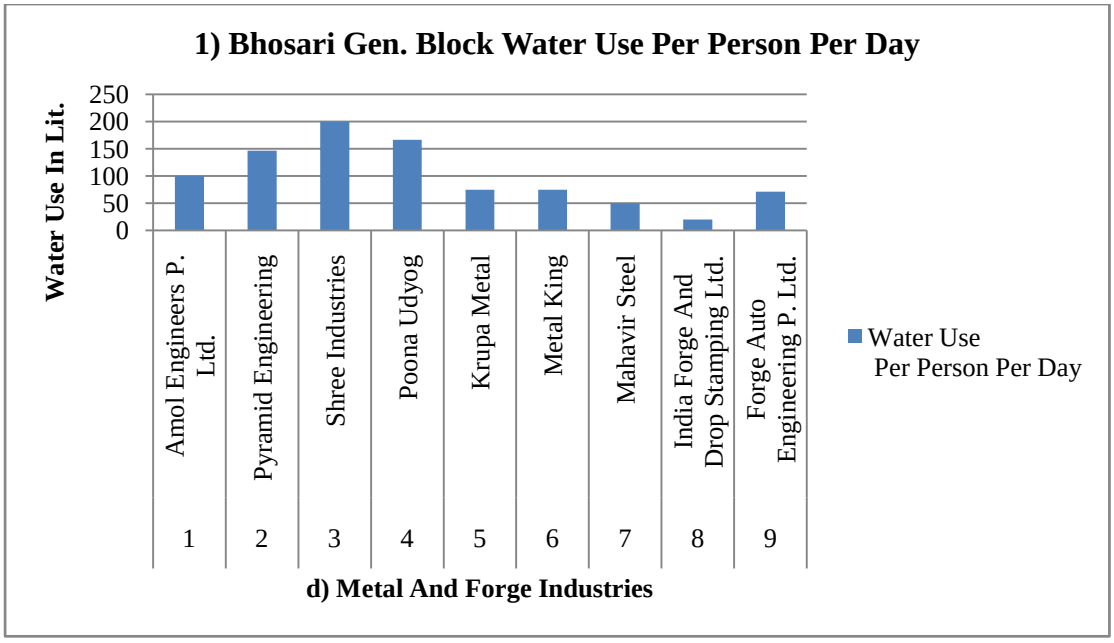

Figure no. 3.40

In the metal and forge industries of Bhosari general block the 1 industrial units are using optimum water, 4 units have their use optimum to excess and only 4 units were using more than excess amount of water for domestic purposes.

The India forge and drop stamping ltd has minimum water per person per day use of water ie. 20 liters respectively, where as Amol Engineers P. Ltd., Pyramid Engineering, Shree Industries and Poona Udyog industry has maximum per day per person use of water ie 100, 147, 200 and 167 liters. These industries are using maximum water because its product is frp and metal product, aluminum die casting, Steel plant spares like Anvil Plates, Spring Retainer, Gripper Plate, Spring coil, Bearing Housing, Liner plates, Coupling etc.

Table no. 3.43 - d) Metal And Forge Industries - 2) D - II Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Shree Samartha Body Bildings	365000	16	1000	63	Optimum to excess
2	Ashoka Iron Industry	1095000	40	3000	75	Optimum to excess
3	Pune Bhat Metals	985500	30	2700	90	Optimum to excess
4	Nirmal Metal Costa	730000	18	2000	111	More than excess
5	Autocraft Engineers	949000	40	2600	65	Optimum to

						excess
6	Trishul Forging	985500	35	2700	77	Optimum to excess

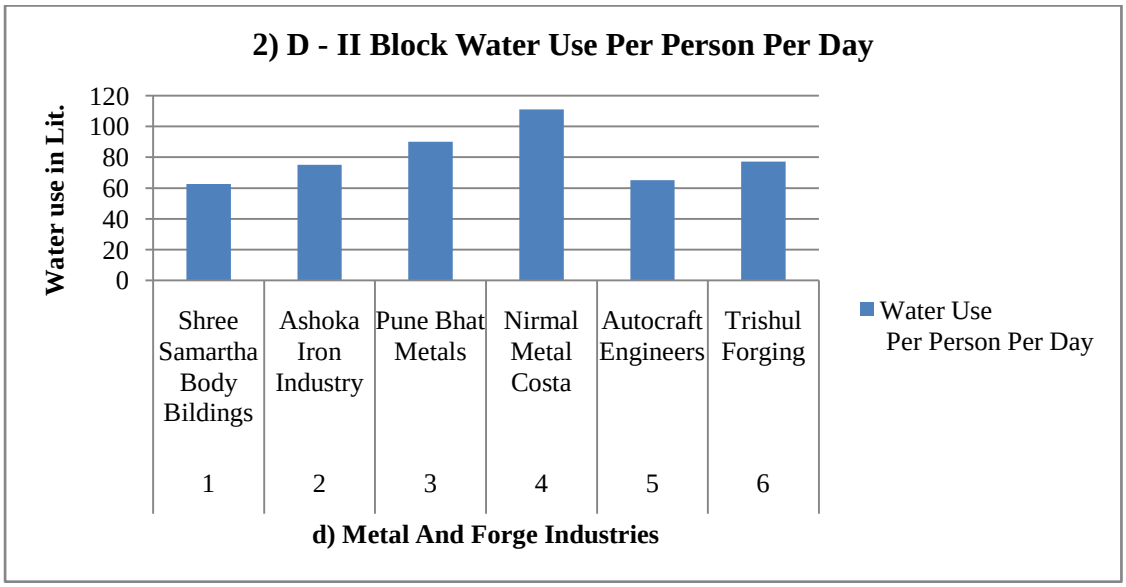

Figure no. 3.41

In the metal and forge industries of D-II block no one any industrial units are using optimum water, 5 units have their use optimum to excess and only 1 units were using more than excess amount of water for domestic purposes.

The Nirmal Metal Costa industry has maximum per day per person use of water ie 111 liters respectively. This industry is using maximum water because its product is metal casting and metals products.

Table no. 3.44 - d) Metal And Forge Industries - 3) F -II Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Quaility Heat Trade	730000	24	2000	83	Optimum to excess
2	anvin Engineers Pvt. Ltd	912500	20	2500	125	More than excess
3	Unifrax pvt. Ltd.	1277500	20	3500	175	More than excess
4	Abhijeet Surface Cutting	839500	15	2300	153	More than excess

5	Mogara Engineering	803000	15	2200	147	More than excess
6	Ishwar Forge Pvt. Ltd.	912500	20	2500	125	More than excess

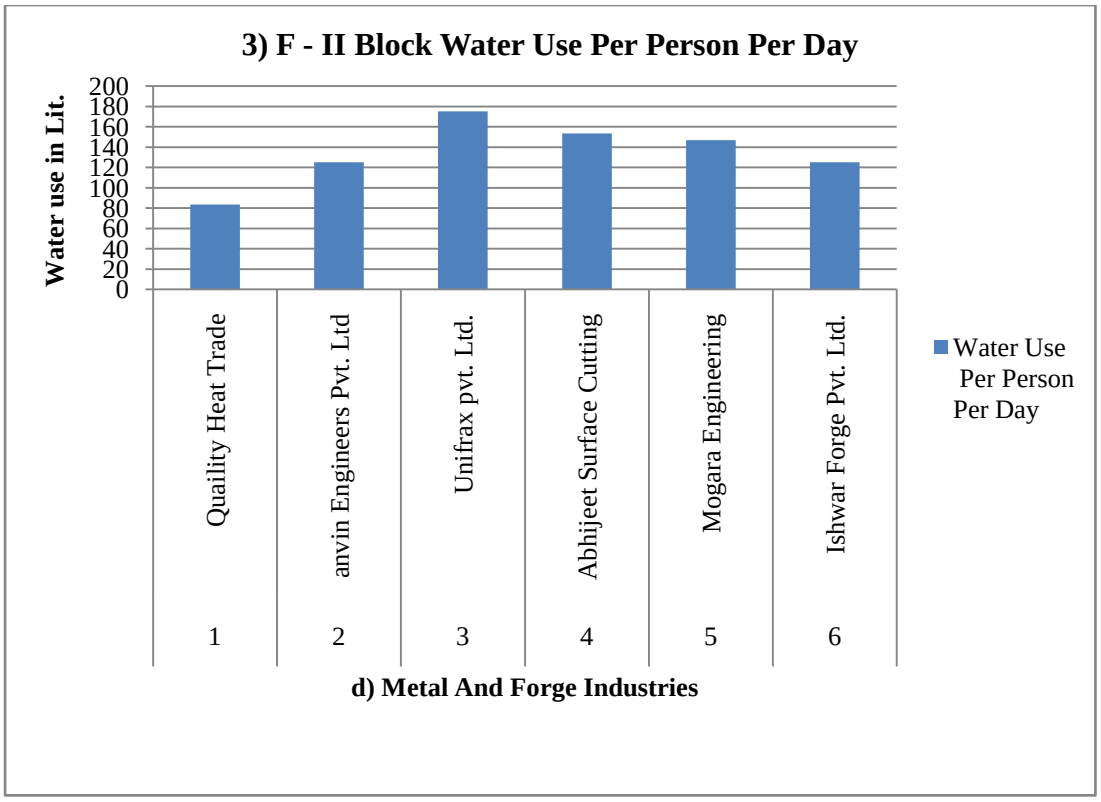

Figure no. 3.42

In the metal and forge industries of F-II block no one any industrial units are using optimum water, 1 units have their use optimum to excess and 5 units were using more than excess amount of water for domestic purposes.

The anvin Engineers Pvt. Ltd, nifrax pvt. Ltd, Abhijeet Surface Cutting, Mogara Engineering and Ishwar Forge Pvt. Ltd. industry has maximum per day per person use of water ie 125, 175, 153, 147 and 125 liters respectively. These industries are using maximum water because its product is metal cutting, surface cutting and forge components etc.

Table no. 3.45 - d) Metal And Forge Industries - 4) J Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**

1	Modern Metal Works	255500	18	700	39	Optimum
2	Jimcap Industries	438000	15	1200	80	Optimum to excess
3	Engineers India	803000	25	2200	88	Optimum to excess
4	Vaibhav Industries	365000	15	1000	67	Optimum to excess
5	Om Sai Engineers	365000	20	1000	50	Optimum to excess
6	Shree Engineering Associates	547500	19	1500	79	Optimum to excess
7	Mahalaxmi Fabrication	730000	15	2000	133	More than excess
8	A S Engineers And Fabricators	547500	25	1500	60	Optimum to excess
9	CSK Engineers And Fabricators	365000	20	1000	50	Optimum to excess
10	Alukam Fabrication P. Ltd.	182500	8	500	63	Optimum to excess
11	Kreativ Moltring P. Ltd.	182500	14	500	36	Optimum
12	Kalate Works	292000	11	800	73	Optimum to excess
13	Almas Steel And Oil P. Ltd.	547500	14	1500	107	More than excess
14	Durga Metal Art	547500	17	1500	88	Optimum to excess
15	Alok Fabrications	438000	15	1200	80	Optimum to excess
16	V K Forge	401500	20	1100	55	Optimum to excess
17	Vchil Industries	401500	20	1100	55	Optimum to excess
18	S S Engineering Works	365000	20	1000	50	Optimum to excess
19	Creative Fabritech	365000	10	1000	100	More than excess
20	Siddharth Machanical Works	365000	25	1000	40	Optimum
21	Guru Engineers	438000	35	1200	34	Optimum
22	Arya Industries	365000	30	1000	33	Optimum
23	Mechatherma Services India Pvt. Ltd.	365000	25	1000	40	Optimum

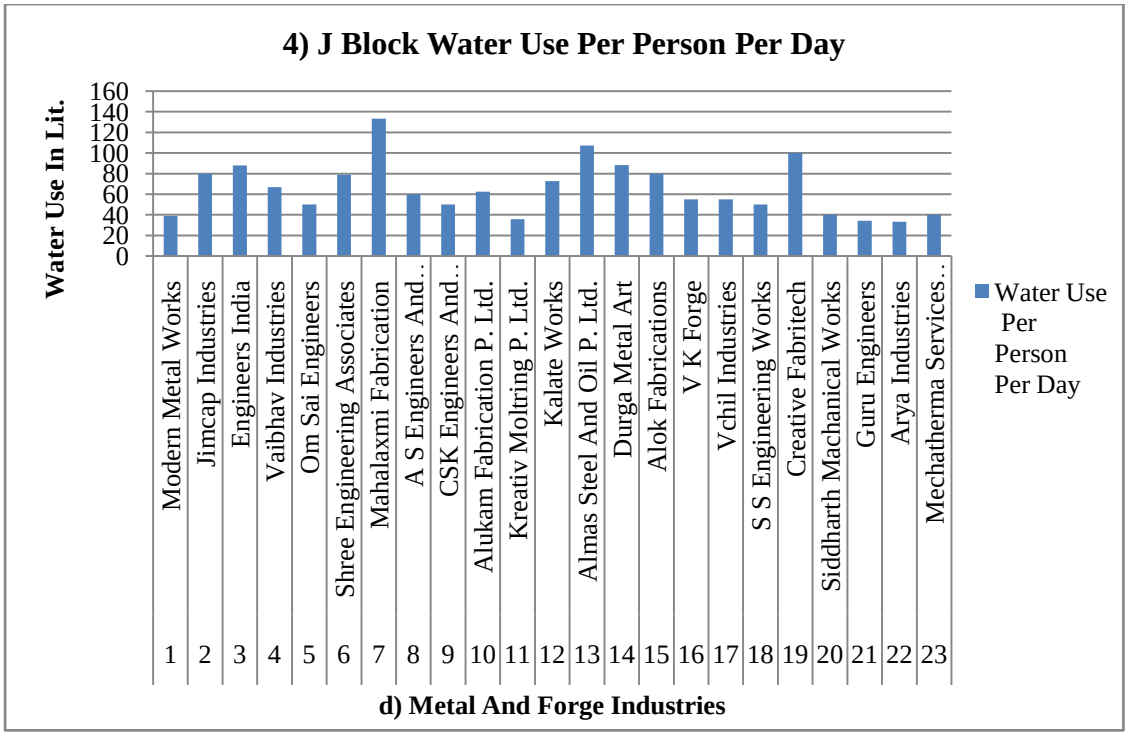

Figure no. 3.43

In the metal and forge industries of J block the 6 industrial units are using optimum water, 14 units have their use optimum to excess and only 3 units were using more than excess amount of water for domestic purposes.

The Modern Metal Works, Kreativ Moltring P. Ltd, Siddharth Machanical Works, Guru Engineers, Arya Industries and Mechatherma Services India Pvt. Ltd. industries has minimum water per person per day use of water ie. 39, 36, 40, 34, 33 and 40 liters respectively, where as Mahalaxmi fabrication, Almas steel and oil P. Ltd and creative fabritech industry has maximum per day per person use of water ie 133, 107 and 100 liters respectively. These industries are using maximum water because its product is metal fabrication, steel fabrication and molding etc.

Table no. 3.46 - d) Metal And Forge Industries - 5) H Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Ace Metal Treters P. Ltd	1277500	30	3500	117	More than excess
2	Sushil Engineers	1350500	20	3700	185	More than excess

3	Mahalaxmi Still Corporation	730000	10	2000	200	More than excess
4	Balaji Steel Enterprises	1168000	20	3200	160	More than excess
5	Angel Steel Corporation	547500	15	1500	100	More than excess
6	Artech Welders Pvt.Ltd	1095000	15	3000	200	More than excess
7	Automatic Components	1277500	22	3500	159	More than excess
8	Angel Steel Corporation	1277500	25	3500	140	More than excess

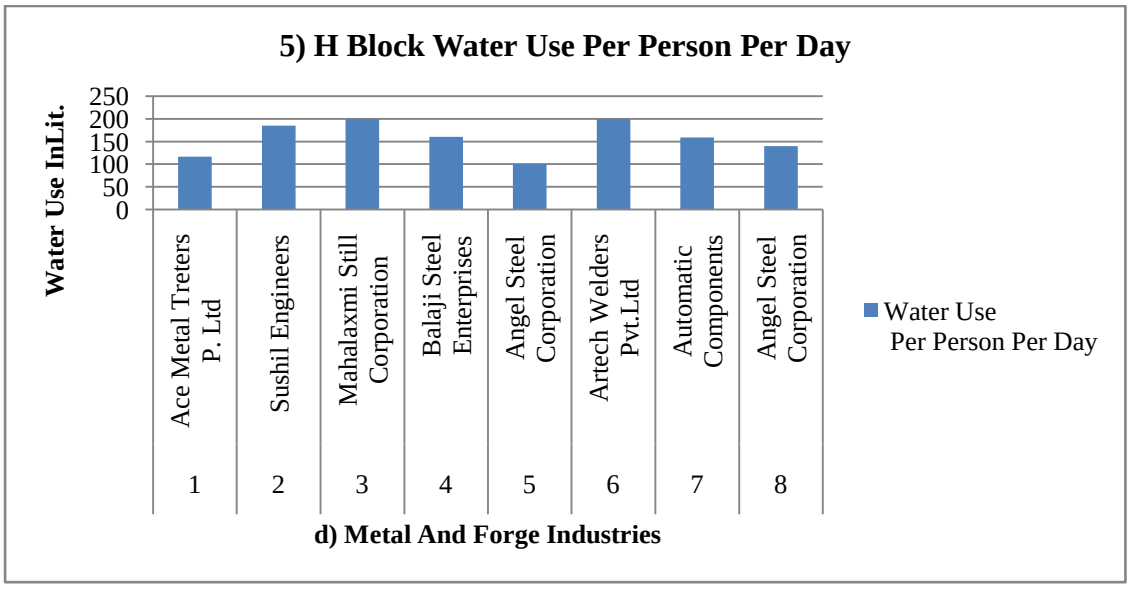

Figure no. 3.44

In the metal and forge industries of H block no one any industrial units are using optimum water, no one any units have their use optimum to excess and total 8 units were using more than excess amount of water for domestic purposes.

The Ace Metal Treters P. Ltd, Sushil Engineers, Mahalaxmi Still Corporation, Balaji Steel Enterprises, Angel Steel Corporation, Artech Welders Pvt.Ltd, Automatic Components and Angel Steel Corporation industry has maximum per day per person use of water ie 117, 185, 200, 160, 100, 200, 159 and 140 liters respectively. These industries are using maximum water because its product is metal treatment process machine manufacturing and services, still modules and fabrication, metal and still welding works and industrial components manufacturing .

Table no. 3.47 - d) Metal And Forge Industries - 6) S Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Bhairav Metals	1168000	25	3200	128	More than excess
2	Bhairav Metals	255500	12	700	58	Optimum to excess
3	KBK Fabricator	985500	25	2700	108	More than excess
4	Metal Arts	803000	15	2200	147	More than excess
5	A B Industries	1460000	28	4000	143	More than excess
6	Metal Arts	620500	15	1700	113	More than excess
7	Metal Arts	1095000	20	3000	150	More than excess
8	Industrial Accessories Corporation	1460000	15	4000	267	More than excess

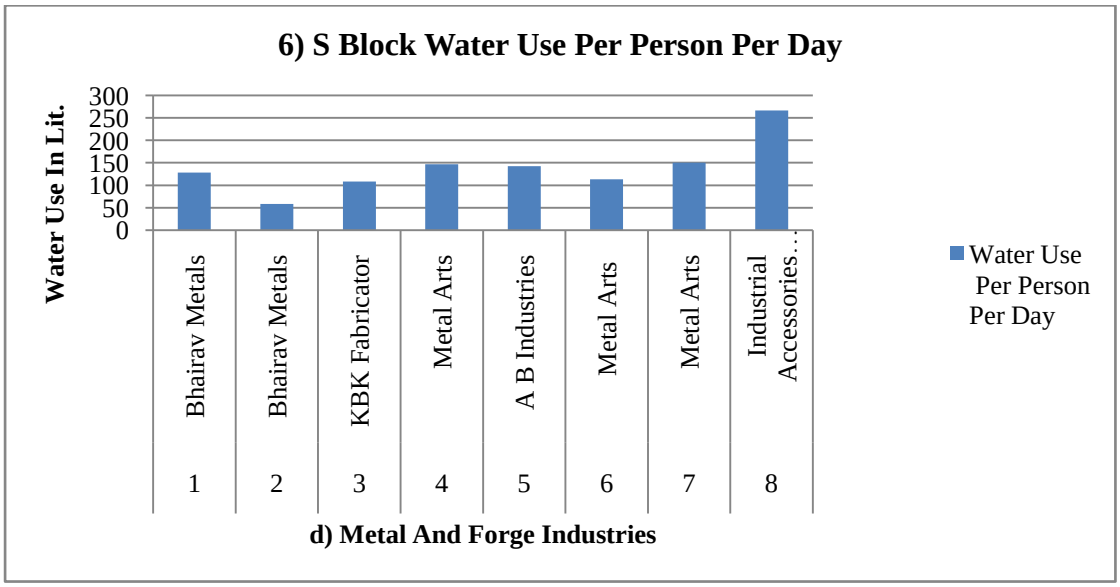

Figure no. 3.45

In the metal and forge industries of S block no one any industrial units are using optimum water, 1 units have their use optimum to excess and only 7 units were using more than excess amount of water for domestic purposes.

The Bhairav Metals, KBK Fabricator, Metal Arts, A B Industries, Metal Arts , Metal Arts And Industrial Accessories Corporation industry has maximum per day per person use of water ie 128, 108, 147, 143, 113, 150 and 267 liters. These industries are using maximum water because its product is metal fabrication, metal components and goods manufacturing, metal casting, metal accessories manufacturing.

e) Chemical Industries:

Table no. 3.48 - e) Chemical Industries - 1) Bhosari Gen. Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Subhaoh Chemical	912500	33	2500	76	Optimum to excess
2	Rathi Chemicals	3650000	55	10000	182	More than excess
3	J P Fine Chemical	730000	34	2000	59	Optimum to excess
4	Aqu Chemical	730000	20	2000	100	More than excess

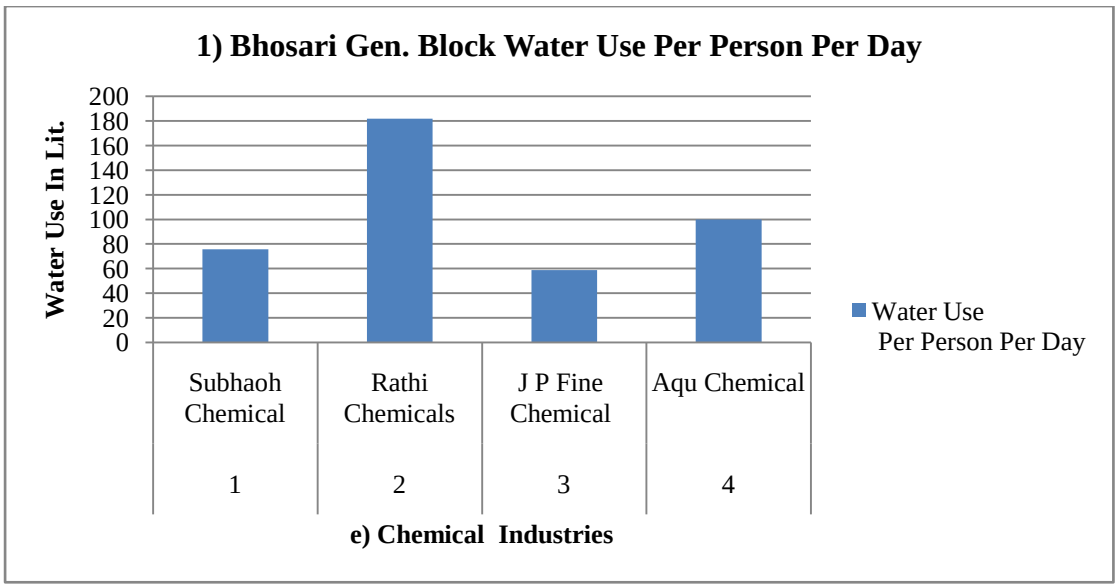

Figure no. 3.46

In the chemical industries of Bhosari general block no one any industrial units are using optimum water, 2 units have their use optimum to excess and only 2 units were using more than excess amount of water for domestic purposes.

The Rathi Chemicals and Aqu Chemical industry has maximum per day per person use of water ie 182 and 100 liters. These industries are using maximum water.

Table no. 3.49 - e) Chemical Industries							
Block	**Sr. No**	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
2) D - II Block	1	Surekha Chemical Industries	730000	25	2000	80	Optimum to excess
3) J Block	1	Central And Western (I) Chemicals	803000	30	2200	73	Optimum to excess
4) S Block	1	Manisha chemicles	1168000	25	3200	128	More than excess
5) Electronic Zone	1	Alok Chemicle P. Ltd.	1095000	26	3000	115	More than excess

In the chemical industries no one any industrial units are using optimum water, D-II and J blocks 2 units have their use optimum to excess and S blocks and Electronics zone blocks 2 units were using more than excess amount of water for domestic purposes.

S block and Electronics zones Manisha chemicals and Alok Chemicals P. Ltd. Industries has using maximum water ie 128 and 115 liters respectively.

f) Water Base Industries:

Table no. 3.50 - f) Water Base Industries - 1) Bhosari Gen.Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Vishal Ice Factory	365000	6	1000	167	More than excess
2	Bharat Ice Factory	730000	5	2000	400	More than excess

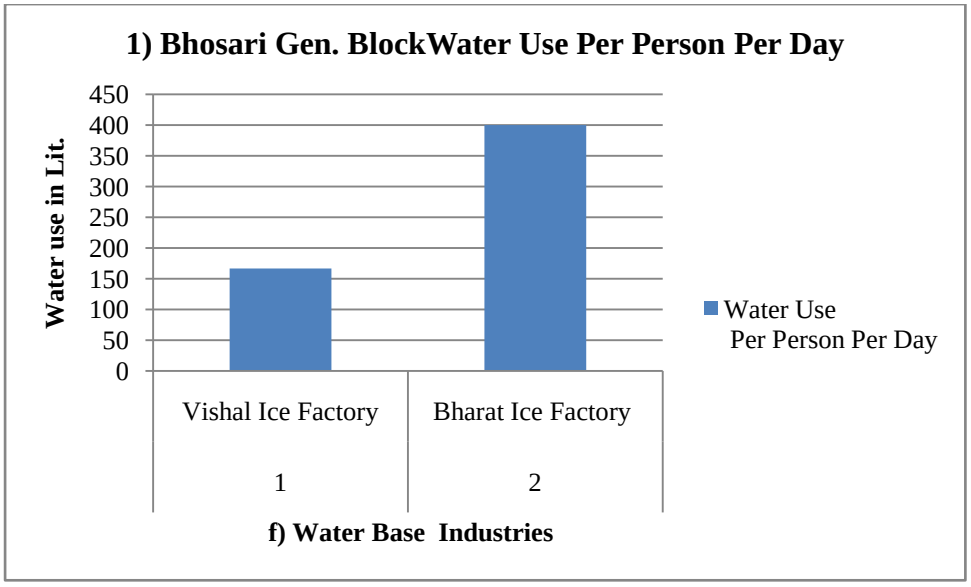

Figure no. 3.47

In the water base industries of Bhosari general block no one any industrial units are using optimum water, no one any units have their use optimum to excess and total 2 units were using more than excess amount of water for domestic purposes.

The Vishal Ice Factory and Bharat Ice Factory industry has maximum per day per person use of water ie 167 and 400 liters respectively. These industries are using maximum water because its product ice making.

Table no. 3.51 - f) Water Base Industries - 2) D-III Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Revos Aqua Systems Pvt. Ltd	1095000	10	3000	300	More than excess
2	Neel Distempers	620500	25	1700	68	Optimum to excess

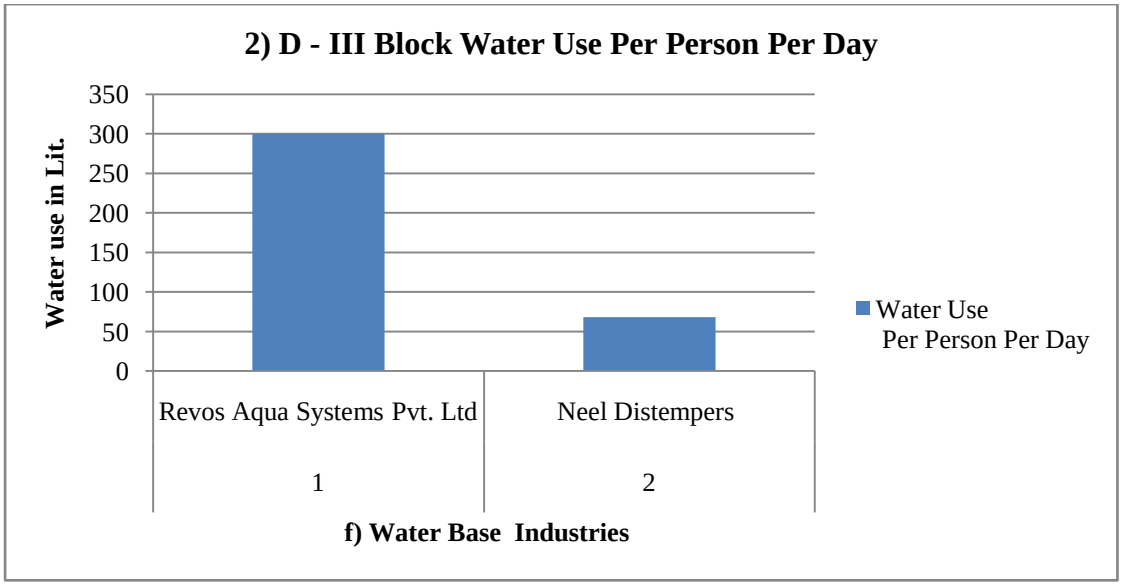

Figure no. 3.48

In the water base industries of D-II block no one any industrial units are using optimum water, 1 units have their use optimum to excess and only 1 units were using more than excess amount of water for domestic purposes.

The Revos aqua systems Pvt. Ltd industry has maximum per day per person use of water ie 300 liters respectively. These industries are using maximum water because its product Manufacturers, exporters and suppliers of water treatment plant, filtration plants, water softening plants, de-mineralization plants, mixed bed units, domestic reverse osmosis plants, industrial reverse osmosis plants, ultra filtration plants, ultra filtration systems, effluent treatment plant, sewage treatment etc.

Table no. 3.52 - f) Water Base Industries - 3) S Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Shilpa Paints	730000	20	2000	100	More than excess
2	Box Print Industries	1460000	30	4000	133	More than excess
3	Kwality Paints	1642500	40	4500	113	More than excess
4	Color Bond	1460000	50	4000	80	Optimum to excess

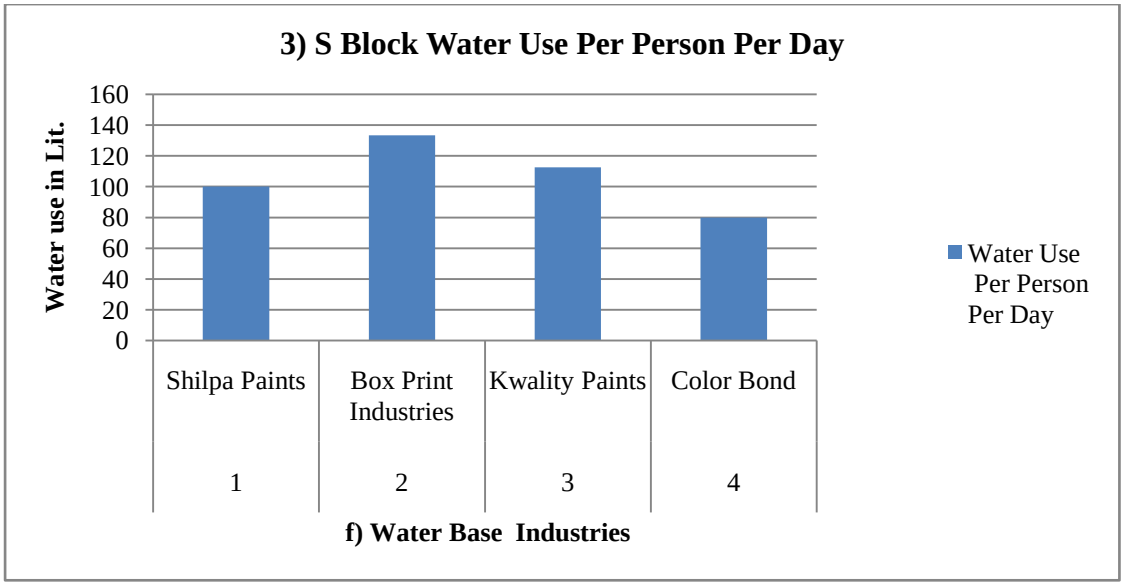

Figure no. 3.49

In the water base industries of S block no one any industrial units are using optimum water, 1 units have their use optimum to excess and 3 units were using more than excess amount of water for domestic purposes.

The Shilpa Paints,Box Print Industries and Kwality Paints industry has maximum per day per person use of water ie 100, 133 and 113 liters respectively. These industries are using maximum water because its product is oil paint, distemper, cement paint and box printing etc.

Table no. 3.53 - f) Water Base Industries

Block	Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
4) D- I Block	1	Punit Cement Pipe Industry	730000	25	2000	80	Optimum to excess
5) J Block	1	Water Treatment Enterprises	547500	23	1500	65	Optimum to excess
6) H Block	1	Corporate Dhobi Company	1533000	30	4200	140	More than excess

In the water base industries no one any industrial units are using optimum water, D-I and J blocks 2 units have their use optimum to excess and H blocks 1 units were using more than excess amount of water for domestic purposes.

H blocks Corporate Dhobi Company has maximum per person per day use of water ie. 140liters.This industry provides industrial and corporate dry cleaning services.

g) Automotive Industry:

Table no. 3.54 - g) Automotive Industry - 1) F - II Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Shree Auto Industries	730000	40	2000	50	Optimum to excess
2	Suyog Auto Cast Pvt. Ltd.	803000	30	2200	73	Optimum to excess
3	Talbors Automotive components Ltd	803000	40	2200	55	Optimum to excess
4	Wonder Car	730000	40	2000	50	Optimum to excess
5	Prachi Batteris Pvt.Ltd.	1095000	35	3000	86	Optimum to excess

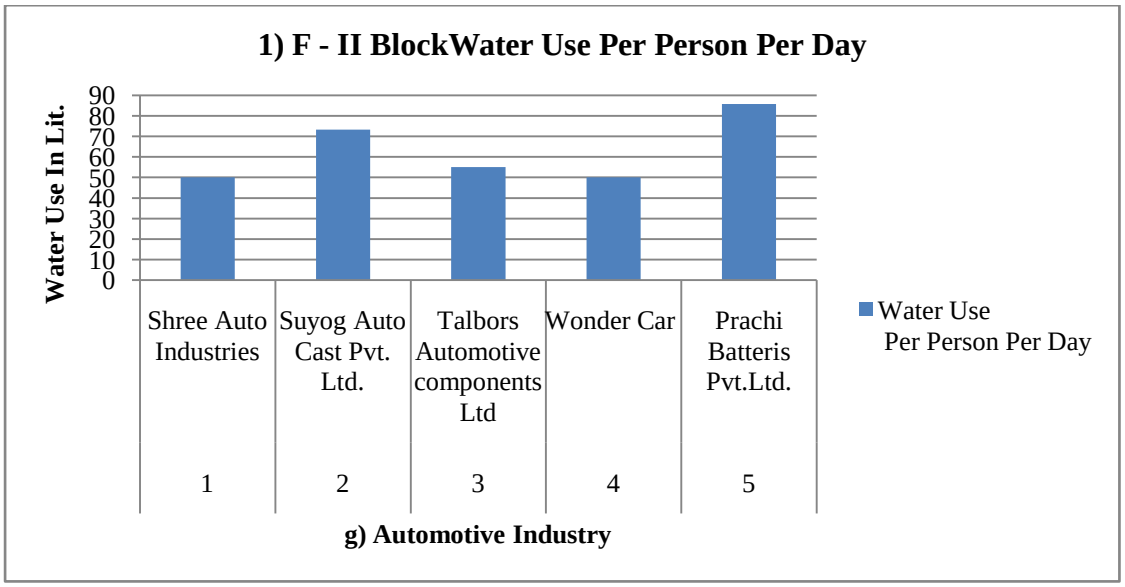

Figure no. 3.50

In the automotive industries of F-II block no one any industrial units are using optimum water, total 5 units have their use optimum to excess and no one any units were using more than excess amount of water for domestic purposes.

Table no. 3.55 - g) Automotive Industry - 2) J Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Renuka Auto Crank	365000	20	1000	50	Optimum to excess
2	Panse Autocomps Pvt. Ltd.	511000	23	1400	61	Optimum to excess
3	Fab Auto Parts Pvt. Ltd.	730000	40	2000	50	Optimum to excess
4	Dyna Automotive Stamping P. Ltd.	620500	35	1700	49	Optimum to excess
5	Automoblies Carporuting Ltd.	547500	17	1500	88	Optimum to excess
6	Aristo Folls Mfg. Company	365000	15	1000	67	Optimum to excess
7	Lumax Auto Technologies Ltd.	547500	20	1500	75	Optimum to excess

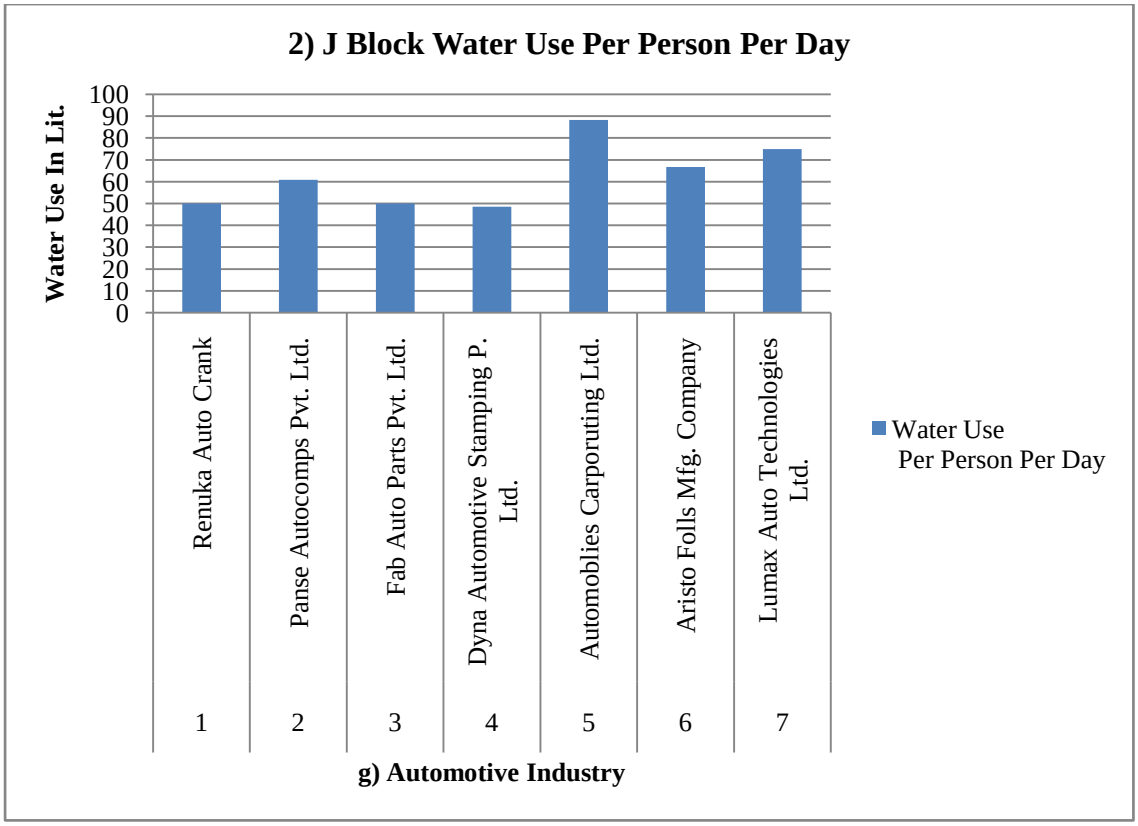

Figure no. 3.51

In the automotive industries of J block no one any industrial units are using optimum water, total 7 units have their use optimum to excess and no one any units were using more than excess amount of water for domestic purposes.

Table no. 3.56 - g) Automotive Industry - 3) S Block						
Sr. No	**Name Of Industry**	**Total Domestic Annual Water Use**	**No of working staff in Industries**	**Water Use Per day Per Unit**	**Water Use Per Person Per Day**	**Remark**
1	Autotech Engineering	255500	15	700	47	Optimum to excess
2	Genie Auto Ducts Pvt. Ltd.	365000	20	1000	50	Optimum to excess
3	Gaurav Auto Parts Mfg. Pvt. Ltd.	730000	25	2000	80	Optimum to excess

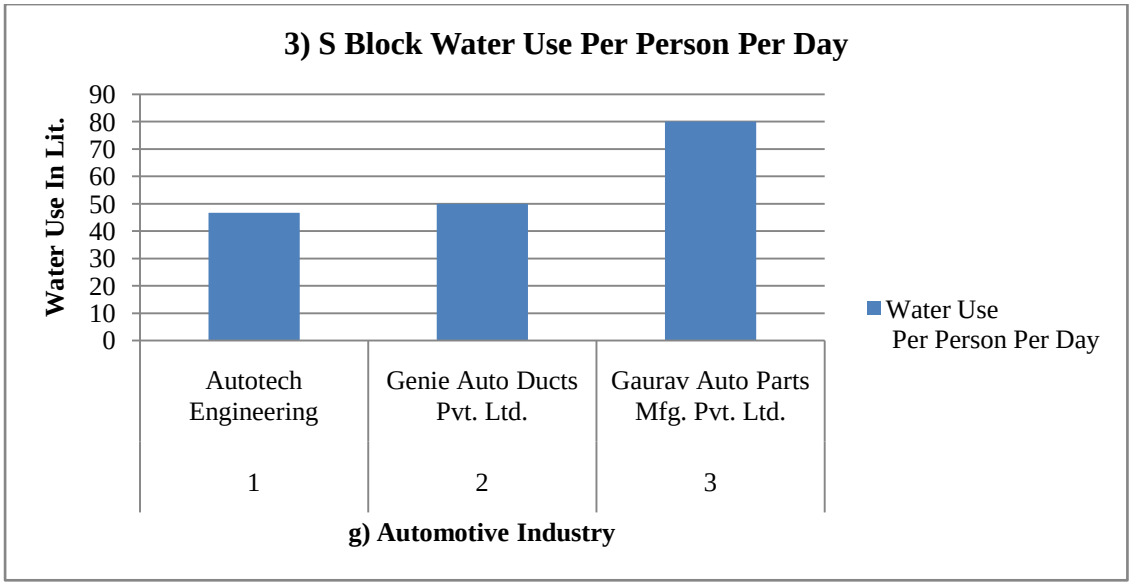

Figure no. 3.52

In the automotive industries of S block no one any industrial units are using optimum water, total 3 units have their use optimum to excess and no one any units were using more than excess amount of water for domestic purposes.

h) Pharmaceuticals Industry:

Table no. 3.57 - h) Pharmaceuticals Industry -1) F- II Block

Sr. No	Name Of Industry	Total Domestic Annual Water Use	No of working staff in Industries	Water Use Per day Per Unit	Water Use Per Person Per Day	Remark
1	Nullife Pharmaceuticals	912500	20	2500	125	More than excess
2	Bombay Oxigen Corp. Ltd	803000	25	2200	88	Optimum to excess

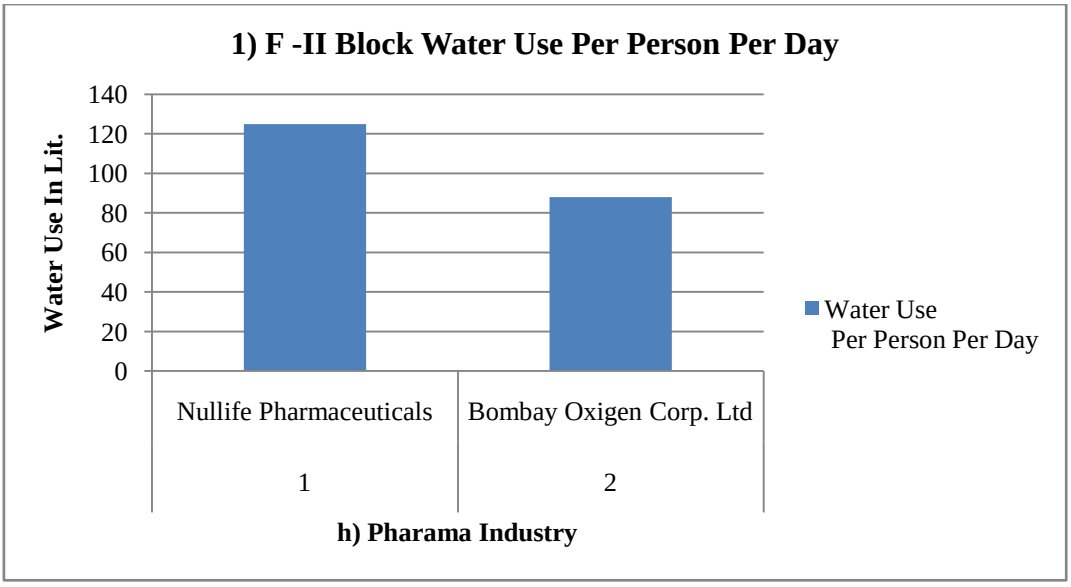

Figure no. 3.53

In the pharmaceuticals industries of F-II block no one any industrial units are using optimum water, 1 units have their use optimum to excess and only 1 units were using more than excess amount of water for domestic purposes.

The Nullife pharmaceuticals industry has maximum per day per person use of water ie 125 liters. This industry is using maximum water because its product is pharmaceuticals product manufacturing.

4.3 Industrial water management:

a) Manufacturing industries:

Table no. 3.58 - a) Manufacturing industries. 1) Bhosari Genral Block

Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
1	Sedmack	255500	700
2	Satandred Profile Pissine	182500	500
3	Pareect C P Ltd.	292000	800
4	Manoj Industry	365000	1000
5	Nama Enterprises	255500	700
6	E M Cure Pvt. Ltd.	365000	1000
7	Naween H P Ltd.	365000	1000
8	Rolex Engineers	255500	700

9	S B llp p. Ltd.	255500	700
10	Cosmos Engineers	365000	1000
11	Anurlri Mechf P. Ltd.	365000	1000
12	OSG India P. Ltd.	365000	1000
13	Ucco Mechfilters Pvt. Ltd.	365000	1000
14	Apex Ecotech Pvt. Ltd.	146000	400
15	J J Vertex	255500	700
16	Mechnocret Engineering Pvt.Ltd.	146000	400
17	Anubhav Enterprises	182500	500
18	Ashok Leyland Creative Auto Services	730000	2000
19	Transprecision Gears Pvt. Ltd.	365000	1000
20	D D Enterprises	146000	400
21	Sathyam Fasterners Pvt. Ltd.	182500	500
22	Sharp Engineering	292000	800
23	Mojj Engineering Systems Ltd.	182500	500
24	Five Spark	292000	800
25	N. D. Gupta Enterprises	584000	1600
26	Arihant Alloys And Engineers	255500	700
27	Indo Group	292000	800
28	Spin India	365000	1000
29	Prma Pvt. Ltd.	365000	1000
30	Anant Enterprises	730000	2000
31	Sona Pvt. Ltd.	365000	1000
32	Kedar Coating And Engineering P. Ltd.	73000	200
33	IndoSwe Engineers Pvt. Ltd.	547500	1500
34	Kartos Engineering & IT Solutions Pvt. Ltd.	182500	500
35	KTR Capling Pvt. Ltd.	365000	1000
36	Suyog Engineers	365000	1000
37	Units Gauge and Co. Pvt . Ltd.	365000	1000
38	Rajasthan Cromax India	365000	1000
39	Vats	255500	700
40	Met Paw	365000	1000
41	Suaan	292000	800
42	Arjunwadkar Consolidated Engineers Pvt. Ltd.	292000	800
43	Demech	3650000	10000
44	Mikron Engineering	365000	1000
45	Auto Mile And Company	365000	1000
46	Neuman And Esser Compressor	365000	1000
47	Emulsichem Lubricants Pvt. Ltd.	1825000	5000
48	Kesh Kent Wear Pvt. Ltd.	3650000	10000
49	ARM Welers P. Ltd.	292000	800
50	Perfect Oil Sills Acr.	730000	2000

51	Laxmi Pvt. Ltd.	292000	800
52	CPS Pvt. Ltd.	365000	1000
53	Unique Engineers	73000	200
54	Pune Tectol P. Ltd.	547500	1500

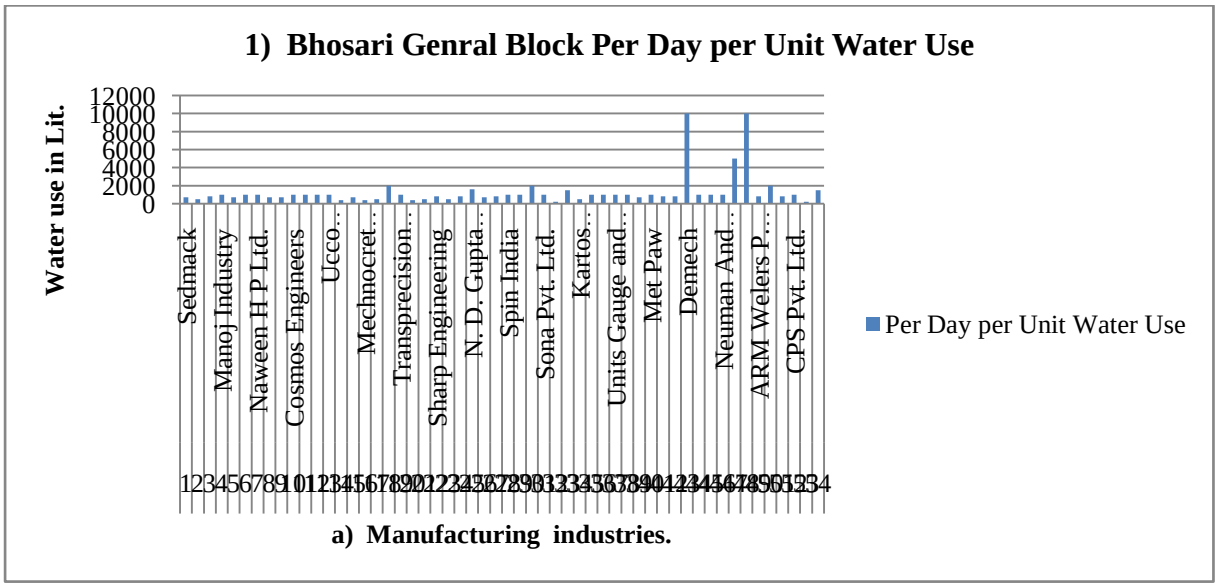

Figure no. 3.54

In the manufacturing sectors of Bhosari general blocks industrial units require water for their industrial process because its products is tool manufacturing, air filter and water treatment machinery, manufacturer and Supplier of a wide assortment of Thread Rolled Component, Industrial Stud, Automobile Component, Industrial Shaft, 2 Stage Helical Gear Unit, 3 Stage Helical Gear Unit, F-Parallel Shaft Helical Gearbox, Geared Motors, Helical Parallel Shaft Vertical Gearbox, Planetary GB, Planetary Gear Drive, Right Angle Drive, Helical Inline Geared Motors, Cutting Oil Dealers, Lubricant Manufacturers, Lubricant Oil Manufacturers, Cutting Oil Manufacturers, oil seals manufacturing, Couplings, Torque limiters, Clamping sets and Precision joints, Active floating caliper brakes, Passive floating caliper brakes, Yaw brakes, Rotor Lock, Clamping systems, Hydraulic components, Bellhousing and accessories, Tanks and Accessories, Temperature control and monitoring and many more industrial product manufacturing. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.59 - a) Manufacturing industries. 2) D-I Block			
Sr.	**Name Of Industry**	**Industrial Annul Water Use**	**Per Day per Unit**

No			Water Use
1	Autoshine Coaters	365000	1000
2	Shree Ganesh Industry	292000	800
3	A P Industries	182500	500
4	Technovision Industries	182500	500
5	Shivshakti Industries	365000	1000
6	Precision	365000	1000
7	Tecil Engineering	292000	800
8	Avadhut Paper Product	365000	1000
9	Shanaz Engineers	292000	800
10	Repute Engineers P. Ltd.	438000	1200
11	Scan Tech	182500	500
12	Ima Technology	365000	1000
13	Glorla Engineer co.	292000	800
14	Unique Industries	438000	1200
15	Esdss Enterprises	292000	800

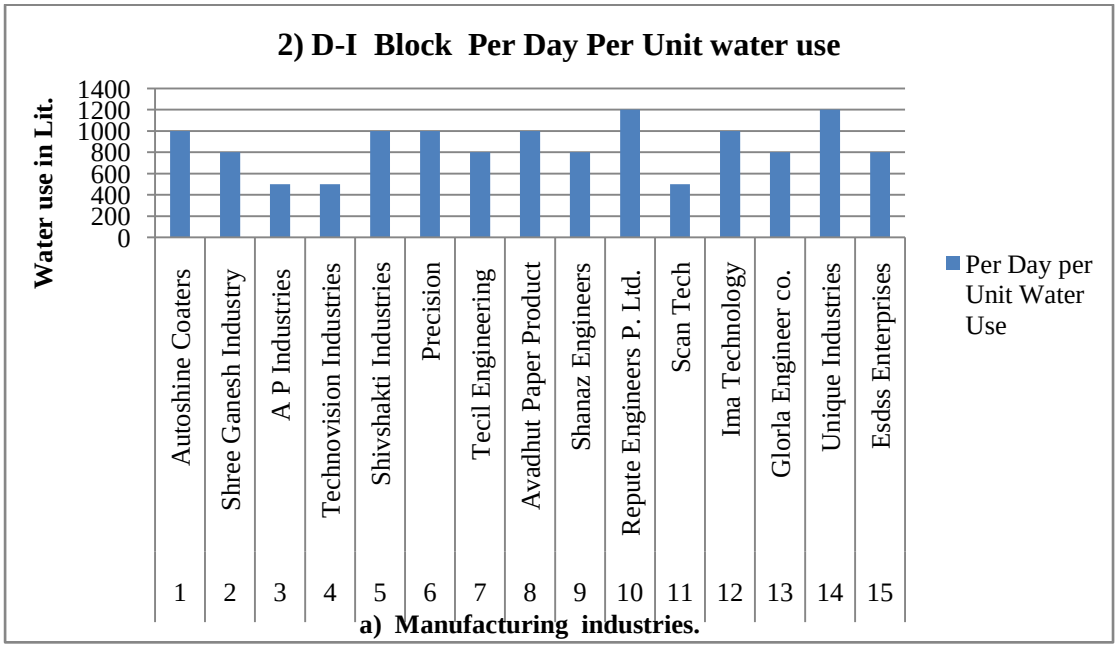

Figure no. 3.55

In the manufacturing sectors of D - I blocks industrial units require water for their industrial process because its products is Manufacturer of CED and ED coating, powder coating, spray painting and shot blasting of sheet metal parts and welding assemblies of auto and non auto parts, sheet metal parts and welding assemblies, Corrugated Boards, Corrugated Boxes, Craft Paper Corrugated Boxes and Packaging Boxes & Cartons, manufacturer of Pasteurisation Plant, Process Plants, Cleaning in place system, Refrigeration Module, Homogeniser, Aseptic Steriliser, Tubular components like seat frames Assemblies for automobile, Buses, Brake Pedal

Assemblies, Footrest Assemblies and Tow Hooks Assemblies, Head Rest Assemblies, Components and sub assemblies from bright bars like Brake Pedal Assemblies, Footrest Assemblies and Tow Hooks Etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.60 - a) Manufacturing industries. 3) D-II Block			
Sr. No	**Name Of Industry**	**Industrial Annul Water Use**	**Per Day per Unit Water Use**
1	Dhanlaxmi Industries	292000	800
2	Eddycanes Engineers P. Ltd	438000	1200
3	Vivek Engineering	255500	700
4	Amit Engineering Pvt.Ltd.	365000	1000
5	Sparc Engineering Pvt. Ltd	365000	1000
6	Vijay Engineering	365000	1000
7	Dinesh Industries	182500	500
8	Mehata Engineering Works	365000	1000
9	Lensel Optics Pvt. Ltd.	182500	500
10	Ravi Industries	292000	800
11	Shree Gurukrupa Engineering Works	292000	800
12	Tirupati automobiles	365000	1000
13	Lokesh Industries	365000	1000
14	Fair Teeth Engineers	365000	1000
15	Samsa Auto Engineering P. Ltd.	365000	1000
16	Hyt Engineering Company Pvt. Ltd.	292000	800
17	Creative Combience .	365000	1000
18	Gopal Enterprises	365000	1000
19	Hydrotech Engineering Company	365000	1000
20	Miracle Engineering Pvt. Ltd.	365000	1000
21	NeelKamal Industries	365000	1000
22	Aseptic thrmoprocess Pvt. Ltd.	365000	1000
23	Omkar Industries	182500	500
24	Walujkar Engineering	365000	1000
25	Fab-O-Wed Engineers	365000	1000
26	Indo Bioactive lawhs Ltd	292000	800

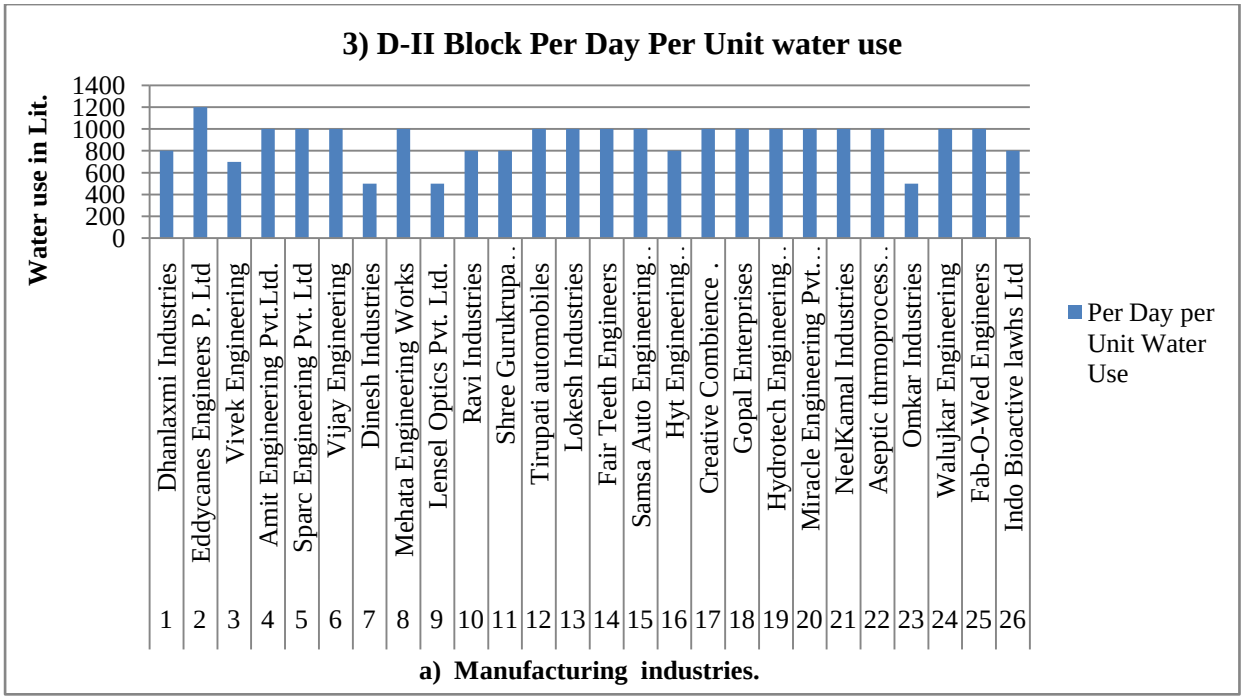

Figure no. 3.56

In the manufacturing sectors of D - II blocks industrial units require water for their industrial process because its products is Double Girder Eot Crane, Single Girder and Underlung E.O.T Cranes, Flameproof Eot Cranes, Hand Operated Cranes, Goliath Cranes, Jib Cranes, Grab Buckets, Conical Motor, Modular Construction Electric Hoist, Winches, Tarpaulin Sealing Machine, Tarpaulin Heat Sealing Machine, Sealing Machine, Silpaulin Sealing Machine , S Perforated Sheets, MS Perforated Sheets, Metal Perforated Sheets, Ferrous Metal Perforated Sheets, Non Ferrous Metal Perforated Sheets, sheets thermostat, coil thermostat & flow meter, aluminium foundry, LPDC, GDC, decoring, RCM, Washing machine, insert fitment machine, leaktesting machine etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.61 - a) Manufacturing industries. 4) D-III Block

Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
1	TcIpl	292000	800
2	Gloria Engineering Company Unit II	365000	1000
3	Yash Marbels	365000	1000
4	Laxmi Engineering Works	292000	800
5	Msl Product Casting	365000	1000
6	Vmar Engineering	438000	1200
7	Manish Industries	365000	1000
8	SAR Industries	292000	800

9	Jetline Corrugated Boxes	182500	500
10	Yash Engineering And Industrial Suppliers	365000	1000
11	Bestall Engineering Works	547500	1500
12	Prince Industry	438000	1200
13	Kohinoor Industry	365000	1000

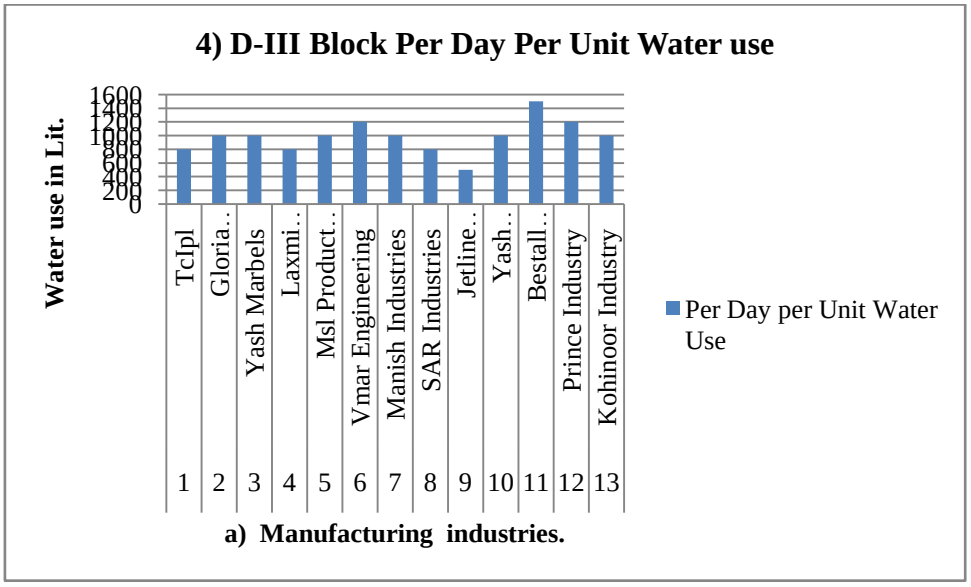

Figure no. 3.57

In the manufacturing sectors of D - III blocks industrial units require water for their industrial process because its products All types of Front Bumper, Long Member Reinforcement, Cross Member, RUPD Beam, SUPD Support, FUPD Beam, Fuel Tank Support, Complete Sub-Structure Front, Others BIW Parts like D-Pillar, Shot Gun, B-Pillar (under body part), End Shield, Stator Plate (K-70), Top and Bottom Housing, Aluminum Case, Regulator Housing, P C Body And Cover, Borewell drilling services, Dewatering services, Underwater drilling services, Borewell motor repair & services, Engineering Supplies, Boiler Manufacturers & Suppliers etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.62 - a) Manufacturing industries. 5) F-II Block

Sr. No.	Name Of Industry	Industrial Annul Water Use	Per Day per Unit Water Use
1	Turened Engineers P Ltd	365000	1000
2	LGD Composite	365000	1000
3	Dalmec Industry	365000	1000
4	Jyoti Die	365000	1000
5	Spark Line Care	365000	1000

6	Ekadant Enterprises	365000	1000
7	Mempor India	292000	800
8	Jayshree	365000	1000
9	Micron Pvt. Ltd.	365000	1000
10	Micron Industries	365000	1000
11	Himalaya Udyog	292000	800

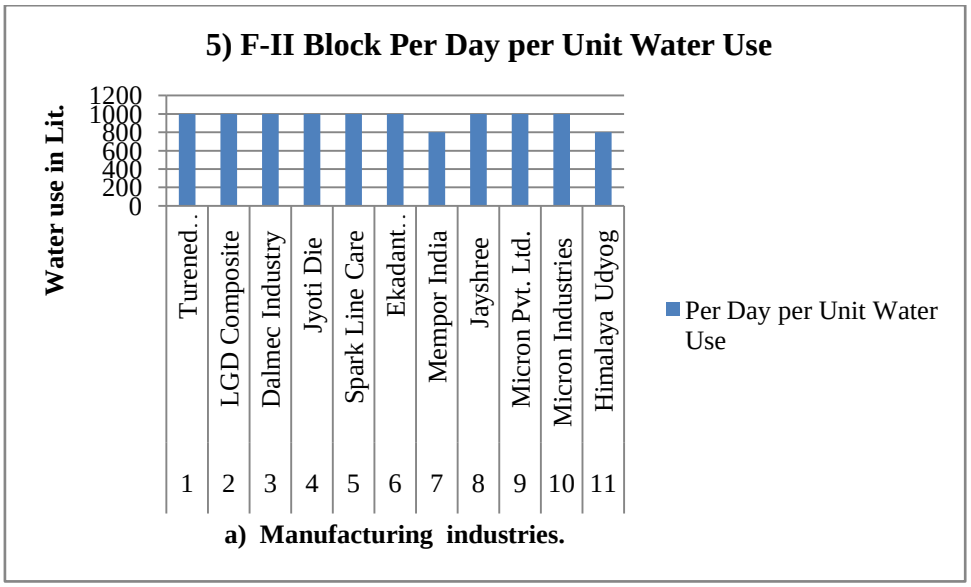

Figure no. 3.58

In the manufacturing sectors of F –II blocks industrial units require water for their industrial process because its products is series lifting equipment, lifting platforms, Under slung Crane, EOT Crane, Goliath Crane, Jib Crane, Providing sand blasting and shot blasting machine manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.63 - a) Manufacturing industries. 6) J Block			
Sr. No.	**Name Of Industry**	**Industrial Annul Water Use**	**Per Day per Unit Water Use**
1	National Engineering Company	474500	1300
2	Swami Samarth Engineering	255500	700
3	Ebhd dar Engineers	146000	400
4	Dynamic Industries	438000	1200
5	Poona Engineering Pvt.Ltd.	146000	400
6	Naramax Whahara Industries	547500	1500
7	Nirmitee Engineering	365000	1000
8	D D Engineering	219000	600
9	Shweta Enterprises	365000	1000
10	Richs	365000	1000

11	Hindustan Pressing Pvt. Ltd.	292000	800
12	Capulm Engineering Pvt. Ltd.	146000	400
13	Shubham Udyog	912500	2500
14	Mahavir Enterprises	438000	1200
15	Corrdyne Coating Pvt. Ltd.	365000	1000
16	Indark Formtech Pvt. Ltd.	255500	700
17	Gurukrupa Engineers Pvt. Ltd.	365000	1000
18	Surabhi Industries	511000	1400
19	Sai Engineering	365000	1000
20	Utkarsh Engineers	219000	600
21	OHM Polytech Ltd.	365000	1000
22	Priya Capacitors Pvt. Ltd.	511000	1400
23	Shree Krushna	255500	700
24	M M Engineering	365000	1000
25	Bharat Industries	146000	400
26	Shakti Industries	255500	700
27	Darekar Heat Treat	365000	1000
28	Dinesh Enterprises	255500	700
29	Supreem Profiles Pvt. Ltd.	219000	600
30	Divyang Ingineering Pvt. Ltd.	255500	700
31	Nikul Engineers P. Ltd.	438000	1200
32	Autopress Engineering Pvt. Ltd.	255500	700
33	Shriram Engineering	182500	500
34	S S Industries	182500	500
35	Prescomp Engineers	365000	1000
36	Suri Industries	292000	800
37	Productive Aid Pvt. Ltd.	365000	1000
38	Shree Precision	182500	500
39	Audhyogik Stamping	182500	500
40	Jayhind Atomation P. Ltd.	365000	1000
41	CSK Engineers	73000	200
42	S R Auto Parts	365000	1000
43	K C Rooms P. Ltd.	255500	700
44	Menar Camp. P. Ltd.	365000	1000
45	V R Coating P. Ltd.	365000	1000
46	Dyna -K Auto	438000	1200
47	Rayan Enterprises	255500	700
48	Spark Engineers	365000	1000
49	Tech-Well Engineering Pvt. Ltd.	547500	1500
50	Emerson	365000	1000
51	Sher SPC	365000	1000
52	Laxmi Engineers	182500	500

53	Applied Power Industries	182500	500
54	Hind Udyog	365000	1000
55	A C K Engineers	255500	700
56	Alwn Union	365000	1000
57	A One Electonech Pvt. Ltd.	365000	1000
58	Amrit Enterprises	182500	500
59	BMC Enterprises	365000	1000
60	Jyoti Polyclip	182500	500
61	Arora Refreataries P. Ltd.	182500	500
62	Hexagon Industries	255500	700
63	Gurumdas Engineers	365000	1000
64	Mass Engineers	182500	500
65	Bharat Dairy Eqp. P. Ltd.	365000	1000
66	Inovative Automotions	365000	1000
67	S S Engineering	255500	700
68	Kalyani Enterprises	182500	500
69	Alfa Heat Tech	365000	1000
70	Sayali Engineering Pvt. Ltd.	255500	700
71	Om Sai Engineers Pvt. Ltd	292000	800
72	Doright Engineering	365000	1000
73	Varun Company	365000	1000
74	Bharati Industries	182500	500
75	Metapow Pvt. Ltd.	328500	900
76	S P Engineers	255500	700
77	Universial Eneressing	182500	500
78	Modern Engineers	182500	500
79	Natras Enterprises	255500	700
80	Nikho Engineers	365000	1000
81	Raj-Deep Industries	365000	1000
82	Siddheshwar Engineering	182500	500
83	D Tech Engineers	255500	700
84	Aror Engineers	182500	500
85	Sai Tee Industries	365000	1000
86	Vrlv Enerprises	365000	1000
87	Dhanlaxmi Engineering Enterprises	182500	500
88	Prasad Medi Tech	365000	1000
89	Laxmi Industries	255500	700
90	Jyoti Heat Treat Indestries	365000	1000
91	Gress Engineering	182500	500
92	Sai Industries	182500	500
93	Madhav Industries	365000	1000
94	Dhanashree Engineering Pvt. Ltd.	365000	1000

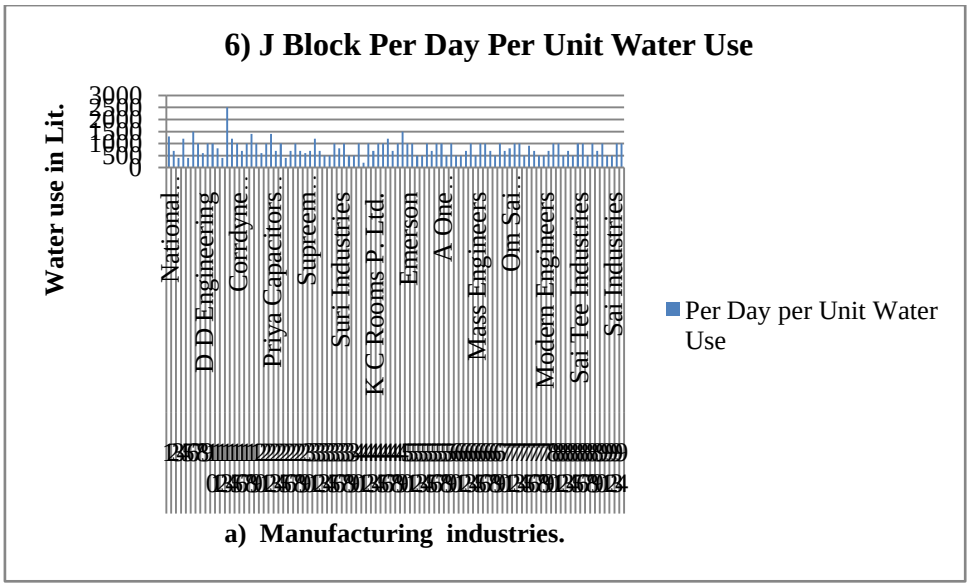

Figure no. 3.59

In the manufacturing sectors of J blocks industrial units require water for their industrial process because its products is Boilers & Pressure Parts, Thermic Fluid Heaters, High Pressure Autoclaves, Deaerator With Storage Tanks, Chemical Dosing Systems, Hot Air Generators, Hot Water Generators, Drying Oven, West Heat Recovery Boilers & Steam Generation, Heat Exchangers, Incinerators And Calorifiers, Industrial Chimneys, Handling Systems For industrial Solution, S.S.Fabrications, Ladder Type Cable Tray, Perforated Type Cable Tray, Trefoil Clamps, Utility Channel - Flexible Support System, Utility Channel - Strut Fittings, Cable Tray Accessories, Cable Ducts or Trunking, Cable Tray Cover, Coupler Plates with Hardware, Earthing Strip - Flat, Earthing Plates, G. I. Wire, Capacitors for Fan & Motor Capacitors for Lighting Motor Start CapacitorsLT Shunt Capacitors, manufacturer and supplier of LPG Road Tankers, LPG Storage Tanks, Heavyweigh Bridges, Electric Operated Cranes, Sugar Plant Machines, etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.64 - a) Manufacturing industries. 7) H Block			
Sr. No.	**Name Of Industry**	**Industrial Annul Water Use**	**Per Day per Unit Water Use**
1	Sulshane Aplices	365000	1000
2	Faleo And Fear	365000	1000
3	Ador Welding Accdemy Pvt. Ltd	547500	1500
4	Kulpak Engineering	365000	1000
5	Shri Samrtha Industries	365000	1000
6	Elemec Industries	365000	1000
7	Siddhalaxmi Engineering Industries P. Ltd	365000	1000

8	Premier Ferrocast And Engineers Pvt. Ltd.	365000	1000
9	Sudarshan Shakti	182500	500
10	Globle Packing	182500	500
11	S M Auto Engineering Pvt. Ltd.	365000	1000
12	Amar Enterprises	182500	500
13	Precision Industries	365000	1000
14	Klmgelnbere Pvt. Ltd	365000	1000
15	Yashwant Udyog	365000	1000
16	Indlab Industries	182500	500
17	United Industries	365000	1000
18	Santherm Engineering Pvt. Ltd	365000	1000
19	Kamatisu India Pvt. Ltd.	365000	1000
20	Associated Equipment Rentals Pvt. Ltd.	182500	500
21	Hary Rock	365000	1000
22	Precision Industries	365000	1000
23	Prajyo	182500	500
24	Forbes Marshall	730000	2000
25	Dayal Associates	365000	1000
26	Falam	365000	1000
27	Enpro Industry Pvt.Ltd.	3650000	10000
28	Devi Industries	3650000	10000

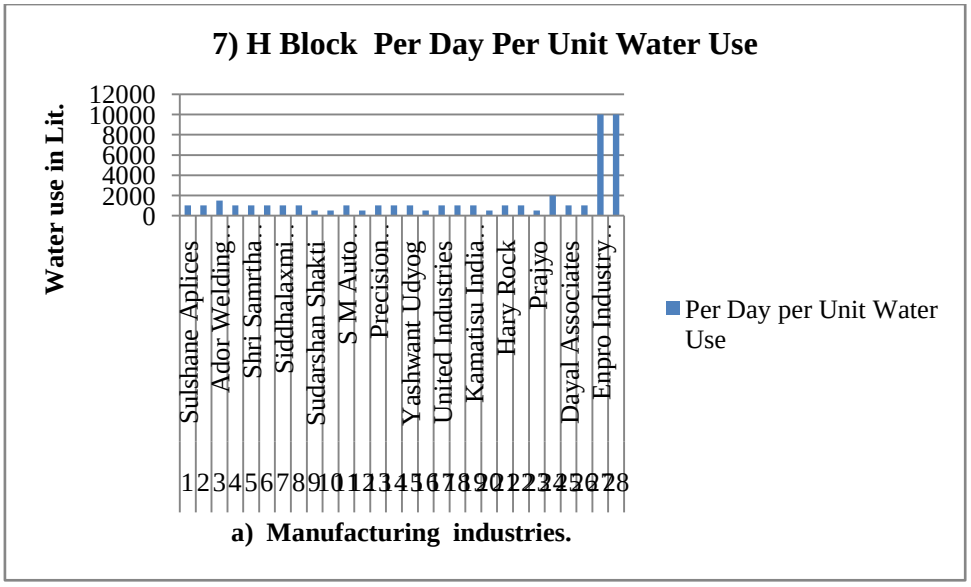

Figure no. 3.60

In the manufacturing sectors of H blocks industrial units require water for their industrial process because its products is Automotive Switch Gear, Small arms, Mining instrument, Electronics, Compressors, Crimping Tools, Textile Machine, Packing Machine, Pumps & Valves, Sewing Machine, Instrumentation, Aerospace,

General Engineering, Cutting Tools, Medical Body Parts, Petrochemical, Special Purpose Machine, die manufacturing, and welding etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.65 - a) Manufacturing industries. 8) S Block			
Sr. No.	**Name Of Industry**	**Industrial Annul Water Use**	**Per Day Per Unit Water Use**
1	Pune Heat	365000	1000
2	J K Engineers	365000	1000
3	Angel Bright	365000	1000
4	Rajdeep Engineering	365000	1000
5	Ralex Engineers	438000	1200
6	Amol Engineering Works	438000	1200
7	Sankalp Engineering	292000	800
8	R P Industries	365000	1000
9	Hexa Tech Engineers	576700	1580
10	Lano Engineering	365000	1000
11	Shrinivas Engineering	547500	1500
12	Mechatronic Systems	365000	1000
13	Rajesh Engineering Works	438000	1200
14	Worth Engineering Pvt. Ltd	365000	1000
15	Nikhil Industries	182500	500
16	Desai Engineering Works	182500	500
17	Dilip Industries	365000	1000
18	Prasho Engineers	438000	1200
19	Pinacle Dies Modul	365000	1000
20	Vyankateshwar Engineers	365000	1000
21	Harshad Industries	365000	1000
22	Sankalp Engineering	292000	800
23	Sailaxmi Industries	365000	1000
24	Dynomerk Controls	438000	1200
25	Systems Technologies	438000	1200
26	Jay Suprabha Protative Product Pvt. Ltd	474500	1300
27	Divya Engineering Projects	438000	1200
28	Leo Enterprises	511000	1400
29	Aravind Vishnu Govande And Company	292000	800
30	Sai Hari Enterprises	365000	1000
31	Rushi Engineering Pvt. Ltd.	620500	1700
32	Burhani Industries	438000	1200
33	Kumar Industries	657000	1800

34	Elcher Engineers Pvt. Ltd.	474500	1300
35	Harshada Industries	547500	1500
36	Nand Composites Pvt. Ltd	365000	1000
37	B J Perfect Work	365000	1000
38	Jyoti Heatsinks Pvt. Ltd	365000	1000
39	Ferroform Engineering Pvt. Ltd	365000	1000
40	Shree Parshwa Ind.	365000	1000
41	Akshay Organies Pvt. Ltd.	365000	1000
42	Bax Industries	365000	1000
43	Anand Trans	365000	1000
44	Lunar Enterprises Pvt. Ltd.	365000	1000
45	Sunil Engineers	365000	1000
46	Crasling	365000	1000

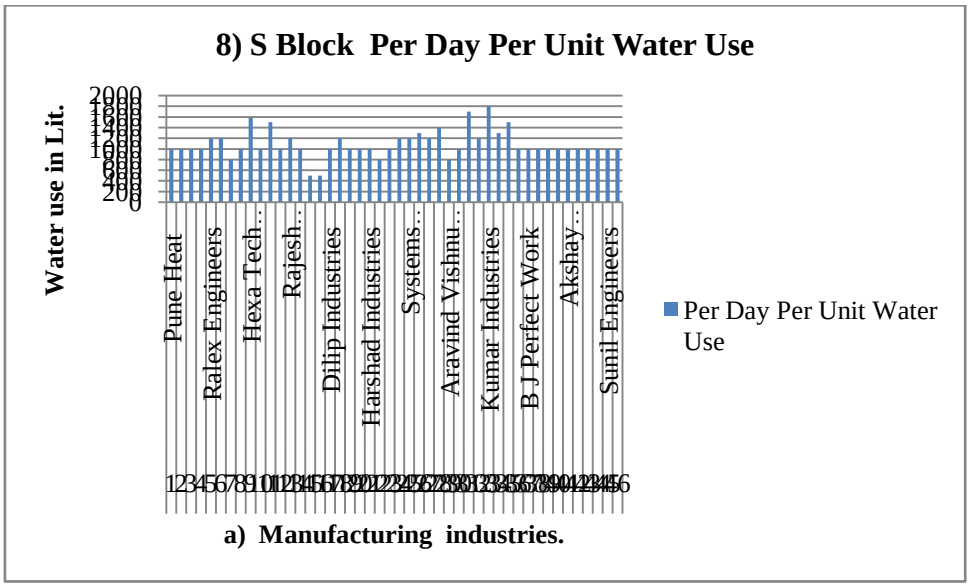

Figure no. 3.61

In the manufacturing sectors of S blocks industrial units require water for their industrial process because its products is heat treatment, induction Harding manufacturing, manufacturing and Supplying high quality Automotive Components like Thread Rolling, Spline Rolling, CNC Machining, engineering job work, agriculture machining products & automotive passenger machine products, machining manufacturer, CNC Components, Cylinder Damper Assembly, Damper Assembly Piston, Drive Gear Blank, Gear Drive, Gear Crank Shaft, Hub Sleeve, Shift Rail, Speedo Body Adapter, Ungrouped Products, General Engineering, Cutting Tools, Medical Body Parts, Petrochemical, Special Purpose Machine, die manufacturing, and welding etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.66 - a) Manufacturing industries. 9) Electronics Zone Block			
Sr. No.	**Name Of Industry**	**Industrial Annul Water Use**	**Per Day Per Unit Water Use**
1	Rasco Industry	365000	1000
2	Mogora Cosmic Ltd	730000	2000
3	S H Pithkar Ortho tools	365000	1000
4	Lonlife Sciences Ltd.	292000	800
5	Prasad Mcab p Ltd.	365000	1000
6	Zeutch Engineers P. Ltd	365000	1000
7	Jabro Engineers	292000	800
8	Jaldoot material and handling P. Ltd	365000	1000
9	Deairj Tech India	365000	1000

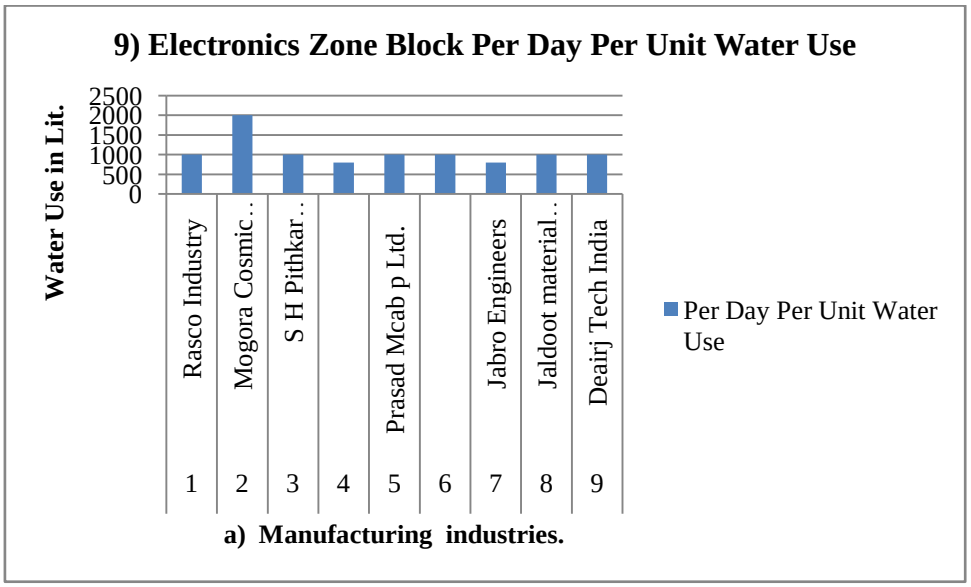

Figure no. 3.62

In the manufacturing sectors of S blocks industrial units require water for their industrial process because its products is industrial spare manufacturing., CNC Components, Cylinder Damper Assembly, Damper Assembly Piston, Drive Gear Blank, Gear Drive, Gear Crank Shaft, Hub Sleeve, Shift Rail, Speedo Body Adapter, Ungrouped Products, General Engineering, Cutting Tools etc. In this production require water for cooling, heating, cutting, testing and washing process.

b) Tool manufacturing industries:

Table no. 3.67- b) Tool Manufacturing industries. 1) Bhosari General Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Kumar Tools	365000	1000
2	Carbtools India Pvt.Ltd.	182500	500
3	Truthread Gauges And Tools Pvt. Ltd	365000	1000
4	Sharp_Ex Enterprises	365000	1000
5	Kishor Industries	146000	400
6	Jivan Profile	146000	400
7	Malti Engineering Works	73000	200
8	AMP Technologies	182500	500
9	Mouj Engineering	292000	800
10	Bodymaster Engineering	730000	2000
11	Arihant Engineers	365000	1000
12	Redint Engineering	365000	1000

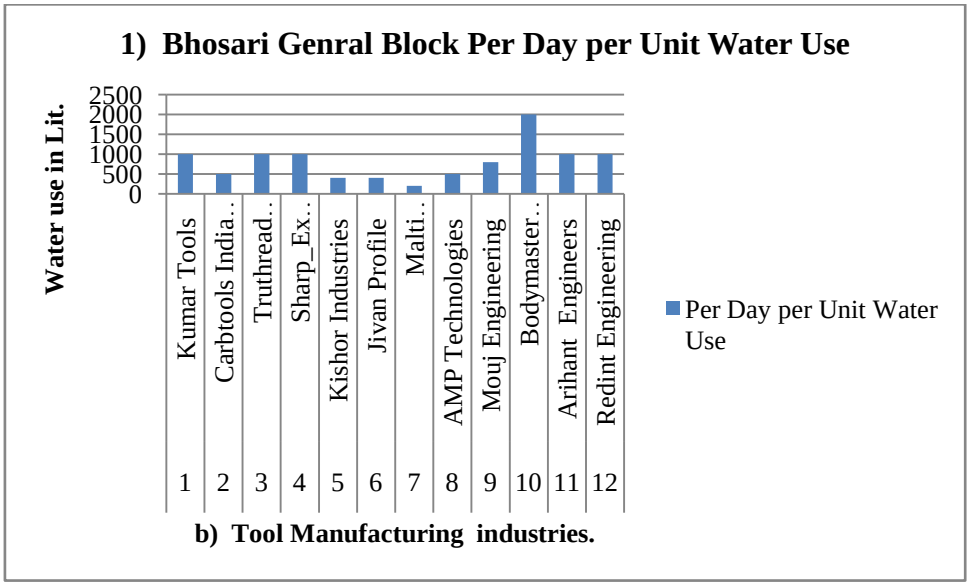

Figure no. 3.63

In the tool manufacturing sectors of Bhosari general blocks industrial units require water for their industrial process because its products is industrial spare manufacturing Cutting Tools and various industrial tools manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.68 - b) Tool Manufacturing industries. 2) J Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Parvati Machine Tools	219000	600
2	Biltz Cutting Tools Company	438000	1200
3	Bright Metals And Tools	219000	600
4	Mision Tools And Technology	547500	1500
5	Suman Engineering	255500	700
6	Accurate Laser Cutting	365000	1000
7	A D M Engineering	365000	1000
8	Super Engineers	365000	1000
9	Aksons Engineering	182500	500
10	Prashant Engineering	365000	1000
11	Raviras Components	255500	700
12	Shreeyash Industries	365000	1000
13	Taoovan Tools & Proto Tech. LLP	182500	500
14	Mona Engineering	182500	500
15	Accu-Size Gauges & Tools Pvt. Ltd.	365000	1000

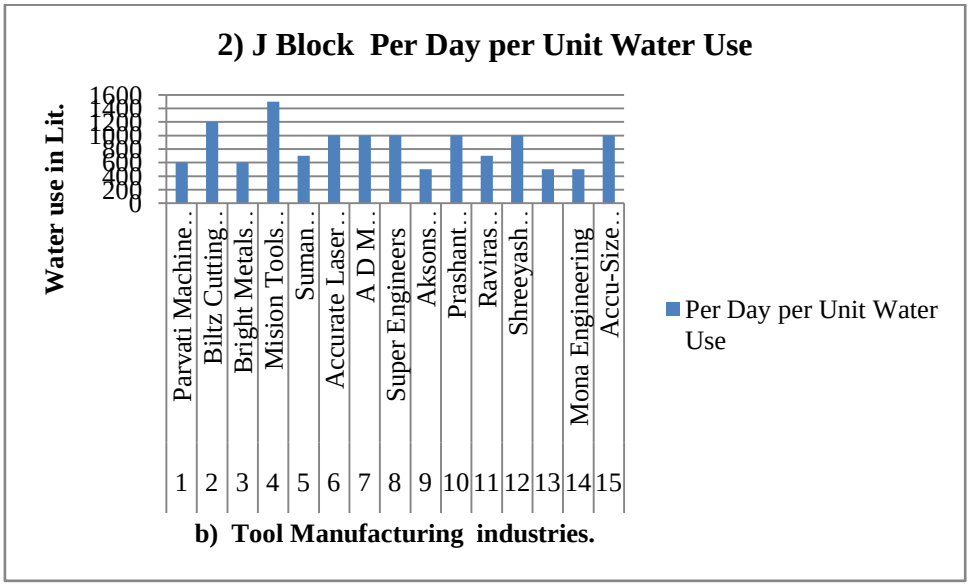

Figure no. 3.64

In the tool manufacturing sectors of J blocks industrial units require water for their industrial process because its products is industrial spare manufacturing Cutting Tools and various industrial tool manufacturing and industrial component manufacturing, tool casting job work etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.69 - b) Tool Manufacturing industries. 3) H Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Industrial Products	365000	1000
2	Iec air Tools Pvt. Ltd.	365000	1000
3	Jyoti Tooling And Press Components P. Ltd	547500	1500

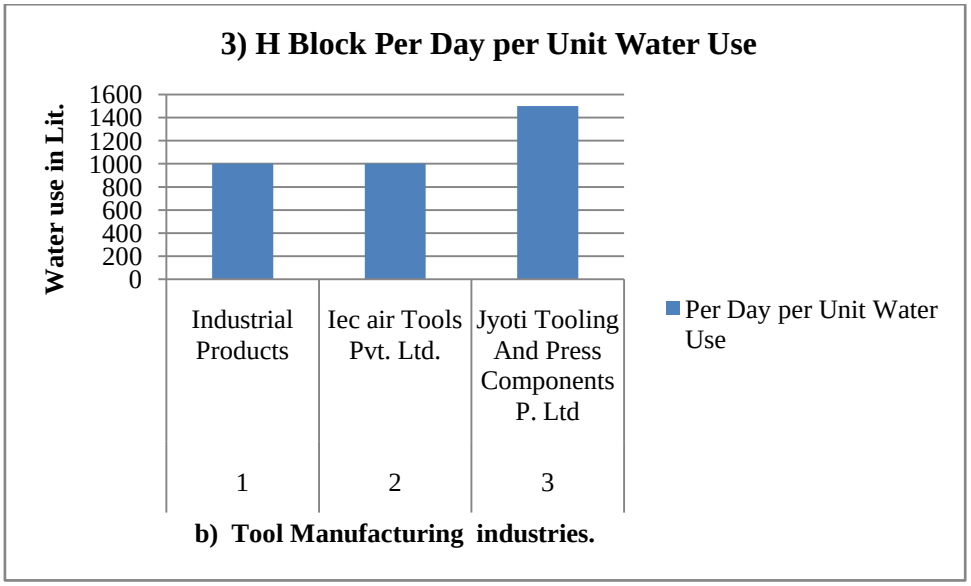

Figure no. 3.65

In the tool manufacturing sectors of H blocks industrial units require water for their industrial process because its products is Accura Oil Pulse Shut Off Wrenches (ST+), Cycle Monitoring System – CMS (NS), Accura Oil Pulse Wrenches, Accura Pulse 'N' Series Wrenches, Oil Filler IAP-OF-300, + Series Light Weight Impact Wrenches, N Series Light Weight Impact Wrenches, Impact Wrenches, Torque Controlled Shut Off Screw Drivers, Slip Clutch Screw Drivers, Impact Screw Drivers, Ratchet Wrenches, Air Tapper and other industrial tools and press components etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.70 - b) Tool Manufacturing industries. 4) S Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Jis Tools Company	182500	500
2	Jose Brother Industries	365000	1000
3	Ganesh Engineering work	365000	1000
4	Delpro Equipments Pvt.	657000	1800

	Ltd		

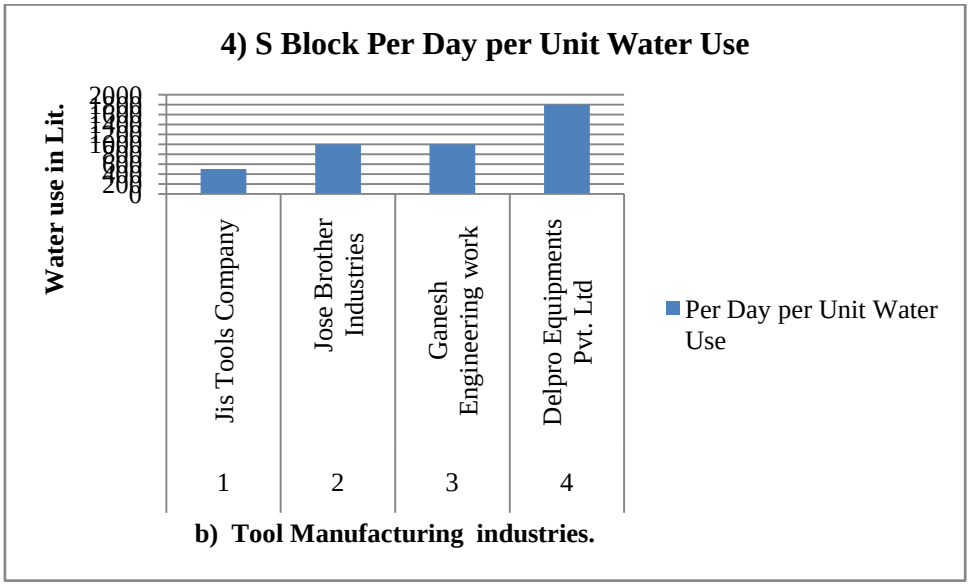

Figure no. 3.66

In the tool manufacturing sectors of S blocks industrial units require water for their industrial process because its products is Form releaved cutters, taps, end mils, miling cutters, T- slot cutters, reamers, serration cutters, drill cum reamers, Sheet Metal Pressed Components, Sheet Metal Stamping, Precision Machined Components, Metal Mouldings, Metal Die and Moulds, Press Tools, Automotive Spare Parts, VMC in Makino and Wire Cutting in Makino, Process Equipments, Pressure Vessels, Process Vessels, Shell & Tube Heat exchangers, Accumulator Vessels, Mechanical Seal Support System etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.71 - b) Tool Manufacturing industries. 5) Electronics Zone Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Sakshi metal and tools P. Ltd	438000	1200

c) Plastic and Rubber, fiber industries:

Table no. 3.72 - c) Plastic and rubber, fiber Industries. 1) Bhosari Gen. Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water**	**Per Day per Unit Water Use**

		Use	
1	Multi Crafts	438000	1200
2	Elite Plastic Industries	365000	1000
3	Tanbe Enterprises	255500	700
4	Lala Rubber Products	365000	1000
5	Tharma Fab	365000	1000
6	Suvarna Fibo Tech Pvt. Ltd.	255500	700
7	Shriram Rubber Product Pvt. Ltd.	730000	2000
8	Ardfine Plymers Pvt. Ltd.	365000	1000
9	Arofine Polymers Pvt. Ltd.	365000	1000
10	Cipy Polymers	365000	1000
11	Agio Polymer Ltd.	365000	1000

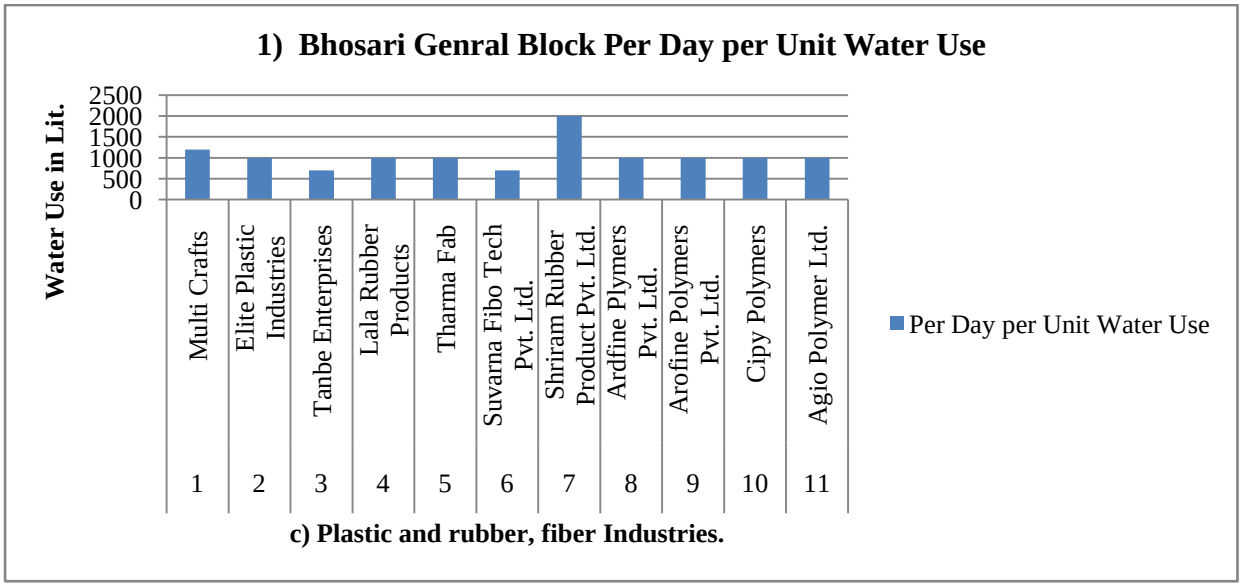

Figure no. 3.67

In the plastic, rubber and fiber sectors of Bhosari general blocks industrial units require water for their industrial process because its products Fibre glass Product Manufacturers, also known for Optical Fibre Cable Dealers, Moulded Fibreglass Product Dealers, Optical Fibre Dealers, Fibreglass Products, Electrical Insulation etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.73 - c) Plastic and rubber, fiber Industries. 2) D - I Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**

1	venus Fabica	547500	1500
2	Jayashree Plymer Pvt. Ltd	730000	2000
3	Auto Fibre Works P. Ltd.	365000	1000

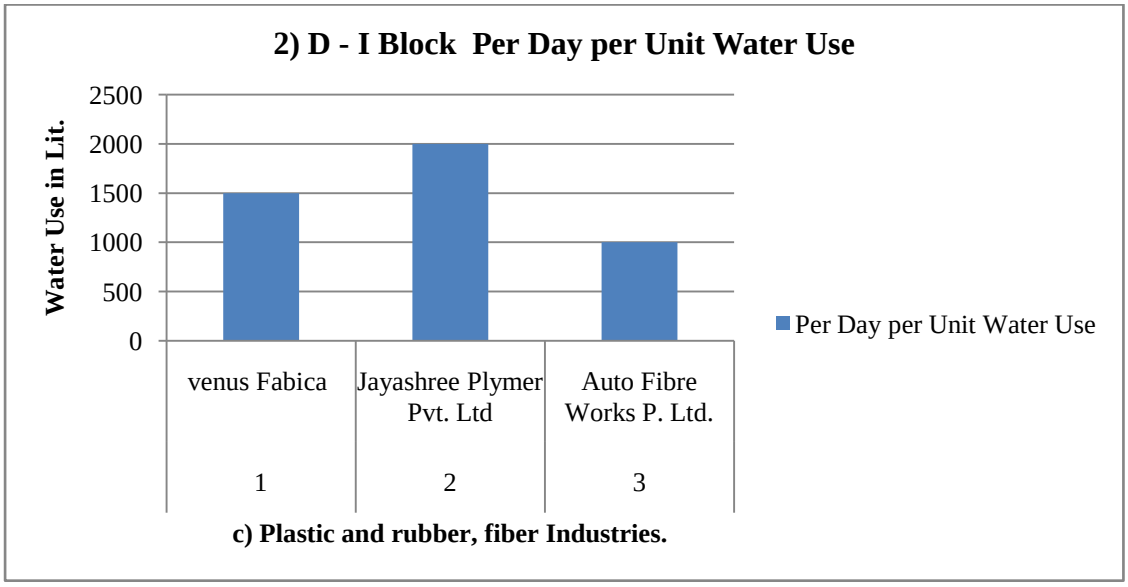

Figure no. 3.68

In the plastic, rubber and fiber sectors of D - I blocks industrial units require water for their industrial process because its products Metal to Rubber Bonded Rubber Hoses Rubber Profiles Moulded Rubber Parts Fuel Tubes Sub Assemblies and fiber works etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.74 - c) Plastic and rubber, fiber Industries. 3) D - II Block

Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
1	Bhavika Plastics	365000	1000
2	Rubber Linings	365000	1000
3	Shridhar Rubber Products Pvt. Ltd.	750000	2055
4	Sunny FRP Products	365000	1000
5	Pradip Plastic Molders P. Ltd.	365000	1000
6	Pradip Plastic Molders P. Ltd.	365000	1000
7	Electro Fab	365000	1000

8	Hitch Plast Pvt. Ltd.	365000	1000
9	Hirkesh Rubber Products	365000	1000

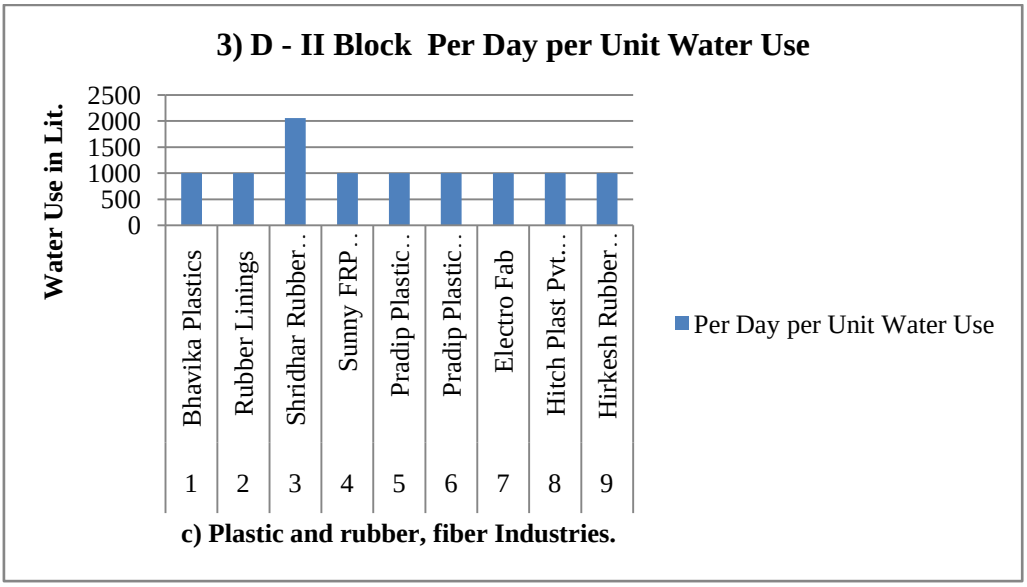

Figure no. 3.69

In the plastic, rubber and fiber sectors of D - II blocks industrial units require water for their industrial process because its products plastic modules, rubber modules, FRP sheets manufacturing, plastic product, and fiber product manufacturing ,Molded Rubber Parts Fuel Tubes Sub Assemblies and fiber works etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.75 - c) Plastic and rubber, fiber Industries. 4) D - III Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Premier Plastics	365000	1000
2	Plastic Modules	730000	2000

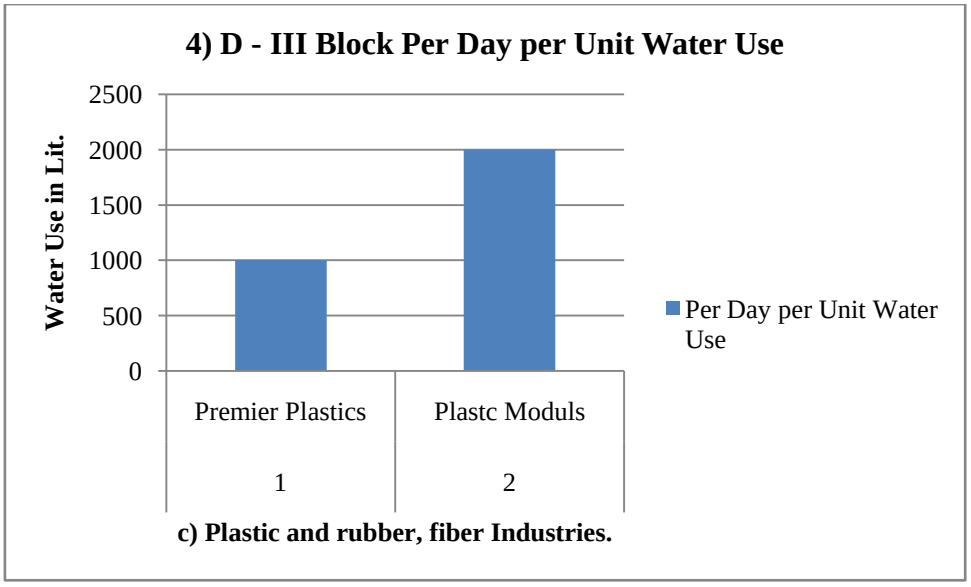

Figure no. 3.70

In the plastic, rubber and fiber sectors of D - III blocks industrial units require water for their industrial process because its products is plastic manufacturing and molding. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.76 - c) Plastic and rubber, fiber Industries. 5) F-II Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Bhagat Plastics	365000	1000
2	Pioneek Rubber	438000	1200

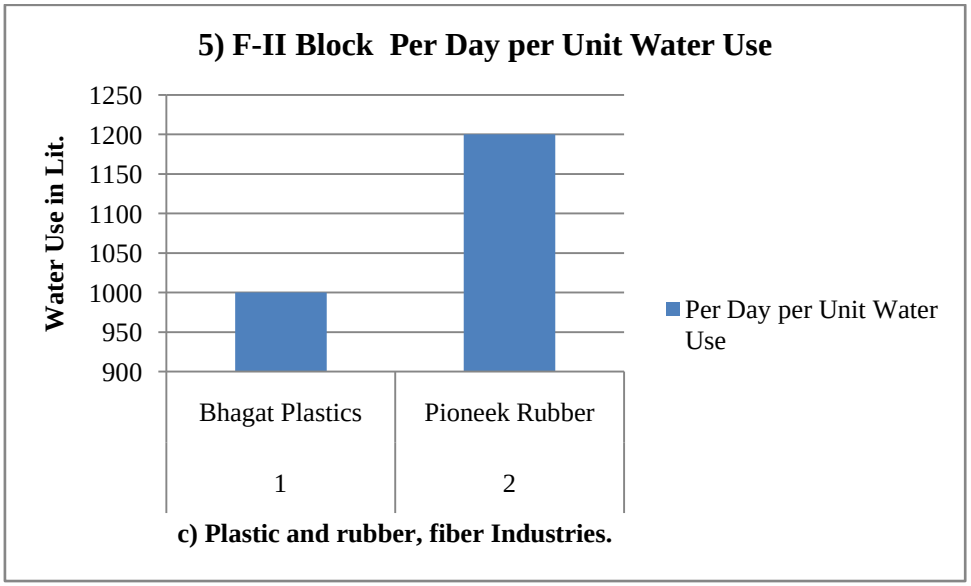

Figure no. 3.71

In the plastic, rubber and fiber sectors of F - II blocks industrial units require water for their industrial process because its products is plastic manufacturing and molding. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.77 - c) Plastic and rubber, fiber Industries. 6) J Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Crown Rubber Product	730000	2000
2	Policemical Fabi	438000	1200
3	Tej Plastics	365000	1000
4	Multi Plast	438000	1200
5	Abhi Tech Fab P. Ltd.	365000	1000
6	Heramb Thermoplastics Pvt. Ltd.	547500	1500
7	Imperial Rubber Products	438000	1200
8	Polymers And Adhesves	182500	500

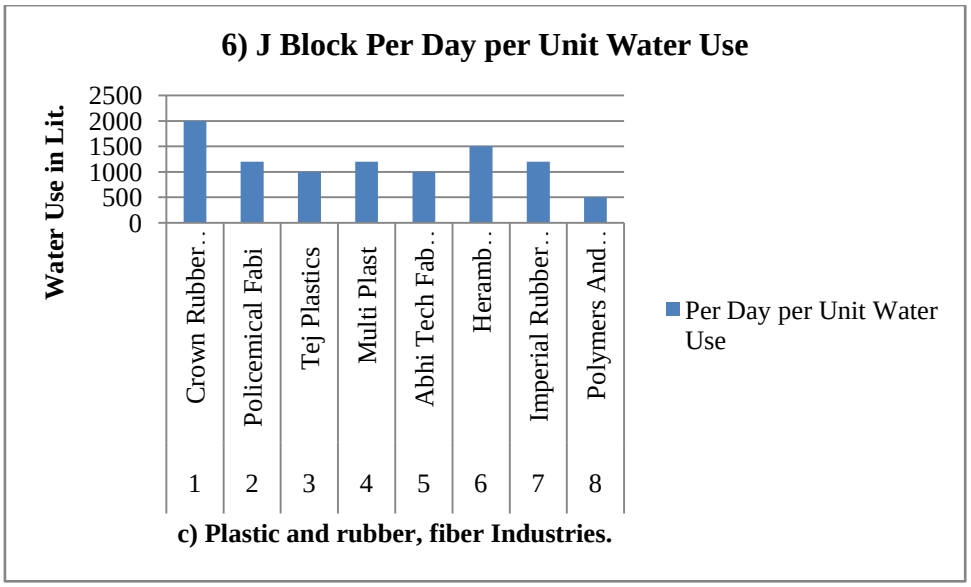

Figure no. 3.72

In the plastic, rubber and fiber sectors of J blocks industrial units require water for their industrial process because its products is plastic manufacturing and molding, fiber works, fiber glass manufacturing, fiber modules and plastic manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.78 - c) Plastic and rubber, fiber Industries. 7) H Block

Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
1	Anupama Rubber	730000	2000
2	Rohan Plastic Industries	547500	1500
3	Uma Plast Wark Pvt. Ltd.	3650000	10000

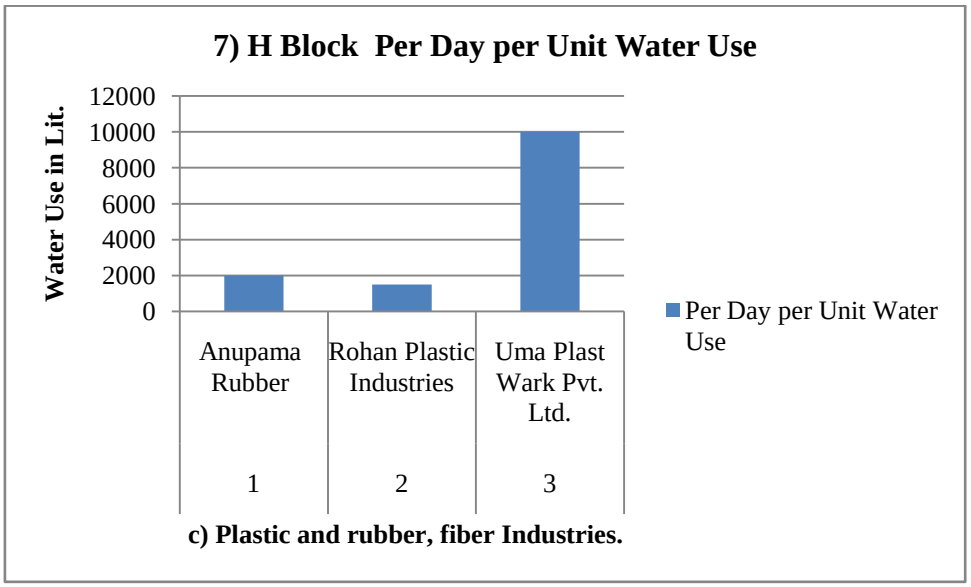

Figure no. 3.73

In the plastic, rubber and fiber sectors of H blocks industrial units require water for their industrial process because its products is plastic manufacturing and molding, fiber works, fiber glass manufacturing, fiber modules and plastic manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.79 - c) Plastic and rubber, fiber Industries. 8) S Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Nest Fab	438000	1200
2	Harshal Fibereglass	657000	1800
3	Criative Polymers Pvt. Ltd	365000	1000
4	Rohit Rubber Product	438000	1200
5	Vinayak Plastic	657000	1800
6	Fabri Tech Engineering	365000	1000

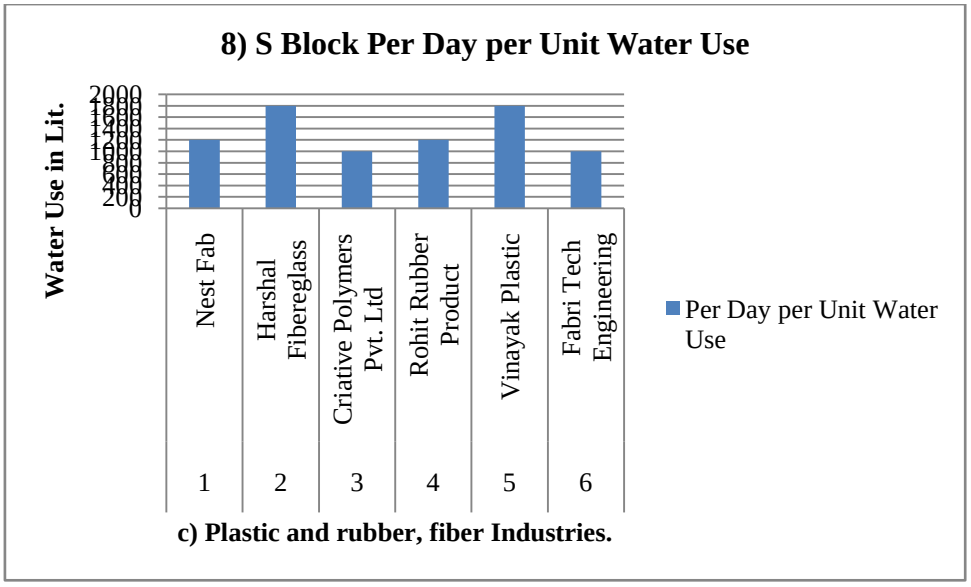

Figure no. 3.74

In the plastic, rubber and fiber sectors of S blocks industrial units require water for their industrial process because its products is plastic manufacturing and molding, fiber works, fiber glass manufacturing, Fiber glass Product Manufacturers, also known for Optical Fibre Cable Dealers, Moulded Fibreglass Product Dealers, Optical Fibre Dealers, Fibreglass Products, fiber modules and plastic manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

d) Metal and forge industry:

Table no. 3.80 - d) Metal And Forge Industries. 1) Bhosari Gen. Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Amol Engineers P. Ltd.	365000	1000
2	Pyramid Engineering	365000	1000
3	Shree Industries	365000	1000
4	Poona Udyog	182500	500
5	Krupa Metal	328500	900
6	Metal King	547500	1500
7	Mahavir Steel	182500	500
8	India Forge And Drop Stamping Ltd.	365000	1000
9	Forge Auto Engineering P. Ltd.	730000	2000

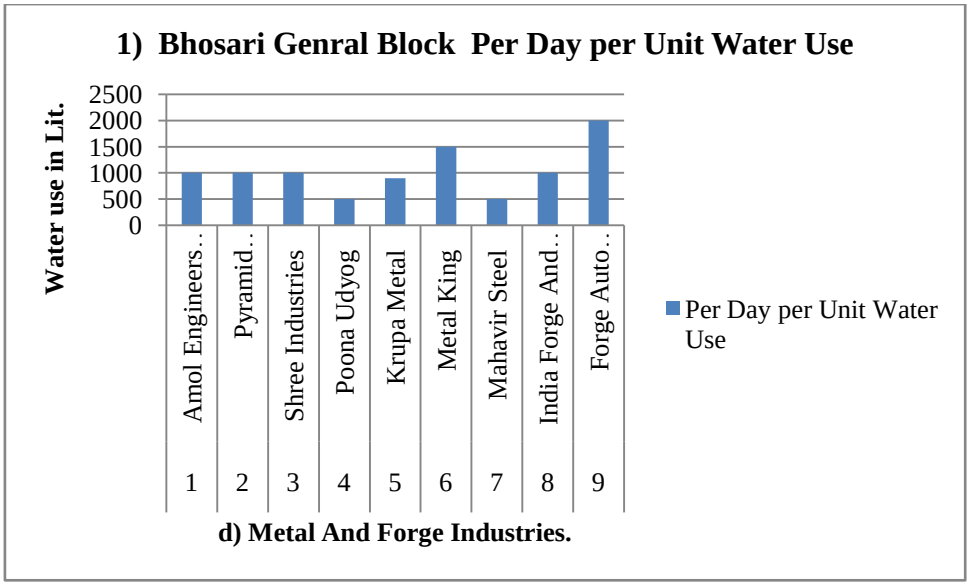

Figure no. 3.75

In the metal and forge sectors of Bhosari general blocks industrial units require water for their industrial process because its products is frp and metal product, aluminum die casting, Steel plant spares like Anvil Plates, Spring Retainer, Gripper Plate, Spring coil, Bearing Housing, Liner plates, Coupling etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.81 - d) Metal And Forge Industries. 2) D - II Block

Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
1	Shree Samartha Body Bildings	365000	1000
2	Ashoka Iron Industry	365000	1000
3	Pune Bhat Metals	365000	1000
4	Nirmal Metal Costa	365000	1000
5	Autocraft Engineers	292000	800
6	Trishul Forging	182500	500

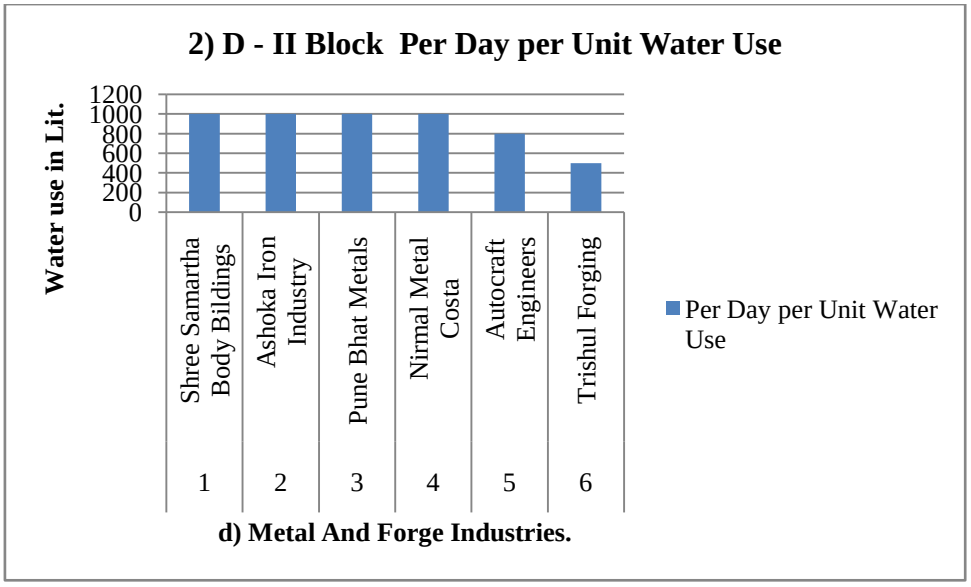

Figure no. 3.76

In the metal and forge sectors of D -II blocks industrial units require water for their industrial process because its products metal casting and metals products. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.82 - d) Metal And Forge Industries. 3) F - II Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Quaility Heat Trade	365000	1000
2	anvin Engineers Pvt. Ltd	365000	1000
3	Unifrax pvt. Ltd.	292000	800
4	Abhijeet Surface Cutting	292000	800
5	Mogara Engineering	182500	500
6	Ishwar Forge Pvt. Ltd.	292000	800

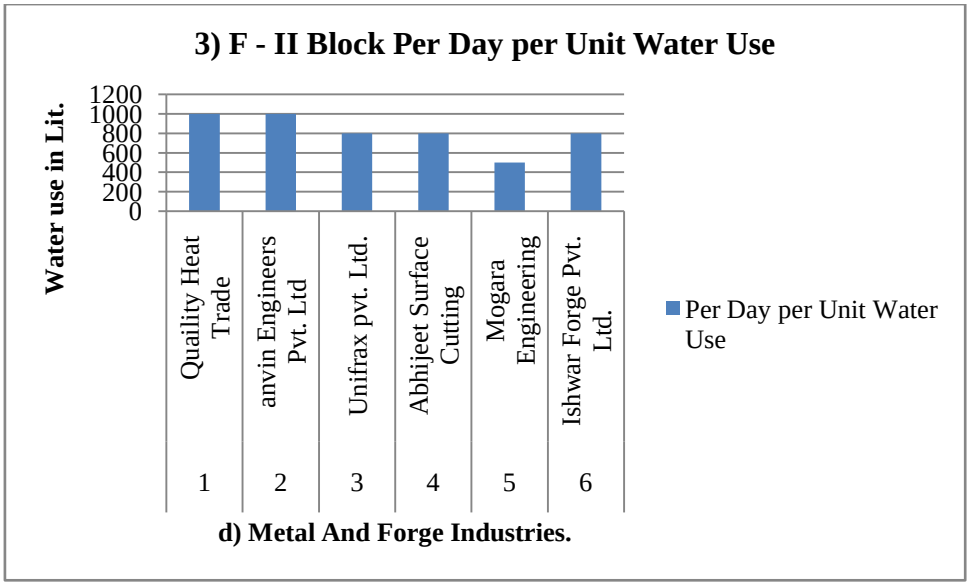

Figure no. 3.77

In the metal and forge sectors of F -II blocks industrial units require water for their industrial process because its products metal casting and metals products metal cutting, surface cutting and forge components etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.83 - d) Metal And Forge Industries. 4) J Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Modern Metal Works	255500	700
2	Jimcap Industries	146000	400
3	Engineers India	584000	1600
4	Vaibhav Industries	182500	500
5	Om Sai Engineers	146000	400
6	Shree Engineering Associates	365000	1000
7	Mahalaxmi Fabrication	438000	1200
8	A S Engineers And Fabricators	365000	1000
9	CSK Engineers And Fabricators	182500	500
10	Alukam Fabrication P. Ltd.	182500	500
11	Kreativ Moltring P. Ltd.	146000	400
12	Kalate Works	182500	500
13	Almas Steel And Oil P. Ltd.	365000	1000
14	Durga Metal Art	365000	1000
15	Alok Fabrications	182500	500
16	V K Forge	365000	1000

17	Vchil Industries	365000	1000
18	S S Engineering Works	146000	400
19	Creative Fabritech	182500	500
20	Siddharth Machanical Works	438000	1200
21	Guru Engineers	255500	700
22	Arya Industries	109500	300
23	Mechatherma Services India Pvt. Ltd.	255500	700

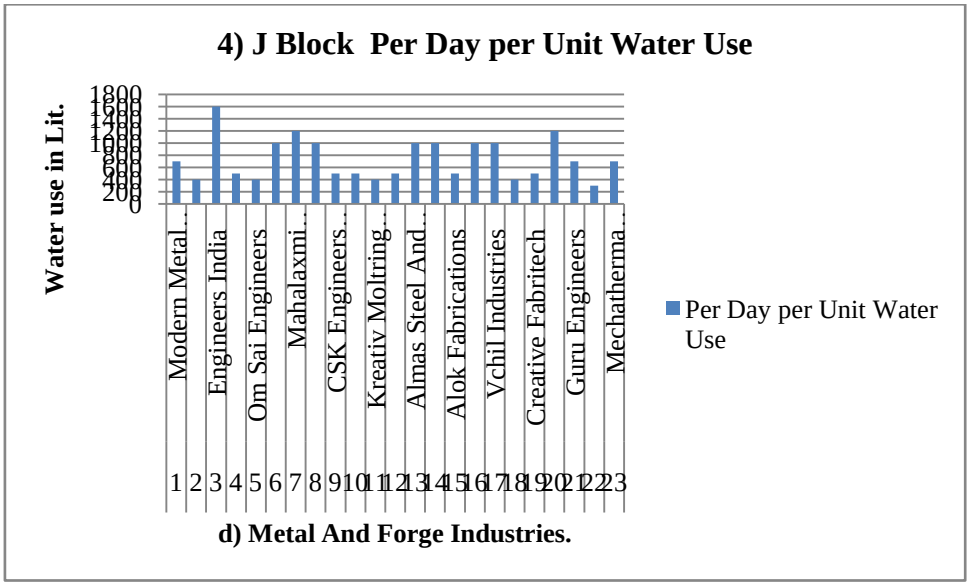

Figure no. 3.78

In the metal and forge sectors of J blocks industrial units require water for their industrial process because its products metal casting and metals products metal cutting, surface cutting and forge components, product is metal fabrication, steel fabrication and molding etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.84 - d) Metal And Forge Industries. 5) H Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Ace Metal Treters P. Ltd	365000	1000
2	Sushil Engineers	365000	1000
3	Mahalaxmi Still Corporation	365000	1000
4	Balaji Steel Enterprises	365000	1000
5	Angel Steel Corporation	365000	1000
6	Artech Welders Pvt.Ltd	365000	1000
7	Automatic Components	365000	1000

8	Angel Steel Corporation	365000	1000

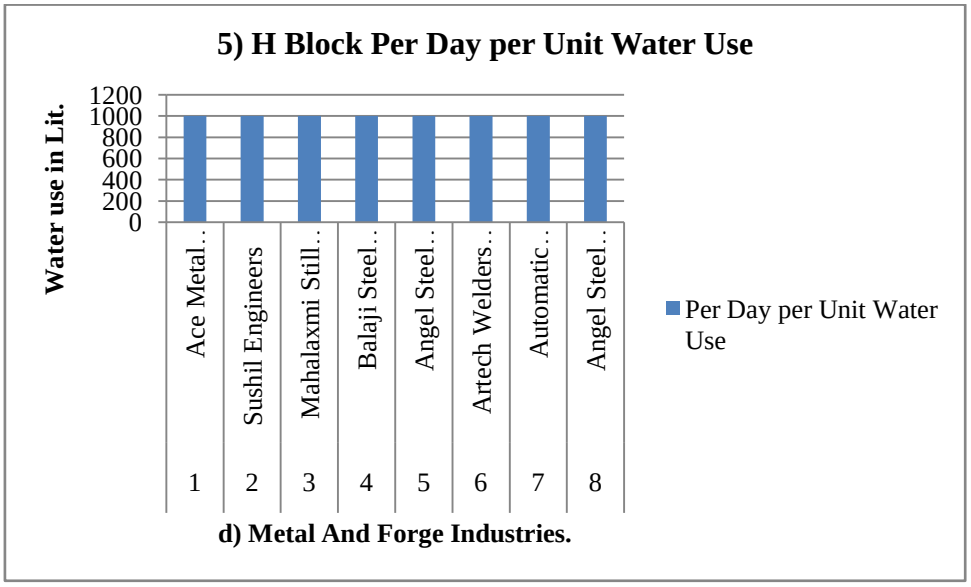

Figure no. 3.79

In the metal and forge sectors of H blocks industrial units require water for their industrial process because its products metal casting and metals products metal cutting, surface cutting and forge components, product is metal fabrication, steel fabrication and molding etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.85 - d) Metal And Forge Industries. 6) S Block

Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
1	Bhairav Metals	365000	1000
2	Bhairav Metals	474500	1300
3	KBK Fabricator	365000	1000
4	Metal Arts	365000	1000
5	A B Industries	730000	2000
6	Metal Arts	438000	1200
7	Metal Arts	547500	1500
8	Industrial Accessories Corporation	365000	1000

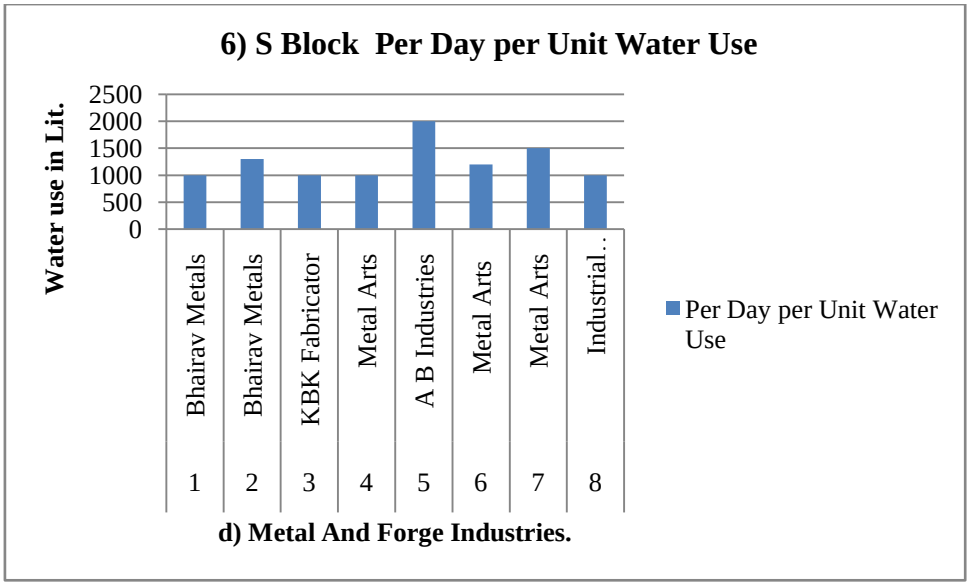

Figure no. 3.80

In the metal and forge sectors of S blocks industrial units require water for their industrial process because its products metal casting and metals products metal cutting, surface cutting and forge components, product is metal fabrication, steel fabrication and molding, metal components and goods manufacturing, metal casting, metal accessories manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

e) Chemical Industry:

Table no. 3.86 - e) Chemical Industries. 1) Bhosari Gen. Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Subhaoh Chemical	438000	1200
2	Rathi Chemicals	4380000	12000
3	J P Fine Chemical	547500	1500
4	Aqu Chemical	365000	1000

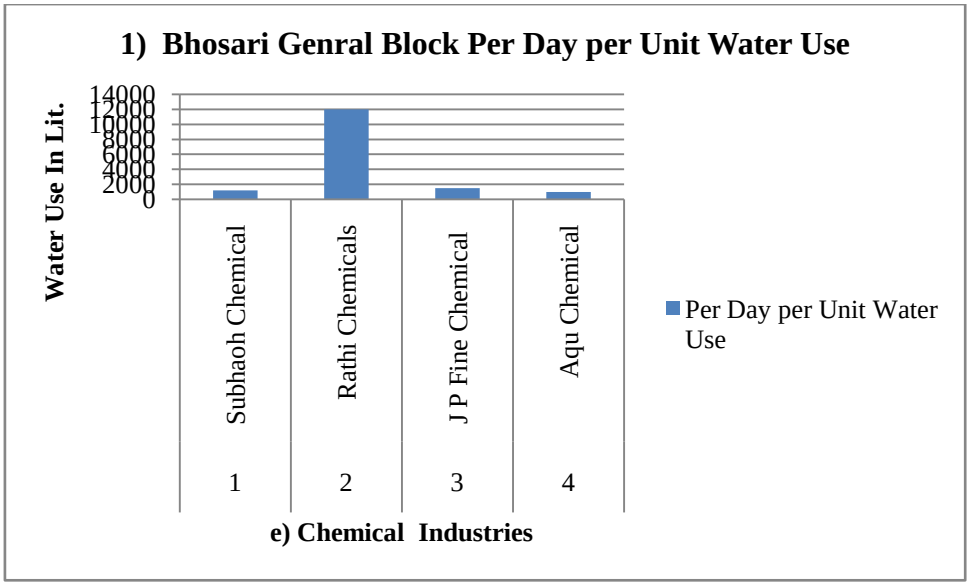

Figure no. 3.81

In the Chemical sectors of Bhosari general blocks industrial units require water for their industrial process because its production is various industrial chemicals. In this production require water for cooling, testing and washing process.

Table no. 3.87 - e) Chemical Industries.

Block	Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
D - II Block	1	Surekha Chemical Industries	365000	1000
J Block	1	Central And Western (I) Chemicals	547500	1500
S Block	1	Manisha chemicles	563500	1544
Electronics Zone	1	Alok Chemicle P. Ltd.	730000	2000

In the Chemical sectors of D-II , J Block, S block and Electronic zone blocks industrial units require water for their industrial process because its production is various industrial chemicals. In this production require water for cooling, testing and washing process.

f) Water base industries:

Table no. 3.88 - f) Water base Industries. 1) Bhosari Gen. Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Vishal Ice Factory	7300000	20000
2	Bharat Ice Factory	7300000	20000

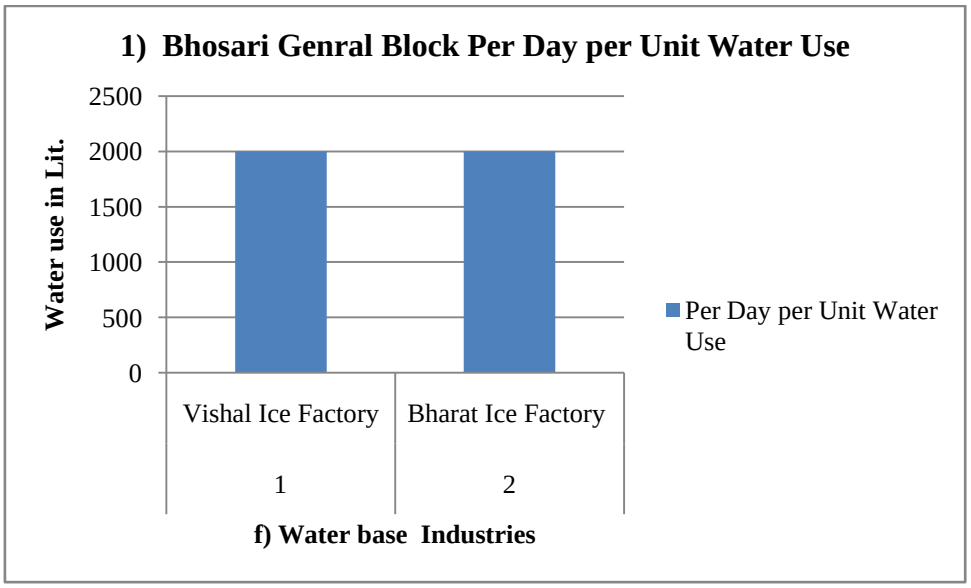

Figure no. 3.82

In the water base sectors of Bhosari general blocks industrial units require water for their industrial process because its products is ice making. In this production require water for cooling, heating, testing and washing process.

Table no. 3.89 - f) Water base Industries. 2) D - III Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Revos Aqua Systems Pvt. Ltd	365000	1000
2	Neel Distempers	730000	2000

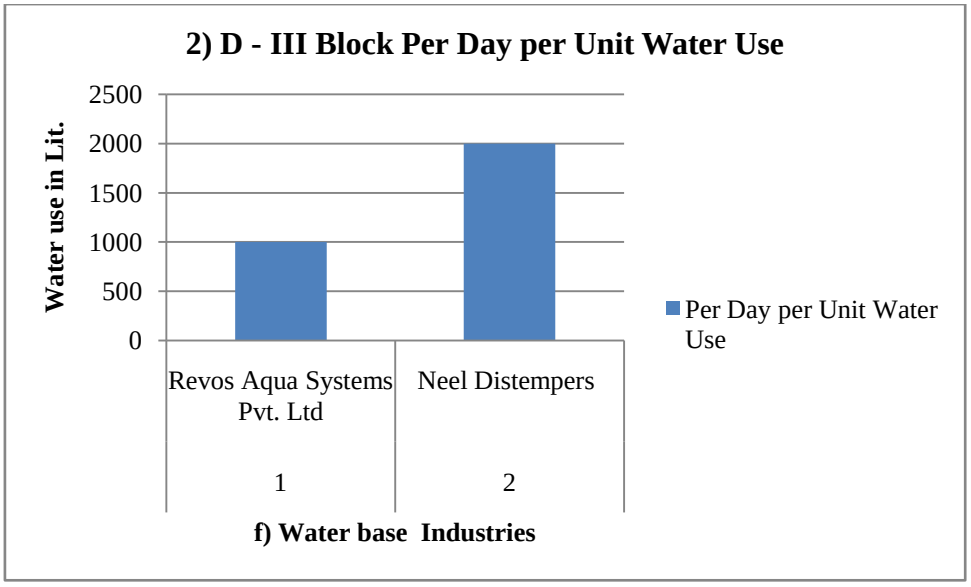

Figure no. 3.83

In the water base sectors of D – III blocks industrial units require water for their industrial process because its products is water treatment plant, filtration plants, water softening plants, de-mineralization plants, mixed bed units, domestic reverse osmosis plants, industrial reverse osmosis plants, ultra filtration plants, ultra filtration systems, effluent treatment plant, sewage treatment etc. In this production require water for cooling, heating, testing and washing process.

Table no. 3.90 - f) Water base Industries. 3) S Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Shilpa Paints	730000	2000
2	Box Print Industries	365000	1000
3	Kwality Paints	730000	2000
4	Color Bond	730000	2000

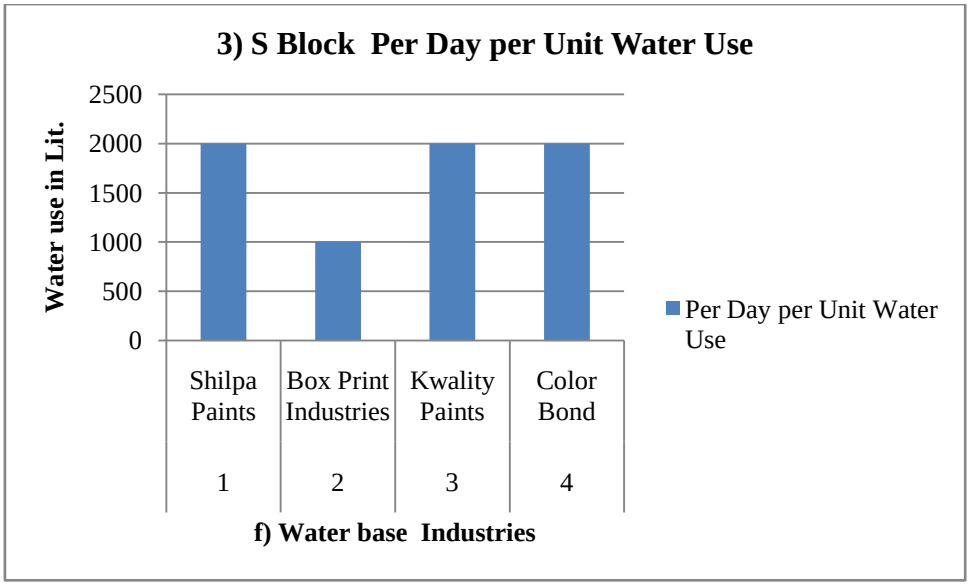

Figure no. 3.84

In the water base sectors of S blocks industrial units require water for their industrial process because its products is oil paint, distemper, cement paint and box printing etc. In this production require water for cooling, heating, testing and washing process.

Table no. 3.91 - f) Water base Industries.				
Block	**Sr. No**	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
D - I Block	1	Punit Cement Pipe Industry	754000	2066
J Block	1	Water Tretment Enterprises	365000	1000
H Block	1	Corporate Dhobi Company	2555000	7000

In the water base sectors of D-I, J Block and H blocks industrial units require water for their industrial process because their product is corporate dry cleaning services, cement pipe and water treatment machinery etc. In this production require water for cooling, heating, testing and washing process.

g) Automotive industry:

Table no. 3.92 - g) Automotive Industries. 1) F - II Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Shree Auto Industries	255500	700
2	Suyog Auto Cast Pvt. Ltd.	365000	1000
3	Talbors Automotive components Ltd	292000	800
4	Wonder Car	365000	1000
5	Prachi Batteris Pvt.Ltd.	365000	1000

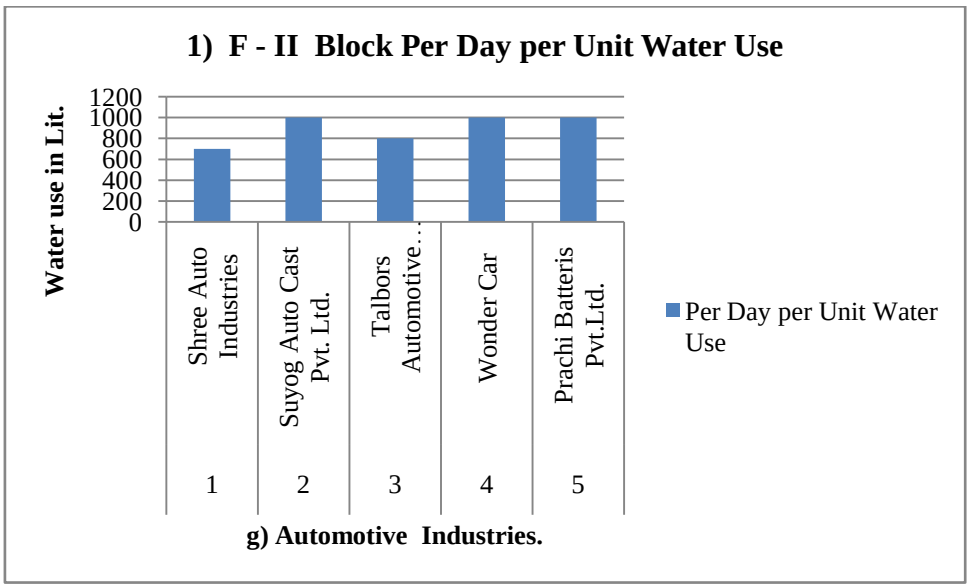

Figure no. 3.85

In the automotive industrial sectors of F – II blocks industrial units require water for their industrial process because their product and service is auto parts manufacturing, automotive spare parts and accessories manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.93 - g) Automotive Industries. 2) J Block			
Sr.	**Name Of Industry**	**Industrial**	**Per Day per Unit**

No		Annual Water Use	Water Use
1	Renuka Auto Crank	438000	1200
2	Panse Autocomps Pvt. Ltd.	547500	1500
3	Fab Auto Parts Pvt. Ltd.	365000	1000
4	Dyna Automotive Stamping P. Ltd.	365000	1000
5	Automoblies Carporuting Ltd.	182500	500
6	Aristo Folls Mfg. Company	182500	500
7	Lumax Auto Technologies Ltd.	255500	700

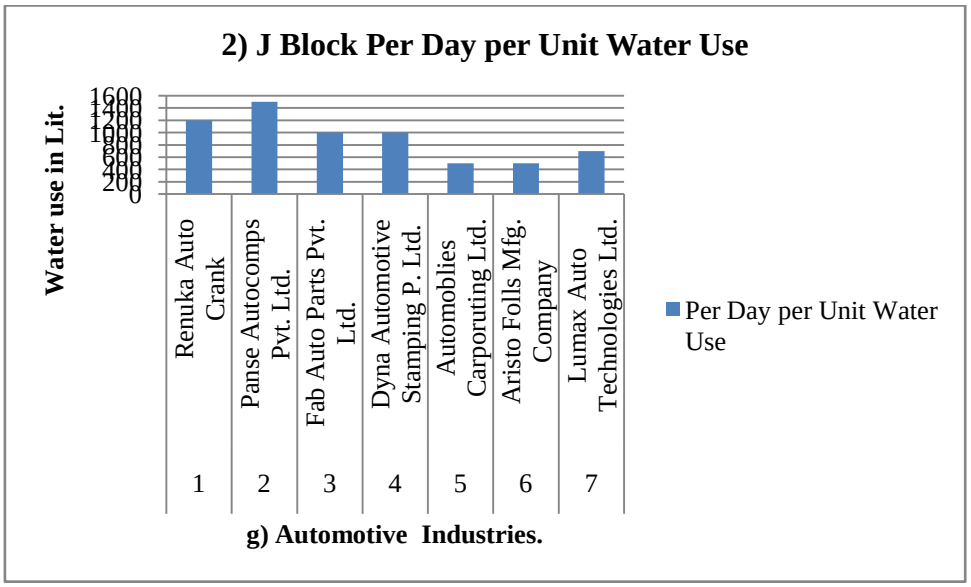

Figure no. 3.86

In the automotive industrial sectors of J blocks industrial units require water for their industrial process because their product and service is auto parts manufacturing, automotive spare parts and accessories manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.94 - g) Automotive Industries. 3) S Block			
Sr. No	**Name Of Industry**	**Industrial Annual Water Use**	**Per Day per Unit Water Use**
1	Autotech Engineering	292000	800
2	Genie Auto Ducts Pvt. Ltd.	365000	1000
3	Gaurav Auto Parts Mfg. Pvt. Ltd.	292000	800

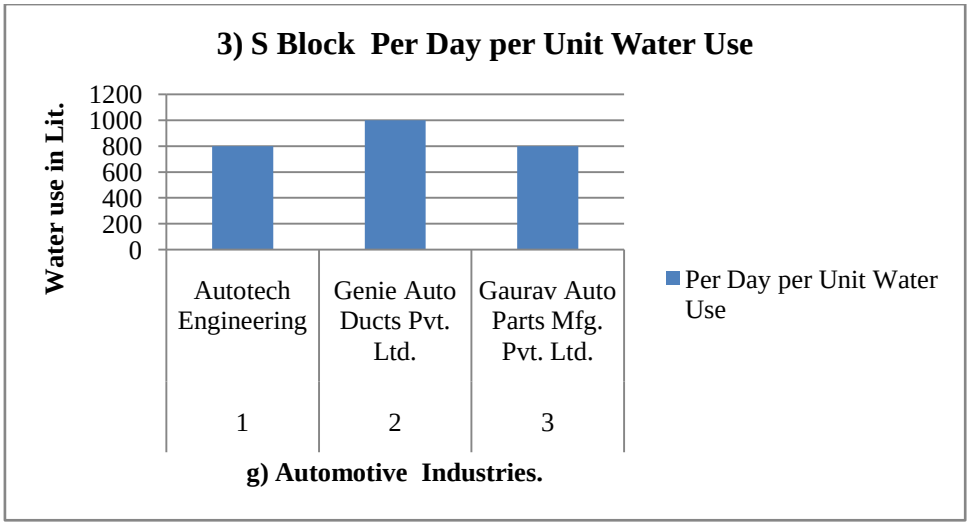

Figure no.3.87

In the automotive industrial sectors of S blocks industrial units require water for their industrial process because their product and service is auto parts manufacturing, automotive spare parts and accessories manufacturing etc. In this production require water for cooling, heating, cutting, testing and washing process.

Table no. 3.95 - h) Pharmaceutical Industries. 1) F - II Block

Sr. No	Name Of Industry	Industrial Annual Water Use	Per Day per Unit Water Use
1	Nullife Pharmaceuticals	365000	1000
2	Bombay Oxigen Corp. Ltd	365000	1000

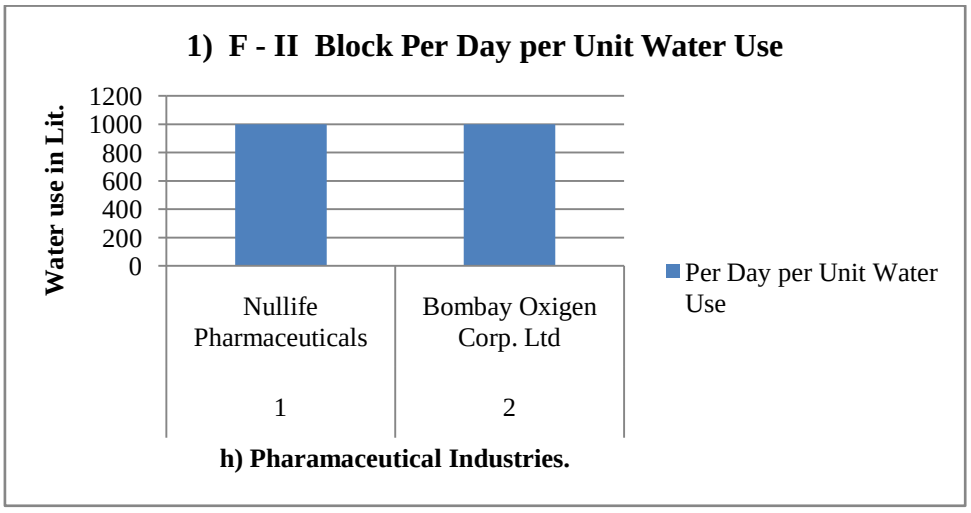

Figure no. 3.88

In the pharmaceuticals industrial sectors of F- II blocks industrial units require water for their industrial process because their product medicine manufacturing. In this production require water for cooling, heating, mixing, testing and washing process.

4.4 Associated Problems:

As define previously field observation made for the industries having optimum water use level it does not show any problem in water supply management. They are taking care for the conservative of water.

The industries which were categorized as optimum to excess use of water and more than excess use of water had lack of planning. The field observation made for these purpose we had pointed out the following common problem in the water supply management level and water use level.

1) Excess use of water in toilet and cleaning process.
2) Water distribution system does not work properly linkages of pipeline and water tab are observed in industrial units.
3) Water was found to be wasting self cleaning area.
4) Water use in traditional ways in garden irrigation.
5) No industry has adopted the system of recycling of used water.
6) Lack of awareness on water use in domestic purpose.

Figure No.3.89 Domestic Water use and Associated Problems Photo Plate

Pipeline Likage and missmanagment of water suplly system

Figure No. 3.80 Industrial Water Use and associated problems

B) RAINWATER HARVESTING POTENTIAL AN ALTERNATIVE TO INDUSTRIAL WATER NEED IN PIMPRI-CHINCHWAD MIDC INDUSTRIAL UNITS.

4.1 Introduction.

4.2 Rainwater harvesting potential Calculation and discussion.

A) Without water use in industrial process:

a) Service industries.
b) Manufacturing Industries.
c) Packing industries

B) Water use in industrial process:

a) Manufacturing industries.
b) Tool manufacturing industries.
c) Plastic and rubber, fiber industries.
d) Metal and forge industries.
e) Chemical industries
f) Water base industries.
g) Automotive industries.
h) Pharmaceutical industries.

Rainwater harvesting potential an alternative to industrial water need in Pimpri-Chinchwad MIDC industrial units.

4.1 Introduction:

In this chapter we refer to various source of harvestable rainwater in Pimpri – Chinchwad MIDC industrial blocks. In campus surface area and Rooftop area are the two sources of harvestable rainwater. In this study the more focus is given on rooftop water harvesting potential of industrial units. In general campus area is divided in to open surface area and area covered with different types of roofs. The surfaces are of industrial campuses were used for parking, open space, garden and road, roof covered structure may include godown, Slab- rooftop area and cross metal sheet – rooftop area.

The calculation method of harvestable rainwater potential of surface and rooftop area taken from the Manual of rainwater harvesting and conservation by Govt. Of India, Consultancy services organization central public works department, Nirman Bhavan, New Delhi. In 2002.

Rainwater Harvesting Potential (In Cum) =

Area (in Sq.meter) X Annual Rainfall (m) X Co-efficient X Constant Co-eff.

Runoff Co-efficient:

The collection efficiency accounts for the facts that all the rain water falling over an area cannot be effectively harvested because of evaporation, spillage etc. factor like runoff coefficient as stated for various types of roof and land surface etc. as shown in below table and the first flush wastage i.e. first spell of rain is flushed out, evaporation and spillage does not enter the systems so a constant co-efficient of 0.80 may be adopted for all situations. This is done because the first spell of rain carries with it a relatively larger amount of pollutenants from the air and catchment surface.

Run-off is basically the water flowing away from a catchment area after precipitation. Runoff is dependent on the type of catchment area (surface features) and the size of the area. For example, normal concrete roof has the highest run off value as compared to an area under heavy vegetation. Runoff coefficient is the ratio of runoff to rainfall.

How to calculate run-off coefficient

There are many parts of the hydrologic cycle that affect the runoff coefficient. These include interception, evaporation, infiltration, slope, soil types (not applicable to roof top systems), etc. Therefore to estimate run-off coefficient, following parameters need to be assessed – Roof type; slope; soil type; land use; degree of imperviousness; surface roughness and duration and intensity of rainfall.

(Ref. Calculation of Rainwater Harvesting Potential by Using Mean Annual Rainfall, Surface Runoff and Catchment area - Puskar Pande, and Shailesh Telang , Global Advanced Research Journal of Agricultural Science (ISSN: 2315-5094) Vol. 3(7) pp. 200-204, July, 2014.)

A) Runoff co-efficient used to calculate the surface area water potential.

Table no. 4.1

Surface Area	Parking	Open Space	Garden	Road
Ground Surface Covering	Aspheltic or concrete Pavement	Unimproved land area	Parks	Aspheltic or concrete Pavement
Co- efficient	0.70 - 0.85	0.10 - 0.30	0.10 -0.25	0.70 - 0.85
Consider Co – Efficient	0.77	0.20	0.17	0.77

B) Runoff co-efficient used to calculate the roof area- water potential

Table no. – 4.2

Roof Area	Slab	Cross Metal Sheet	Go down
Roof Catchment	Tiles	Corrugated metal sheets	Corrugated metal sheets
Co- efficient	0.8 -0.9	0.7 -0.9	0.7 - 0.9
Consider Co – Efficient	0.8.5	0.8	0.8

C) Constant Co-eff. – 0.80

D) Annual Rainfall –

Pimpari Chinchwad MIDC annual rainfall In mm = 700 - 800 mm,

Consider rainfall - 750 mm,

Rainfall In meter = 0.75

4.2 Rainwater harvesting potential Calculation.

A) Without water use in industrial process:

a) Service industries:

Table no. 4.3 - a) Service Industries 1) Bhosari General Block surface and roof area in sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	PBJ Associates	149	74	74	56	0	297	173
2	TUN	37	0	111	149	297	557	508
3	A V Fargtul Ltd.	149	0	74	297	0	1338	927
4	Sachin Industries	446	0	223	111	0	1394	825
5	Darekar Garding Industry	0	33	223	223	0	669	433
6	Standred Industry	223	13	149	149	0	446	259
7	Fluid Cantrols	0	20	669	20	595	1486	1052
8	Foy Okam Pvt. Ltd.	0	223	89	149	595	892	897
9	Das Thinbak	669	0	892	502	0	3345	1977
10	Refaetory Sheps Pvt. Ltd.	0	0	56	223	0	502	375
11	Shree Govind	0	74	20	20	669	0	316
12	Dharia Engineers	33	0	22	111	0	3716	2495
13	Nirmity Automotive P . Ltd .	0	45	223	297	1784	0	840
14	Amiso Good P. Ltd.	0	0	74	74	0	446	292
15	Mask Seals Company	297	0	74	74	29	0	94

						7		
16	Esbee Electrotech LLP	0	0	14	42	93	0	50
17	Ashtech Tooling And Stampings Pvt. Ltd.	0	0	70	28	0	223	133
18	Alfa Enterprises	0	0	58	0	0	5351	3548
19	Yash Enterprises	0	42	56	84	186	0	93
20	Mahindra C/E automotive Ltd	0	0	56	93	669	446	616
21	Electronics Sadn	37	0	21	116	0	892	614
22	Shree Stamping	0	0	223	223	297	0	124
23	Rajasthan 2 Stock	0	0	14	0	0	446	293
24	Danchal Steel	223	0	111	111	0	446	260
	Total	2263	525	3597	3152	5481	22891	17194
	Total	2788		6749		45566		

In the service industries of Bhosari general block surface area components measure to be 1) Open space = 2263 sqm. 2) Garden = 525 sqm. 3) Parking = 3597 sqm. and 4) Road = 3152 sqm. Whereas roof covered area components measured as 1) Slab roof area = 5481 sqm. 2) Cross metal sheet roof area = 22891 sqm. and 3) Godown roof area = 17194 sqm.

Table no. 4.4 - a) Service Industries - 1) Bhosari General Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	PBJ Associates	18	8	34	26	0	143	83
2	TUN	4	0	52	69	143	268	244
3	A V Fargtul Ltd.	18	0	34	137	0	642	445
4	Sachin Industries	54	0	103	52	0	669	396
5	Darekar Garding	0	3	103	10	0	321	208

	Industry				3			
6	Standred Industry	27	1	69	69	0	214	124
7	Fluid Cantrols	0	2	309	9	285	713	505
8	Foy Okam Pvt. Ltd.	0	23	41	69	285	428	430
9	Das Thinbak	80	0	412	232	0	1605	949
10	Refaetory Sheps Pvt. Ltd.	0	0	26	103	0	241	180
11	Shree Govind	0	8	9	9	321	0	152
12	Dharia Engineers	4	0	10	52	0	1784	1198
13	Nirmity Automotive P . Ltd .	0	5	103	137	856	0	403
14	Amiso Good P. Ltd.	0	0	34	34	0	214	140
15	Mask Seals Company	36	0	34	34	143	0	45
16	Esbee Electrotech LLP	0	0	6	19	45	0	24
17	Ashtech Tooling And Stampings Pvt. Ltd.	0	0	32	13	0	107	64
18	Alfa Enterprises	0	0	27	0	0	2569	1703
19	Yash Enterprises	0	4	26	39	89	0	45
20	Mahindra C/E automotive Ltd	0	0	26	43	321	214	296
21	Electronics Sadn	4	0	10	54	0	428	295
22	Shree Stamping	0	0	103	103	143	0	59
23	Rajasthan 2 Stock	0	0	6	0	0	214	140
24	Danchal Steel	27	0	52	52	0	214	125
	Total in cum.	272	54	1662	1456	2631	10988	8253
	Total	325		3118		21872		

Above Table no.4.4 gives detail about the rainwater harvesting potential of surface area and roof areas of 24 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 24 industrial units open space and gardens occupies the total area of 2788 sqm. and it provides the opportunity to get 325 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 6749 sqm surface area and it provides the opportunity to get 3118 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 24 industrial units maximum area occupies on roof area which is 45566 sqm areas and it's provide the opportunity to get 21872 cum. of water harvesting potential.

Table no. 4.5 - a) Service Industries 1) Bhosari General block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	PBJ Associates	329	226	69	103	31
2	TUN	730	654	90	76	10
3	A V Fargtul Ltd.	256	1087	425	831	325
4	Sachin Industries	256	1065	417	809	317
5	Darekar Garding Industry	329	529	161	201	61
6	Standred Industry	365	338	93	27	7
7	Fluid Cantrols	913	1504	165	591	65
8	Foy Okam Pvt. Ltd.	1278	1144	90	134	10
9	Das Thinbak	730	2554	350	1824	250
10	Refaetory Sheps Pvt. Ltd.	365	421	115	56	15
11	Shree Govind	730	473	65	257	35
12	Dharia Engineers	913	2981	327	2069	227
13	Nirmity Automotive P . Ltd .	548	1260	230	712	130
14	Amiso Good P. Ltd.	548	354	65	193	35
15	Mask Seals Company	365	188	51	177	48
16	Esbee Electrotech LLP	1095	69	6	1026	94
17	Ashtech Tooling And Stampings Pvt. Ltd.	913	171	19	742	81
18	Alfa Enterprises	730	4272	585	3542	485
19	Yash Enterprises	548	134	24	414	76
20	Mahindra C/E automotive Ltd	730	831	114	101	14
21	Electronics Sadn	1825	723	40	1102	60
22	Shree Stamping	913	202	22	710	78
23	Rajasthan 2 Stock	256	355	139	99	39
24	Danchal Steel	256	339	133	83	32

25	Total in Cum.	15914	21872	137	5958	37

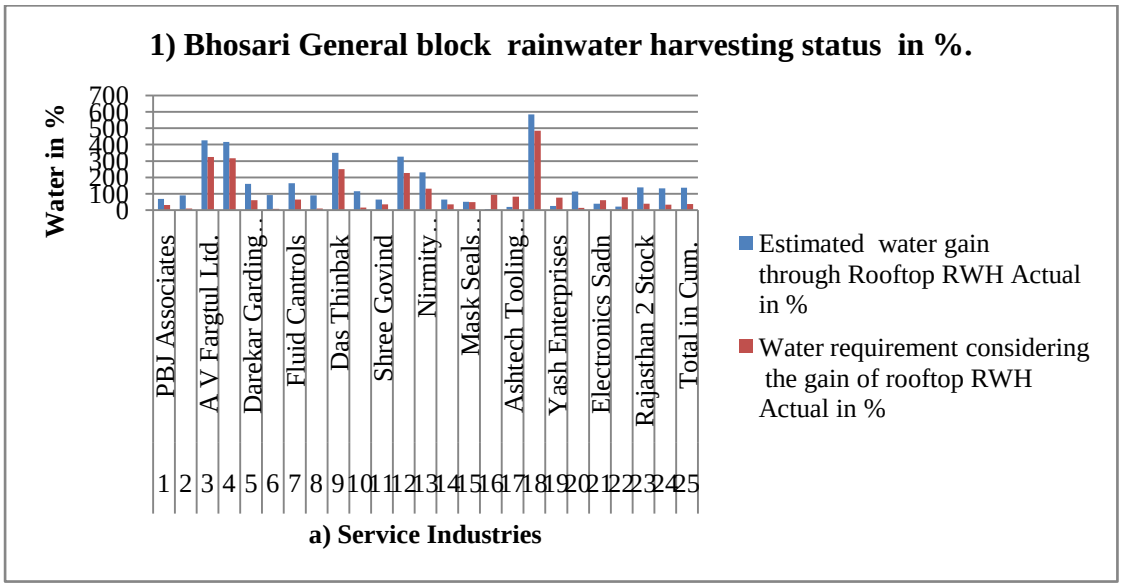

Figure no. 4.1

Above table no. 4.5 and graph no. 4.1 gives detail about the rooftop rainwater harvesting status in the service industries of Bhosari general block.

For all these 24 industrial units total annual water requirement from outside sources is 1594 cum. and estimated water gain through rooftop rainwater harvesting is 21872 cum which is 137 % therefore water requirement considering the gain of rooftop rainwater harvesting is 5958 which is 37 %

In this block observed 37% excess availability of rooftop rainwater.

Table no. 4.6 - a) Service Industries 2) D-I Block surface and roof area in sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Amol Auto Parts	46	0	0	14	279	0	0
2	Jay Auto Parts	93	0	0	14	0	372	0
3	Hegade accessories And Components	46	0	0	14	465	0	0
4	Magnum machine technologies Ltd.	46	93	46	19	0	325	46
5	Sava Helthcare Ltd.	0	46	46	0	325	0	0

	Total	232	139	93	60	1068	697	46
	Total	372		153		1812		

In the service industries of D – I block surface area components measure to be 1) Open space = 232 sqm. 2) Garden = 139 sqm. 3) Parking = 93 sqm. and 4) Road = 60 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1068 sqm. 2) Cross metal sheet roof area = 697 sqm. and 3) Godown roof area = 46 sqm.

Table no. 4.7 - a) Service Industries - 2) D -I Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Amol Auto Parts	6	0	0	6	134	0	0
2	Jay Auto Parts	11	0	0	6	0	178	0
3	Hegade accessories And Components	6	0	0	6	223	0	0
4	Magnum machine technologies Ltd.	6	9	21	9	0	156	22
5	Sava Helthcare Ltd.	0	5	21	0	156	0	0
	Total	28	14	42	28	513	334	22
	Total	42		70		870		

Above Table no. 4.7 gives detail about the rainwater harvesting potential of surface area and roof areas of 24 industrial units in the D- I block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 5 industrial units open space and gardens occupies the total area of 372 sqm. and it provides the opportunity to get 42 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and

roads occupies 153 sqm surface area and it provides the opportunity to get 70 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 5 industrial units maximum area occupies on roof area which is 1812 sqm areas and it's provide the opportunity to get 870 cum. of water harvesting potential.

Table no. 4.8 - a) Service Industries 2) D - I block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Amol Auto Parts	730	134	18	596	82
2	Jay Auto Parts	803	178	22	625	78
3	Hegade accessories And Components	256	223	87	33	13
4	Magnum machine technologies Ltd.	1095	178	16	917	84
5	Sava Helthcare Ltd.	913	156	17	756	83
6	Total in cum.	3796	870	23	2926	77

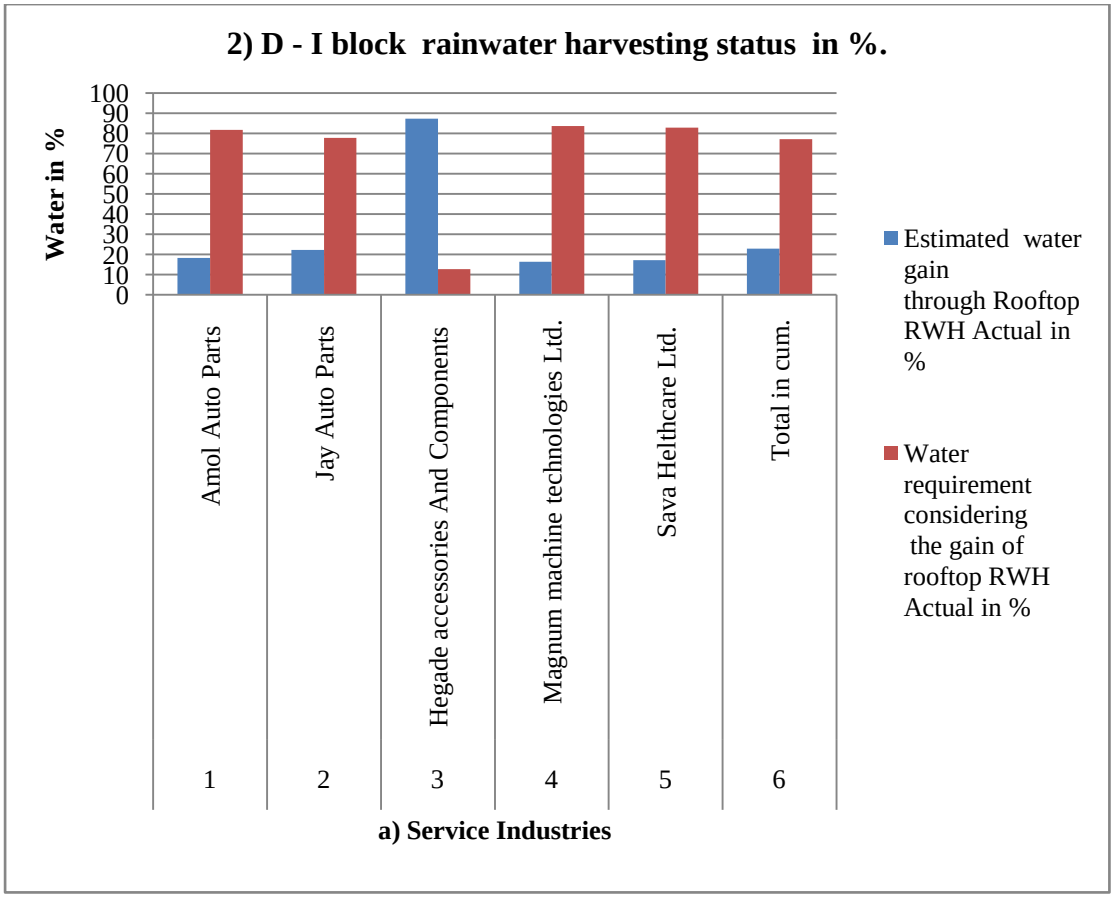

Figure no. 4.2

Above table no. 4.8 and graph no. 4.2 gives detail about the rooftop rainwater harvesting status in the service industries of D – I block.

For all these 6 industrial units total annual water requirement from outside sources is 3796 cum. and estimated water gain through rooftop rainwater harvesting is 870 cum which is 23 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2926 which is 77 %

Table no. 4.9 a) Service Industries 3) D-II Block surface and roof area in sqm

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	M E Cranes	93	0	0	0	0	372	0
2	Aman Stamping, Toolings Pvt. Ltd.	186	0	93	0	372	0	0

3	Freedom Steels	37	0	19	19	186	0	0
4	Alfa Enterprises	0	19	19	9	929	0	0
5	Daoll	186	19	46	14	0	465	0
6	Bhandur Carane And Transport	929	0	0	0	0	0	0
7	Metro Lab	0	14	23	19	0	418	0
8	Spectra Electronics P. Ltd.	0	0	28	167	0	557	0
9	Nirmal	186	0	0	93	0	372	0
10	Kaweri Electronics	111	0	130	93	669	0	0
11	Shree Trimurti Mudrika	0	46	0	37	0	232	93
12	Autometic Products	186	93	0	14	279	0	0
13	Virher Engineering	223	56	111	56	669	0	0
14	Safe Auto India	111	19	56	111	669	669	0
15	Rahul Industries	167	19	74	56	0	669	232
16	Kwality Flexi	223	19	56	15	892	0	0
17	Poljmauls Polymer Pvt. Ltd.	186	56	56	111	6689	0	0
	Total	2824	358	711	814	11353	3753	325
	Total	3182		1525		15431		

In the service industries of D – II block surface area components measure to be 1) Open space = 2824 sqm. 2) Garden = 358 sqm. 3) Parking = 711 sqm. and 4) Road = 814 sqm. Whereas roof covered area components measured as 1) Slab roof area = 11353 sqm. 2) Cross metal sheet roof area = 3753 sqm. and 3) Godown roof area = 325 sqm.

Table no. 4.10 - a) Service Industries - 3) D -II Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	M E Cranes	11	0	0	0	0	178	0
2	Aman Stamping, Toolings Pvt. Ltd.	22	0	43	0	178	0	0
3	Freedom Steels	4	0	9	9	89	0	0

4	Alfa Enterprises	0	2	9	4	446	0	0
5	Daoll	22	2	21	6	0	223	0
6	Bhandur Carane And Transport	111	0	0	0	0	0	0
7	Metro Lab	0	1	11	9	0	201	0
8	Spectra Electronics P. Ltd.	0	0	13	77	0	268	0
9	Nirmal	22	0	0	43	0	178	0
10	Kaweri Electronics	13	0	60	43	321	0	0
11	Shree Trimurti Mudrika	0	5	0	17	0	111	45
12	Autometic Products	22	9	0	6	134	0	0
13	Virher Engineering	27	6	52	26	321	0	0
14	Safe Auto India	13	2	26	52	321	321	0
15	Rahul Industries	20	2	34	26	0	321	111
16	Kwality Flexi	27	2	26	7	428	0	0
17	Poljmauls Polymer Pvt. Ltd.	22	6	26	52	3211	0	0
	Total	339	36	328	376	5449	1802	156
	Total	375		704		7407		

Above Table no. 4.10 gives detail about the rainwater harvesting potential of surface area and roof areas of 17 industrial units in the D - II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 17 industrial units open space and gardens occupies the total area of 3182 sqm. and it provides the opportunity to get 375 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1525 sqm surface area and it provides the opportunity to get 704 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 17 industrial units maximum area occupies on roof area which is

15431 sqm areas and it's provide the opportunity to get 7407 cum. of water harvesting potential.

Table no. 4.11 - a) Service Industries 3) D - II block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	M E Cranes	730	178	24	552	76
2	Aman Stamping, Toolings Pvt. Ltd.	730	178	24	552	76
3	Freedom Steels	548	89	16	458	84
4	Alfa Enterprises	256	446	175	190	75
5	Daoll	730	223	31	507	69
6	Bhandur Carane And Transport	730	0	0	730	100
7	Metro Lab	913	201	22	712	78
8	Spectra Electronics P. Ltd.	548	268	49	280	51
9	Nirmal	730	178	24	552	76
10	Kaweri Electronics	730	321	44	409	56
11	Shree Trimurti Mudrika	913	156	17	756	83
12	Autometic Products	730	134	18	596	82
13	Virher Engineering	730	321	44	409	56
14	Safe Auto India	913	642	70	270	30
15	Rahul Industries	730	433	59	297	41
16	Kwality Flexi	913	428	47	484	53
17	Poljmauls Polymer Pvt. Ltd.	913	3211	352	2298	252
18	Total in cum.	12483	7407	59	5076	41

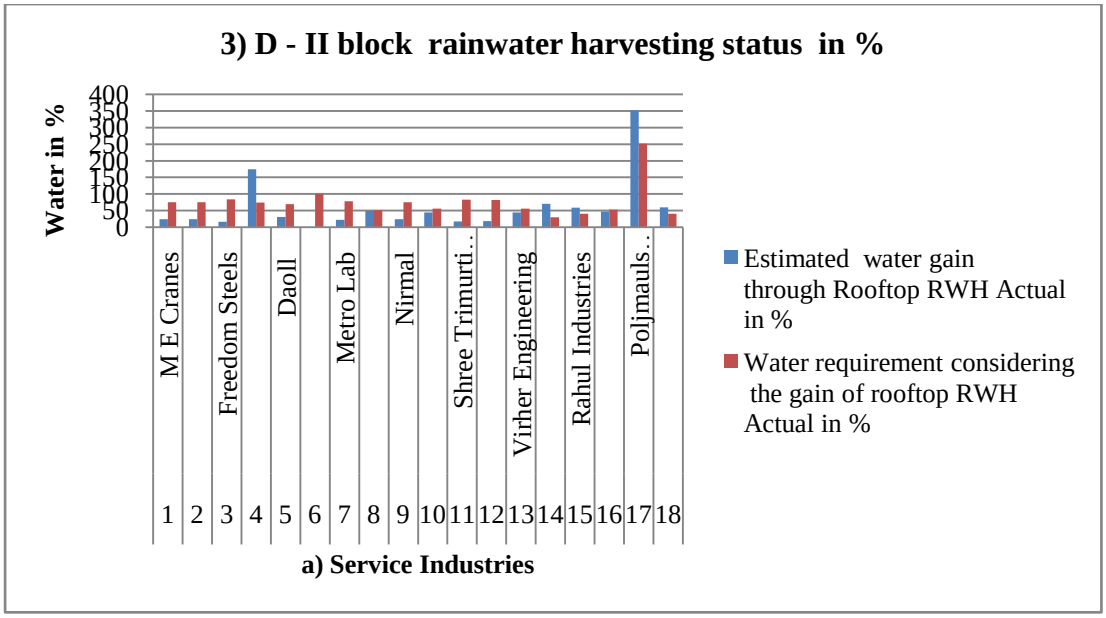

Figure no. 4.3

Above table no. 4.11 and graph no. 4.3 gives detail about the rooftop rainwater harvesting status in the service industries of D – II block.

For all these 17 industrial units total annual water requirement from outside sources is 12483 cum. and estimated water gain through rooftop rainwater harvesting is 7407 cum which is 59 % therefore water requirement considering the gain of rooftop rainwater harvesting is 5076 which is 41 %

Table no. 4.12 - a) Service Industries 4) D-III Block surface and roof area in sqm

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Laminate gallery	19	46	46	9	0	232	93
2	Saki Auto Products Pvt. Ltd.	0	19	0	28	0	279	46
3	Jayhind Playwood	9	0	0	9	0	232	19
4	Ansari Kens Pvt. Ltd.	0	46	0	46	0	232	46
5	Credene	0	0	186	93	279	0	0
6	Cosmic Automotions Pvt. Ltd.	0	0	0	0	0	372	0
7	Raghuwanshi Trading Company	0	1	14	35	0	139	0
8	Shalimar Steel Treadrs	186	0	111	16	0	669	139

					7			
9	M Product Catings	279	0	111	111	446	0	74
10	Paras Naturment Pvt. Ltd.	167	0	56	74	0	502	223
11	Hajtech Saports	111	19	111	502	0	669	0
12	Vimiya Marketing Timber Merchants	84	0	28	70	186	0	0
	Total	855	131	664	1145	910	3326	641
	Total	986		1809		4877		

In the service industries of D – III surface area components measure to be 1) Open space = 855 sqm. 2) Garden = 131 sqm. 3) Parking = 624 sqm. and 4) Road = 1145 sqm. Whereas roof covered area components measured as 1) Slab roof area = 910 sqm. 2) Cross metal sheet roof area = 3326 sqm. and 3) Godown roof area = 641 sqm.

Table no. 4.13 - a) Service Industries - 4) D -III Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Laminate gallery	2	5	21	4	0	111	45
2	Saki Auto Products Pvt. Ltd.	0	2	0	13	0	134	22
3	Jayhind Playwood	1	0	0	4	0	111	9
4	Ansari Kens Pvt. Ltd.	0	5	0	21	0	111	22
5	Credene	0	0	86	43	134	0	0
6	Cosmic Automotions Pvt. Ltd.	0	0	0	0	0	178	0
7	Raghuwanshi Trading Company	0	0	6	16	0	67	0
8	Shalimar Steel Treadrs	22	0	52	77	0	321	67
9	M Product Catings	33	0	52	52	214	0	36
10	Paras Naturment Pvt. Ltd.	20	0	26	34	0	241	107
11	Hajtech Saports	13	2	52	232	0	321	0

12	Vimiya Marketing Timber Merchants	10	0	13	32	89	0	0
	Total	103	13	307	529	437	1596	308
	Total	116		836		2341		

Above Table no. 4.13 gives detail about the rainwater harvesting potential of surface area and roof areas of 12 industrial units in the D -II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 12 industrial units open space and gardens occupies the total area of 986 sqm. and it provides the opportunity to get 116 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1809 sqm surface area and it provides the opportunity to get 836 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 12 industrial units maximum area occupies on roof area which is 4877 sqm areas and it's provide the opportunity to get 2341 cum. of water harvesting potential.

Table no. 4.14 - a) Service Industries 4) D - III block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Laminate gallery	1095	156	14	939	86
2	Saki Auto Products Pvt. Ltd.	803	156	19	647	81
3	Jayhind Playwood	730	120	16	610	84
4	Ansari Kens Pvt. Ltd.	986	134	14	852	86

5	Credene	913	134	15	779	85
6	Cosmic Automotions Pvt. Ltd.	548	178	33	369	67
7	Raghuwanshi Trading Company	438	67	15	371	85
8	Shalimar Steel Treadrs	256	388	152	132	52
9	M Product Catings	548	250	46	298	54
10	Paras Naturment Pvt. Ltd.	548	348	64	200	36
11	Hajtech Saports	329	321	98	7	2
12	Vimiya Marketing Timber Merchants	365	89	24	276	76
13	Total in cum.	7556	2341	31	5214	69

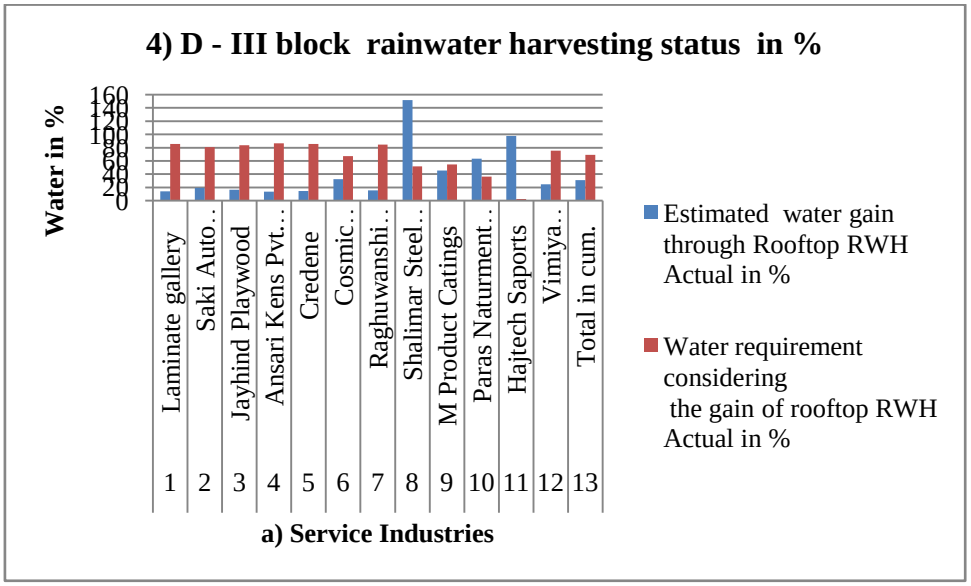

Figure no. 4.4

Above table no. 4.14 and graph no. 4.4 gives detail about the rooftop rainwater harvesting status in the service industries of D – III block.

For all these 12 industrial units total annual water requirement from outside sources is 7556 cum. and estimated water gain through rooftop rainwater harvesting is 2341 cum which is 31 % therefore water requirement considering the gain of rooftop rainwater harvesting is 5214 which is 69 %

Table no. 4.15 - a) Service Industries 5) F-II Block surface and roof area in sqm								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Agarwal Containers Pvt. Ltd.	17	28	84	35	0	279	46
2	Classic Automotive Industries	0	19	35	0	0	14632	0
	Total	17	46	118	35	0	14911	46
	Total	63		153		14957		

In the service industries of F - II block surface area components measure to be 1) Open space = 17 sqm. 2) Garden = 46 sqm. 3) Parking = 118 sqm. and 4) Road = 35 sqm. Whereas roof covered area components measured as 1) Slab roof area = 0 sqm. 2) Cross metal sheet roof area = 14911 sqm. and 3) Godown roof area = 46 sqm.

Table no. 4.16 - a) Service Industries - 5) F-II Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Agarwal Containers Pvt. Ltd.	2	3	39	16	0	134	22
2	Classic Automotive Industries	0	2	16	0	0	7023	0
	Total	2	5	55	16	0	7157	22
	Total	7		71		7180		

Above Table no. 4.16 gives detail about the rainwater harvesting potential of surface area and roof areas of 2 industrial units in the F-II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 2 industrial units open space and gardens occupies the total area of 63 sqm. and it provides the opportunity to get 7 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 153 sqm surface area and it provides the opportunity to get 71 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 2 industrial units maximum area occupies on roof area which is 14957 sqm areas and it's provide the opportunity to get 7180 cum. of water harvesting potential.

Table no. 4.17 - a) Service Industries 5) F - II block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Agarwal Containers Pvt. Ltd.	986	156	16	829	84
2	Classic Automotive Industries	803	7023	875	6220	775
3	Total in cum.	1789	7180	401	5391	301

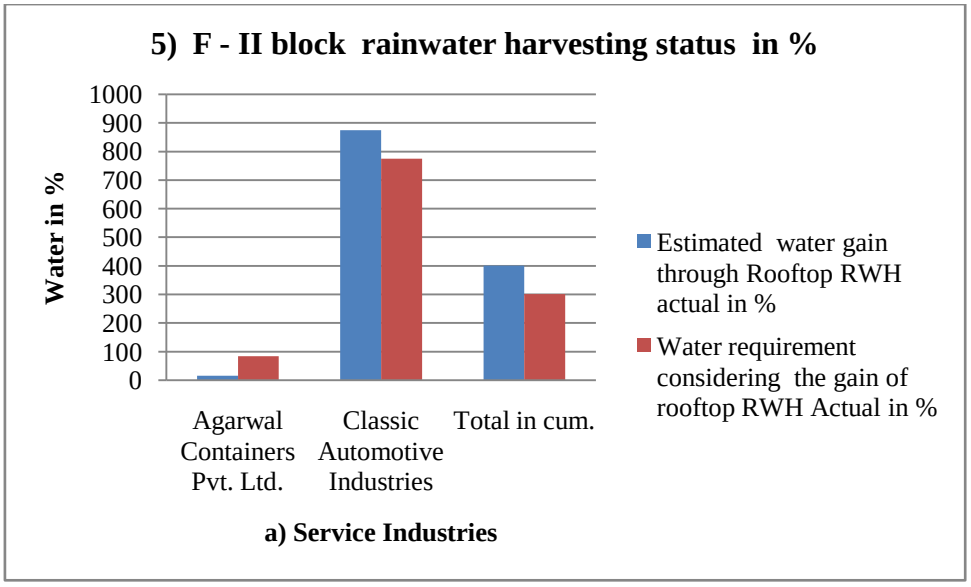

Figure no. 4.5

Above table no. 4.17 and graph no. 4.5 gives detail about the rooftop rainwater harvesting status in the service industries of F - II block.

For all these 2 industrial units total annual water requirement from outside sources is 1789 cum. and estimated water gain through rooftop rainwater harvesting is 7180 cum which is 401 % therefore water requirement considering the gain of rooftop rainwater harvesting is 5391 which is 301 %

In this block observed 301 % excess availability of rooftop rainwater.

Table no. 4.18 - a) Service Industries 6) J Block surface and roof area in sqm

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Energy Equipment And Systems	19	0	19	37	0	446	0
2	Raj Surface Treatment	0	0	56	149	446	0	0
3	Nat Steel Entriprises	0	167	56	33	0	446	0
4	Ambika Steel Corpration	37	0	19	149	0	557	0
5	Shri Ram Transmissions	78	0	111	56	0	1301	0
6	Suprabha Protective	0	0	65	105	0	650	0

	Products Pvt. Ltd.						3	
7	Arora Refreataries P. Ltd.	111	0	111	223	595	0	0
8	Mugnuplal Test Technologies Pvt. Ltd.	186	0	65	0	0	465	0
	Total	431	167	502	751	1041	9718	0
	Total	598		1253		10758		

In the service industries of J block surface area components measure to be 1) Open space = 431 sqm. 2) Garden = 167 sqm. 3) Parking = 502 sqm. and 4) Road = 751 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1041 sqm. 2) Cross metal sheet roof area = 9718 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.19 - a) Service Industries - 6) J Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Energy Equipment And Systems	2	0	9	17	0	214	0
2	Raj Surface Treatment	0	0	26	69	214	0	0
3	Nat Steel Entriprises	0	17	26	15	0	214	0
4	Ambika Steel Corpration	4	0	9	69	0	268	0
5	Shri Ram Transmissions	9	0	52	26	0	624	0
6	Suprabha Protective Products Pvt. Ltd.	0	0	30	48	0	3122	0
7	Arora Refreataries P. Ltd.	13	0	52	103	285	0	0
8	Mugnuplal Test Technologies Pvt. Ltd.	22	0	30	0	0	223	0
	Total	52	17	232	347	499	4664	0
	Total	69		579		5164		

Above Table no. 4.19 gives detail about the rainwater harvesting potential of surface area and roof areas of 8 industrial units in the J block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 8 industrial units open space and gardens occupies the total area of 598 sqm. and it provides the opportunity to get 69 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1253 sqm surface area and it provides the opportunity to get 579 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 8 industrial units maximum area occupies on roof area which is 10758 sqm areas and it's provide the opportunity to get 5164 cum. of water harvesting potential.

Table no. 4.20 - a) Service Industries 6) J block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Energy Equipment And Systems	256	214	84	41	16
2	Raj Surface Treatment	256	214	84	41	16
3	Nat Steel Entriprises	329	214	65	114	35
4	Ambika Steel Corpration	438	268	61	170	39
5	Shri Ram Transmissions	548	624	114	77	14
6	Suprabha Protective Products Pvt. Ltd.	730	3122	428	2392	328
7	Arora Refreataries P. Ltd.	183	285	156	103	56
8	Mugnuplal Test	548	223	41	325	59

	Technologies Pvt. Ltd.					
9	Total in cum.	3285	5164	157	1879	57

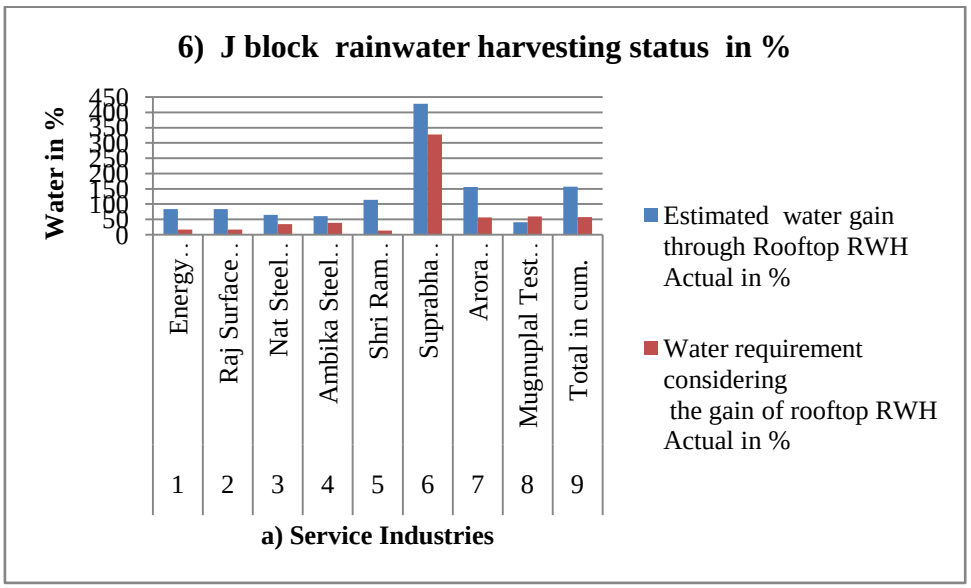

Figure no. 4.6

Above table no. 4.20 and graph no. 4.6 gives detail about the rooftop rainwater harvesting status in the service industries of J block.

For all these 8 industrial units total annual water requirement from outside sources is 3285 cum. and estimated water gain through rooftop rainwater harvesting is 5164 cum which is 157 % therefore water requirement considering the gain of rooftop rainwater harvesting is 1879 which is 57 %

In this block observed 57 % excess availability of rooftop rainwater.

Table no. 4.21 - a) Service Industries 7) H Block surface and roof area in sqm

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	G R Construction	167	130	19	37	502	0	0
2	Veldate Equpment (Ind) Ltd	84	0	56	56	186	0	0

3	Shamlal Aytun And Steel company	35	35	0	70	0	669	0
4	Deepjyoti Assocaiates	0	0	56	14	0	446	0
	Total	286	165	130	177	687	1115	0
	Total	451		307		1802		

In the service industries of H block surface area components measure to be 1) Open space = 286 sqm. 2) Garden = 165 sqm. 3) Parking = 130 sqm. and 4) Road = 177 sqm. Whereas roof covered area components measured as 1) Slab roof area = 687 sqm. 2) Cross metal sheet roof area = 1115 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.22 - a) Service Industries - 7) H Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	G R Construction	20	13	9	17	241	0	0
2	Veldate Equpment (Ind) Ltd	10	0	26	26	89	0	0
3	Shamlal Aytun And Steel company	4	4	0	32	0	321	0
4	Deepjyoti Assocaiates	0	0	26	6	0	214	0
	Total	34	17	60	82	330	535	0
	Total	51		142		865		

Above Table no. 4.22 gives detail about the rainwater harvesting potential of surface area and roof areas of 4 industrial units in the H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 4 industrial units open space and gardens occupies the total area of 451 sqm. and it provides the opportunity to get 51 cum. of water harvesting potential, where as other open surface area

component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 307 sqm surface area and it provides the opportunity to get 142 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 4 industrial units maximum area occupies on roof area which is 1802 sqm areas and it's provide the opportunity to get 865 cum. of water harvesting potential.

Table no. 4.23 - a) Service Industries 7) H block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	G R Construction	1278	241	19	1037	81
2	Veldate Equpment (Ind) Ltd	657	89	14	568	86
3	Shamlal Aytun And Steel company	1278	321	25	956	75
4	Deepjyoti Assocaiates	730	214	29	516	71
	Total in cum.	3942	865	22	3077	78

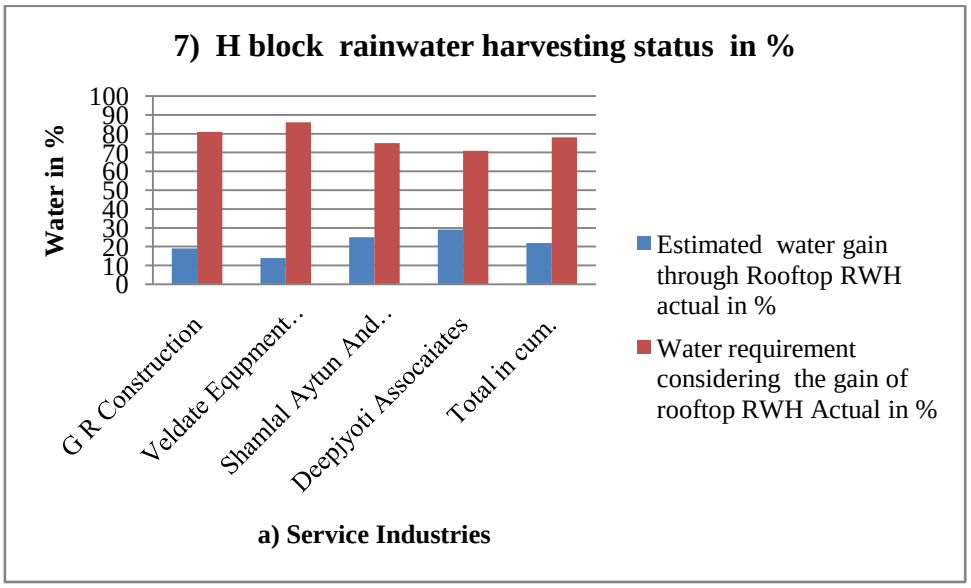

Figure no. 4.7

Above table no. 4.23 and graph no. 4.7 gives detail about the rooftop rainwater harvesting status in the service industries of H block.

For all these 4 industrial units total annual water requirement from outside sources is 3942 cum. and estimated water gain through rooftop rainwater harvesting is 865 cum which is 22 % therefore water requirement considering the gain of rooftop rainwater harvesting is 3077 which is 78 %

Table no. 4.24 - a) Service Industries 8) S Block surface and roof area in sqm								
Sr. No	**Name Of Industry**	**Surface Area In Sqm.**				**Roof Area In Sqm.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross Metal Sheet**	**Godown**
1	Jangid Furnitures	0	0	5	14	139	0	0
2	Surya Furnitech Pvt. Ltd	0	0	9	5	0	372	0
3	Wlmade Locking Systems Pvt. Ltd.	0	0	35	19	0	372	0
4	Galaxy Industrial Equipment	0	0	35	46	0	557	0
5	Accurate Electro Industries	0	0	14	46	0	650	0
6	Lectra Tools CNC Wire Cuttings	0	5	14	19	0	186	0
7	SR Electro Systems	0	1	5	0	0	650	0
8	Raja Sysytems Pvt. Ltd	0	1	35	19	0	418	0
9	S S Technology	0	1	35	14	0	418	0
10	Neha Enterprises	0	0	5	14	93	0	0
11	Arihant Enterprises	139	46	46	93	186	0	186
	Total	139	54	237	288	418	3623	186
	Total	193		525		4227		

In the service industries of S block surface area components measure to be 1) Open space = 139 sqm. 2) Garden = 54 sqm. 3) Parking = 237 sqm. and 4) Road = 288 sqm. Whereas roof covered area components measured as 1) Slab roof area = 418 sqm. 2) Cross metal sheet roof area = 3623 sqm. and 3) Godown roof area = 186 sqm.

Table no. 4.25 - a) Service Industries - 8) S Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Jangid Furnitures	0	0	2	6	67	0	0
2	Surya Furnitech Pvt. Ltd	0	0	4	2	0	178	0
3	Wlmade Locking Systems Pvt. Ltd.	0	0	16	9	0	178	0
4	Galaxy Industrial Equipment	0	0	16	21	0	268	0
5	Accurate Electro Industries	0	0	6	21	0	312	0
6	Lectra Tools CNC Wire Cuttings	0	0	6	9	0	89	0
7	SR Electro Systems	0	0	2	0	0	312	0
8	Raja Sysytems Pvt. Ltd	0	0	16	9	0	201	0
9	S S Technology	0	0	16	6	0	201	0
10	Neha Enterprises	0	0	2	6	45	0	0
11	Arihant Enterprises	17	5	21	43	89	0	89
	Total	17	5	109	133	201	1739	89
	Total	22		243		2029		

Above Table no. 4.25 gives detail about the rainwater harvesting potential of surface area and roof areas of 11 industrial units in the S block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 11 industrial units open space and gardens occupies the total area of 193 sqm. and it provides the opportunity to get 22 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 525 sqm surface area and it provides the opportunity to get 243 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 11 industrial units maximum area occupies on roof area which is 4227 sqm areas and it's provide the opportunity to get 2029 cum. of water harvesting potential.

Table no. 4.26 - a) Service Industries 8) S block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	Jangid Furnitures	803	67	8	736	92
2	Surya Furnitech Pvt. Ltd	730	178	24	552	76
3	Wlmade Locking Systems Pvt. Ltd.	730	178	24	552	76
4	Galaxy Industrial Equipment	1095	268	24	827	76
5	Accurate Electro Industries	1460	312	21	1148	79
6	Lectra Tools CNC Wire Cuttings	1351	89	7	1261	93
7	SR Electro Systems	913	312	34	600	66
8	Raja Sysytems Pvt. Ltd	1095	201	18	894	82
9	S S Technology	913	201	22	712	78
10	Neha Enterprises	730	45	6	685	94
11	Arihant Enterprises	548	178	33	369	67
12	Total in cum	10366	2029	20	8337	80

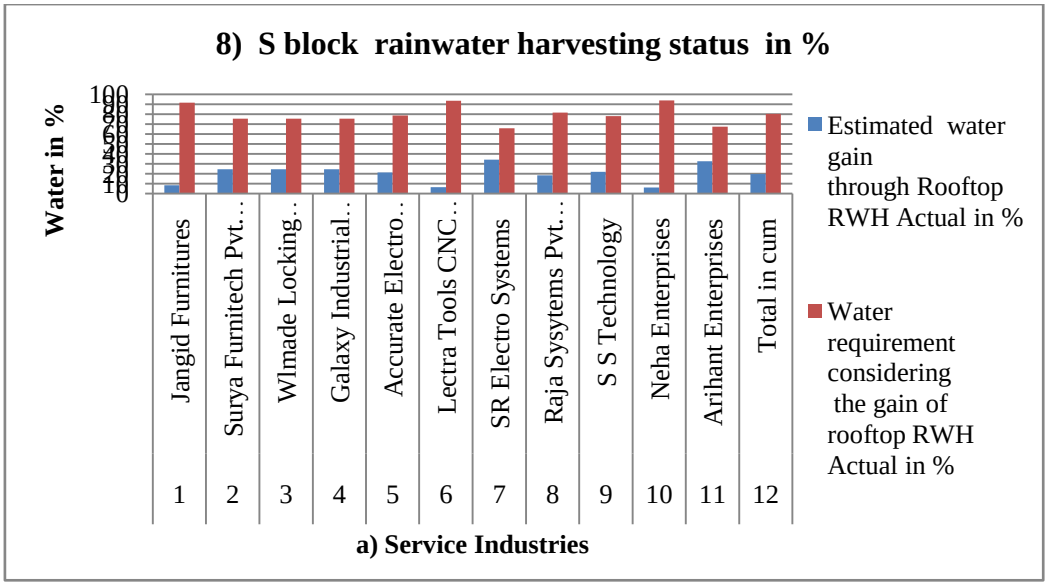

Figure no. 4.8

Above table no. 4.26 and graph no. 4.8 gives detail about the rooftop rainwater harvesting status in the service industries of S block.

For all these 11 industrial units total annual water requirement from outside sources is 10366 cum. and estimated water gain through rooftop rainwater harvesting is 2029 cum which is 20 % therefore water requirement considering the gain of rooftop rainwater harvesting is 8337 which is 80 %

b) Manufacturing Industries:

Table no. 4.27 - b) Manufacturing Industries - 1) Bhosari Genral Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Taniohq Engineering	0	0	0	11	0	446	300
2	Shree Ganesh Engineering	0	0	74	16	149	669	495
3	Ajio Asso Pvt. Ltd.	56	16	223	0	0	297	117
4	President P. Ltd	0	74	0	223	669	0	377
5	Bhushan Engineering	0	111	74	74	0	446	300
6	Jwala Sagar Industries	111	37	74	669	0	446	439

7	Anand Industries	0	297	111	74	0	669	448
8	Shree Ganesh Forge	74	0	15	167	1115	0	550
9	EMC Enterprises	0	0	84	0	0	520	319
10	N.C. Precision Pvt. Ltd.	9	0	111	0	279	0	92
11	Industrial Entrprises	186	0	0	0	372	0	149
12	Pravara	0	0	0	0	0	186	124
13	SSV Engineers Pvt. Ltd.	0	0	0	223	0	297	258
14	Disigen Steel Pvt. Ltd.	0	0	14	139	0	1338	924
15	Thermax Lmted	7	0	0	0	669	0	311
16	A L Duse Maniufacturs	0	0	223	669	297	251	410
17	Shirodkar Engineeing	0	19	650	17	0	297	13
18	Shirodkar Precicom P. Ltd.	93	0	131	0	572	0	211
19	ARM	130	0	0	0	1208	139	639
20	Rajguru Pan	186	37	0	0	0	1115	721
21	Hitech Metal Process	0	0	14	45	357	446	471
22	K K Enterprises	0	167	0	446	892	0	546
23	Yashodhan Engineering	0	1	2	7	0	107	73
24	S A Engineering	0	0	21	74	0	743	508
25	AGSA Springs	0	0	19	19	0	669	445
26	Precise Cutting Tools	0	0	28	56	0	624	422
27	Pravin Industries	0	14	56	7	0	446	281
28	Sneha Berings Pvt. Ltd.	0	0	5	5	0	892	594
29	Asha Springs And Plastic Works	0	5	5	0	111	0	51
30	Hill Man Forging Pvt. Ltd.	14	0	9	5	0	297	194
31	Saet Group Induction Equipment India Pvt. Ltd.	0	0	0	223	0	557	431
32	Solidus Hightech Products Pvt. Ltd.	21	0	58	669	743	149	602
33	Igm Polysoude	0	0	446	1338	0	2323	1756
34	Compex Engineering Systems P. Ltd.	0	0	149	28	929	372	639
35	Rajdeep Industrial Product	46	46	0	0	186	0	84

36	Standred Machine Tools P.Ltd.	93	0	0	0	186	0	74
37	Rajesh Engineering Works	0	111	74	74	669	0	315
38	MoJ Engineering	297	0	223	297	0	892	560
	Total	1324	937	2893	5574	9402	15633	15243
	Total	2261		8468		40278		

In the manufacturing industries of Bhosari general block surface area components measure to be 1) Open space = 1324 sqm. 2) Garden = 937 sqm. 3) Parking = 2893 sqm. and 4) Road = 5574 sqm. Whereas roof covered area components measured as 1) Slab roof area = 9402 sqm. 2) Cross metal sheet roof area = 15633 sqm. and 3) Godown roof area = 15243 sqm

Table no. 4.28 - b) Manufacturing Industries - 1) Bhosari General Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Taniohq Engineering	0	0	0	5	0	214	36
2	Shree Ganesh Engineering	0	0	34	7	71	321	0
3	Ajio Asso Pvt. Ltd.	7	2	103	0	0	143	0
4	President P. Ltd	0	8	0	103	321	0	214
5	Bhushan Engineering	0	11	34	34	0	214	0
6	Jwala Sagar Industries	13	4	34	309	0	214	0
7	Anand Industries	0	30	52	34	0	321	0
8	Shree Ganesh Forge	9	0	7	77	535	0	0
9	EMC Enterprises	0	0	39	0	0	250	0
10	N.C. Precision Pvt. Ltd.	1	0	52	0	134	0	0
11	Industrial Entrprises	22	0	0	0	178	0	0
12	Pravara	0	0	0	0	0	89	0

13	SSV Engineers Pvt. Ltd.	0	0	0	103	0	143	143
14	Disigen Steel Pvt. Ltd.	0	0	6	64	0	642	0
15	Thermax Lmted	1	0	0	0	321	0	27
16	A L Duse Maniufacturs	0	0	103	309	143	120	0
17	Shirodkar Engineeing	0	2	300	8	0	143	178
18	Shirodkar Precicom P. Ltd.	11	0	60	0	275	0	0
19	ARM	16	0	0	0	580	67	0
20	Rajguru Pan	22	4	0	0	0	535	0
21	Hitech Metal Process	0	0	6	21	171	214	0
22	K K Enterprises	0	17	0	206	428	0	45
23	Yashodhan Engineering	0	0	1	3	0	51	0
24	S A Engineering	0	0	10	34	0	357	0
25	AGSA Springs	0	0	9	9	0	321	0
26	Precise Cutting Tools	0	0	13	26	0	300	0
27	Pravin Industries	0	1	26	3	0	214	0
28	Sneha Berings Pvt. Ltd.	0	0	2	2	0	428	0
29	Asha Springs And Plastic Works	0	0	2	0	54	0	0
30	Hill Man Forging Pvt. Ltd.	2	0	4	2	0	143	0
31	Saet Group Induction Equipment India Pvt. Ltd.	0	0	0	103	0	268	669
32	Solidus Hightech Products Pvt. Ltd.	3	0	27	309	357	71	0
33	Igm Polysoude	0	0	206	618	0	1115	0
34	Compex Engineering Systems P. Ltd.	0	0	69	13	446	178	0
35	Rajdeep Industrial Product	6	5	0	0	89	0	0
36	Standred Machine Tools P.Ltd.	11	0	0	0	89	0	0
37	Rajesh Engineering Works	0	11	34	34	321	0	0
38	MoJ Engineering	36	0	103	137	0	428	0
	Total	159	96	1337	2575	4513	7504	1311
	Total	254		3912		13328		

Above Table no. 4.28 gives detail about the rainwater harvesting potential of surface area and roof areas of 38 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 38 industrial units open space and gardens occupies the total area of 2261 sqm. and it provides the opportunity to get 254 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 8468 sqm surface area and it provides the opportunity to get 3912 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 38 industrial units maximum area occupies on roof area which is 40278 sqm areas and it's provide the opportunity to get 13328 cum. of water harvesting potential.

Table no. 4.29 - b) Manufacturing Industries 1) Bhosari General block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Taniohq Engineering	548	250	46	298	54
2	Shree Ganesh Engineering	548	392	72	155	28
3	Ajio Asso Pvt. Ltd.	365	143	39	222	61
4	President P. Ltd	548	535	98	12	2
5	Bhushan Engineering	438	214	49	224	51
6	Jwala Sagar Industries	730	214	29	516	71
7	Anand Industries	438	321	73	117	27
8	Shree Ganesh Forge	730	535	73	195	27
9	EMC Enterprises	730	250	34	480	66
10	N.C. Precision Pvt. Ltd.	730	134	18	596	82

11	Industrial Entrprises	548	178	33	369	67
12	Pravara	548	89	16	458	84
13	SSV Engineers Pvt. Ltd.	730	285	39	445	61
14	Disigen Steel Pvt. Ltd.	329	642	195	314	95
15	Thermax Lmted	5475	348	6	5127	94
16	A L Duse Maniufacturs	548	263	48	284	52
17	Shirodkar Engineeing	548	321	59	226	41
18	Shirodkar Precicom P. Ltd.	1095	275	25	820	75
19	ARM	1278	647	51	631	49
20	Rajguru Pan	256	535	209	280	109
21	Hitech Metal Process	256	385	151	130	51
22	K K Enterprises	365	473	130	108	30
23	Yashodhan Engineering	730	51	7	679	93
24	S A Engineering	730	357	49	373	51
25	AGSA Springs	365	321	88	44	12
26	Precise Cutting Tools	1460	300	21	1160	79
27	Pravin Industries	730	214	29	516	71
28	Sneha Berings Pvt. Ltd.	438	428	98	10	2
29	Asha Springs And Plastic Works	730	54	7	676	93
30	Hill Man Forging Pvt. Ltd.	730	143	20	587	80
31	Saet Group Induction Equipment India Pvt. Ltd.	2920	936	32	1984	68
32	Solidus Hightech Products Pvt. Ltd.	1460	428	29	1032	71
33	Igm Polysoude	730	1115	153	385	53
34	Compex Engineering Systems P. Ltd.	913	624	68	288	32
35	Rajdeep Industrial Product	256	89	35	166	65
36	Standred Machine Tools P.Ltd.	256	89	35	166	65
37	Rajesh Engineering Works	329	321	98	7	2
38	MoJ Engineering	256	428	168	173	68
39	Total in cum.	30806	13328	43	17478	57

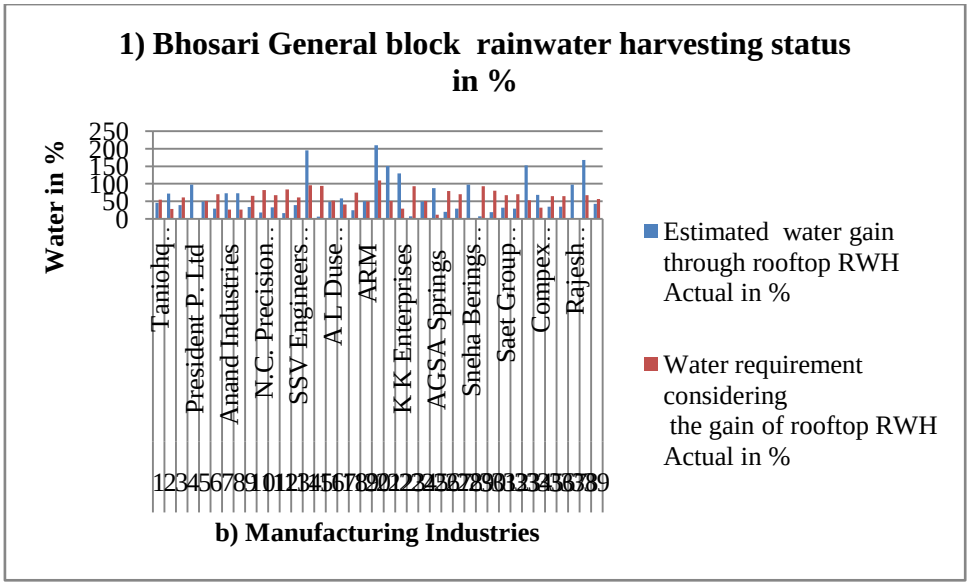

Figure no. 4.9

Above table no. 4.29 and graph no. 4.9 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of Bhosari general block.

For all these 38 industrial units total annual water requirement from outside sources is 30806 cum. and estimated water gain through rooftop rainwater harvesting is 13328 cum which is 43 % therefore water requirement considering the gain of rooftop rainwater harvesting is 17478 which is 57%

Table no. 4.30 - b) Manufacturing Industries -2) D - I Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Relience Engineers	55	0	11	111	0	67	93
2	Trani box lit.	56	0	372	37	0	780	74
3	N-Pro P. Ltd	186	0	111	149	446	669	334
	Total	297	0	494	297	446	1516	502
	Total	297		792		2464		

In the manufacturing industries of D-I block surface area components measure to be 1) Open space = 297 sqm. 2) Garden = 0 sqm. 3) Parking = 494 sqm. and 4) Road = 297 sqm. Whereas roof covered area components measured as 1) Slab roof area = 446 sqm. 2) Cross metal sheet roof area = 1516 sqm. and 3) Godown roof area = 502 sqm.

Table no. 4.31 - b) Manufacturing Industries - 2) D - I Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Relience Engineers	7	0	5	52	0	32	45
2	Trani box lit.	7	0	172	17	0	375	36
3	N-Pro P. Ltd	22	0	52	69	214	321	161
	Total	36	0	228	137	214	728	241
	Total	36		366		1183		

Above Table no. 4.31 gives detail about the rainwater harvesting potential of surface area and roof areas of 3 industrial units in the D -I block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 3 industrial units open space and gardens occupies the total area of 297 sqm. and it provides the opportunity to get 36 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 792 sqm surface area and it provides the opportunity to get 366 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 3 industrial units maximum area occupies on roof area which is 2464 sqm areas and it's provide the opportunity to get 1183 cum. of water harvesting potential.

Table no. 4.32 - b) Manufacturing Industries 2) D - I block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in	Actual	Actual in	Actual

		from outside sources in cum.	cum.	in %	cum.	in %
1	Relience Engineers	730	77	11	653	89
2	Trani box lit.	548	410	75	137	25
3	N-Pro P. Ltd	730	696	95	34	5
4	Total in cum.	2008	1183	59	825	41

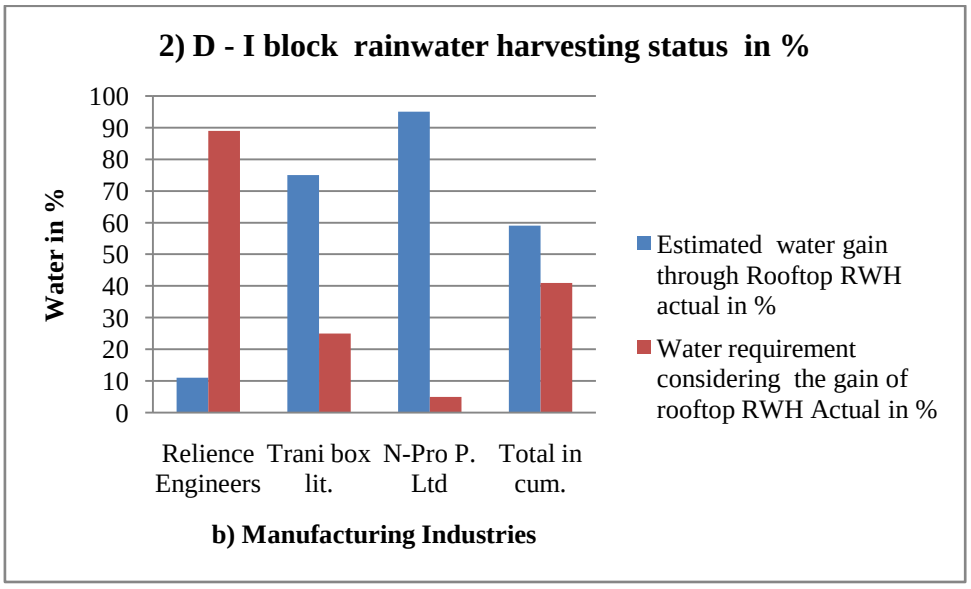

Figure no. 4.10

Above table no. 4.32 and graph no. 4.10 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of D - I block.

For all these 3 industrial units total annual water requirement from outside sources is 2008 cum. and estimated water gain through rooftop rainwater harvesting is 1183 cum which is 59 % therefore water requirement considering the gain of rooftop rainwater harvesting is 825 which is 41 %

Table no. 4.33 - b) Manufacturing Industries - 3) D - II Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Rajdeep Industries	0	65	84	9	111	74	0
2	Hyt Engineering Company Pvt. Ltd. Unit	167	19	56	111	418	446	0

	II							
3	Advent Tool Tech	37	19	56	56	251	0	0
4	Anand Techwen P. Ltd.	74	17	56	17	669	0	0
5	Machine Reconditioners Pvt. Ltd.	0	0	0	0	279	93	93
6	Nachi Electronics	0	2	28	56	0	232	0
7	S A Tools	0	0	2	5	2555	0	0
8	Sai Enterprises	0	5	28	0	0	372	0
9	Kalpataru Patterns	0	5	14	0	0	418	0
10	Maestratech Systems Pvt. Ltd.	0	1	14	19	0	232	0
11	Spectra Trading Company	0	5	0	2	0	232	0
	Total	279	136	337	275	4283	2100	93
	Total	415		611		6475		

In the manufacturing industries of D - II block surface area components measure to be 1) Open space = 279 sqm. 2) Garden = 136 sqm. 3) Parking = 337 sqm. and 4) Road = 275 sqm. Whereas roof covered area components measured as 1) Slab roof area = 4283 sqm. 2) Cross metal sheet roof area = 2100 sqm. and 3) Godown roof area = 93 sqm

Table no. 4.34 - b) Manufacturing Industries - 3) D - II Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Rajdeep Industries	0	7	39	4	54	36	0
2	Hyt Engineering Company Pvt. Ltd. Unit II	20	2	26	52	201	214	0
3	Advent Tool Tech	4	2	26	26	120	0	0
4	Anand Techwen P. Ltd.	9	2	26	8	321	0	0
5	Machine Reconditioners Pvt.	0	0	0	0	13	45	45

	Ltd.					4		
6	Nachi Electronics	0	0	13	26	0	111	0
7	S A Tools	0	0	1	2	1226	0	0
8	Sai Enterprises	0	0	13	0	0	178	0
9	Kalpataru Patterns	0	0	6	0	0	201	0
10	Maestratech Systems Pvt. Ltd.	0	0	6	9	0	111	0
11	Spectra Trading Company	0	0	0	1	0	111	0
	Total	33	14	156	127	2056	1008	45
	Total	47		282		3108		

Above Table no. 4.34 gives detail about the rainwater harvesting potential of surface area and roof areas of 11 industrial units in the D-II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 11 industrial units open space and gardens occupies the total area of 415 sqm. and it provides the opportunity to get 47 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 611 sqm surface area and it provides the opportunity to get 282 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 11 industrial units maximum area occupies on roof area which is 6475 sqm areas and it's provide the opportunity to get 3108 cum. of water harvesting potential.

Table no. 4.35 - b) Manufacturing Industries 3) D - II block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside**	**Estimated water gain through rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**

		sources in cum.				
1	Rajdeep Industries	730	89	12	641	88
2	Hyt Engineering Company Pvt. Ltd. Unit II	730	415	57	315	43
3	Advent Tool Tech	730	120	16	610	84
4	Anand Techwen P. Ltd.	730	321	44	409	56
5	Machine Reconditioners Pvt. Ltd.	548	223	41	325	59
6	Nachi Electronics	767	111	15	655	85
7	S A Tools	548	1226	224	679	124
8	Sai Enterprises	1168	178	15	990	85
9	Kalpataru Patterns	840	201	24	639	76
10	Maestratech Systems Pvt. Ltd.	803	111	14	692	86
11	Spectra Trading Company	803	111	14	692	86
12	Total in cum.	8395	3108	37	5287	63

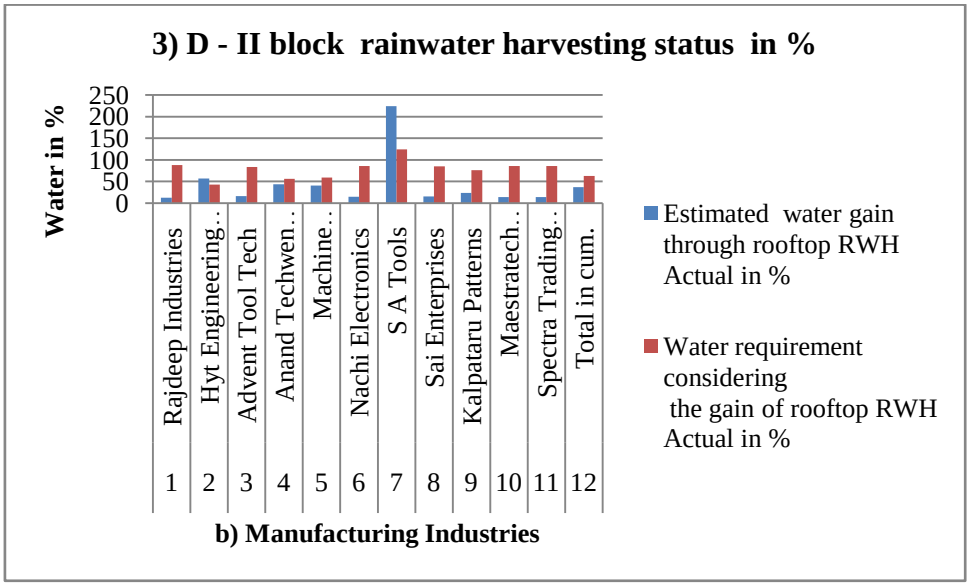

Figure no. 4.11

Above table no. 4.35 and graph no. 4.11 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of D - II block.

For all these 11 industrial units total annual water requirement from outside sources is 8395 cum. and estimated water gain through rooftop rainwater harvesting

is 3108 cum which is 37 % therefore water requirement considering the gain of rooftop rainwater harvesting is 5287 which is 63 %

Table no. 4.36 - b) Manufacturing Industries - 4) F - II Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	R S Enterprises	111	0	20	42	251	446	0
2	Phonex	223	15	56	100	223	669	0
3	Viduyt Plast	74	19	111	74	0	669	251
4	Mayur Hevey	223	0	67	74	0	1003	167
5	Precisian	0	9	167	74	223	0	223
6	PPM P. Ltd.	223	0	111	139	0	502	0
7	Universal Tools Ltd	223	74	223	0	446	0	139
8	Kap Engineers	14	56	111	223	502	0	0
9	Avishkar	186	84	111	167	0	669	0
10	M Process Moter	251	56	223	167	0	279	56
11	Pasrma Industries	223	0	111	139	0	780	251
12	Sonwin Engineering P. Ltd.	0	1	14	19	1394	0	0
13	Grap Fire Industries	0	1	19	23	93	0	0
14	Sabari Enterprises	0	1	14	5	0	325	0
15	Bhansali Ispat	0	1	139	0	0	186	0
16	Accumeesure Tools	0	28	35	14	186	0	0
17	Rinder Industries Pvt.Ltd.	0	5	19	35	139	0	0
18	Four Felin	223	15	167	111	334	334	56
19	Damodar Hard	74	56	223	74	0	502	0
20	Sharada Industries	186	56	111	223	669	446	0
21	Mudra Engineering	139	0	223	223	0	669	0
22	Balaji Industries	223	7	111	111	0	892	111
	Total	2597	482	2389	2040	4459	8371	1254
	Total	3078		4428		14084		

In the manufacturing industries of F-II block surface area components measure to be 1) Open space = 2597 sqm. 2) Garden = 482 sqm. 3) Parking = 2389 sqm. and

4) Road = 2040 sqm. Whereas roof covered area components measured as 1) Slab roof area = 4459 sqm. 2) Cross metal sheet roof area = 8371 sqm. and 3) Godown roof area = 1254 sqm.

Table no. 4.37 - b) Manufacturing Industries - 4) F- II Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	R S Enterprises	13	0	9	19	120	214	0
2	Phonex	27	2	26	46	107	321	0
3	Viduyt Plast	9	2	52	34	0	321	120
4	Mayur Hevey	27	0	31	34	0	482	80
5	Precisian	0	1	77	34	107	0	107
6	PPM P. Ltd.	27	0	52	64	0	241	0
7	Universal Tools Ltd	27	8	103	0	214	0	67
8	Kap Engineers	2	6	52	103	241	0	0
9	Avishkar	22	9	52	77	0	321	0
10	M Process Moter	30	6	103	77	0	134	27
11	Pasrma Industries	27	0	52	64	0	375	120
12	Sonwin Engineering P. Ltd.	0	0	6	9	669	0	0
13	Grap Fire Industries	0	0	9	11	45	0	0
14	Sabari Enterprises	0	0	6	2	0	156	0
15	Bhansali Ispat	0	0	64	0	0	89	0
16	Accumeesure Tools	0	3	16	6	89	0	0
17	Rinder Industries Pvt.Ltd.	0	0	9	16	67	0	0
18	Four Felin	27	2	77	52	161	161	27
19	Damodar Hard	9	6	103	34	0	241	0
20	Sharada Industries	22	6	52	103	321	214	0
21	Mudra Engineering	17	0	103	103	0	321	0
22	Balaji Industries	27	1	52	52	0	428	54
	Total	312	49	1104	942	2140	4018	602

	Total	361	2046	6760

Above Table no. 4.37 gives detail about the rainwater harvesting potential of surface area and roof areas of 22 industrial units in the F-II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 22 industrial units open space and gardens occupies the total area of 3078 sqm. and it provides the opportunity to get 361 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 4428 sqm surface area and it provides the opportunity to get 2046 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 22 industrial units maximum area occupies on roof area which is 14084 sqm areas and it's provide the opportunity to get 6760 cum. of water harvesting potential.

Table no. 4.38 - b) Manufacturing Industries 4) F - II block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	R S Enterprises	548	334	61	213	39
2	Phonex	730	428	59	302	41
3	Viduyt Plast	730	441	60	289	40
4	Mayur Hevey	548	562	103	14	3
5	Precisian	730	214	29	516	71
6	PPM P. Ltd.	548	241	44	307	56
7	Universal Tools Ltd	730	281	38	449	62
8	Kap Engineers	730	241	33	489	67
9	Avishkar	438	321	73	117	27
10	M Process Moter	329	161	49	168	51

11	Pasrma Industries	256	495	194	239	94
12	Sonwin Engineering P. Ltd.	803	669	83	134	17
13	Grap Fire Industries	803	45	6	758	94
14	Sabari Enterprises	511	156	31	355	69
15	Bhansali Ispat	803	89	11	714	89
16	Accumeesure Tools	621	89	14	531	86
17	Rinder Industries Pvt.Ltd.	803	67	8	736	92
18	Four Felin	621	348	56	273	44
19	Damodar Hard	329	241	73	88	27
20	Sharada Industries	913	535	59	377	41
21	Mudra Engineering	555	321	58	234	42
22	Balaji Industries	730	482	66	248	34
23	Total in cum.	13804	6760	49	7044	51

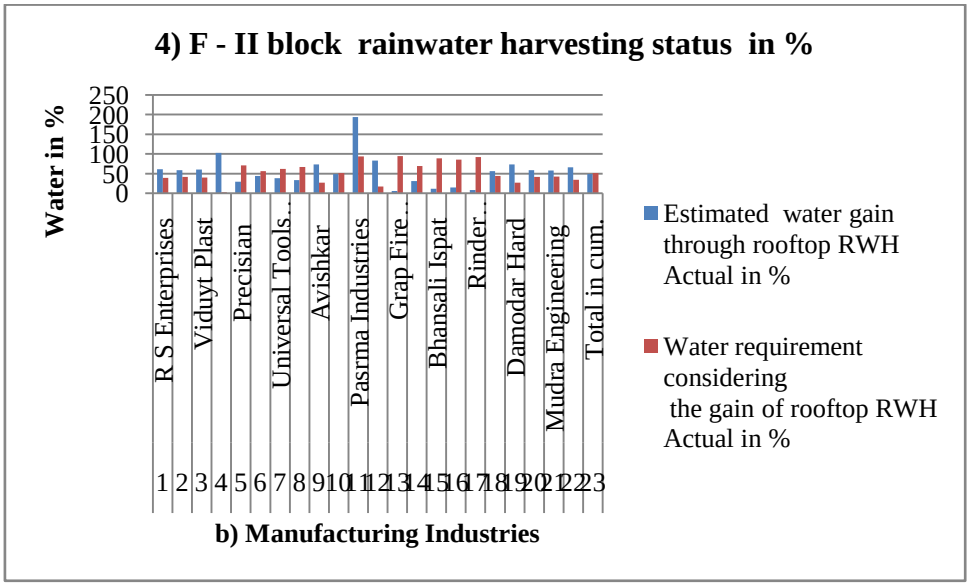

Figure no. 4.12

Above table no. 4.38 and graph no. 4.12 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of F - II block.

For all these 22 industrial units total annual water requirement from outside sources is 13804 cum. and estimated water gain through rooftop rainwater harvesting is 6760 cum which is 49 % therefore water requirement considering the gain of rooftop rainwater harvesting is 7044 which is 51 %

Table no. 4.39 - b) Manufacturing Industries - 5) J Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Quility Engineering	9	9	37	149	0	334	0
2	Pargee Placstics Pvt. Ltd.	74	0	149	223	446	0	0
3	Patson Engineering	186	0	56	167	0	502	0
4	Siddhivinayak Agri P. Ltd.	223	0	56	725	0	1003	223
5	Vee Bee Industries	37	0	9	111	0	446	0
6	A K Steel	502	0	56	111	0	1003	669
7	Jriveny Industries	167	0	111	55	0	502	276
8	Shree Nivas Industries	74	0	149	149	0	892	0
9	Divin Tooling	107	74	56	167	1003	0	223
10	Ulka Industries	167	0	19	46	0	502	0
11	Turakhia Metals Pvt. Ltd.	33	0	19	111	0	223	0
12	EliteK	60	56	22	19	0	446	0
13	Mova Buik Hand Ltd.	223	45	56	37	0	334	0
14	Jyoti	111	22	22	334	334	334	0
15	A B Engineers	279	0	74	74	0	502	669
16	Kualits Engineers	167	37	111	74	0	669	0
17	G M Tools	167	56	56	56	0	669	0
18	Visitor Parve	56	0	37	111	0	557	0
19	Fine Sheet Metal Works	37	0	130	56	0	836	0
20	Revin Industries	37	0	111	149	0	1858	0
21	Omkara	149	22	84	149	446	0	0
22	Google Engineering	334	56	111	6	446	446	0
23	M J Engineering	223	37	372	56	0	2230	111
24	Yogi Engineering Ltd.	74	74	37	74	0	669	0
25	S S Engineering	111	0	149	56	0	1486	0
26	Shrimahavir P. Ltd.	74	149	111	74	780	0	0
27	Cut Art Fabrication	111	0	74	74	0	669	669
28	Ghalsasi Works P. Ltd.	223	28	56	74	0	669	0
29	Parth Enterprises	167	56	56	74	0	725	0

30	Target Engineers	74	0	56	28	0	334	0
31	Jayashree p. Ltd.	56	0	28	28	0	334	167
32	Royal Fabricators	56	0	19	111	0	446	0
33	Sayaji Entrprises	0	186	251	502	669	1003	0
34	Jeena Enterprises	502	186	56	93	1003	669	0
35	Devdatta Industries	502	111	74	84	1003	669	0
36	Najan Electronic	502	56	46	418	1003	502	186
37	Autotrans Systems	0	19	81	46	0	5121	98
38	Saiprit Enterprises	5	28	65	35	0	8454	35
39	Auto Partas	0	0	28	105	0	2683	81
40	Auto Parts Engineers	0	0	130	74	0	5284	0
41	Evole Technologies And Services Pvt. Ltd.	0	74	49	28	9929	0	557
42	Mehata Presing	84	0	81	35	0	2323	84
43	Ram Entrerprises	223	67	74	111	0	669	74
44	Jabbal Aut	40	20	67	28	446	892	0
45	D M Engineering	223	22	74	20	0	669	0
46	Shakti Electronic	669	0	74	892	0	892	0
47	Varun Enterprises	446	11	74	669	0	1003	0
48	Laxmi Engineering	446	0	16	22	0	446	23
49	Savan Tools P.Ltd.	223	0	223	74	0	669	56
50	S S Technoservises P. Ltd.	74	28	84	297	446	0	0
51	Jectram Pvt. Ltd.	16	11	111	84	0	743	0
52	Onkar Dies P. Ltd.	446	11	111	669	0	892	0
53	Ganga Ato-M P. Ltd.	223	0	669	502	892	0	0
54	Glab Engineers	74	0	33	111	0	1003	0
55	Jay Industries	74	0	18	74	0	669	0
56	Robey P. Ltd.	167	0	20	446	446	0	0
57	Deepdrsha Meseer	74	149	111	111	0	1003	0
58	Sent Jorge Industries	297	74	74	74	892	0	0
59	Nsg Industries	446	89	111	892	0	892	0
60	Applied Power Industries	167	16	74	446	0	669	334
61	Sai Electric Company	93	0	19	19	186	0	0
62	S S Technoservises P. Ltd.	74	0	372	0	93	186	0

63	Electronica Automation Pvt. Ltd.	93	56	93	0	279	0	0
64	Carmac Technologies Pvt. Ltd.	279	0	0	0	0	929	139
65	Teknik Plant Machinery	0	2	28	35	0	272	0
66	Olikara Enterprises	0	5	35	37	418	0	0
	Total	10833	1942	5917	10764	21161	58826	4675
	Total	12775		16680		84662		

In the manufacturing industries of J block surface area components measure to be 1) Open space = 10833 sqm. 2) Garden = 1942 sqm. 3) Parking = 5917 sqm. and 4) Road = 10764 sqm. Whereas roof covered area components measured as 1) Slab roof area = 21161 sqm. 2) Cross metal sheet roof area = 58826 sqm. and 3) Godown roof area = 4675 sqm.

Table no. 4.40 - b) Manufacturing Industries - 5) J Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Quility Engineering	1	1	17	69	0	161	0
2	Pargee Placstics Pvt. Ltd.	9	0	69	103	214	0	0
3	Patson Engineering	22	0	26	77	0	241	0
4	Siddhivinayak Agri P. Ltd.	27	0	26	335	0	482	107
5	Vee Bee Industries	4	0	4	52	0	214	0
6	A K Steel	60	0	26	52	0	482	321
7	Jriveny Industries	20	0	52	26	0	241	132
8	Shree Nivas Industries	9	0	69	69	0	428	0
9	Divin Tooling	13	8	26	77	482	0	107
10	Ulka Industries	20	0	9	21	0	241	0
11	Turakhia Metals Pvt. Ltd.	4	0	9	52	0	107	0
12	EliteK	7	6	10	9	0	214	0
13	Mova Buik Hand Ltd.	27	5	26	17	0	161	0
14	Jyoti	13	2	10	155	161	161	0
15	A B Engineers	33	0	34	34	0	241	321

16	Kualits Engineers	20	4	52	34	0	321	0
17	G M Tools	20	6	26	26	0	321	0
18	Visitor Parve	7	0	17	52	0	268	0
19	Fine Sheet Metal Works	4	0	60	26	0	401	0
20	Revin Industries	4	0	52	69	0	892	0
21	Omkara	18	2	39	69	214	0	0
22	Google Engineering	40	6	52	3	214	214	0
23	M J Engineering	27	4	172	26	0	1070	54
24	Yogi Engineering Ltd.	9	8	17	34	0	321	0
25	S S Engineering	13	0	69	26	0	713	0
26	Shrimahavir P. Ltd.	9	15	52	34	375	0	0
27	Cut Art Fabrication	13	0	34	34	0	321	321
28	Ghalsasi Works P. Ltd.	27	3	26	34	0	321	0
29	Parth Enterprises	20	6	26	34	0	348	0
30	Target Engineers	9	0	26	13	0	161	0
31	Jayashree p. Ltd.	7	0	13	13	0	161	80
32	Royal Fabricators	7	0	9	52	0	214	0
33	Sayaji Entrprises	0	19	116	232	321	482	0
34	Jeena Enterprises	60	19	26	43	482	321	0
35	Devdatta Industries	60	11	34	39	482	321	0
36	Najan Electronic	60	6	21	193	482	241	89
37	Autotrans Systems	0	2	38	21	0	2458	47
38	Saiprit Enterprises	1	3	30	16	0	4058	17
39	Auto Partas	0	0	13	48	0	1288	39
40	Auto Parts Engineers	0	0	60	34	0	2536	0
41	Evole Technologies And Services Pvt. Ltd.	0	8	23	13	4766	0	268
42	Mehata Presing	10	0	38	16	0	1115	40
43	Ram Entrerprises	27	7	34	52	0	321	36
44	Jabbal Aut	5	2	31	13	214	428	0
45	D M Engineering	27	2	34	9	0	321	0
46	Shakti Electronic	80	0	34	412	0	428	0
47	Varun Enterprises	54	1	34	309	0	482	0
48	Laxmi Engineering	54	0	7	10	0	214	11
49	Savan Tools P.Ltd.	27	0	103	34	0	321	27
50	S S Technoservises P. Ltd.	9	3	39	137	214	0	0
51	Jectram Pvt. Ltd.	2	1	52	39	0	357	0
52	Onkar Dies P. Ltd.	54	1	52	309	0	428	0

53	Ganga Ato-M P. Ltd.	27	0	309	232	428	0	0
54	Glab Engineers	9	0	15	52	0	482	0
55	Jay Industries	9	0	8	34	0	321	0
56	Robey P. Ltd.	20	0	9	206	214	0	0
57	Deepdrsha Meseer	9	15	52	52	0	482	0
58	Sent Jorge Industries	36	8	34	34	428	0	0
59	Nsg Industries	54	9	52	412	0	428	0
60	Applied Power Industries	20	2	34	206	0	321	161
61	Sai Electric Company	11	0	9	9	89	0	0
62	S S Technoservises P. Ltd.	9	0	172	0	45	89	0
63	Electronica Automation Pvt. Ltd.	11	6	43	0	134	0	0
64	Carmac Technologies Pvt. Ltd.	33	0	0	0	0	446	67
65	Teknik Plant Machinery	0	0	13	16	0	130	0
66	Olikara Enterprises	0	0	16	17	201	0	0
	Total	1300	198	2733	4973	10157	28237	2244
	Total	1498		7706		40638		

Above Table no. 4.40 gives detail about the rainwater harvesting potential of surface area and roof areas of 66 industrial units in the J block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 66 industrial units open space and gardens occupies the total area of 12775 sqm. and it provides the opportunity to get 1498 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 16680 sqm surface area and it provides the opportunity to get 7706 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 66 industrial units maximum area occupies on roof area which is 84662 sqm areas and it's provide the opportunity to get 40638 cum. of water harvesting potential.

Table no. 4.41 - b) Manufacturing Industries 5) J block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Quility Engineering	438	161	37	277	63
2	Pargee Placstics Pvt. Ltd.	256	214	84	41	16
3	Patson Engineering	256	241	94	15	6
4	Siddhivinayak Agri P. Ltd.	730	589	81	141	19
5	Vee Bee Industries	256	214	84	41	16
6	A K Steel	548	803	147	255	47
7	Jriveny Industries	146	373	256	227	156
8	Shree Nivas Industries	110	428	391	319	291
9	Divin Tooling	256	589	230	333	130
10	Ulka Industries	256	241	94	15	6
11	Turakhia Metals Pvt. Ltd.	146	107	73	39	27
12	EliteK	475	214	45	260	55
13	Mova Buik Hand Ltd.	548	161	29	387	71
14	Jyoti	548	321	59	226	41
15	A B Engineers	256	562	220	306	120
16	Kualits Engineers	621	321	52	299	48
17	G M Tools	621	321	52	299	48
18	Visitor Parve	256	268	105	12	5
19	Fine Sheet Metal Works	256	401	157	146	57
20	Revin Industries	256	892	349	636	249
21	Omkara	621	214	34	406	66
22	Google Engineering	329	428	130	100	30
23	M J Engineering	438	1124	257	686	157
24	Yogi Engineering Ltd.	329	321	98	7	2
25	S S Engineering	110	713	652	604	552
26	Shrimahavir P. Ltd.	256	375	147	119	47
27	Cut Art Fabrication	256	642	251	387	151
28	Ghalsasi Works P. Ltd.	438	321	73	117	27
29	Parth Enterprises	183	348	191	165	91
30	Target Engineers	146	161	110	15	10

31	Jayashree p. Ltd.	219	241	110	22	10
32	Royal Fabricators	146	214	147	68	47
33	Sayaji Entrprises	438	803	183	365	83
34	Jeena Enterprises	621	803	129	182	29
35	Devdatta Industries	621	803	129	182	29
36	Najan Electronic	438	812	185	374	85
37	Autotrans Systems	365	2505	686	2140	586
38	Saiprit Enterprises	365	4075	1116	3710	1016
39	Auto Partas	365	1327	363	962	263
40	Auto Parts Engineers	365	2536	695	2171	595
41	Evole Technologies And Services Pvt. Ltd.	913	5033	552	4121	452
42	Mehata Presing	365	1155	316	790	216
43	Ram Entrerprises	584	357	61	227	39
44	Jabbal Aut	584	642	110	58	10
45	D M Engineering	402	321	80	80	20
46	Shakti Electronic	146	428	293	282	193
47	Varun Enterprises	292	482	165	190	65
48	Laxmi Engineering	256	225	88	30	12
49	Savan Tools P.Ltd.	256	348	136	92	36
50	S S Technoservises P. Ltd.	183	214	117	32	17
51	Jectram Pvt. Ltd.	256	357	140	101	40
52	Onkar Dies P. Ltd.	402	428	107	27	7
53	Ganga Ato-M P. Ltd.	365	428	117	63	17
54	Glab Engineers	183	482	264	299	164
55	Jay Industries	183	321	176	139	76
56	Robey P. Ltd.	548	214	39	333	61
57	Deepdrsha Meseer	183	482	264	299	164
58	Sent Jorge Industries	292	428	147	136	47
59	Nsg Industries	329	428	130	100	30
60	Applied Power Industries	548	482	88	66	12
61	Sai Electric Company	548	89	16	458	84
62	S S Technoservises P. Ltd.	256	134	52	122	48
63	Electronica Automation Pvt. Ltd.	548	134	24	414	76
64	Carmac Technologies Pvt. Ltd.	730	513	70	217	30
65	Teknik Plant Machinery	365	130	36	235	64
66	Olikara Enterprises	402	201	50	201	50
67	Total in cum.	24382	40638	167	16256	67

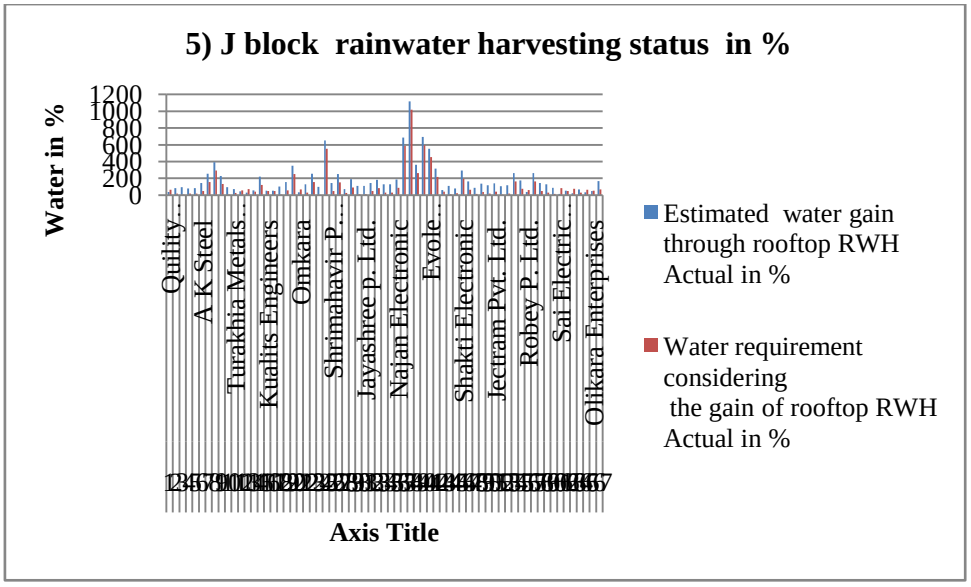

Figure no. 4.13

Above table no. 4.41 and graph no. 4.13 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of J block.

For all these 66 industrial units total annual water requirement from outside sources is 24382 cum. and estimated water gain through rooftop rainwater harvesting is 40638 cum which is 167 % therefore water requirement considering the gain of rooftop rainwater harvesting is 16256 which is 67 %

In this block observed 67 % excess availability of rooftop rainwater.

Table no. 4.42 - b) Manufacturing Industries - 6) H Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Avmato Compresr	111	19	56	56	502	483	139
2	Starling	56	19	56	149	0	502	0
3	New Generation Tools	111	56	74	19	669	0	0
4	Flcab Condactors	111	56	56	56	334	0	0
5	Four M Technologies	186	19	56	111	50	0	0

						2		
6	Universal Engineers	167	0	56	56	669	0	0
7	G K Cumstr	111	37	56	74	223	0	0
8	Abhinav Enterprises	111	19	28	111	780	0	0
9	J K Udyog	65	46	28	28	0	232	46
10	Shree Electronics	19	46	0	19	0	325	93
11	Bharat Fritz Werher Ltd	46	46	46	46	232	0	46
12	Keje Electric Company	0	28	5	35	0	232	0
13	Shingania Services	0	14	5	5	93	0	0
14	Vishnu Enterprises	0	0	14	28	0	1115	0
15	Excel Enlosure	0	0	23	42	0	743	0
16	Mesm Li B Technorial	0	2	2	14	0	139	0
17	Sparkonix India Pvt. Ltd.	81	14	0	14	520	0	0
18	Jekuma Tools And Gavges Pvt. Ltd.	46	46	0	28	279	0	93
19	Quaility Engineers	37	11	19	56	334	0	0
20	K D Joshi	111	19	37	56	0	334	0
21	Sparko Imax	74	16	56	56	297	0	0
22	Rohit Engineers	56	16	45	56	446	0	0
23	Archana Industries	0	0	0	0	232	0	0
24	Ashutor Enterprises Pvt. Ltd.	0	0	5	28	0	260	0
	Total	1503	528	720	1140	6113	4366	418
	Total	2030		1861		10898		

In the manufacturing industries of H block surface area components measure to be 1) Open space = 1503 sqm. 2) Garden = 528 sqm. 3) Parking = 720 sqm. and 4) Road = 1140 sqm. Whereas roof covered area components measured as 1) Slab roof area = 6113 sqm. 2) Cross metal sheet roof area = 4366 sqm. and 3) Godown roof area = 418 sqm.

Table no. 4.43 - b) Manufacturing Industries - 6) H Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Avmato Compresr	13	2	26	26	241	232	67
2	Starling	7	2	26	69	0	241	0
3	New Generation Tools	13	6	34	9	321	0	0
4	Flcab Condactors	13	6	26	26	161	0	0
5	Four M Technologies	22	2	26	52	241	0	0
6	Universal Engineers	20	0	26	26	321	0	0
7	G K Cumstr	13	4	26	34	107	0	0
8	Abhinav Enterprises	13	2	13	52	375	0	0
9	J K Udyog	8	5	13	13	0	111	22
10	Shree Electronics	2	5	0	9	0	156	45
11	Bharat Fritz Werher Ltd	6	5	21	21	111	0	22
12	Keje Electric Company	0	3	2	16	0	111	0
13	Shingania Services	0	1	2	2	45	0	0
14	Vishnu Enterprises	0	0	6	13	0	535	0
15	Excel Enlosure	0	0	11	19	0	357	0
16	Mesm Li B Technorial	0	0	1	6	0	67	0
17	Sparkonix India Pvt. Ltd.	10	1	0	6	250	0	0
18	Jekuma Tools And Gavges Pvt. Ltd.	6	5	0	13	134	0	45
19	Quaility Engineers	4	1	9	26	161	0	0
20	K D Joshi	13	2	17	26	0	161	0
21	Sparko Imax	9	2	26	26	143	0	0
22	Rohit Engineers	7	2	21	26	214	0	0
23	Archana Industries	0	0	0	0	111	0	0

24	Ashutor Enterprises Pvt. Ltd.	0	0	2	13	0	125	0
	Total	180	54	333	527	2934	2096	201
	Total	234		860		5231		

Above Table no. 4.43 gives detail about the rainwater harvesting potential of surface area and roof areas of 24 industrial units in the H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 24 industrial units open space and gardens occupies the total area of 2030 sqm. and it provides the opportunity to get 234 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1861 sqm surface area and it provides the opportunity to get 860 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 24 industrial units maximum area occupies on roof area which is 10898 sqm areas and it's provide the opportunity to get 5231 cum. of water harvesting potential.

Table no. 4.44 - b) Manufacturing Industries 6) H block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Avmato Compresr	1095	540	49	555	51
2	Starling	1095	241	22	854	78
3	New Generation Tools	1095	321	29	774	71
4	Flcab Condactors	1278	161	13	1117	87
5	Four M Technologies	1278	241	19	1037	81
6	Universal Engineers	1095	321	29	774	71
7	G K Cumstr	986	107	11	878	89

8	Abhinav Enterprises	548	375	68	173	32
9	J K Udyog	1278	134	10	1144	90
10	Shree Electronics	1278	201	16	1077	84
11	Bharat Fritz Werher Ltd	1460	134	9	1326	91
12	Keje Electric Company	1278	111	9	1166	91
13	Shingania Services	1278	45	3	1233	97
14	Vishnu Enterprises	803	535	67	268	33
15	Excel Enlosure	1095	357	33	738	67
16	Mesm Li B Technorial	1278	67	5	1211	95
17	Sparkonix India Pvt. Ltd.	1095	250	23	845	77
18	Jekuma Tools And Gavges Pvt. Ltd.	1460	178	12	1282	88
19	Quaility Engineers	730	161	22	569	78
20	K D Joshi	730	161	22	569	78
21	Sparko Imax	1278	143	11	1135	89
22	Rohit Engineers	2920	214	7	2706	93
23	Archana Industries	365	111	31	254	69
24	Ashutor Enterprises Pvt. Ltd.	1095	125	11	970	89
25	Total in cum.	27886	5231	19	22655	81

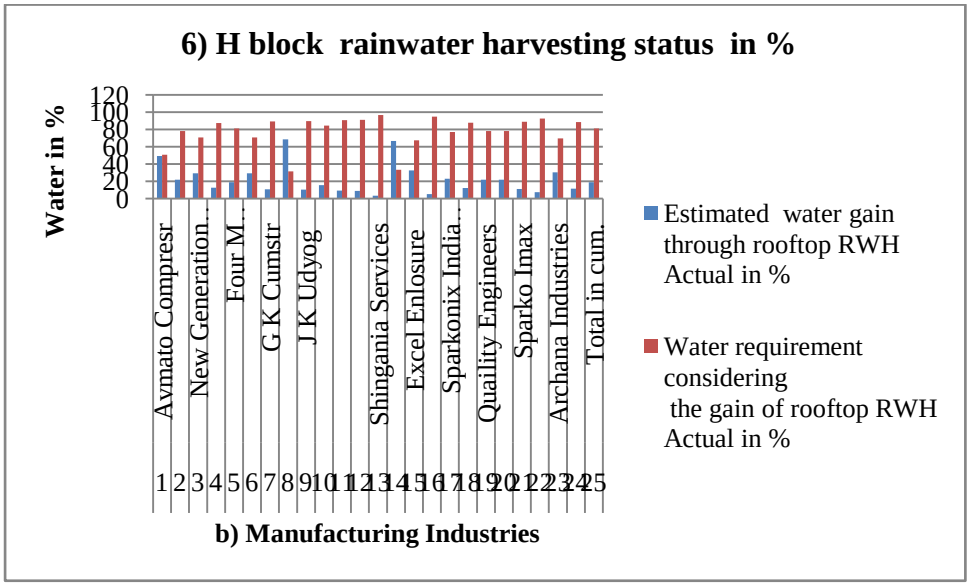

Figure no. 4.14

Above table no. 4.44 and graph no. 4.14 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of H block.

For all these 24 industrial units total annual water requirement from outside sources is 27886 cum. and estimated water gain through rooftop rainwater harvesting is 5231 cum which is 19 % therefore water requirement considering the gain of rooftop rainwater harvesting is 26655 which is 81 %

Table no. 4.45 - b) Manufacturing Industries - 7) S Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Super Precirian	0	2	2	35	232	0	0
2	Anand Industries	0	1	35	0	186	0	0
3	Mane Industries	0	0	5	19	0	93	0
4	Mahiya Enterprises	0	7	28	46	0	139	0
5	Surya Company	0	0	28	0	0	465	0
6	Envar Electronidyne Ltd.	93	93	93	93	325	0	0
7	Sound Ancillary Industries	139	93	0	84	0	232	0
8	Magicl Fusion Technologies Pvt. Ltd.	0	0	0	0	372	186	0
9	H C And Company	46	0	0	0	372	0	93
10	AK Auto Electric Systems IndiaPvt. Ltd	139	74	93	46	325	0	186
11	Electro Tools	0	186	93	0	0	279	0
12	Quility Industries	390	325	279	780	780	186	0
13	Sanjay T A Pvt. Ltd	139	20	74	223	669	0	0
14	Fitwel Gaskit Company	251	279	297	948	1003	0	0
15	Shitole Enterprises	279	93	74	167	0	446	0
16	Cotmack Electronics	167	297	279	37	669	0	0
17	Mega Fabric	446	22	251	186	0	669	0
18	Eficiency Engineering	279	74	111	186	0	948	0
19	Emersan Process	446	0	186	93	1171	0	0
20	Poonam Design	446	56	334	32	0	669	0

					5			
21	G B Rubber Product	260	0	167	390	892	0	186
22	Park Palastimart Pvt. Ltd.	325	111	223	0	279	780	0
23	Maruti Globle Industries	186	93	167	223	1003	0	0
24	Trinity Services	0	0	35	21	0	892	0
25	Uniq Engineers	167	0	56	139	0	892	0
26	San	186	0	260	74	0	892	56
27	Max Engineers	223	0	56	139	0	1003	418
28	Serview Enterprises	223	74	139	19	0	836	0
29	Shree Enterprises	0	56	111	74	0	390	0
30	Mehul Enterprises	502	28	56	56	0	669	0
31	Warwing Enterprises	56	56	139	139	0	446	279
32	J J Enterprises	186	93	232	167	502	557	0
33	Evoleve IX	390	111	19	186	1421	0	0
34	S E Enterprises	0	0	46	139	223	223	0
35	Varada Enterprises	0	0	35	14	0	892	0
	Total	5964	2245	4004	5049	10424	12783	1217
	Total	8209		9053		24424		

In the manufacturing industries of S block surface area components measure to be 1) Open space = 5964 sqm. 2) Garden = 2245 sqm. 3) Parking = 4004 sqm. and 4) Road = 5049 sqm. Whereas roof covered area components measured as 1) Slab roof area = 10424 sqm. 2) Cross metal sheet roof area = 12783 sqm. and 3) Godown roof area = 1217 sqm.

Table no. 4.46 - b) Manufacturing Industries - 7) S Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown

1	Super Precirian	0	0	1	16	111	0	0
2	Anand Industries	0	0	16	0	89	0	0
3	Mane Industries	0	0	2	9	0	45	0
4	Mahiya Enterprises	0	1	13	21	0	67	0
5	Surya Company	0	0	13	0	0	223	0
6	Envar Electronidyne Ltd.	11	9	43	43	156	0	0
7	Sound Ancillary Industries	17	9	0	39	0	111	0
8	Magicl Fusion Technologies Pvt. Ltd.	0	0	0	0	178	89	0
9	H C And Company	6	0	0	0	178	0	45
10	AK Auto Electric Systems IndiaPvt. Ltd	17	8	43	21	156	0	89
11	Electro Tools	0	19	43	0	0	134	0
12	Quility Industries	47	33	129	361	375	89	0
13	Sanjay T A Pvt. Ltd	17	2	34	103	321	0	0
14	Fitwel Gaskit Company	30	28	137	438	482	0	0
15	Shitole Enterprises	33	9	34	77	0	214	0
16	Cotmack Electronics	20	30	129	17	321	0	0
17	Mega Fabric	54	2	116	86	0	321	0
18	Eficiency Engineering	33	8	52	86	0	455	0
19	Emersan Process	54	0	86	43	562	0	0
20	Poonam Design	54	6	155	150	0	321	0
21	G B Rubber Product	31	0	77	180	428	0	89
22	Park Palastimart Pvt. Ltd.	39	11	103	0	134	375	0
23	Maruti Globle Industries	22	9	77	103	482	0	0
24	Trinity Services	0	0	16	10	0	428	0
25	Uniq Engineers	20	0	26	64	0	428	0
26	San	22	0	120	34	0	428	27
27	Max Engineers	27	0	26	64	0	482	201
28	Serview Enterprises	27	8	64	9	0	401	0
29	Shree Enterprises	0	6	52	34	0	187	0
30	Mehul Enterprises	60	3	26	26	0	321	0
31	Warwing Enterprises	7	6	64	64	0	214	134
32	J J Enterprises	22	9	107	77	24	268	0

						1		
33	Evoleve IX	47	11	9	86	682	0	0
34	S E Enterprises	0	0	21	64	107	107	0
35	Varada Enterprises	0	0	16	6	0	428	0
	Total	716	229	1850	2333	5003	6136	584
	Total	945		4183		11724		

Above Table no. 4.46 gives detail about the rainwater harvesting potential of surface area and roof areas of 35 industrial units in the H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 35 industrial units open space and gardens occupies the total area of 8209 sqm. and it provides the opportunity to get 945 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 9053 sqm surface area and it provides the opportunity to get 4183 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 35 industrial units maximum area occupies on roof area which is 24424 sqm areas and it's provide the opportunity to get 11724 cum. of water harvesting potential.

Table no. 4.47 - b) Manufacturing Industries 7) S block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Super Precirian	1424	111	8	1312	92
2	Anand Industries	1168	89	8	1079	92
3	Mane Industries	730	45	6	685	94

4	Mahiya Enterprises	913	67	7	846	93
5	Surya Company	1460	223	15	1237	85
6	Envar Electronidyne Ltd.	2190	156	7	2034	93
7	Sound Ancillary Industries	1643	111	7	1531	93
8	Magicl Fusion Technologies Pvt. Ltd.	1825	268	15	1557	85
9	H C And Company	548	223	41	325	59
10	AK Auto Electric Systems IndiaPvt. Ltd	1460	245	17	1215	83
11	Electro Tools	1460	134	9	1326	91
12	Quility Industries	730	464	64	266	36
13	Sanjay T A Pvt. Ltd	730	321	44	409	56
14	Fitwel Gaskit Company	2920	482	16	2438	84
15	Shitole Enterprises	730	214	29	516	71
16	Cotmack Electronics	1278	321	25	956	75
17	Mega Fabric	1862	321	17	1540	83
18	Eficiency Engineering	2190	455	21	1735	79
19	Emersan Process	1825	562	31	1263	69
20	Poonam Design	730	321	44	409	56
21	G B Rubber Product	1095	517	47	578	53
22	Park Palastimart Pvt. Ltd.	1460	508	35	952	65
23	Maruti Globle Industries	1278	482	38	796	62
24	Trinity Services	548	428	78	119	22
25	Uniq Engineers	548	428	78	119	22
26	San	365	455	125	90	25
27	Max Engineers	1095	682	62	413	38
28	Serview Enterprises	1460	401	27	1059	73
29	Shree Enterprises	548	187	34	360	66
30	Mehul Enterprises	1278	321	25	956	75
31	Warwing Enterprises	1095	348	32	747	68
32	J J Enterprises	1095	508	46	587	54
33	Evoleve IX	2190	682	31	1508	69
34	S E Enterprises	548	214	39	333	61
35	Varada Enterprises	548	428	78	119	22
36	Total in cum.	42961	11724	27	31237	73

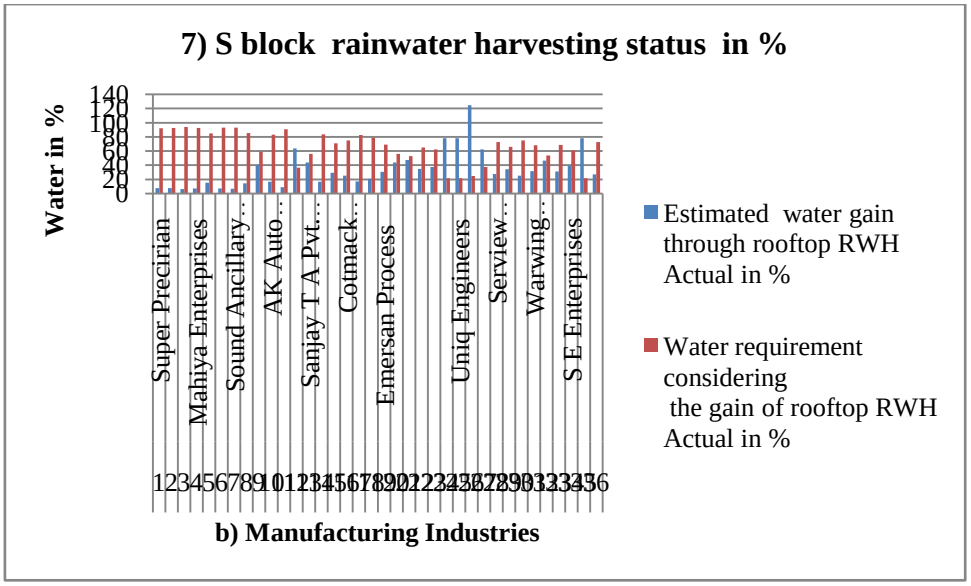

Figure no. 4.15

Above table no. 4.47 and graph no. 4.15 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of S block.

For all these 35 industrial units total annual water requirement from outside sources is 42961 cum. and estimated water gain through rooftop rainwater harvesting is 11724 cum which is 27 % therefore water requirement considering the gain of rooftop rainwater harvesting is 31237 which is 73 %

Table no. 4.48 - b) Manufacturing Industries - 8) Electronics Zone Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Jayashree Electron	186	186	93	93	372	0	0
2	Power Formers Eng.	186	186	186	93	186	186	0
3	Tri-o Enterprises	279	0	93	0	0	186	0
4	Savm Electronics P. Ltd	0	186	93	0	372	0	0
5	Asain Power system P. Ltd	186	0	93	0	372	279	0
6	Svs Industries	0	0	0	0	0	279	0
7	Mithsagar Electronic P. Ltd	93	0	0	0	372	186	0
8	Power Win House	186	186	0	0	372	0	0
9	Jayashree Electricle P. Ltd	93	93	0	0	372	0	0
10	Frontline	93	93	0	0	37	0	0

	Electronics					2		
11	Mitoubhi Electricle	111	93	111	186	669	0	0
12	Cpgemini	19	74	19	46	223	0	0
13	Shree Industries	279	372	669	334	1338	0	0
14	Scope T and M Ltd	780	892	669	84	4181	780	418
15	Fablectiani Engineers	167	0	93	186	0	502	0
16	Try Engineers	279	93	0	0	0	1115	279
17	Sru Tech Engineering	111	0	279	0	502	139	446
	Total	3047	2453	2397	1022	9699	3651	1143
	Total	5500		3419		14493		

In the manufacturing industries of Electronics Zone surface area components measure to be 1) Open space = 3047 sqm. 2) Garden = 2453 sqm. 3) Parking = 2397 sqm. and 4) Road = 1022 sqm. Whereas roof covered area components measured as 1) Slab roof area = 9699 sqm. 2) Cross metal sheet roof area = 3651 sqm. and 3) Godown roof area = 1143 sqm.

Table no. 4.49 - b) Manufacturing Industries - 8) Electronics Zone - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Jayashree Electron	36	30	56	56	214	0	0
2	Power Formers Eng.	36	30	113	56	107	107	0
3	Tri-o Enterprises	54	0	56	0	0	107	0
4	Savm Electronics P. Ltd	0	30	56	0	214	0	0
5	Asain Power system P. Ltd	36	0	56	0	214	161	0
6	Svs Industries	0	0	0	0	0	161	0
7	Mithsagar	18	0	0	0	21	107	0

	Electronic P. Ltd					4		
8	Power Win House	36	30	0	0	214	0	0
9	Jayashree Electricle P. Ltd	18	15	0	0	214	0	0
10	Frontline Electronics	18	15	0	0	214	0	0
11	Mitoubhi Electricle	21	15	68	113	385	0	0
12	Cpgemini	4	12	11	28	128	0	0
13	Shree Industries	54	59	407	203	771	0	0
14	Scope T and M Ltd	150	143	407	51	2408	450	241
15	Fablectiani Engineers	32	0	56	113	0	289	0
16	Try Engineers	54	15	0	0	0	642	161
17	Sru Tech Engineering	21	0	169	0	289	80	257
	Total	585	392	1457	621	5587	2103	658
	Total	977		2079		8348		

Above Table no. 49 gives detail about the rainwater harvesting potential of surface area and roof areas of 17 industrial units in the Electronics Zone block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 17 industrial units open space and gardens occupies the total area of 5500 sqm. and it provides the opportunity to get 977 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 3419 sqm surface area and it provides the opportunity to get 2079 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 17 industrial units maximum area occupies on roof area which is 14493 sqm areas and it's provide the opportunity to get 8348 cum. of water harvesting potential.

Table no. 4.50 - b) Manufacturing Industries 8) Electronics Zone block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Jayashree Electron	1825	214	12	1611	88
2	Power Formers Eng.	1095	214	20	881	80
3	Tri-o Enterprises	548	107	20	440	80
4	Savm Electronics P. Ltd	913	214	23	698	77
5	Asain Power system P. Ltd	730	375	51	355	49
6	Svs Industries	548	161	29	387	71
7	Mithsagar Electronic P. Ltd	730	321	44	409	56
8	Power Win House	913	214	23	698	77
9	Jayashree Electricle P. Ltd	1460	214	15	1246	85
10	Frontline Electronics	1460	214	15	1246	85
11	Mitoubhi Electricle	548	385	70	162	30
12	Cpgemini	730	128	18	602	82
13	Shree Industries	730	771	106	41	6
14	Scope T and M Ltd	1643	2858	174	1215	74
15	Fablectiani Engineers	256	289	113	33	13
16	Try Engineers	913	642	70	270	30
17	Sru Tech Engineering	256	369	145	114	45
18	Total in cum.	15038	7320	49	7718	51

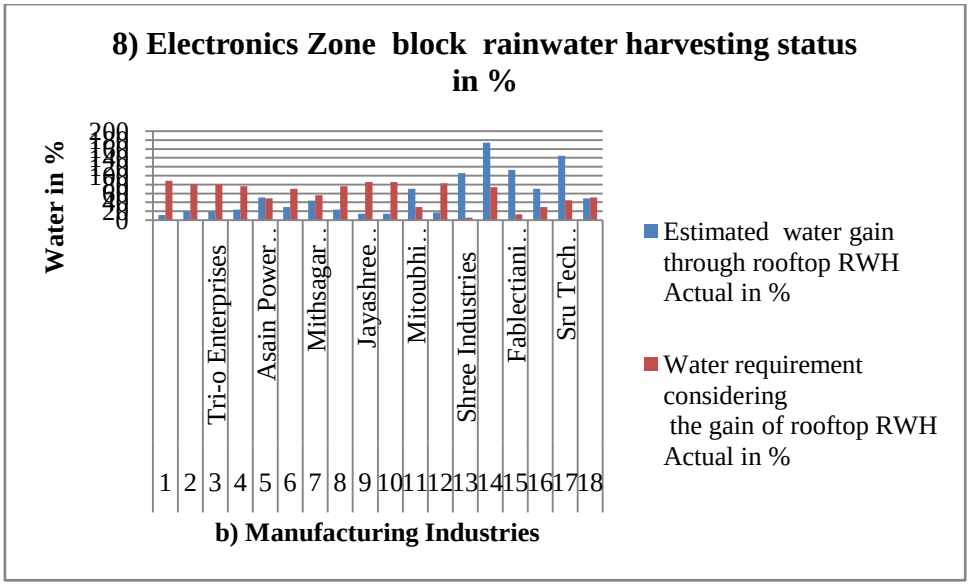

Figure no. 4.16

Above table no. 4.50 and graph no. 4.16 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of Electronics Zone.

For all these 17 industrial units total annual water requirement from outside sources is 15038 cum. and estimated water gain through rooftop rainwater harvesting is 7320 cum which is 49 % therefore water requirement considering the gain of rooftop rainwater harvesting is 7718 which is 51 %

c) Packing Industries:

Table no. 4.51 - c) Packing Industries - 1) Bhosari Genral Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Spiro Pack Pvt. Ltd.	0	22	297	669	892	0	497
2	Umiya Pckers Pvt. Ltd.	0	0	0	0	0	372	248
3	Jyoti Packing	0	2	70	98	0	1338	895
4	B R Packing	0	2	5	2	0	446	297
5	Jay Enterprises	93	0	0	0	186	0	74
	Total	93	27	372	769	1078	2155	2010
	Total	120		1140		5243		

In the packing industries of Bhosari general block surface area components measure to be 1) Open space = 93 sqm. 2) Garden = 27 sqm. 3) Parking = 372 sqm. and 4) Road = 769 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1078 sqm. 2) Cross metal sheet roof area = 2155 sqm. and 3) Godown roof area = 2010 sqm.

Table no. 4.52 - c) Packing Industries - 1) Bhosari General Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Spiro Pack Pvt. Ltd.	0	2	137	309	428	0	0
2	Umiya Pckers Pvt. Ltd.	0	0	0	0	0	178	18
3	Jyoti Packing	0	0	32	45	0	642	0
4	B R Packing	0	0	2	1	0	214	0
5	Jay Enterprises	11	0	0	0	89	0	0
	Total	11	3	172	355	517	1035	18
	Total	14		527		1570		

Above Table no. 4.52 gives detail about the rainwater harvesting potential of surface area and roof areas of 5 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 5 industrial units open space and gardens occupies the total area of 120 sqm. and it provides the opportunity to get 14 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1140 sqm surface area and it provides the opportunity to get 527 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 5 industrial units maximum area occupies on roof area which is

5243 sqm areas and it's provide the opportunity to get 1579 cum. of water harvesting potential.

Table no. 4.53 - C) Packing Industries 1) Bhosari General block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Spiro Pack Pvt. Ltd.	730	428	59	302	41
2	Umiya Pckers Pvt. Ltd.	730	196	27	534	73
3	Jyoti Packing	803	642	80	161	20
4	B R Packing	730	214	29	516	71
5	Jay Enterprises	548	89	16	458	84
6	Total in cum.	3541	1570	44	1971	56

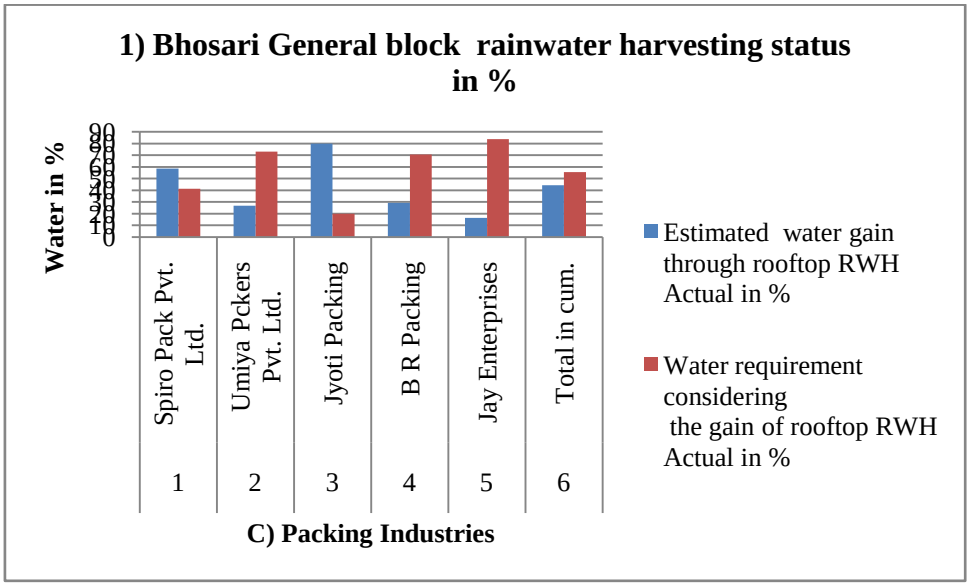

Figure no. 4.17

Above table no. 4.53 and graph no. 4.17 gives detail about the rooftop rainwater harvesting status in the packing industries of Bhosari general block.

For all these 5 industrial units total annual water requirement from outside sources is 3541 cum. and estimated water gain through rooftop rainwater harvesting is 1570 cum which is 44 % therefore water requirement considering the gain of rooftop rainwater harvesting is 1971 which is 56 %

Tabe no. 4.54 c) Packing Industries - 2) D - I Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Enterprise	19	0	46	0	0	232	93
2	Surekha Packers	0	19	70	0	297	0	0
3	Abros Enterprises	0	0	37	3	0	502	130
	Total	19	19	153	3	297	734	223
	Total	38		156		1254		

In the packing industries of D-I block surface area components measure to be 1) Open space = 19 sqm. 2) Garden = 19 sqm. 3) Parking = 153 sqm. and 4) Road = 3 sqm. Whereas roof covered area components measured as 1) Slab roof area = 297 sqm. 2) Cross metal sheet roof area = 734 sqm. and 3) Godown roof area = 223 sqm.

Table no. 4.55 - c) Packing Industries - 2) D -I Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
1	Enterprise	2	0	21	0	0	111	45
2	Surekha Packers	0	2	32	0	143	0	0
3	Abros Enterprises	0	0	17	1	0	241	62
	Total	2	2	71	1	143	352	107
	Total	4		72		602		

Above Table no. 4.55 gives detail about the rainwater harvesting potential of surface area and roof areas of 3 industrial units in the D-I block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 3 industrial units open space and gardens occupies the total area of 38 sqm. and it provides the opportunity to get 4 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 156 sqm surface area and it provides the opportunity to get 72 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 3 industrial units maximum area occupies on roof area which is 1254 sqm areas and it's provide the opportunity to get 602 cum. of water harvesting potential.

Table no. 4.56 - C) Packing Industries 2) D - I block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Enterprise	256	156	61	99	39
2	Surekha Packers	730	143	20	587	80
3	Abros Enterprises	548	303	55	244	45
4	Total in cum.	1533	602	39	931	61

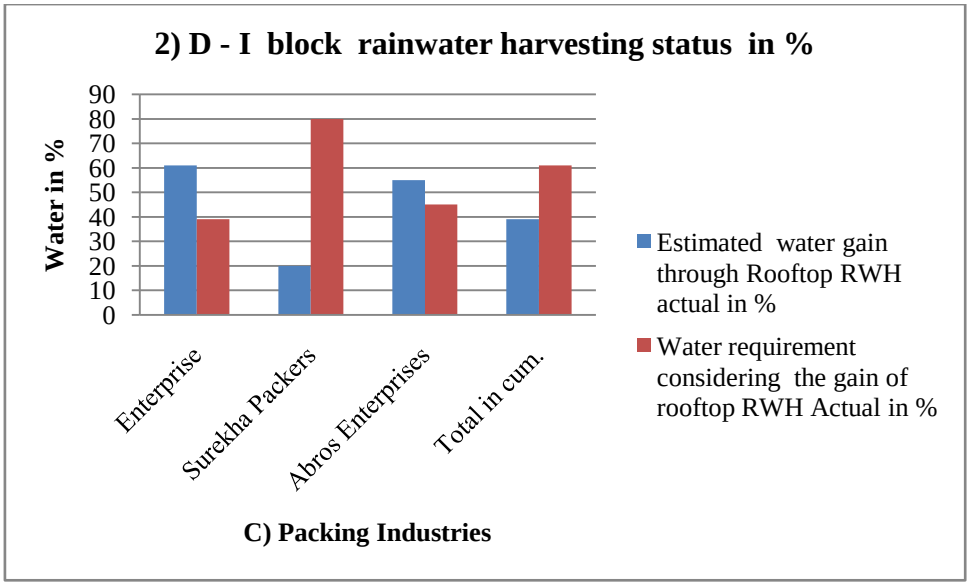

Figure no. 4.18

Above table no. 4.56 and graph no. 4.18 gives detail about the rooftop rainwater harvesting status in the packing industries of D -I block.

For all these 3 industrial units total annual water requirement from outside sources is 1533 cum. and estimated water gain through rooftop rainwater harvesting is 602 cum which is 39 % therefore water requirement considering the gain of rooftop rainwater harvesting is 931 which is 61 %

Table no. 4.57 - c) Packing Industries - Surface And Roof Area In Sqm.

Block	Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
			Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
D - III Block	1	Balaji Packing Industries	0	19	81	14	0	418	0
J Block	1	Jyoti Polypack	223	21	84	111	0	669	0
H Block	1	Sunil Packers	56	27	16	111	0	669	56

In the Packing industries of D –III, J Block and H block surface area components measure to be 1) Open space = 0, 223,56 sqm. respectviely 2) Garden = 19, 21, 27 sqm. respectviely 3) Parking = 81, 84, 16 sqm. respectviely and 4) Road = 0 ,0,0 sqm. respectively. Whereas roof covered area components measured as 1) Slab

roof area = 0sqm. respectviely 2) Cross metal sheet roof area = 418, 669, 669 sqm. respectviely and 3) Godown roof area = 0, 0, 56 sqm. respectively.

Table no. 4.58 - c) Packing Industries - Rainwater Harvesting Potential									
Block	Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
			Open Space	Garden	Parking	Road	Slab	Cross Metal Sheet	Godown
D - III Block	1	Balaji Packing Industries	0	2	38	6	0	201	0
J Block	1	Jyoti Polypack	27	2	39	52	0	321	0
H Block	1	Sunil Packers	7	3	7	52	0	321	27

Above Table no. 4.58 gives detail about the rainwater harvesting potential of surface area and roof areas of industrial units in the D –III, J block and H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these industrial units open space and gardens occupies the total area of 19, 244, 82 sqm. respectviely and it provides the opportunity to get 2, 29, 10 cum. respectviely of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 95, 195, 127 sqm. respectviely surface area and it provides the opportunity to get 44, 90, 59 respectviely cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this industrial units maximum area occupies on roof area which is 418, 669, 725 sqm respectviely areas and it's provide the opportunity to get 201, 321, 348 cum. respectviely of water harvesting potential.

Table no. 4.59 - C) Packing Industries 3) Block rainwater harvesting status in cum.							
Block	Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through rooftop RWH		Water requirement considering the gain of rooftop RWH	
				Actual in cum.	Actual in %	Actual in cum.	Actual in %
D - III Block	1	Balaji Packing Industries	1278	201	16	1077	84
J Block	2	Jyoti Polypack	365	321	88	44	12
H Block	3	Sunil Packers	1095	348	32	747	68

Above table no. 4.59 gives detail about the rooftop rainwater harvesting status in the packing industries of D-III, J and H block.

For all these industrial units total annual water requirement from outside sources is 1278, 365 and 1095 cum. respectively and estimated water gain through rooftop rainwater harvesting is 201, 321 and 348 cum which is 16, 88 and 32 % respectively therefore water requirement considering the gain of rooftop rainwater harvesting is 1077, 44 and 68 which is 84, 12 and 68 % respectively.

B) Water use in industrial process:

a) Manufacturing industries:

Table no. 4.60 - a) Manufacturing industries. -1) Bhosari Genral Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	God own
1	Sedmack	1041	0	892	892	2007	0	0
2	Satandred Profile Pissine	0	74	74	37	0	892	0
3	Pareect C P Ltd.	111	0	74	11	66	0	0

					1	9		
4	Manoj Industry	669	0	149	223	446	0	0
5	Nama Enterprises	446	0	74	74	446	0	0
6	E M Cure Pvt. Ltd.	149	149	223	111	149	892	0
7	Naween H P Ltd.	0	11	149	149	297	0	0
8	Rolex Engineers	20	0	74	149	0	1561	0
9	Cosmos Engineers	111	0	223	223	0	669	0
10	Anurlri Mechf P. Ltd.	37	0	74	223	0	1003	0
11	OSG India P. Ltd.	0	74	223	37	1338	0	0
12	Ucco Mechfilters Pvt. Ltd.	0	0	21	0	0	186	0
13	Apex Ecotech Pvt. Ltd.	37	0	14	65	0	232	0
14	J J Vertex	0	0	28	93	0	1301	0
15	Mechnocret Engineering Pvt.Ltd.	0	0	42	0	520	0	0
16	Anubhav Enterprises	0	0	28	70	0	465	0
17	Ashok Leyland Creative Auto Services	0	0	70	139	0	650	0
18	Transprecision Gears Pvt. Ltd.	0	0	70	21	0	520	0
19	D D Enterprises	0	0	251	0	0	279	0
20	Sathyam Fasterners Pvt. Ltd.	0	1	28	21	0	251	0
21	Sharp Engineering	0	0	14	5	0	260	0
22	Mojj Engineering Systems Ltd.	279	0	11	279	650	0	0
23	Five Spark	0	0	14	5	557	0	0
24	N. D. Gupta Enterprises	0	0	28	0	0	297	0
25	Arihant Alloys And Engineers	0	0	28	46	0	105	0
26	Indo Group	21	0	111	5	364	0	0
27	Spin India	0	19	46	0	0	186	0
28	Prma Pvt. Ltd.	111	0	0	70	1561	0	0
29	Anant Enterprises	0	223	74	35	2378	0	0
30	Sona Pvt. Ltd.	557	186	186	186	669	0	0

31	Kedar Coating And Engineering P. Ltd.	41	0	0	17	209	0	0
32	IndoSwe Engineers Pvt. Ltd.	0	21	111	0	3345	0	3345
33	Kartos Engineering & IT Solutions Pvt. Ltd.	0	70	0	446	0	4181	0
34	KTR Capling Pvt. Ltd.	167	892	297	520	1041	0	0
35	Suyog Engineers	186	0	111	0	0	351	251
36	Units Gauge and Co. Pvt . Ltd.	74	37	0	22	1041	0	0
37	Rajasthan Cromax India	46	0	0	22	8974	520	892
38	Vats	892	669	669	892	1003	0	0
39	Met Paw	279	0	93	0	0	1459	0
40	Suaan	74	0	297	372	892	0	0
41	Arjunwadkar Consolidated Engineers Pvt. Ltd.	37	0	74	14	0	743	0
42	Demech	0	186	139	0	455	650	0
43	Mikron Engineering	74	0	70	0	0	325	0
44	Auto Mile And Company	0	0	9	28	0	1394	0
45	Neuman And Esser Compressor	0	37	297	669	2230	1812	1812
46	Emulsichem Lubricants Pvt. Ltd.	186	0	111	669	0	5946	595
47	Kesh Kent Wear Pvt. Ltd.	0	21	111	669	0	966	0
48	ARM Welers P. Ltd.	0	446	111	0	0	2230	892
49	Perfect Oil Sills Acr.	186	0	93	0	186	372	186
50	Laxmi Pvt. Ltd.	0	0	0	20	0	892	446
51	CPS Pvt. Ltd.	0	0	0	223	0	669	669
52	Rajdeep Industrial Product	93	0	0	0	186	0	0
53	Unique Engineers	93	0	0	0	0	186	0
54	Pune Tectol P. Ltd.	186	93	93	0	465	0	186
	Total	6204	3208	5982	7850	32077	32442	9272
	Total	9412		13833		73791		

In the manufacturing industries of Bhosari general block surface area components measure to be 1) Open space = 6204 sqm. 2) Garden = 3208 sqm. 3) Parking = 5982 sqm. and 4) Road = 7850 sqm. Whereas roof covered area components measured as 1) Slab roof area = 32077 sqm. 2) Cross metal sheet roof area = 32442 sqm. and 3) Godown roof area = 9272 sqm.

Table no. 4.61 - a) Manufacturing industries. -1) Bhosari Genral Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Sedmack	125	0	412	412	963	0	0
2	Satandred Profile Pissine	0	8	34	17	0	428	0
3	Pareect C P Ltd.	13	0	34	52	321	0	0
4	Manoj Industry	80	0	69	103	214	0	0
5	Nama Enterprises	54	0	34	34	214	0	0
6	E M Cure Pvt. Ltd.	18	15	103	52	71	428	0
7	Naween H P Ltd.	0	1	69	69	143	0	0
8	Rolex Engineers	2	0	34	69	0	749	0
9	Cosmos Engineers	13	0	103	103	0	321	0
10	Anurlri Mechf P. Ltd.	4	0	34	103	0	482	0
11	OSG India P. Ltd.	0	8	103	17	642	0	0
12	Ucco Mechfilters Pvt. Ltd.	0	0	10	0	0	89	0
13	Apex Ecotech Pvt. Ltd.	4	0	6	30	0	111	0
14	J J Vertex	0	0	13	43	0	624	0
15	Mechnocret Engineering Pvt.Ltd.	0	0	19	0	250	0	0
16	Anubhav Enterprises	0	0	13	32	0	223	0
17	Ashok Leyland Creative Auto Services	0	0	32	64	0	312	0
18	Transprecision Gears Pvt. Ltd.	0	0	32	10	0	250	0
19	D D Enterprises	0	0	116	0	0	134	0
20	Sathyam Fasterners Pvt. Ltd.	0	0	13	10	0	120	0

21	Sharp Engineering	0	0	6	2	0	125	0
22	Mojj Engineering Systems Ltd.	33	0	5	129	312	0	0
23	Five Spark	0	0	6	2	268	0	0
24	N. D. Gupta Enterprises	0	0	13	0	0	143	0
25	Arihant Alloys And Engineers	0	0	13	21	0	50	0
26	Indo Group	3	0	52	2	175	0	0
27	Spin India	0	2	21	0	0	89	0
28	Prma Pvt. Ltd.	13	0	0	32	749	0	0
29	Anant Enterprises	0	23	34	16	1142	0	0
30	Sona Pvt. Ltd.	67	19	86	86	321	0	0
31	Kedar Coating And Engineering P. Ltd.	5	0	0	8	100	0	0
32	IndoSwe Engineers Pvt. Ltd.	0	2	52	0	1605	0	1605
33	Kartos Engineering & IT Solutions Pvt. Ltd.	0	7	0	206	0	2007	0
34	KTR Capling Pvt. Ltd.	20	91	137	240	499	0	0
35	Suyog Engineers	22	0	52	0	0	169	120
36	Units Gauge and Co. Pvt . Ltd.	9	4	0	10	499	0	0
37	Rajasthan Cromax India	6	0	0	10	4308	250	428
38	Vats	107	68	309	412	482	0	0
39	Met Paw	33	0	43	0	0	700	0
40	Suaan	9	0	137	172	428	0	0
41	Arjunwadkar Consolidated Engineers Pvt. Ltd.	4	0	34	6	0	357	0
42	Demech	0	19	64	0	219	312	0
43	Mikron Engineering	9	0	32	0	0	156	0
44	Auto Mile And Company	0	0	4	13	0	669	0
45	Neuman And Esser Compressor	0	4	137	309	1070	870	870
46	Emulsichem Lubricants Pvt. Ltd.	22	0	52	309	0	2854	285
47	Kesh Kent Wear Pvt. Ltd.	0	2	52	309	0	464	0

48	ARM Welers P. Ltd.	0	45	52	0	0	1070	428
49	Perfect Oil Sills Acr.	22	0	43	0	89	178	89
50	Laxmi Pvt. Ltd.	0	0	0	9	0	428	214
51	CPS Pvt. Ltd.	0	0	0	103	0	321	321
52	Rajdeep Industrial Product	11	0	0	0	89	0	0
53	Unique Engineers	11	0	0	0	0	89	0
54	Pune Tectol P. Ltd.	22	9	43	0	223	0	89
	Total	744	327	2764	3627	1539 7	15572	4450
	Total	1072		6391		35419		

Above Table no. 4.61 gives detail about the rainwater harvesting potential of surface area and roof areas of 54 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 54 industrial units open space and gardens occupies the total area of 9412 sqm. and it provides the opportunity to get 1072 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 13833 sqm surface area and it provides the opportunity to get 6391 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 54 industrial units maximum area occupies on roof area which is 73791 sqm areas and it's provide the opportunity to get 35419 cum. of water harvesting potential.

Table no. 4.62 - a) Manufacturing industries 1) Bhosari General block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside source**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**

		s in cum.				
1	Sedmack	986	963	98	22	2
2	Satandred Profile Pissine	913	428	47	484	53
3	Pareect C P Ltd.	840	321	38	518	62
4	Manoj Industry	1095	214	20	881	80
5	Nama Enterprises	803	214	27	589	73
6	E M Cure Pvt. Ltd.	1278	499	39	778	61
7	Naween H P Ltd.	694	143	21	551	79
8	Rolex Engineers	803	749	93	54	7
9	Cosmos Engineers	913	321	35	591	65
10	Anurlri Mechf P. Ltd.	913	482	53	431	47
11	OSG India P. Ltd.	1095	642	59	453	41
12	Ucco Mechfilters Pvt. Ltd.	730	89	12	641	88
13	Apex Ecotech Pvt. Ltd.	511	111	22	400	78
14	J J Vertex	986	624	63	361	37
15	Mechnocret Engineering Pvt.Ltd.	876	250	29	626	71
16	Anubhav Enterprises	913	223	24	690	76
17	Ashok Leyland Creative Auto Services	2190	312	14	1878	86
18	Transprecision Gears Pvt. Ltd.	1095	250	23	845	77
19	D D Enterprises	876	134	15	742	85
20	Sathyam Fasterners Pvt. Ltd.	1095	120	11	975	89
21	Sharp Engineering	1205	125	10	1080	90
22	Mojj Engineering Systems Ltd.	1095	312	29	783	71
23	Five Spark	1022	268	26	754	74
24	N. D. Gupta Enterprises	1314	143	11	1171	89
25	Arihant Alloys And Engineers	986	50	5	935	95
26	Indo Group	1022	175	17	847	83
27	Spin India	1278	89	7	1188	93
28	Prma Pvt. Ltd.	1460	749	51	711	49
29	Anant Enterprises	1460	1142	78	318	22
30	Sona Pvt. Ltd.	1825	321	18	1504	82
31	Kedar Coating And Engineering P. Ltd.	511	100	20	411	80
32	IndoSwe Engineers Pvt. Ltd.	2008	3211	160	1203	60
33	Kartos Engineering & IT Solutions Pvt. Ltd.	1278	2007	157	729	57
34	KTR Capling Pvt. Ltd.	913	499	55	413	45

35	Suyog Engineers	913	289	32	624	68
36	Units Gauge and Co. Pvt . Ltd.	1460	499	34	961	66
37	Rajasthan Cromax India	621	4986	803	4365	703
38	Vats	1351	482	36	869	64
39	Met Paw	1095	700	64	395	36
40	Suaan	840	428	51	411	49
41	Arjunwadkar Consolidated Engineers Pvt. Ltd.	548	357	65	191	35
42	Demech	4745	531	11	4214	89
43	Mikron Engineering	986	156	16	829	84
44	Auto Mile And Company	730	669	92	61	8
45	Neuman And Esser Compressor	1825	2809	154	984	54
46	Emulsichem Lubricants Pvt. Ltd.	5475	3139	57	2336	43
47	Kesh Kent Wear Pvt. Ltd.	4015	464	12	3551	88
48	ARM Welers P. Ltd.	1205	1498	124	294	24
49	Perfect Oil Sills Acr.	1825	357	20	1468	80
50	Laxmi Pvt. Ltd.	1022	642	63	380	37
51	CPS Pvt. Ltd.	913	642	70	270	30
52	Rajdeep Industrial Product	256	89	35	166	65
53	Unique Engineers	329	89	27	239	73
54	Pune Tectol P. Ltd.	2008	312	16	1695	84
55	Total in cum.	69131	35419	51	33712	49

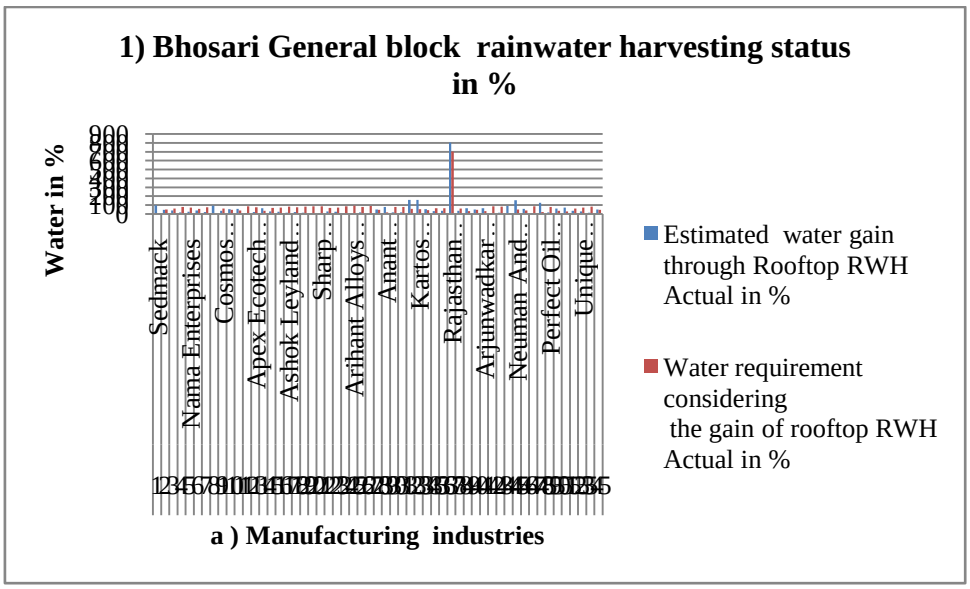

Figure no. 4.19

Above table no. 4.62 and graph no. 4.19 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of Bhosari general block.

For all these 54 industrial units total annual water requirement from outside sources is 69131 cum. and estimated water gain through rooftop rainwater harvesting is 35419 cum which is 51 % therefore water requirement considering the gain of rooftop rainwater harvesting is 33712 which is 49 %

Table no. 4.63 - a) Manufacturing industries. -2) D -I Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Autoshine Coaters	186	0	0	0	0	465	0
2	Shree Ganesh Industry	0	0	0	0	93	279	0
3	A P Industries	14	0	0	14	0	372	23
4	Technovision Industries	28	9	0	19	0	232	93
5	Shivshakti Industries	46	19	0	28	0	232	46
6	Precision	28	46	0	46	0	279	0
7	Tecil Engineering	0	0	46	33	0	279	0
8	Avadhut Paper Product	0	28	56	14	743	0	0
9	Shanaz Engineers	19	0	46	21	74	743	0
10	Repute Engineers P. Ltd.	0	28	42	46	334	167	0
11	Scan Tech	279	0	56	11	334	669	0
12	Ima Technology	502	16	74	149	1171	0	669
13	Glorla Engineer co.	0	1	14	28	0	139	0
14	Unique Industries	0	1	19	14	0	929	0
15	Esdss Enterprises	0	1	0	14	0	418	0
	Total	1101	148	353	436	2750	5203	831
	Total	1249		789		8784		

In the manufacturing industries of D-I block surface area components measure to be 1) Open space = 1101 sqm. 2) Garden = 148 sqm. 3) Parking = 353 sqm. and 4) Road = 436 sqm. Whereas roof covered area components measured as 1) Slab roof area = 2750 sqm. 2) Cross metal sheet roof area = 5203 sqm. and 3) Godown roof area = 831 sqm.

Table no. 4.64 - a) Manufacturing industries. - 2) D - I Block Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Autoshine Coaters	22	0	0	0	0	223	0
2	Shree Ganesh Industry	0	0	0	0	45	134	0
3	A P Industries	2	0	0	6	0	178	11
4	Technovision Industries	3	1	0	9	0	111	45
5	Shivshakti Industries	6	2	0	13	0	111	22
6	Precision	3	5	0	21	0	134	0
7	Tecil Engineering	0	0	21	15	0	134	0
8	Avadhut Paper Product	0	3	26	6	357	0	0
9	Shanaz Engineers	2	0	21	10	36	357	0
10	Repute Engineers P. Ltd.	0	3	19	21	161	80	0
11	Scan Tech	33	0	26	5	161	321	0
12	Ima Technology	60	2	34	69	562	0	321
13	Glorla Engineer co.	0	0	6	13	0	67	0
14	Unique Industries	0	0	9	6	0	446	0
15	Esdss Enterprises	0	0	0	6	0	201	0
	Total	132	15	163	202	1320	2497	399
	Total	147		365		4216		

Above Table no. 4.64 gives detail about the rainwater harvesting potential of surface area and roof areas of 15 industrial units in the D -I block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 15 industrial units open space and gardens occupies the total area of 1249 sqm. and it provides the opportunity to get 147 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 789 sqm surface area and it provides the opportunity to get 365 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 15 industrial units maximum area occupies on roof area which is 8784 sqm areas and it's provide the opportunity to get 4216 cum. of water harvesting potential.

Table no. 4.65 - a) Manufacturing industries 2) D - I block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Autoshine Coaters	913	223	24	690	76
2	Shree Ganesh Industry	548	178	33	369	67
3	A P Industries	913	190	21	723	79
4	Technovision Industries	438	156	36	282	64
5	Shivshakti Industries	803	134	17	669	83
6	Precision	1278	134	10	1144	90
7	Tecil Engineering	1022	134	13	888	87
8	Avadhut Paper Product	1278	357	28	921	72
9	Shanaz	1022	392	38	630	62

	Engineers					
10	Repute Engineers P. Ltd.	1898	241	13	1657	87
11	Scan Tech	913	482	53	431	47
12	Ima Technology	1278	883	69	395	31
13	Glorla Engineer co.	1022	67	7	955	93
14	Unique Industries	1351	446	33	905	67
15	Esdss Enterprises	1460	201	14	1259	86
16	Total in cum.	16133	4216	26	11917	74

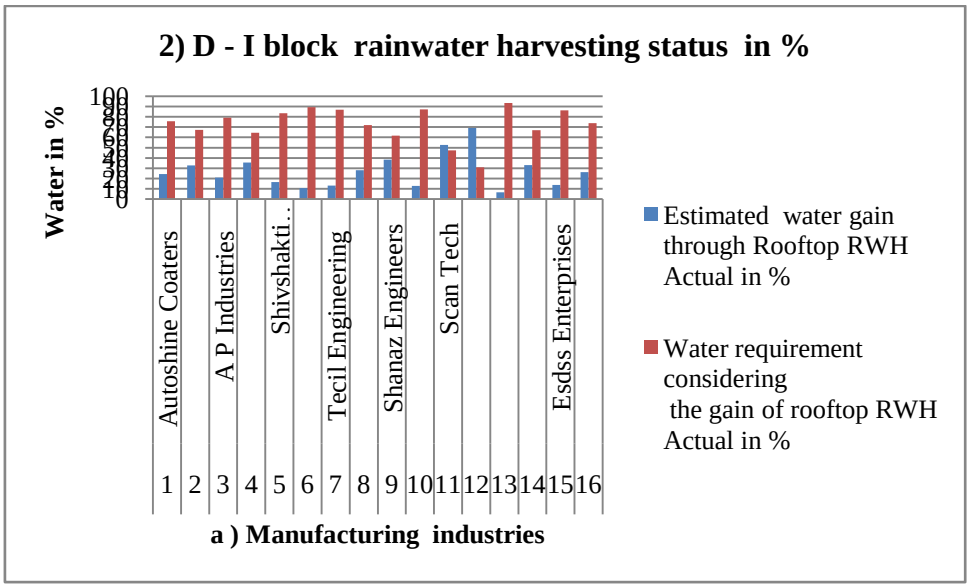

Figure no. 4.20

Above table no. 4.66 and graph no. 4.20 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of D – I block.

For all these 15 industrial units total annual water requirement from outside sources is 16133 cum. and estimated water gain through rooftop rainwater harvesting is 4216 cum which is 26 % therefore water requirement considering the gain of rooftop rainwater harvesting is 11917 which is 74 %

Table no. 4.66 - a) Manufacturing industries. -3) D -II Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Dhanlaxmi Industries	186	0	0	0	0	279	0
2	Eddycanes Engineers P. Ltd	0	0	93	14	0	372	0
3	Vivek Engineering	186	0	93	14	0	465	0
4	Amit Engineering Pvt.Ltd.	93	0	46	14	0	279	0
5	Sparc Engineering Pvt. Ltd	186	0	46	0	0	465	0
6	Vijay Engineering	186	0	93	14	93	279	0
7	Dinesh Industries	0	0	186	0	186	93	0
8	Mehata Engineering Works	0	37	0	19	0	232	0
9	Lensel Optics Pvt. Ltd.	0	46	46	19	0	186	93
10	Ravi Industries	19	19	0	19	0	186	0
11	Shree Gurukrupa Engineering Works	0	0	149	35	0	3716	0
12	Tirupati automobiles	0	0	5	5	0	93	0
13	Lokesh Industries	84	0	139	56	149	223	0
14	Fair Teeth Engineers	0	46	93	0	0	279	0
15	Samsa Auto Engineering P. Ltd.	93	0	46	0	279	93	0
16	Hyt Engineering Company Pvt. Ltd.	0	0	14	7	0	502	0
17	Creative Combience .	0	0	35	58	56	446	0
18	Gopal Enterprises	111	19	74	6	520	0	0
19	Hydrotech Engineering Company	0	0	19	19	0	279	93
20	Miracle Engineering Pvt. Ltd.	0	46	0	19	0	279	46
21	NeelKamal Industries	0	5	2	0	0	139	0
22	Aseptic thrmoprocess Pvt. Ltd.	186	0	0	14	279	0	93
23	Omkar Industries	0	1	5	35	0	139	0
24	Walujkar Engineering	0	1	5	35	0	455	0
25	Fab-O-Wed Engineers	111	22	111	37	195	186	167

26	Indo Bioactive lawhs Ltd	167	19	56	56	1171	585	0
	Total	1607	261	1356	491	2926	10247	492
	Total	1868		1847		13666		

In the manufacturing industries of D - II block surface area components measure to be 1) Open space = 1607 sqm. 2) Garden = 261 sqm. 3) Parking = 1356 sqm. and 4) Road = 491 sqm. Whereas roof covered area components measured as 1) Slab roof area = 2926 sqm. 2) Cross metal sheet roof area = 10247 sqm. and 3) Godown roof area = 492 sqm.

Table no. 4.67 - a) Manufacturing industries. - 3) D - II Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Dhanlaxmi Industries	22	0	0	0	0	134	0
2	Eddycanes Engineers P. Ltd	0	0	43	6	0	178	0
3	Vivek Engineering	22	0	43	6	0	223	0
4	Amit Engineering Pvt.Ltd.	11	0	21	6	0	134	0
5	Sparc Engineering Pvt. Ltd	22	0	21	0	0	223	0
6	Vijay Engineering	22	0	43	6	45	134	0
7	Dinesh Industries	0	0	86	0	89	45	0
8	Mehata Engineering Works	0	4	0	9	0	111	0
9	Lensel Optics Pvt. Ltd.	0	5	21	9	0	89	45
10	Ravi Industries	2	2	0	9	0	89	0
11	Shree Gurukrupa Engineering Works	0	0	69	16	0	1784	0
12	Tirupati automobiles	0	0	2	2	0	45	0
13	Lokesh Industries	10	0	64	26	71	107	0
14	Fair Teeth Engineers	0	5	43	0	0	134	0
15	Samsa Auto Engineering P. Ltd.	11	0	21	0	134	45	0
16	Hyt Engineering Company Pvt. Ltd.	0	0	6	3	0	241	0
17	Creative Combience .	0	0	16	27	27	214	0
18	Gopal Enterprises	13	2	34	3	25	0	0

						0		
19	Hydrotech Engineering Company	0	0	9	9	0	134	45
20	Miracle Engineering Pvt. Ltd.	0	5	0	9	0	134	22
21	NeelKamal Industries	0	0	1	0	0	67	0
22	Aseptic thrmoprocess Pvt. Ltd.	22	0	0	6	134	0	45
23	Omkar Industries	0	0	2	16	0	67	0
24	Walujkar Engineering	0	0	2	16	0	219	0
25	Fab-O-Wed Engineers	13	2	52	17	94	89	80
26	Indo Bioactive lawhs Ltd	20	2	26	26	562	281	0
	Total	193	27	627	227	1405	4919	236
	Total	219		853		6560		

Above Table no. 4.67 gives detail about the rainwater harvesting potential of surface area and roof areas of 26 industrial units in the D-II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 26 industrial units open space and gardens occupies the total area of 1868 sqm. and it provides the opportunity to get 219 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1847 sqm surface area and it provides the opportunity to get 853 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 26 industrial units maximum area occupies on roof area which is 13666 sqm areas and it’s provide the opportunity to get 6560 cum. of water harvesting potential.

Table no. 4.68 - a) Manufacturing industries 3) D - II block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Dhanlaxmi Industries	657	134	20	523	80
2	Eddycanes Engineers P. Ltd	1168	178	15	990	85
3	Vivek Engineering	986	223	23	763	77
4	Amit Engineering Pvt.Ltd.	913	134	15	779	85
5	Sparc Engineering Pvt. Ltd	1095	223	20	872	80
6	Vijay Engineering	913	178	20	734	80
7	Dinesh Industries	548	134	24	414	76
8	Mehata Engineering Works	1278	111	9	1166	91
9	Lensel Optics Pvt. Ltd.	1168	134	11	1034	89
10	Ravi Industries	1022	89	9	933	91
11	Shree Gurukrupa Engineering Works	1022	1784	175	762	75
12	Tirupati automobiles	694	45	6	649	94
13	Lokesh Industries	1095	178	16	917	84
14	Fair Teeth Engineers	1278	134	10	1144	90
15	Samsa Auto Engineering P. Ltd.	1095	178	16	917	84
16	Hyt Engineering Company Pvt. Ltd.	1022	241	24	781	76
17	Creative Combience .	1095	241	22	854	78
18	Gopal Enterprises	1278	250	20	1028	80
19	Hydrotech Engineering Company	1095	178	16	917	84
20	Miracle Engineering Pvt. Ltd.	1278	156	12	1121	88
21	NeelKamal Industries	1095	67	6	1028	94
22	Aseptic thrmoprocess Pvt. Ltd.	913	178	20	734	80
23	Omkar Industries	949	67	7	882	93
24	Walujkar Engineering	1205	219	18	986	82
25	Fab-O-Wed Engineers	1278	263	21	1014	79
26	Indo Bioactive lawhs	1205	843	70	362	30

	Ltd					
27	Total in cum.	27339	6560	24	20779	76

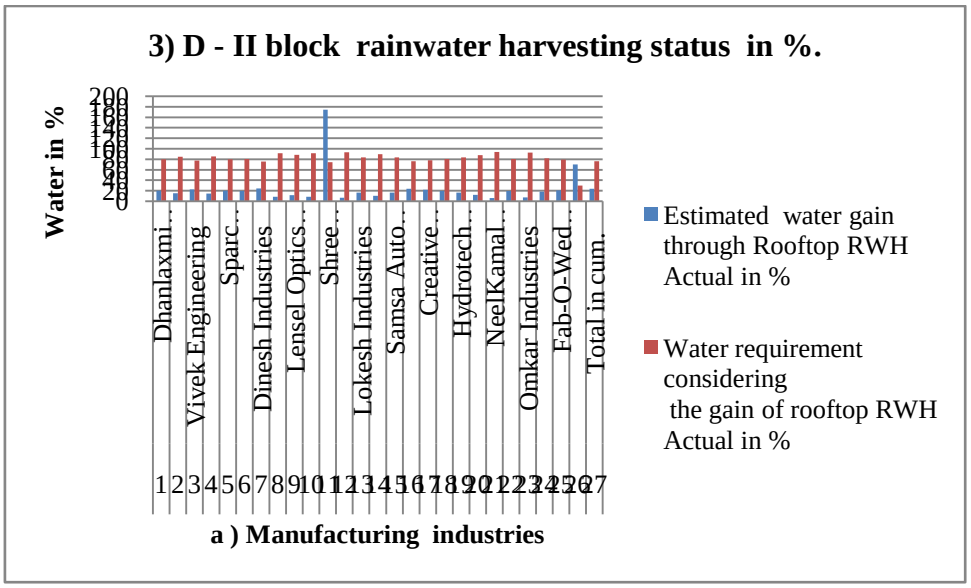

Figure no. 4.21

Above table no. 4.68 and graph no. 4.21 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of D – II block.

For all these 26 industrial units total annual water requirement from outside sources is 27339 cum. and estimated water gain through rooftop rainwater harvesting is 6560 cum which is 24 % therefore water requirement considering the gain of rooftop rainwater harvesting is 20779 which is 76 %

Table no. 4.69 - a) Manufacturing industries. - 4) D -III Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	TcIpl	0	0	0	46	232	0	46
2	Gloria Engineering Company Unit II	37	46	0	19	0	325	93
3	Yash Marbels	0	0	0	186	0	279	93
4	Laxmi Engineering	46	0	35	14	0	279	0

	Works							
5	Msl Product Casting	0	14	19	23	0	167	0
6	Vmar Engineering	0	1	14	19	0	139	0
7	Manish Industries	0	19	14	14	0	232	0
8	SAR Industries	0	0	42	49	446	0	0
9	Jetline Corrugated Boxes	0	0	28	28	446	0	0
10	Yash Engineering And Industrial Suppliers	0	0	58	35	0	669	0
11	Bestall Engineering Works	0	2	14	14	0	372	0
12	Prince Industry	186	0	111	418	0	502	223
13	Kohinoor Industry	139	0	111	223	0	595	0
	Total	409	82	446	1087	1124	3558	455
	Total	491		1533		5138		

In the manufacturing industries of D-III block surface area components measure to be 1) Open space = 409 sqm. 2) Garden = 82 sqm. 3) Parking = 446 sqm. and 4) Road = 1087 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1124 sqm. 2) Cross metal sheet roof area = 3558 sqm. and 3) Godown roof area = 455 sqm.

Table no. 4.70 - a) Manufacturing industries. - 4) D - III Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	TcIpl	0	0	0	21	111	0	22
2	Gloria Engineering Company Unit II	4	5	0	9	0	156	45
3	Yash Marbels	0	0	0	86	0	134	45
4	Laxmi Engineering Works	6	0	16	6	0	134	0
5	Msl Product Casting	0	1	9	11	0	80	0
6	Vmar Engineering	0	0	6	9	0	67	0
7	Manish Industries	0	2	6	6	0	111	0
8	SAR Industries	0	0	19	23	21	0	0

						4		
9	Jetline Corrugated Boxes	0	0	13	13	214	0	0
10	Yash Engineering And Industrial Suppliers	0	0	27	16	0	321	0
11	Bestall Engineering Works	0	0	6	6	0	178	0
12	Prince Industry	22	0	52	193	0	241	107
13	Kohinoor Industry	17	0	52	103	0	285	0
	Total	49	8	206	502	540	1708	219
	Total	57		708		2466		

Above Table no. 4.70 gives detail about the rainwater harvesting potential of surface area and roof areas of 13 industrial units in the D -III block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 13 industrial units open space and gardens occupies the total area of 491 sqm. and it provides the opportunity to get 57 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1533 sqm surface area and it provides the opportunity to get 708 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 13 industrial units maximum area occupies on roof area which is 5138 sqm areas and it's provide the opportunity to get 2466 cum. of water harvesting potential.

Table no. 4.71 - a) Manufacturing industries 4) D - III block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	TcIpl	1095	134	12	961	88
2	Gloria Engineering Company Unit II	1278	201	16	1077	84
3	Yash Marbels	621	178	29	442	71
4	Laxmi Engineering Works	840	134	16	706	84
5	Msl Product Casting	1168	80	7	1088	93
6	Vmar Engineering	1241	67	5	1174	95
7	Manish Industries	1278	111	9	1166	91
8	SAR Industries	1387	214	15	1173	85
9	Jetline Corrugated Boxes	438	214	49	224	51
10	Yash Engineering And Industrial Suppliers	1095	321	29	774	71
11	Bestall Engineering Works	1643	178	11	1464	89
12	Prince Industry	1168	348	30	820	70
13	Kohinoor Industry	913	285	31	627	69
14	Total in cum.	14162	2466	17	11696	83

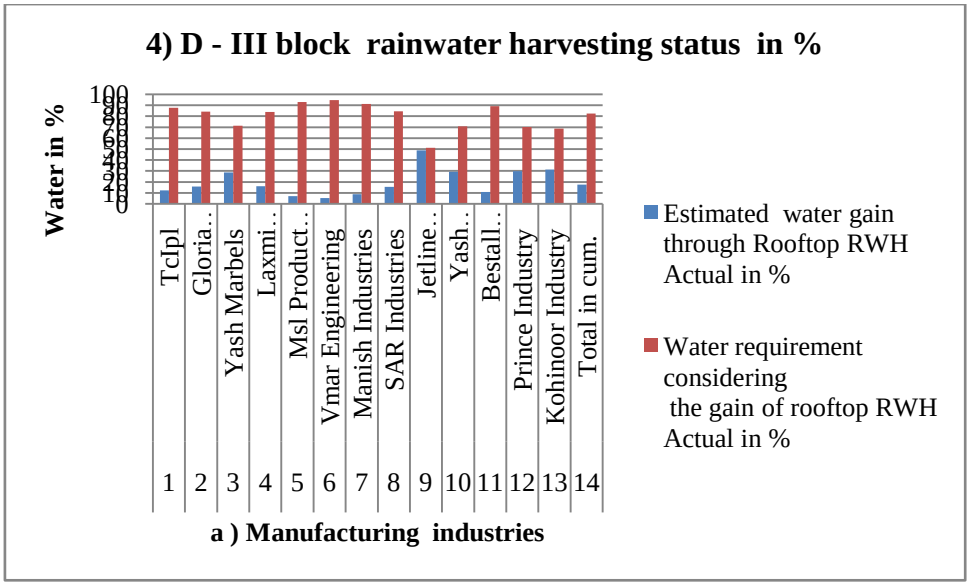

Figure no. 4.22

Above table no. 4.71 and graph no. 4.22 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of D – III block.

For all these 13 industrial units total annual water requirement from outside sources is 14162 cum. and estimated water gain through rooftop rainwater harvesting is 2466 cum which is 17 % therefore water requirement considering the gain of rooftop rainwater harvesting is 11696 which is 83 %

Table no. 4.72 - a) Manufacturing industries. - 5) F - II Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Turened Engineers P Ltd	669	39	56	111	0	446	1003
2	LGD Composite	186	56	111	111	446	0	0
3	Dalmec Industry	279	111	446	93	2601	0	0
4	Jyoti Die	260	56	167	279	0	892	0
5	Spark Line Care	390	74	111	82	0	669	39
6	Ekadant Enterprises	223	0	223	334	0	669	0
7	Mempor India	279	84	56	74	0	502	0
8	Jayshree	557	279	223	167	892	0	251
9	Micron Pvt. Ltd.	98	0	28	130	0	8129	0

10	Micron Industries	46	0	28	65	0	8129	0
11	Himalaya Udyog	0	0	0	14	0	325	0
	Total	2987	699	1449	1461	3939	19760	1294
	Total	3685		2911		24993		

In the manufacturing industries of F-II block surface area components measure to be 1) Open space = 2987 sqm. 2) Garden = 699 sqm. 3) Parking = 1449 sqm. and 4) Road = 1461 sqm. Whereas roof covered area components measured as 1) Slab roof area = 3939 sqm. 2) Cross metal sheet roof area = 19760 sqm. and 3) Godown roof area = 1294 sqm.

Table no. 4.73 - a) Manufacturing industries. - 5) F - II Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Turened Engineers P Ltd	80	4	26	52	0	214	482
2	LGD Composite	22	6	52	52	214	0	0
3	Dalmec Industry	33	11	206	43	1249	0	0
4	Jyoti Die	31	6	77	129	0	428	0
5	Spark Line Care	47	8	52	38	0	321	19
6	Ekadant Enterprises	27	0	103	155	0	321	0
7	Mempor India	33	9	26	34	0	241	0
8	Jayshree	67	28	103	77	428	0	120
9	Micron Pvt. Ltd.	12	0	13	60	0	3902	0
10	Micron Industries	6	0	13	30	0	3902	0
11	Himalaya Udyog	0	0	0	6	0	156	0
	Total	358	71	670	675	1891	9485	621
	Total	430		1345		11997		

Above Table no. 4.73 gives detail about the rainwater harvesting potential of surface area and roof areas of 11 industrial units in the F -II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 11 industrial units open space and gardens occupies the total area of 3685 sqm. and it provides the opportunity to get 430 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 2911 sqm surface area and it provides the opportunity to get 1345 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 11 industrial units maximum area occupies on roof area which is 24993 sqm areas and it's provide the opportunity to get 11997 cum. of water harvesting potential.

Table no. 4.74 - a) Manufacturing industries 5) F - II block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Turened Engineers P Ltd	1095	696	64	399	36
2	LGD Composite	1095	214	20	881	80
3	Dalmec Industry	1095	1249	114	154	14
4	Jyoti Die	1460	428	29	1032	71
5	Spark Line Care	1095	340	31	755	69
6	Ekadant Enterprises	913	321	35	591	65
7	Mempor India	1022	241	24	781	76
8	Jayshree	1278	548	43	729	57
9	Micron Pvt. Ltd.	1095	3902	356	2807	256
10	Micron Industries	1095	3902	356	2807	256
11	Himalaya Udyog	840	156	19	683	81
12	Total in cum.	12082	11997	99	85	1

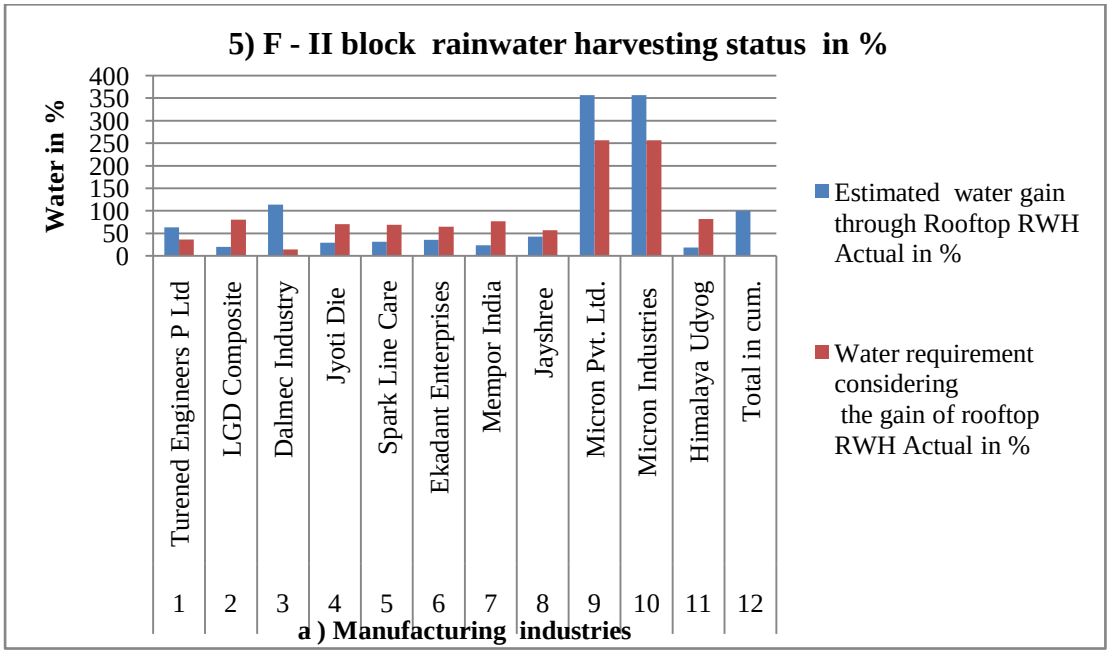

Figure no. 4.23

Above table no. 4.74 and graph no. 4.23 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of F-II block.

For all these 11 industrial units total annual water requirement from outside sources is 12082 cum. and estimated water gain through rooftop rainwater harvesting is 11997 cum which is 99 % therefore water requirement considering the gain of rooftop rainwater harvesting is 85 which is 1 %

Table no. 4.75 - a) Manufacturing industries. - 6) J Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	National Engineering Company	223	139	111	74	251	669	0
2	Swami Samarth Engineering	0	0	19	19	149	0	0
3	Ebhd dar Engineers	33	9	19	111	297	0	0

4	Dynamic Industries	145	139	223	153	1003	0	0
5	Poona Engineering Pvt.Ltd.	0	9	56	74	0	223	0
6	Naramax Whahara Industries	502	98	186	46	1003	557	107
7	Nirmitee Engineering	223	0	111	33	0	446	56
8	D D Engineering	111	0	11	36	0	167	58
9	Shweta Enterprises	223	111	56	74	0	892	0
10	Richs	56	22	149	74	892	0	0
11	Hindustan Pressing Pvt. Ltd.	279	9	223	111	0	669	0
12	Capulm Engineering Pvt. Ltd.	9	0	28	19	223	0	0
13	Shubham Udyog	0	0	179	81	0	9581	81
14	Mahavir Enterprises	49	19	84	0	0	8942	0
15	Corrdyne Coating Pvt. Ltd.	0	37	81	146	0	1394	19
16	Indark Formtech Pvt. Ltd.	46	14	23	146	0	16258	0
17	Gurukrupa Engineers Pvt. Ltd.	0	0	251	114	0	5284	81
18	Surabhi Industries	0	28	81	35	0	3832	0
19	Sai Engineering	0	0	81	35	0	3484	56
20	Utkarsh Engineers	0	0	23	74	0	418	33
21	OHM Polytech Ltd.	0	28	251	81	272	592	383
22	Priya Capacitors Pvt. Ltd.	0	28	81	84	0	3194	84
23	Shree Krushna	0	0	46	14	0	662	49
24	M M Engineering	0	5	49	46	513	0	74
25	Bharat Industries	0	0	39	35	0	1742	14
26	Shakti Industries	0	14	81	49	0	3658	28
27	Darekar Heat Treat	0	35	70	46	0	2938	28
28	Dinesh Enterprises	0	5	49	0	0	453	0
29	Supreem Profiles Pvt. Ltd.	0	14	49	46	3658	0	28
30	Divyang Ingineering Pvt. Ltd.	0	5	35	23	72	0	0
31	Nikul Engineers P. Ltd.	46	0	19	19	0	186	0
32	Autopress Engineering Pvt. Ltd.	23	22	111	40	0	111	0

33	Shriram Engineering	111	0	149	186	669	0	0
34	S S Industries	111	0	37	111	0	372	0
35	Prescomp Engineers	149	0	149	0	0	743	0
36	Suri Industries	74	0	74	669	0	297	89
37	Productive Aid Pvt. Ltd.	11	0	89	33	297	0	0
38	Shree Precision	149	0	149	297	669	0	0
39	Audhyogik Stamping	446	0	0	372	0	557	669
40	Jayhind Atomation P. Ltd.	149	22	149	19	446	0	223
41	CSK Engineers	74	0	149	111	0	669	45
42	S R Auto Parts	111	0	167	334	0	446	0
43	K C Rooms P. Ltd.	111	0	20	78	0	669	0
44	Menar Camp. P. Ltd.	223	56	20	446	0	669	0
45	V R Coating P. Ltd.	0	669	26	334	595	0	0
46	Dyna -K Auto	111	111	84	74	0	1003	0
47	Rayan Enterprises	669	100	16	446	223	669	223
48	Spark Engineers	111	669	74	446	0	1394	0
49	Tech-Well Engineering Pvt. Ltd.	93	0	0	0	0	465	0
50	Emerson	93	0	0	0	372	0	0
51	Sher SPC	93	0	46	0	186	186	0
52	Laxmi Engineers	0	0	0	0	0	186	0
53	Applied Power Industries	186	0	0	0	0	279	0
54	Hind Udyog	93	19	0	0	93	19	0
55	A C K Engineers	93	33	0	0	0	279	0
56	Alwn Union	93	0	0	0	93	186	0
57	A One Electonech Pvt. Ltd.	0	0	0	0	0	372	0
58	Amrit Enterprises	93	0	0	0	0	279	0
59	BMC Enterprises	46	0	0	0	0	279	0
60	Jyoti Polyclip	93	0	0	0	0	186	0

61	Arora Refreataries P. Ltd.	186	0	93	149	0	186	0
62	Hexagon Industries	0	0	0	0	0	7432	0
63	Gurumdas Engineers	93	186	65	279	186	372	0
64	Mass Engineers	93	37	74	0	0	372	0
65	Bharat Dairy Eqp. P. Ltd.	93	46	93	297	93	372	0
66	Inovative Automotions	93	46	0	46	186	279	0
67	S S Engineering	0	0	2	0	0	186	0
68	Kalyani Enterprises	0	0	23	0	0	186	0
69	Alfa Heat Tech	0	5	35	65	0	453	19
70	Sayali Engineering Pvt. Ltd.	0	0	35	14	0	453	0
71	Om Sai Engineers Pvt. Ltd	14	0	28	23	0	557	19
72	Doright Engineering	0	2	23	28	0	105	0
73	Varun Company	0	19	14	5	0	4355	65
74	Bharati Industries	0	5	23	28	0	3658	49
75	Metapow Pvt. Ltd.	0	5	28	23	0	105	19
76	S P Engineers	0	28	28	46	0	871	23
77	Universial Eneressing	0	14	28	19	0	105	0
78	Modern Engineers	0	28	19	35	0	355	0
79	Natras Enterprises	0	2	28	46	0	179	0
80	Nikho Engineers	0	14	49	0	0	105	19
81	Raj-Deep Industries	0	0	46	0	0	179	35
82	Siddheshwar Engineering	0	5	70	19	0	130	0
83	D Tech Engineers	0	2	28	28	0	81	14
84	Aror Engineers	0	14	49	70	0	81	28
85	Sai Tee Industries	0	2	35	28	0	314	0
86	Vrlv Enerprises	28	2	35	35	0	272	65
87	Dhanlaxmi Engineering Enterprises	0	5	42	23	0	244	84
88	Prasad Medi Tech	0	14	35	70	0	332	0
89	Laxmi Industries	0	2	35	35	0	314	65
90	Jyoti Heat Treat Indestries	0	5	35	35	314	0	0
91	Gress Engineering	0	2	81	35	0	272	0
92	Sai Industries	0	14	35	28	0	307	0
93	Madhav Industries	0	2	35	0	0	111	0
94	Dhanashree Engineering Pvt.	0	70	28	146	0	279	0

	Ltd.							
	Total	6156	3045	5547	7554	12754	100149	2928
	Total	9201		13100		115831		

In the manufacturing industries of J block surface area components measure to be 1) Open space = 6156 sqm. 2) Garden = 3045 sqm. 3) Parking = 5547 sqm. and 4) Road = 7554 sqm. Whereas roof covered area components measured as 1) Slab roof area = 12754 sqm. 2) Cross metal sheet roof area = 100149 sqm. and 3) Godown roof area = 2928 sqm.

Table no. 4.76 - a) Manufacturing industries. - 6) J Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	National Engineering Company	27	14	52	34	120	321	0
2	Swami Samarth Engineering	0	0	9	9	71	0	0
3	Ebhd dar Engineers	4	1	9	52	143	0	0
4	Dynamic Industries	17	14	103	71	482	0	0
5	Poona Engineering Pvt.Ltd.	0	1	26	34	0	107	0
6	Naramax Whahara Industries	60	10	86	21	482	268	51
7	Nirmitee Engineering	27	0	52	15	0	214	27
8	D D Engineering	13	0	5	17	0	80	28
9	Shweta Enterprises	27	11	26	34	0	428	0
10	Richs	7	2	69	34	428	0	0
11	Hindustan Pressing Pvt. Ltd.	33	1	103	52	0	321	0
12	Capulm Engineering Pvt. Ltd.	1	0	13	9	107	0	0
13	Shubham Udyog	0	0	83	38	0	4599	39
14	Mahavir Enterprises	6	2	39	0	0	4292	0
15	Corrdyne Coating Pvt. Ltd.	0	4	38	68	0	669	9
16	Indark Formtech Pvt. Ltd.	6	1	11	68	0	7804	0

17	Gurukrupa Engineers Pvt. Ltd.	0	0	116	53	0	2536	39
18	Surabhi Industries	0	3	38	16	0	1839	0
19	Sai Engineering	0	0	38	16	0	1672	27
20	Utkarsh Engineers	0	0	11	34	0	201	16
21	OHM Polytech Ltd.	0	3	116	38	130	284	184
22	Priya Capacitors Pvt. Ltd.	0	3	38	39	0	1533	40
23	Shree Krushna	0	0	21	6	0	318	23
24	M M Engineering	0	0	23	21	246	0	36
25	Bharat Industries	0	0	18	16	0	836	7
26	Shakti Industries	0	1	38	23	0	1756	13
27	Darekar Heat Treat	0	4	32	21	0	1410	13
28	Dinesh Enterprises	0	0	23	0	0	217	0
29	Supreem Profiles Pvt. Ltd.	0	1	23	21	1756	0	13
30	Divyang Ingineering Pvt. Ltd.	0	0	16	11	35	0	0
31	Nikul Engineers P. Ltd.	6	0	9	9	0	89	0
32	Autopress Engineering Pvt. Ltd.	3	2	52	19	0	54	0
33	Shriram Engineering	13	0	69	86	321	0	0
34	S S Industries	13	0	17	52	0	178	0
35	Prescomp Engineers	18	0	69	0	0	357	0
36	Suri Industries	9	0	34	309	0	143	43
37	Productive Aid Pvt. Ltd.	1	0	41	15	143	0	0
38	Shree Precision	18	0	69	137	321	0	0
39	Audhyogik Stamping	54	0	0	172	0	268	321
40	Jayhind Atomation P. Ltd.	18	2	69	9	214	0	107
41	CSK Engineers	9	0	69	52	0	321	21
42	S R Auto Parts	13	0	77	155	0	214	0
43	K C Rooms P. Ltd.	13	0	9	36	0	321	0
44	Menar Camp. P. Ltd.	27	6	9	206	0	321	0
45	V R Coating P. Ltd.	0	68	12	155	285	0	0
46	Dyna -K Auto	13	11	39	34	0	482	0

47	Rayan Enterprises	80	10	7	206	107	321	107
48	Spark Engineers	13	68	34	206	0	669	0
49	Tech-Well Engineering Pvt. Ltd.	11	0	0	0	0	223	0
50	Emerson	11	0	0	0	178	0	0
51	Sher SPC	11	0	21	0	89	89	0
52	Laxmi Engineers	0	0	0	0	0	89	0
53	Applied Power Industries	22	0	0	0	0	134	0
54	Hind Udyog	11	2	0	0	45	9	0
55	A C K Engineers	11	3	0	0	0	134	0
56	Alwn Union	11	0	0	0	45	89	0
57	A One Electonech Pvt. Ltd.	0	0	0	0	0	178	0
58	Amrit Enterprises	11	0	0	0	0	134	0
59	BMC Enterprises	6	0	0	0	0	134	0
60	Jyoti Polyclip	11	0	0	0	0	89	0
61	Arora Refreataries P. Ltd.	22	0	43	69	0	89	0
62	Hexagon Industries	0	0	0	0	0	3567	0
63	Gurumdas Engineers	11	19	30	129	89	178	0
64	Mass Engineers	11	4	34	0	0	178	0
65	Bharat Dairy Eqp. P. Ltd.	11	5	43	137	45	178	0
66	Inovative Automotions	11	5	0	21	89	134	0
67	S S Engineering	0	0	1	0	0	89	0
68	Kalyani Enterprises	0	0	11	0	0	89	0
69	Alfa Heat Tech	0	0	16	30	0	217	9
70	Sayali Engineering Pvt. Ltd.	0	0	16	6	0	217	0
71	Om Sai Engineers Pvt. Ltd	2	0	13	11	0	268	9
72	Doright Engineering	0	0	11	13	0	50	0
73	Varun Company	0	2	6	2	0	2090	31
74	Bharati Industries	0	0	11	13	0	1756	23
75	Metapow Pvt. Ltd.	0	0	13	11	0	50	9
76	S P Engineers	0	3	13	21	0	418	11
77	Universial Eneressing	0	1	13	9	0	50	0
78	Modern Engineers	0	3	9	16	0	171	0
79	Natras Enterprises	0	0	13	21	0	86	0

80	Nikho Engineers	0	1	23	0	0	50	9
81	Raj-Deep Industries	0	0	21	0	0	86	17
82	Siddheshwar Engineering	0	0	32	9	0	62	0
83	D Tech Engineers	0	0	13	13	0	39	7
84	Aror Engineers	0	1	23	32	0	39	13
85	Sai Tee Industries	0	0	16	13	0	151	0
86	Vrlv Enerprises	3	0	16	16	0	130	31
87	Dhanlaxmi Engineering Enterprises	0	0	19	11	0	117	40
88	Prasad Medi Tech	0	1	16	32	0	159	0
89	Laxmi Industries	0	0	16	16	0	151	31
90	Jyoti Heat Treat Indestries	0	0	16	16	151	0	0
91	Gress Engineering	0	0	38	16	0	130	0
92	Sai Industries	0	1	16	13	0	147	0
93	Madhav Industries	0	0	16	0	0	54	0
94	Dhanashree Engineering Pvt. Ltd.	0	7	13	68	0	134	0
	Total	739	311	2563	3490	6122	48072	1405
	Total	1049		6052		55599		

Above Table no. 4.76 gives detail about the rainwater harvesting potential of surface area and roof areas of 94 industrial units in the J block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 94 industrial units open space and gardens occupies the total area of 9201 sqm. and it provides the opportunity to get 1049 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 13100 sqm surface area and it provides the opportunity to get 6052 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 94 industrial units maximum area occupies on roof area which is 115831 sqm areas and it's provide the opportunity to get 55599 cum. of water harvesting potential

Table no. 4.77 - a) Manufacturing industries 6) J block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	National Engineering Company	1570	441	28	1128	72
2	Swami Samarth Engineering	511	71	14	440	86
3	Ebhd dar Engineers	402	143	36	259	64
4	Dynamic Industries	876	482	55	394	45
5	Poona Engineering Pvt.Ltd.	402	107	27	294	73
6	Naramax Whahara Industries	1643	800	49	842	51
7	Nirmitee Engineering	803	241	30	562	70
8	D D Engineering	475	108	23	366	77
9	Shweta Enterprises	1278	428	34	849	66
10	Richs	657	428	65	229	35
11	Hindustan Pressing Pvt. Ltd.	876	321	37	555	63
12	Capulm Engineering Pvt. Ltd.	402	107	27	294	73
13	Shubham Udyog	1643	4638	282	2995	182
14	Mahavir Enterprises	986	4292	436	3307	336
15	Corrdyne Coating Pvt. Ltd.	1022	678	66	344	34
16	Indark Formtech Pvt. Ltd.	1059	7804	737	6745	637
17	Gurukrupa Engineers Pvt. Ltd.	1095	2575	235	1480	135
18	Surabhi Industries	949	1839	194	890	94
19	Sai Engineering	730	1699	233	969	133
20	Utkarsh Engineers	767	216	28	550	72
21	OHM Polytech Ltd.	730	599	82	131	18
22	Priya Capacitors Pvt. Ltd.	876	1573	180	697	80
23	Shree Krushna	621	341	55	279	45
24	M M Engineering	730	282	39	448	61
25	Bharat Industries	511	843	165	332	65
26	Shakti Industries	1022	1769	173	747	73

27	Darekar Heat Treat	1132	1424	126	292	26
28	Dinesh Enterprises	803	217	27	586	73
29	Supreem Profiles Pvt. Ltd.	584	1769	303	1185	203
30	Divyang Ingineering Pvt. Ltd.	621	35	6	586	94
31	Nikul Engineers P. Ltd.	986	89	9	896	91
32	Autopress Engineering Pvt. Ltd.	548	54	10	494	90
33	Shriram Engineering	438	321	73	117	27
34	S S Industries	584	178	31	406	69
35	Prescomp Engineers	621	357	57	264	43
36	Suri Industries	548	186	34	362	66
37	Productive Aid Pvt. Ltd.	913	143	16	770	84
38	Shree Precision	438	321	73	117	27
39	Audhyogik Stamping	438	589	134	151	34
40	Jayhind Atomation P. Ltd.	621	321	52	299	48
41	CSK Engineers	256	342	134	87	34
42	S R Auto Parts	913	214	23	698	77
43	K C Rooms P. Ltd.	475	321	68	153	32
44	Menar Camp. P. Ltd.	730	321	44	409	56
45	V R Coating P. Ltd.	913	285	31	627	69
46	Dyna -K Auto	986	482	49	504	51
47	Rayan Enterprises	621	535	86	85	14
48	Spark Engineers	986	669	68	317	32
49	Tech-Well Engineering Pvt. Ltd.	1095	223	20	872	80
50	Emerson	767	178	23	588	77
51	Sher SPC	1095	178	16	917	84
52	Laxmi Engineers	438	89	20	349	80
53	Applied Power Industries	730	134	18	596	82
54	Hind Udyog	694	54	8	640	92
55	A C K Engineers	548	134	24	414	76
56	Alwn Union	621	134	22	487	78
57	A One Electonech Pvt. Ltd.	621	178	29	442	71
58	Amrit Enterprises	730	134	18	596	82
59	BMC Enterprises	913	134	15	779	85
60	Jyoti Polyclip	730	89	12	641	88
61	Arora Refreataries P. Ltd.	730	89	12	641	88

62	Hexagon Industries	803	3567	444	2764	344
63	Gurumdas Engineers	986	268	27	718	73
64	Mass Engineers	767	178	23	588	77
65	Bharat Dairy Eqp. P. Ltd.	1278	223	17	1055	83
66	Inovative Automotions	1168	223	19	945	81
67	S S Engineering	548	89	16	458	84
68	Kalyani Enterprises	438	89	20	349	80
69	Alfa Heat Tech	803	226	28	577	72
70	Sayali Engineering Pvt. Ltd.	913	217	24	695	76
71	Om Sai Engineers Pvt. Ltd	657	276	42	381	58
72	Doright Engineering	803	50	6	753	94
73	Varun Company	913	2122	232	1209	132
74	Bharati Industries	548	1779	325	1232	225
75	Metapow Pvt. Ltd.	694	59	9	634	91
76	S P Engineers	913	429	47	483	53
77	Universial Eneressing	584	50	9	534	91
78	Modern Engineers	584	171	29	413	71
79	Natras Enterprises	621	86	14	535	86
80	Nikho Engineers	767	59	8	707	92
81	Raj-Deep Industries	730	103	14	627	86
82	Siddheshwar Engineering	548	62	11	485	89
83	D Tech Engineers	803	46	6	757	94
84	Aror Engineers	548	52	10	495	90
85	Sai Tee Industries	803	151	19	652	81
86	Vrlv Enerprises	767	162	21	605	79
87	Dhanlaxmi Engineering Enterprises	548	157	29	390	71
88	Prasad Medi Tech	730	159	22	571	78
89	Laxmi Industries	803	182	23	621	77
90	Jyoti Heat Treat Indestries	730	151	21	579	79
91	Gress Engineering	548	130	24	417	76
92	Sai Industries	548	147	27	400	73
93	Madhav Industries	913	54	6	859	94
94	Dhanashree Engineering Pvt. Ltd.	730	134	18	596	82
95	Total in cum.	72015	55599	77	16416	23

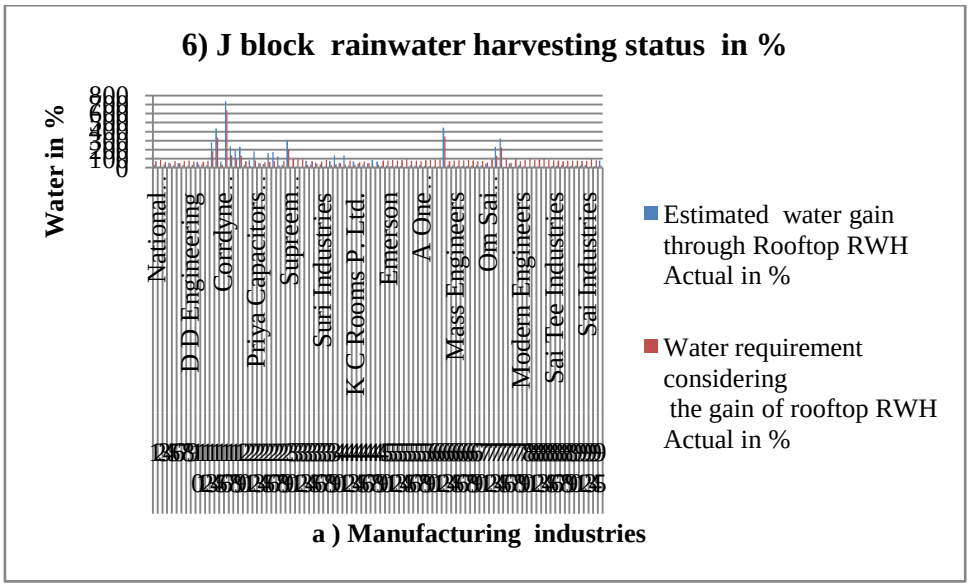

Figure no. 4.24

Above table no. 4.77 and graph no. 4.24 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of J block.

For all these 94 industrial units total annual water requirement from outside sources is 72015cum. and estimated water gain through rooftop rainwater harvesting is 55599 cum which is 77 % therefore water requirement considering the gain of rooftop rainwater harvesting is 16416 which is 23 %

Table no. 4.78 - a) Manufacturing industries. - 7) H Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Sulshane Aplices	56	11	19	56	0	669	0
2	Faleo And Fear	223	56	56	93	585	0	0
3	Ador Welding Accdemy Pvt. Ltd	0	0	9	37	279	0	0
4	Kulpak Engineering	56	0	93	37	186	93	0
5	Shri Samrtha Industries	0	46	0	23	0	209	46
6	Elemec Industries	105	81	14	0	669	0	0
7	Siddhalaxmi	0	46	46	46	27	0	0

	Engineering Industries P. Ltd					9		
8	Premier Ferrocast And Engineers Pvt. Ltd.	0	19	23	0	0	232	0
9	Sudarshan Shakti	65	19	19	19	0	186	46
10	Globle Packing	0	0	0	19	0	279	0
11	S M Auto Engineering Pvt. Ltd.	0	5	81	0	279	0	0
12	Amar Enterprises	0	0	1	5	139	0	0
13	Precision Industries	0	1	14	14	0	418	0
14	Klmgelnbere Pvt. Ltd	0	2	9	14	372	0	0
15	Yashwant Udyog	0	35	14	14	0	372	0
16	Indlab Industries	0	0	0	1	0	232	0
17	United Industries	0	0	14	5	446	0	0
18	Santherm Engineering Pvt. Ltd	0	0	28	28	0	892	0
19	Kamatisu India Pvt. Ltd.	81	146	0	35	818	0	0
20	Associated Equipment Rentals Pvt. Ltd.	17	81	0	0	920	0	0
21	Hary Rock	81	0	0	0	520	818	0
22	Precision Industries	105	35	0	14	93	279	0
23	Prajyo	0	14	0	0	0	279	0
24	Forbes Marshall	0	49	33	28	372	232	0
25	Dayal Associates	0	19	14	35	0	929	0
26	Falam	0	0	46	28	669	0	0
27	Enpro Industry Pvt.Ltd.	84	19	56	84	0	279	0
28	Devi Industries	1161	42	46	89	2081	0	0
	Total	2033	725	635	722	8705	6396	93
	Total	2758		1357		15194		

In the manufacturing industries of H block surface area components measure to be 1) Open space = 2033 sqm. 2) Garden = 725 sqm. 3) Parking = 635 sqm. and 4) Road = 722 sqm. Whereas roof covered area components measured as 1) Slab roof area = 8705 sqm. 2) Cross metal sheet roof area = 6396 sqm. and 3) Godown roof area = 93 sqm

Table no. 4.79 - a) Manufacturing industries. - 7) H Block Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Sulshane Aplices	7	1	9	26	0	321	0
2	Faleo And Fear	27	6	26	43	281	0	0
3	Ador Welding Accdemy Pvt. Ltd	0	0	4	17	134	0	0
4	Kulpak Engineering	7	0	43	17	89	45	0
5	Shri Samrtha Industries	0	5	0	11	0	100	22
6	Elemec Industries	13	8	6	0	321	0	0
7	Siddhalaxmi Engineering Industries P. Ltd	0	5	21	21	134	0	0
8	Premier Ferrocast And Engineers Pvt. Ltd.	0	2	11	0	0	111	0
9	Sudarshan Shakti	8	2	9	9	0	89	22
10	Globle Packing	0	0	0	9	0	134	0
11	S M Auto Engineering Pvt. Ltd.	0	0	38	0	134	0	0
12	Amar Enterprises	0	0	0	2	67	0	0
13	Precision Industries	0	0	6	6	0	201	0
14	Klmgelnbere Pvt. Ltd	0	0	4	6	178	0	0
15	Yashwant Udyog	0	4	6	6	0	178	0
16	Indlab Industries	0	0	0	0	0	111	0
17	United Industries	0	0	6	2	214	0	0
18	Santherm Engineering Pvt. Ltd	0	0	13	13	0	428	0
19	Kamatisu India Pvt. Ltd.	10	15	0	16	392	0	0
20	Associated Equipment Rentals Pvt. Ltd.	2	8	0	0	441	0	0
21	Hary Rock	10	0	0	0	250	392	0
22	Precision Industries	13	4	0	6	45	134	0
23	Prajyo	0	1	0	0	0	134	0
24	Forbes Marshall	0	5	15	13	178	111	0
25	Dayal Associates	0	2	6	16	0	446	0
26	Falam	0	0	21	13	32	0	0

						1		
27	Enpro Industry Pvt.Ltd.	10	2	26	39	0	134	0
28	Devi Industries	139	4	21	41	999	0	0
	Total	244	74	293	333	4178	3070	45
	Total	318		627		7293		

Above Table no. 4.79 gives detail about the rainwater harvesting potential of surface area and roof areas of 28 industrial units in the H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 28 industrial units open space and gardens occupies the total area of 2758 sqm. and it provides the opportunity to get 318 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1357 sqm surface area and it provides the opportunity to get 627 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 28 industrial units maximum area occupies on roof area which is 17503 sqm areas and it's provide the opportunity to get 8401 cum. of water harvesting potential.

Table no. 4.80 - a) Manufacturing industries 7) H block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Sulshane Aplices	1643	321	20	1321	80
2	Faleo And Fear	1533	281	18	1252	82
3	Ador Welding Accdemy Pvt. Ltd	1643	134	8	1509	92
4	Kulpak Engineering	1460	134	9	1326	91

5	Shri Samrtha Industries	1643	123	7	1520	93
6	Elemec Industries	1643	321	20	1321	80
7	Siddhalaxmi Engineering Industries P. Ltd	1716	134	8	1582	92
8	Premier Ferrocast And Engineers Pvt. Ltd.	1606	111	7	1495	93
9	Sudarshan Shakti	1460	111	8	1349	92
10	Globle Packing	1351	134	10	1217	90
11	S M Auto Engineering Pvt. Ltd.	1533	134	9	1399	91
12	Amar Enterprises	986	67	7	919	93
13	Precision Industries	1643	201	12	1442	88
14	Klmgelnbere Pvt. Ltd	1643	178	11	1464	89
15	Yashwant Udyog	1679	178	11	1501	89
16	Indlab Industries	1278	111	9	1166	91
17	United Industries	913	214	23	698	77
18	Santherm Engineering Pvt. Ltd	913	428	47	484	53
19	Kamatisu India Pvt. Ltd.	1643	392	24	1250	76
20	Associated Equipment Rentals Pvt. Ltd.	1460	441	30	1019	70
21	Hary Rock	1460	642	44	818	56
22	Precision Industries	1643	178	11	1464	89
23	Prajyo	1095	134	12	961	88
24	Forbes Marshall	2190	290	13	1900	87
25	Dayal Associates	1679	446	27	1233	73
26	Falam	1643	321	20	1321	80
27	Enpro Industry Pvt.Ltd.	4563	134	3	4429	97
28	Devi Industries	4928	999	20	3929	80
29	Total in cum.	48582	7293	15	41288	85

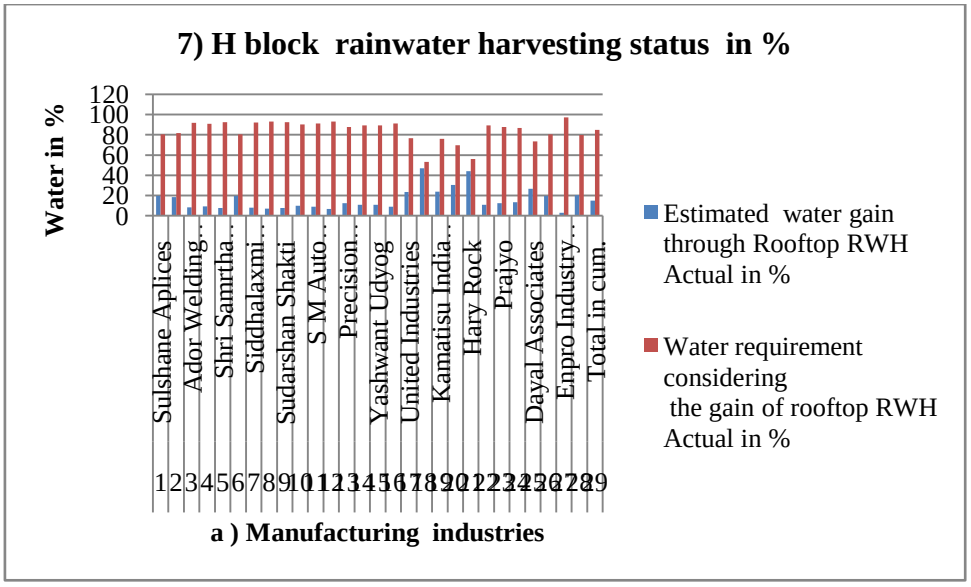

Figure no. 4.25

Above table no. 4.80 and graph no. 4.25 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of H block.

For all these 28 industrial units total annual water requirement from outside sources is 48582 cum. and estimated water gain through rooftop rainwater harvesting is 7293 cum which is 15 % therefore water requirement considering the gain of rooftop rainwater harvesting is 41288 which is 85 %

Table no. 4.81 - a) Manufacturing industries. - 8) S Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Pune Heat	0	1	35	35	0	139	0
2	J K Engineers	0	1	14	35	0	139	0
3	Angel Bright	46	0	0	0	0	186	0
4	Rajdeep Engineering	93	46	0	14	0	279	0
5	Ralex Engineers	0	0	14	35	0	232	0
6	Amol Engineering Works	0	0	28	35	0	418	0
7	Sankalp Engineering	0	0	25	21	0	232	0
8	R P Industries	0	1	14	35	139	0	0
9	Hexa Tech Engineers	0	0	14	35	0	372	0
10	Lano Engineering	0	2	14	35	372	0	0
11	Shrinivas Engineering	0	1	14	28	0	232	0
12	Mechatronic Systems	0	2	9	14	0	232	0

13	Rajesh Engineering Works	0	0	14	46	0	325	0
14	Worth Engineering Pvt. Ltd	0	0	14	28	0	418	0
15	Nikhil Industries	0	0	7	14	223	0	0
16	Desai Engineering Works	0	0	7	35	372	0	0
17	Dilip Industries	279	93	93	0	0	186	0
18	Prasho Engineers	0	0	0	0	0	465	0
19	Pinacle Dies Modul	0	0	0	0	465	93	0
20	Vyankateshwar Engineers	186	0	0	23	0	465	0
21	Harshad Industries	0	1	14	14	0	743	0
22	Sankalp Engineering	0	0	1	14	0	93	0
23	Sailaxmi Industries	0	1	1	14	0	139	0
24	Dynomerk Controls	19	74	65	65	279	0	0
25	Systems Technologies	46	65	46	74	0	232	93
26	Jay Suprabha Protative Product Pvt. Ltd	56	46	23	56	325	0	0
27	Divya Engineering Projects	0	0	46	37	0	325	0
28	Leo Enterprises	93	46	0	46	0	93	0
29	Aravind Vishnu Govande And Company	93	0	0	0	0	186	0
30	Sai Hari Enterprises	0	0	0	0	0	465	0
31	Rushi Engineering Pvt. Ltd.	46	0	0	0	0	465	186
32	Burhani Industries	93	0	46	0	0	372	0
33	Kumar Industries	0	93	0	0	0	465	0
34	Elcher Engineers Pvt. Ltd.	0	0	46	0	279	93	0
35	Harshada Industries	279	0	46	93	0	465	0
36	Nand Composites Pvt. Ltd	28	46	84	74	279	0	186
37	B J Perfect Work	46	46	74	74	0	232	139
38	Jyoti Heatsinks Pvt. Ltd	93	46	46	93	279	0	0
39	Ferroform Engineering Pvt. Ltd	65	0	93	46	0	232	139
40	Shree Parshwa Ind.	139	93	0	0	0	139	0
41	Akshay Organies Pvt. Ltd.	0	46	93	93	0	279	186
42	Bax Industries	46	0	0	0	0	186	0

43	Anand Trans	279	0	446	297	780	0	0
44	Lunar Enterprises Pvt. Ltd.	167	0	167	297	892	0	186
45	Sunil Engineers	279	111	4	223	0	669	0
46	Crasling	279	33	223	223	1421	0	0
	Total	2750	898	1882	2302	6104	10284	1115
	Total	3648		4183		17503		

In the manufacturing industries of S block surface area components measure to be 1) Open space = 2750 sqm. 2) Garden = 898 sqm. 3) Parking = 1882 sqm. and 4) Road = 2302 sqm. Whereas roof covered area components measured as 1) Slab roof area = 6104 sqm. 2) Cross metal sheet roof area = 10284 sqm. and 3) Godown roof area = 1115 sqm.

Table no. 4.82 - a) Manufacturing industries. - 8) S Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Pune Heat	0	0	16	16	0	67	0
2	J K Engineers	0	0	6	16	0	67	0
3	Angel Bright	6	0	0	0	0	89	0
4	Rajdeep Engineering	11	5	0	6	0	134	0
5	Ralex Engineers	0	0	6	16	0	111	0
6	Amol Engineering Works	0	0	13	16	0	201	0
7	Sankalp Engineering	0	0	12	10	0	111	0
8	R P Industries	0	0	6	16	67	0	0
9	Hexa Tech Engineers	0	0	6	16	0	178	0
10	Lano Engineering	0	0	6	16	178	0	0
11	Shrinivas Engineering	0	0	6	13	0	111	0
12	Mechatronic Systems	0	0	4	6	0	111	0
13	Rajesh Engineering Works	0	0	6	21	0	156	0
14	Worth Engineering Pvt. Ltd	0	0	6	13	0	201	0
15	Nikhil Industries	0	0	3	6	107	0	0

16	Desai Engineering Works	0	0	3	16	178	0	0
17	Dilip Industries	33	9	43	0	0	89	0
18	Prasho Engineers	0	0	0	0	0	223	0
19	Pinacle Dies Modul	0	0	0	0	223	45	0
20	Vyankateshwar Engineers	22	0	0	11	0	223	0
21	Harshad Industries	0	0	6	6	0	357	0
22	Sankalp Engineering	0	0	0	6	0	45	0
23	Sailaxmi Industries	0	0	0	6	0	67	0
24	Dynomerk Controls	2	8	30	30	134	0	0
25	Systems Technologies	6	7	21	34	0	111	45
26	Jay Suprabha Protative Product Pvt. Ltd	7	5	11	26	156	0	0
27	Divya Engineering Projects	0	0	21	17	0	156	0
28	Leo Enterprises	11	5	0	21	0	45	0
29	Aravind Vishnu Govande And Company	11	0	0	0	0	89	0
30	Sai Hari Enterprises	0	0	0	0	0	223	0
31	Rushi Engineering Pvt. Ltd.	6	0	0	0	0	223	89
32	Burhani Industries	11	0	21	0	0	178	0
33	Kumar Industries	0	9	0	0	0	223	0
34	Elcher Engineers Pvt. Ltd.	0	0	21	0	134	45	0
35	Harshada Industries	33	0	21	43	0	223	0
36	Nand Composites Pvt. Ltd	3	5	39	34	134	0	89
37	B J Perfect Work	6	5	34	34	0	111	67
38	Jyoti Heatsinks Pvt. Ltd	11	5	21	43	134	0	0
39	Ferroform Engineering Pvt. Ltd	8	0	43	21	0	111	67
40	Shree Parshwa Ind.	17	9	0	0	0	67	0
41	Akshay Organies Pvt. Ltd.	0	5	43	43	0	134	89
42	Bax Industries	6	0	0	0	0	89	0
43	Anand Trans	33	0	206	137	375	0	0
44	Lunar Enterprises Pvt. Ltd.	20	0	77	137	428	0	89
45	Sunil Engineers	33	11	2	103	0	321	0

46	Crasling	33	3	103	103	682	0	0
	Total	330	92	869	1063	2930	4936	535
	Total	422		1933		8401		

Above Table no. 4.82 gives detail about the rainwater harvesting potential of surface area and roof areas of 46 industrial units in the S block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 46 industrial units open space and gardens occupies the total area of 3648 sqm. and it provides the opportunity to get 422 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 818 sqm surface area and it provides the opportunity to get 497 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 46 industrial units maximum area occupies on roof area which is 5667 sqm areas and it's provide the opportunity to get 3264 cum. of water harvesting potential.

Table no. 4.83 - a) Manufacturing industries 8) S block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Pune Heat	1533	67	4	1466	96
2	J K Engineers	1205	67	6	1138	94
3	Angel Bright	621	89	14	531	86
4	Rajdeep Engineering	1059	134	13	925	87
5	Ralex Engineers	1533	111	7	1422	93
6	Amol Engineering Works	1387	201	14	1186	86

7	Sankalp Engineering	1460	111	8	1349	92
8	R P Industries	1234	67	5	1167	95
9	Hexa Tech Engineers	1278	178	14	1099	86
10	Lano Engineering	1533	178	12	1355	88
11	Shrinivas Engineering	1643	111	7	1531	93
12	Mechatronic Systems	1716	111	6	1604	94
13	Rajesh Engineering Works	1460	156	11	1304	89
14	Worth Engineering Pvt. Ltd	1314	201	15	1113	85
15	Nikhil Industries	1278	107	8	1170	92
16	Desai Engineering Works	1460	178	12	1282	88
17	Dilip Industries	1168	89	8	1079	92
18	Prasho Engineers	913	223	24	690	76
19	Pinacle Dies Modul	1022	268	26	754	74
20	Vyankateshwar Engineers	1095	223	20	872	80
21	Harshad Industries	1351	357	26	994	74
22	Sankalp Engineering	1022	45	4	977	96
23	Sailaxmi Industries	1095	67	6	1028	94
24	Dynomerk Controls	2628	134	5	2494	95
25	Systems Technologies	1898	156	8	1742	92
26	Jay Suprabha Protative Product Pvt. Ltd	1752	156	9	1596	91
27	Divya Engineering Projects	1898	156	8	1742	92
28	Leo Enterprises	1789	45	2	1744	98
29	Aravind Vishnu Govande And Company	840	89	11	750	89
30	Sai Hari Enterprises	1643	223	14	1420	86
31	Rushi Engineering Pvt. Ltd.	1898	312	16	1586	84
32	Burhani Industries	1533	178	12	1355	88
33	Kumar Industries	2300	223	10	2077	90
34	Elcher Engineers Pvt. Ltd.	1570	178	11	1391	89
35	Harshada Industries	1643	223	14	1420	86
36	Nand Composites Pvt. Ltd	1679	223	13	1456	87
37	B J Perfect Work	1643	178	11	1464	89
38	Jyoti Heatsinks Pvt. Ltd	1643	134	8	1509	92
39	Ferroform Engineering Pvt. Ltd	1460	178	12	1282	88
40	Shree Parshwa Ind.	1825	67	4	1758	96

41	Akshay Organies Pvt. Ltd.	1643	223	14	1420	86
42	Bax Industries	913	89	10	823	90
43	Anand Trans	1825	375	21	1450	79
44	Lunar Enterprises Pvt. Ltd.	913	517	57	395	43
45	Sunil Engineers	1643	321	20	1321	80
46	Crasling	2738	682	25	2055	75
47	Total in cum.	68686	8401	12	60284	88

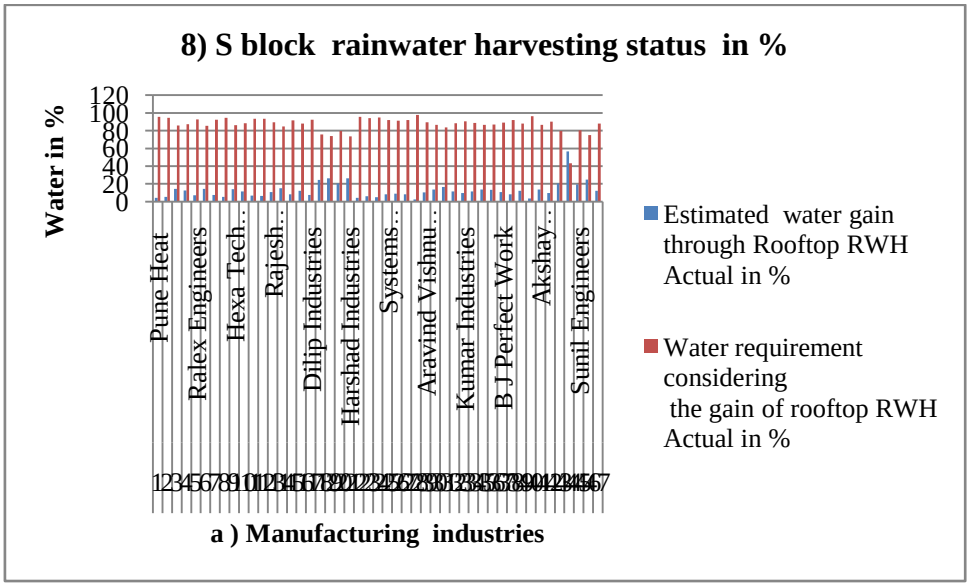

Figure no. 4.26

Above table no. 4.83 and graph no. 4.26 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of S block.

For all these 46 industrial units total annual water requirement from outside sources is 68686 cum. and estimated water gain through rooftop rainwater harvesting is 8401 cum which is 12 % therefore water requirement considering the gain of rooftop rainwater harvesting is 60284 which is 88 %

Table no. 4.84 - a) Manufacturing industries. - 9) Electronics Zone Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Rasco Industry	93	0	0	0	0	557	0
2	Mogora Cosmic Ltd	186	279	93	46	372	0	0
3	S H Pithkar Ortho tools	186	0	186	93	372	0	0

4	Lonlife Sciences Ltd.	279	93	93	0	279	93	0
5	Prasad Mcab p Ltd.	372	93	0	0	0	929	0
6	Zeutch Engineers P. Ltd	0	0	0	0	0	279	0
7	Jabro Engineers	46	0	0	0	0	929	0
8	Jaldoot material and handling P. Ltd	93	0	0	0	0	465	0
9	Deairj Tech India	0	74	111	195	1115	0	279
	Total	1254	539	483	334	2137	3252	279
	Total	1793		818		5667		

In the manufacturing industries of Electronics Zone surface area components measure to be 1) Open space = 1254 sqm. 2) Garden = 539 sqm. 3) Parking = 483 sqm. and 4) Road = 334 sqm. Whereas roof covered area components measured as 1) Slab roof area = 2137 sqm. 2) Cross metal sheet roof area = 3252 sqm. and 3) Godown roof area = 279 sqm.

Table no. 4.85 - a) Manufacturing industries. - 9) Electronics Zone Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Rasco Industry	18	0	0	0	0	321	0
2	Mogora Cosmic Ltd	36	45	56	28	214	0	0
3	S H Pithkar Ortho tools	36	0	113	56	214	0	0
4	Lonlife Sciences Ltd.	54	15	56	0	161	54	0
5	Prasad Mcab p Ltd.	71	15	0	0	0	535	0
6	Zeutch Engineers P. Ltd	0	0	0	0	0	161	0
7	Jabro Engineers	9	0	0	0	0	535	0
8	Jaldoot material and handling P. Ltd	18	0	0	0	0	268	0
9	Deairj Tech India	0	12	68	119	642	0	161
	Total	241	86	294	203	1231	1873	161
	Total	327		497		3264		

Above Table no. 4.85 gives detail about the rainwater harvesting potential of surface area and roof areas of 9 industrial units in the Electronics Zone.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 9 industrial units open space and gardens occupies the total area of 1793 sqm. and it provides the opportunity to get 327 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 818 sqm surface area and it provides the opportunity to get 497 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 9 industrial units maximum area occupies on roof area which is 5667 sqm areas and it's provide the opportunity to get 3264 cum. of water harvesting potential.

Table no. 4.86 - a) Manufacturing industries 9) Electronics Zone block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Rasco Industry	913	321	35	591	65
2	Mogora Cosmic Ltd	2190	214	10	1976	90
3	S H Pithkar Ortho tools	1460	214	15	1246	85
4	Lonlife Sciences Ltd.	1387	214	15	1173	85
5	Prasad Mcab p Ltd.	1460	535	37	925	63
6	Zeutch Engineers P. Ltd	913	161	18	752	82
7	Jabro Engineers	840	535	64	304	36
8	Jaldoot material and handling P. Ltd	1460	268	18	1192	82
9	Deairj Tech India	1095	642	59	453	41
10	Total in cum	11717	3104	26	8613	74

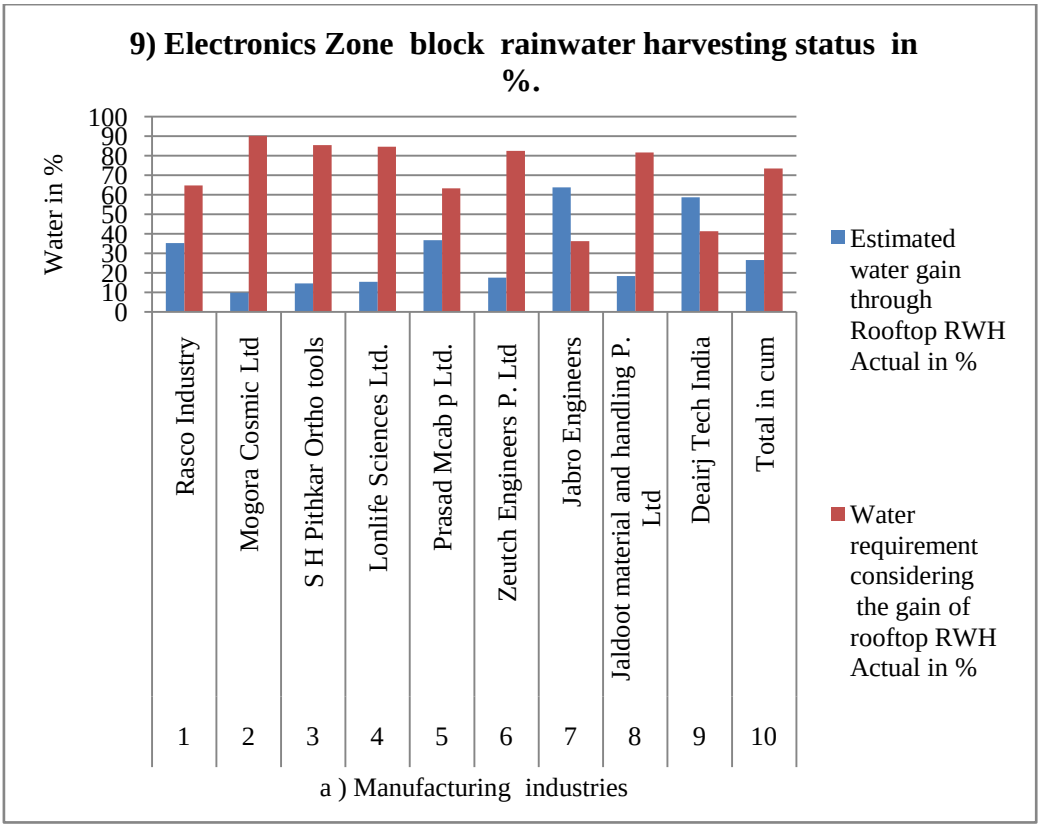

Figure no. 4.27

Above table no. 4.86 and graph no. 4.27 gives detail about the rooftop rainwater harvesting status in the manufacturing industries of Electronics Zone block.

For all these 9 industrial units total annual water requirement from outside sources is 11717 cum. and estimated water gain through rooftop rainwater harvesting is 3104 cum which is 26 % therefore water requirement considering the gain of rooftop rainwater harvesting is 8613 which is 74 %

b) Tool manufacturing industries:

Table no. 4.87 - b) Tool manufacturing industries -1) Bhosari Genral Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	God own
1	Kumar Tools	223	0	149	223	0	1672	0
2	Carbtools India Pvt.Ltd.	0	0	1	28	0	418	0
3	Truthread Gauges And Tools Pvt. Ltd	929	93	186	0	465	0	279

4	Sharp_Ex Enterprises	93	0	0	0	46	93	0
5	Kishor Industries	0	0	0	0	46	186	0
6	Jivan Profile	0	0	0	0	93	93	0
7	Malti Engineering Works	0	0	0	0	93	93	0
8	AMP Technologies	186	28	0	0	372	0	0
9	Mouj Engineering	279	93	93	50	0	279	0
10	Bodymaster Engineering	19	0	19	0	186	372	0
11	Arihant Engineers	46	0	19	0	372	0	0
12	Redint Engineering	93	46	0	0	372	0	0
	Total	1867	260	465	301	2044	3205	279
	Total	2127		766		5528		

In the tool manufacturing industries of Bhosari general block surface area components measure to be 1) Open space = 1867 sqm. 2) Garden = 260 sqm. 3) Parking = 465 sqm. and 4) Road = 301 sqm. Whereas roof covered area components measured as 1) Slab roof area = 2044 sqm. 2) Cross metal sheet roof area = 3205 sqm. and 3) Godown roof area = 279 sqm.

Table no. 4.88 - b)Tool manufacturing industries - 1) Bhosari General Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Kumar Tools	27	0	69	103	0	803	0
2	Carbtools India Pvt.Ltd.	0	0	0	13	0	201	0
3	Truthread Gauges And Tools Pvt. Ltd	111	9	86	0	223	0	134
4	Sharp_Ex Enterprises	11	0	0	0	22	45	0
5	Kishor Industries	0	0	0	0	22	89	0
6	Jivan Profile	0	0	0	0	45	45	0
7	Malti Engineering Works	0	0	0	0	45	45	0
8	AMP Technologies	22	3	0	0	178	0	0
9	Mouj Engineering	33	9	43	23	0	134	0

10	Bodymaster Engineering	2	0	9	0	89	178	0
11	Arihant Engineers	6	0	9	0	178	0	0
12	Redint Engineering	11	5	0	0	178	0	0
	Total	224	27	215	139	981	1538	134
	Total	251		354		2653		

Above Table no. 4.88 gives detail about the rainwater harvesting potential of surface area and roof areas of 12 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 12 industrial units open space and gardens occupies the total area of 2127 sqm. and it provides the opportunity to get 251 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 766 sqm surface area and it provides the opportunity to get 354 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 12 industrial units maximum area occupies on roof area which is 5528 sqm areas and it's provide the opportunity to get 2653 cum. of water harvesting potential.

Table no. 4.89 - b) Manufacturing industries 1) Bhosari General block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Kumar Tools	913	803	88	110	12
2	Carbtools India Pvt.Ltd.	913	201	22	712	78
3	Truthread Gauges And	2008	357	18	1651	82

	Tools Pvt. Ltd					
4	Sharp_Ex Enterprises	803	67	8	736	92
5	Kishor Industries	402	111	28	290	72
6	Jivan Profile	694	89	13	604	87
7	Malti Engineering Works	329	89	27	239	73
8	AMP Technologies	1095	178	16	917	84
9	Mouj Engineering	1387	134	10	1253	90
10	Bodymaster Engineering	1278	268	21	1010	79
11	Arihant Engineers	1095	178	16	917	84
12	Redint Engineering	876	178	20	698	80
13	Total incum.	11790	2653	23	9136	77

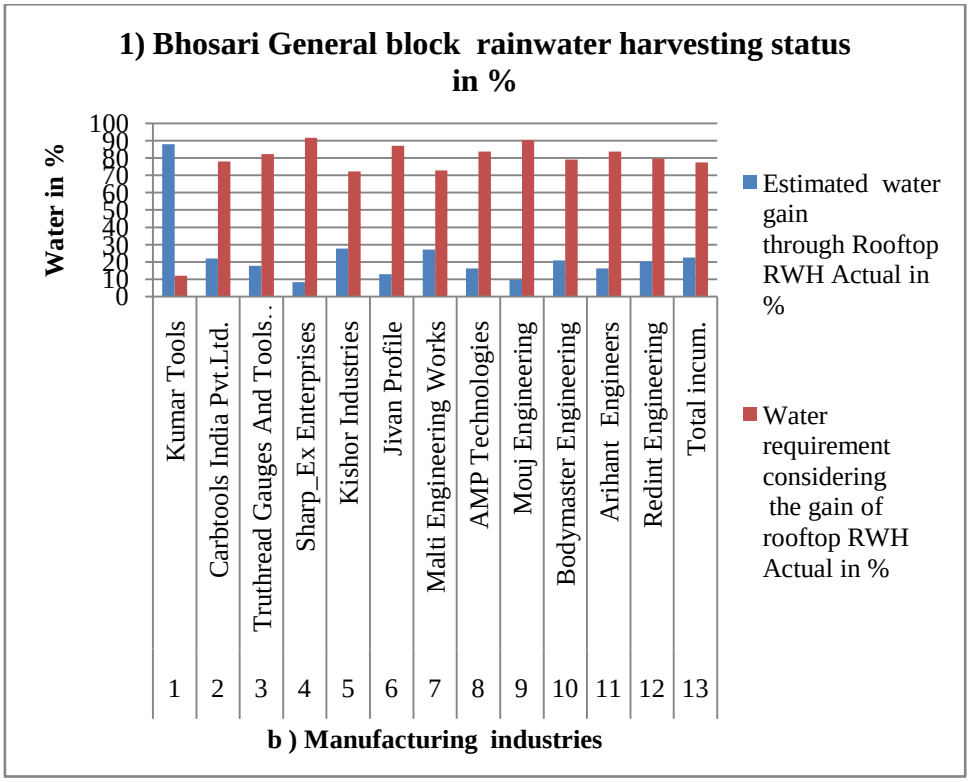

Figure no. 4.28

Above table no. 4.89 and graph no. 4.28 gives detail about the rooftop rainwater harvesting status in the tool manufacturing industries of Bhosari general block.

For all these 12 industrial units total annual water requirement from outside sources is 11790 cum. and estimated water gain through rooftop rainwater harvesting is 2653 cum which is 23 % therefore water requirement considering the gain of rooftop rainwater harvesting is 9136 which is 77 %

Table no. 4.90 - b) Tool manufacturing industries -2) J Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Parvati Machine Tools	74	56	111	74	297	0	0
2	Biltz Cutting Tools Company	0	28	28	146	0	3832	179
3	Bright Metals And Tools	0	7	81	0	0	929	0
4	Mision Tools And Technology	93	0	0	0	372	0	0
5	Suman Engineering	0	2	23	46	279	0	0
6	Accurate Laser Cutting	0	0	93	0	0	372	0
7	A D M Engineering	0	1	28	35	0	453	0
8	Super Engineers	0	2	28	14	186	0	46
9	Aksons Engineering	35	5	19	35	0	314	28
10	Prashant Engineering	0	0	35	19	0	105	14
11	Raviras Components	0	2	23	14	0	105	28
12	Shreeyash Industries	0	5	5	14	0	146	28
13	Taoovan Tools & Proto Tech. LLP	35	2	0	0	0	2032	0
14	Mona Engineering	167	0	56	74	0	251	111
15	Accu-Size Gauges & Tools Pvt. Ltd.	0	28	14	0	0	211	0
	Total	404	138	543	471	1133	8749	434
	Total	542		1015		10317		

In the tool manufacturing industries of J block surface area components measure to be 1) Open space = 404 sqm. 2) Garden = 138 sqm. 3) Parking = 543 sqm. and 4) Road = 471 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1133 sqm. 2) Cross metal sheet roof area = 8749 sqm. and 3) Godown roof area = 434 sqm

Table no. 4.91 - b)Tool manufacturing industries - 2) J Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Parvati Machine Tools	9	6	52	34	143	0	0
2	Biltz Cutting Tools Company	0	3	13	68	0	1839	86
3	Bright Metals And Tools	0	1	38	0	0	446	0
4	Mision Tools And Technology	11	0	0	0	178	0	0
5	Suman Engineering	0	0	11	21	134	0	0
6	Accurate Laser Cutting	0	0	43	0	0	178	0
7	A D M Engineering	0	0	13	16	0	217	0
8	Super Engineers	0	0	13	6	89	0	22
9	Aksons Engineering	4	0	9	16	0	151	13
10	Prashant Engineering	0	0	16	9	0	50	7
11	Raviras Components	0	0	11	6	0	50	13
12	Shreeyash Industries	0	0	2	6	0	70	13
13	Taoovan Tools & Proto Tech. LLP	4	0	0	0	0	975	0
14	Mona Engineering	20	0	26	34	0	120	54
15	Accu-Size Gauges & Tools Pvt. Ltd.	0	3	6	0	0	101	0
	Total	48	14	251	218	544	4200	208
	Total	63		469		4952		

Above Table no. 4.91 gives detail about the rainwater harvesting potential of surface area and roof areas of 15 industrial units in the J block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 15 industrial units open space and gardens occupies the total area of 542 sqm. and it provides the opportunity to get 63 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and

roads occupies 1015 sqm surface area and it provides the opportunity to get 469 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 15 industrial units maximum area occupies on roof area which is 10317 sqm areas and it's provide the opportunity to get 4952 cum. of water harvesting potential.

Table no. 4.92 - b) Manufacturing industries 2) J block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Parvati Machine Tools	511	143	28	368	72
2	Biltz Cutting Tools Company	803	1925	240	1122	140
3	Bright Metals And Tools	767	446	58	321	42
4	Mision Tools And Technology	1095	178	16	917	84
5	Suman Engineering	548	134	24	414	76
6	Accurate Laser Cutting	913	178	20	734	80
7	A D M Engineering	803	217	27	586	73
8	Super Engineers	913	111	12	801	88
9	Aksons Engineering	840	164	20	676	80
10	Prashant Engineering	840	57	7	783	93
11	Raviras Components	657	64	10	593	90
12	Shreeyash Industries	1022	84	8	938	92
13	Taoovan Tools & Proto Tech. LLP	548	975	178	428	78
14	Mona Engineering	913	174	19	739	81
15	Accu-Size Gauges & Tools Pvt. Ltd.	840	101	12	738	88
16	Total in cum.	12009	4952	41	7056	59

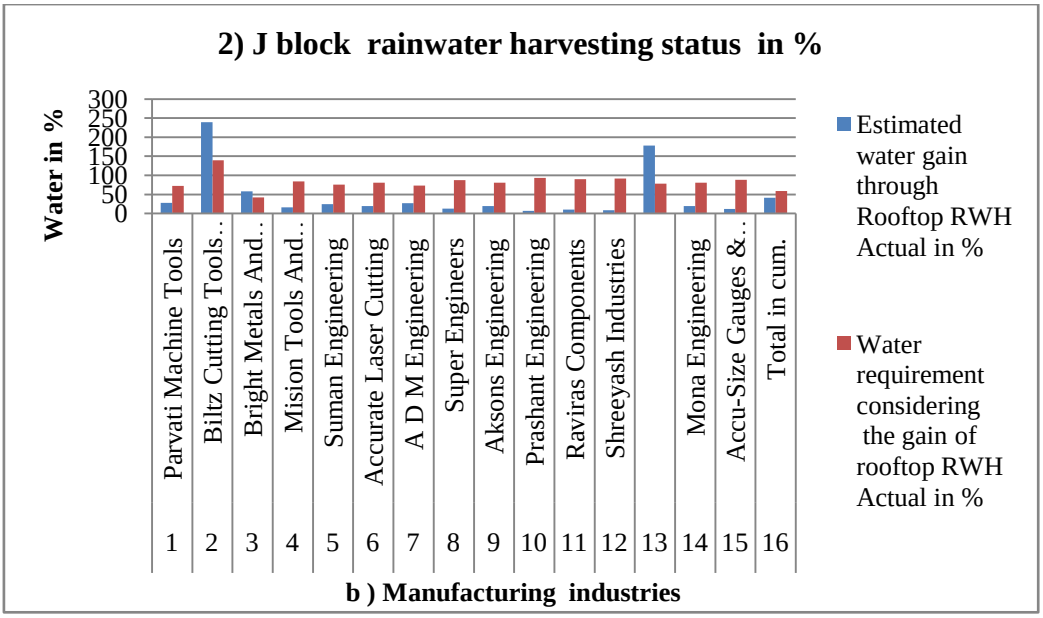

Figure no. 4.29

Above table no. 4.92 and graph no. 4.29 gives detail about the rooftop rainwater harvesting status in the tool manufacturing industries of J block.

For all these 15 industrial units total annual water requirement from outside sources is 12009 cum. and estimated water gain through rooftop rainwater harvesting is 4952 cum which is 41 % therefore water requirement considering the gain of rooftop rainwater harvesting is 7056 which is 59 %

Table no. 4.93 - b) Tool manufacturing industries -3) H Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Industrial Products	19	46	46	28	0	232	93
2	Iec air Tools Pvt. Ltd.	0	2	14	14	0	93	0
3	Jyoti Tooling And Press Components P. Ltd	35	70	0	0	585	0	0
	Total	53	118	60	42	585	325	93
	Total	172		102		1003		

In the tool manufacturing industries of H block surface area components measure to be 1) Open space = 53 sqm. 2) Garden = 118 sqm. 3) Parking = 60 sqm. and 4) Road = 42 sqm. Whereas roof covered area components measured as 1) Slab roof area = 585 sqm. 2) Cross metal sheet roof area = 325 sqm. and 3) Godown roof area = 93 sqm.

Table no. 4.94 - b)Tool manufacturing industries - 3) H Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Industrial Products	2	5	21	13	0	111	45
2	Iec air Tools Pvt. Ltd.	0	0	6	6	0	45	0
3	Jyoti Tooling And Press Components P. Ltd	4	7	0	0	281	0	0
	Total	6	12	28	19	281	156	45
	Total	18		47		482		

Above Table no.4.94 gives detail about the rainwater harvesting potential of surface area and roof areas of 3 industrial units in the H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 3 industrial units open space and gardens occupies the total area of 172 sqm. and it provides the opportunity to get 18 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 102 sqm surface area and it provides the opportunity to get 47 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 3 industrial units maximum area occupies on roof area which is 1003 sqm areas and it’s provide the opportunity to get 482 cum. of water harvesting potential.

Table no. 4.95 - b) Manufacturing industries 3) H block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Industrial Products	1278	156	12	1121	88
2	Iec air Tools Pvt. Ltd.	1716	45	3	1671	97
3	Jyoti Tooling And Press Components P. Ltd	1825	281	15	1544	85
4	Total in cum.	4818	482	10	4336	90

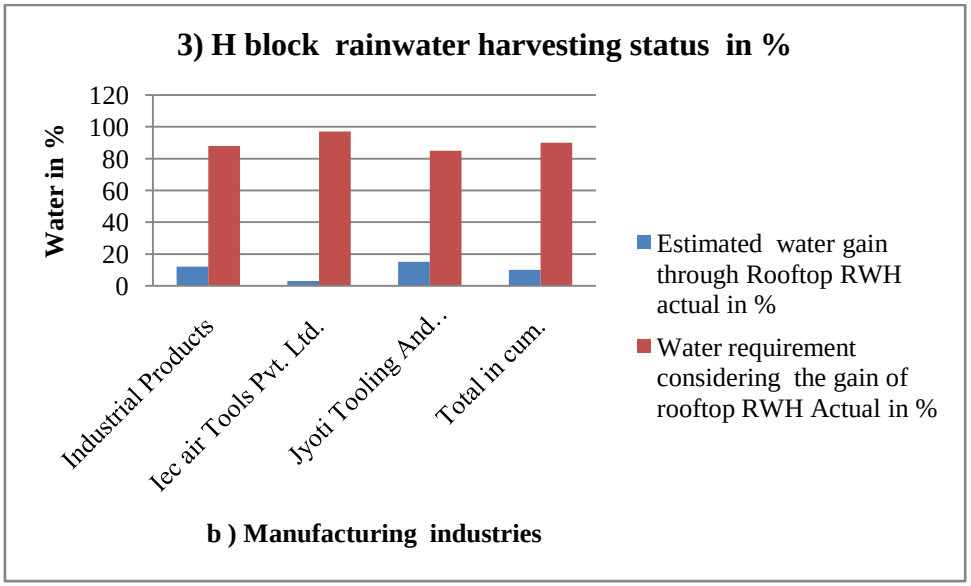

Figure no. 4.30

Above table no. 4.95 And graph no. 4.30 Gives detail about the rooftop rainwater harvesting status in the tool manufacturing industries of H block.

For all these 3 industrial units total annual water requirement from outside sources is 4818 cum. and estimated water gain through rooftop rainwater harvesting is 482 cum which is 10 % therefore water requirement considering the gain of rooftop rainwater harvesting is 4336 which is 90 %

Table no. 4.96 - b) Tool manufacturing industries -4) S Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Jis Tools Company	46	93	0	0	0	279	0
2	Jose Brother Industries	0	0	28	28	0	520	0
3	Ganesh Engineering work	0	0	28	74	0	892	0
4	Delpro Equipments Pvt. Ltd	0	0	93	0	0	372	0
	Total	46	93	149	102	0	2062	0
	Total	139		251		2062		

In the tool manufacturing industries of S block surface area components measure to be 1) Open space = 46 sqm. 2) Garden = 93 sqm. 3) Parking = 149 sqm. and 4) Road = 102 sqm. Whereas roof covered area components measured as 1) Slab roof area = 0 sqm. 2) Cross metal sheet roof area = 2062 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.97 - b)Tool manufacturing industries - 4) S Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Jis Tools Company	11	5	0	0	0	134	0
2	Jose Brother Industries	0	0	13	13	0	250	0
3	Ganesh Engineering work	0	0	13	34	0	428	0
4	Delpro Equipments Pvt. Ltd	0	0	43	0	0	178	0
	Total	11	5	69	47	0	990	0
	Total	16		116		990		

Above Table no. 4.97 gives detail about the rainwater harvesting potential of surface area and roof areas of 4 industrial units in the S block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 4 industrial units open space and gardens occupies the total area of 139 sqm. and it provides the opportunity to get 16 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 251 sqm surface area and it provides the opportunity to get 116 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 4 industrial units maximum area occupies on roof area which is 2062 sqm areas and it's provide the opportunity to get 990 cum. of water harvesting potential.

Table no. 4.98 - b) Manufacturing industries 4) S block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Jis Tools Company	1825	134	7	1691	93
2	Jose Brother Industries	913	250	27	663	73
3	Ganesh Engineering work	1278	428	34	849	66
4	Delpro Equipments Pvt. Ltd	1752	178	10	1574	90
5	Total in cum.	5767	990	17	4777	83

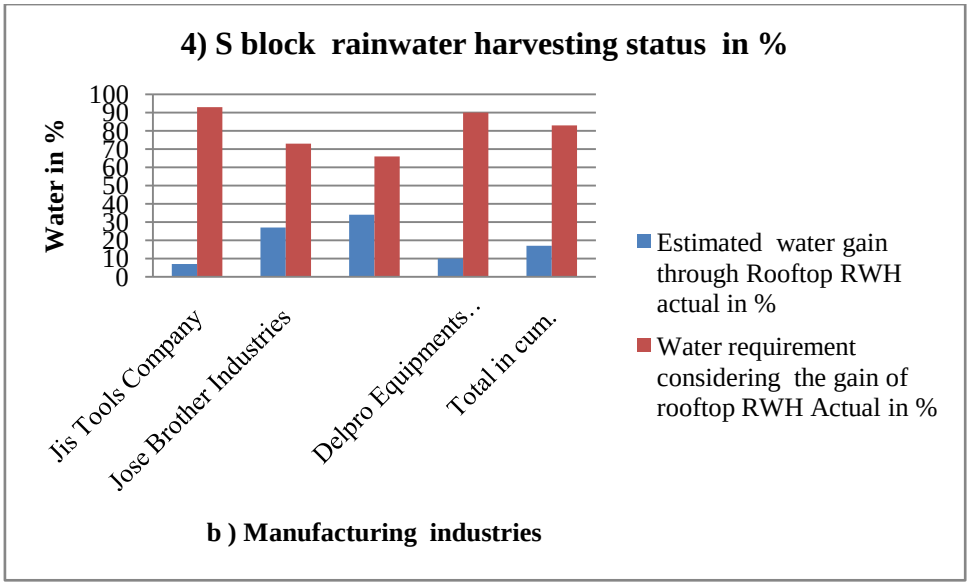

Figure no. 4.31

Above table no. 4.98 and graph no. 4.31 gives detail about the rooftop rainwater harvesting status in the tool manufacturing industries of S block.

For all these 4 industrial units total annual water requirement from outside sources is 5767 cum. and estimated water gain through rooftop rainwater harvesting is 990 cum which is 17 % therefore water requirement considering the gain of rooftop rainwater harvesting is 4777 which is 83 %

Table no. 4.99 - b) Tool manufacturing industries - 5) Electronics Zone Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Sakshi metal and tools P. Ltd	279	186	0	0	0	465	0
	Total	465		0		465		

In the tool manufacturing industries of Electronics Zone surface area components measure to be 1) Open space = 279 sqm. 2) Garden = 186 sqm. 3) Parking = 0 sqm. and 4) Road = 0 sqm. Whereas roof covered area components measured as 1) Slab roof area = 0 sqm. 2) Cross metal sheet roof area = 465 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.100 - b) Tool manufacturing industries - 5) Electronics Zone Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheets	Godown
1	Sakshi metal and tools P. Ltd	54	30	0	0	0	268	0
	Total	84		0		268		

Above Table no. 4.100 gives detail about the rainwater harvesting potential of surface area and roof areas of 1 industrial units in the Electronics Zone.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 1 industrial units open space and gardens occupies the total area of 465 sqm. and it provides the opportunity to get 84 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 0 sqm surface area and it provides the opportunity to get 0 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 1 industrial units maximum area occupies on roof area which is 465 sqm areas and it's provide the opportunity to get 268 cum. of water harvesting potential.

Table no. 4.101 - b) Manufacturing industries 5) Electronics Zone block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Sakshi metal and tools P. Ltd	1533	268	17	1265	83

Above table no. 4.101 gives detail about the rooftop rainwater harvesting status in the tool manufacturing industries of Electronics Zone block.

For all these 1 industrial units total annual water requirement from outside sources is 1533 cum. and estimated water gain through rooftop rainwater harvesting is 268 cum which is 17 % therefore water requirement considering the gain of rooftop rainwater harvesting is 1265 which is 83 %

c) Plastic and rubber, fiber industries:

Table no. 4.102 - c) Plastic and rubber, fiber industries. -1) Bhosari Genral Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Multi Crafts	0	28	70	46	446	0	0
2	Elite Plastic Industries	16	0	37	37	0	669	0
3	Tanbe Enterprises	16	0	446	16	74	1784	0
4	Lala Rubber Products	0	0	46	0	0	465	0
5	Tharma Fab	0	0	14	5	0	167	0
6	Suvarna Fibo Tech Pvt. Ltd.	0	0	297	446	669	0	0
7	Shriram Rubber Product Pvt. Ltd.	46	0	46	0	139	0	139
8	Ardfine Plymers Pvt. Ltd.	0	0	56	111	186	297	0
9	Arofine Polymers Pvt. Ltd.	0	1	28	0	0	372	0
10	Cipy Polymers	0	0	56	67	212	0	0
11	Agio Polymer Ltd.	0	0	297	111	892	0	0
	Total	78	29	1394	840	2618	3753	139
	Total	106		2233		6511		

In the plastic and rubber, fiber industries of Bhosari general block surface area components measure to be 1) Open space = 78 sqm. 2) Garden = 29 sqm. 3) Parking = 1394 sqm. and 4) Road = 840 sqm. Whereas roof covered area components measured as 1) Slab roof area = 2618 sqm. 2) Cross metal sheet roof area = 3753 sqm. and 3) Godown roof area = 139 sqm.

Table no. 4.103 - c) Plastic and rubber, fiber industries. - 1) Bhosari General Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Multi Crafts	0	3	32	21	214	0	0
2	Elite Plastic Industries	2	0	17	17	0	321	0
3	Tanbe Enterprises	2	0	206	7	36	856	0
4	Lala Rubber Products	0	0	21	0	0	223	0
5	Tharma Fab	0	0	6	2	0	80	0
6	Suvarna Fibo Tech Pvt. Ltd.	0	0	137	206	321	0	0
7	Shriram Rubber Product Pvt. Ltd.	6	0	21	0	67	0	67
8	Ardfine Plymers Pvt. Ltd.	0	0	26	52	89	143	0
9	Arofine Polymers Pvt. Ltd.	0	0	13	0	0	178	0
10	Cipy Polymers	0	0	26	31	102	0	0
11	Agio Polymer Ltd.	0	0	137	52	428	0	0
	Total	9	3	506	336	829	1802	67
	Total	12		843		2697		

Above Table no. 4.103 gives detail about the rainwater harvesting potential of surface area and roof areas of 11 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 11 industrial units open space and gardens occupies the total area of 106 sqm. and it provides the opportunity to get 12 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and

roads occupies 2233 sqm surface area and it provides the opportunity to get 843 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 11 industrial units maximum area occupies on roof area which is 6511 sqm areas and it's provide the opportunity to get 2697 cum. of water harvesting potential.

Table no. 4.104 - c) Plastic and rubber, fiber industries 1) Bhosari General block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Multi Crafts	1351	214	16	1136	84
2	Elite Plastic Industries	1095	321	29	774	71
3	Tanbe Enterprises	986	892	90	94	10
4	Lala Rubber Products	1095	223	20	872	80
5	Tharma Fab	1095	80	7	1015	93
6	Suvarna Fibo Tech Pvt. Ltd.	986	321	33	664	67
7	Shriram Rubber Product Pvt. Ltd.	1460	134	9	1326	91
8	Ardfine Plymers Pvt. Ltd.	1278	232	18	1046	82
9	Arofine Polymers Pvt. Ltd.	1898	178	9	1720	91
10	Cipy Polymers	1095	102	9	993	91
11	Agio Polymer Ltd.	1095	428	39	667	61
12	Total in cum.	13432	3125	23	10307	77

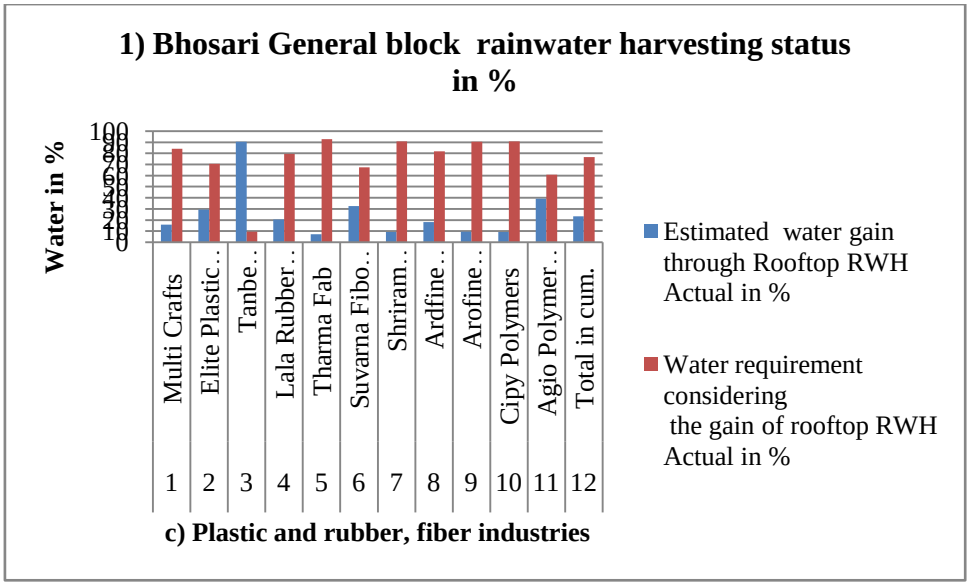

Figure no. 4.32

Above table no. 4.104 and graph no. 4.32 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of Bhosari general block.

For all these 11 industrial units total annual water requirement from outside sources is 13432 cum. and estimated water gain through rooftop rainwater harvesting is 3125 cum which is 23 % therefore water requirement considering the gain of rooftop rainwater harvesting is 10307 which is 77 %

Table no. 4.105 - c) Plastic and rubber, fiber industries. -2) D - I Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	venus Fabica	46	0	0	0	465	0	0
2	Jayashree Plymer Pvt. Ltd	669	37	297	446	845	1100	446
3	Auto Fibre Works P. Ltd.	0	1	28	35	0	232	0
	Total	715	38	325	481	1310	1332	446
	Total	753		806		3088		

In the plastic and rubber, fiber industries of D -I block surface area components measure to be 1) Open space = 715 sqm. 2) Garden = 38 sqm. 3) Parking = 325 sqm. and 4) Road = 481 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1310 sqm. 2) Cross metal sheet roof area = 1332 sqm. and 3) Godown roof area = 446 sqm

Table no. 4.106 - c) Plastic and rubber, fiber industries. - 2) D - I Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	venus Fabica	6	0	0	0	223	0	0
2	Jayashree Plymer Pvt. Ltd	80	4	137	206	406	528	214
3	Auto Fibre Works P. Ltd.	0	0	13	16	0	111	0
	Total	86	4	150	222	629	639	214
	Total	90		372		1482		

Above Table no. 4.106 gives detail about the rainwater harvesting potential of surface area and roof areas of 3 industrial units in the D - I block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 3 industrial units open space and gardens occupies the total area of 753 sqm. and it provides the opportunity to get 90 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 806 sqm surface area and it provides the opportunity to get 372 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 3 industrial units maximum area occupies on roof area which is 3088 sqm areas and it's provide the opportunity to get 1482 cum. of water harvesting potential.

Table no. 4.107 - c) Plastic and rubber, fiber industries 2) D - I block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**

		in cum.				
1	venus Fabica	1095	223	20	872	80
2	Jayashree Plymer Pvt. Ltd	2555	1148	45	1407	55
3	Auto Fibre Works P. Ltd.	1168	111	10	1057	90
4	Total in cum.	4818	1482	31	3336	69

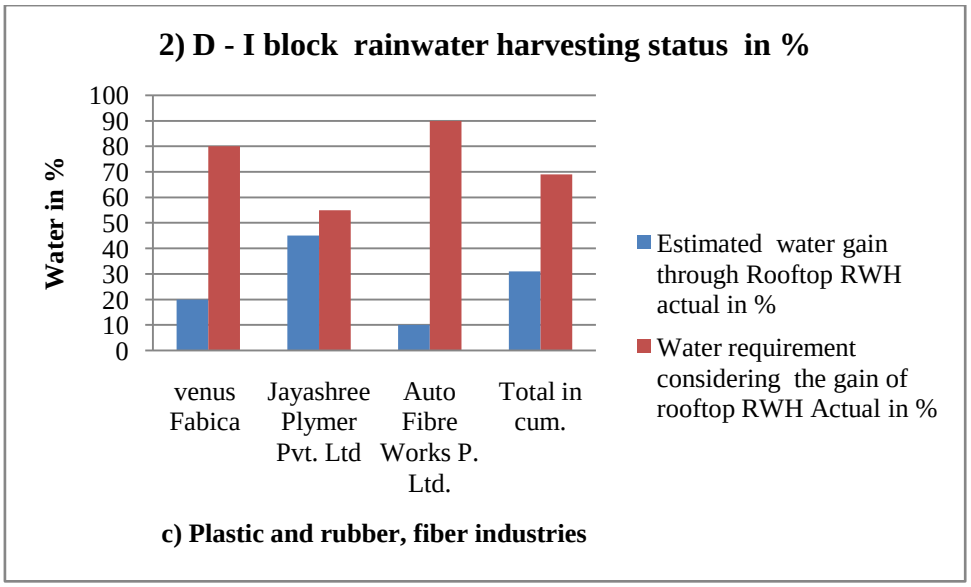

Figure no. 4.33

Above table no. 4.107 and graph no 4.33 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of D-I block.

For all these 3 industrial units total annual water requirement from outside sources is 4818 cum. and estimated water gain through rooftop rainwater harvesting is 1482 cum which is 31 % therefore water requirement considering the gain of rooftop rainwater harvesting is 3336 which is 69 %

Table no. 4.108 - c) Plastic and rubber, fiber industries. -3) D - II Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Bhavika Plastics	0	0	19	19	0	929	0
2	Rubber Linings	0	19	0	19	0	232	0
3	Shridhar Rubber Products Pvt. Ltd.	0	37	46	9	279	0	93
4	Sunny FRP Products	28	37	19	19	0	325	93
5	Pradip Plastic Molders P. Ltd.	93	0	14	93	0	372	0

6	Pradip Plastic Molders P. Ltd.	186	0	0	0	465	186	0
7	Electro Fab	93	0	0	93	93	279	186
8	Hitch Plast Pvt. Ltd.	0	5	14	28	0	511	0
9	Hirkesh Rubber Products	0	14	5	0	0	325	0
	Total	399	98	111	279	836	2834	372
	Total	497		390		4041		

In the plastic and rubber, fiber industries of D - II block surface area components measure to be 1) Open space = 399 sqm. 2) Garden = 98 sqm. 3) Parking = 111 sqm. and 4) Road = 279 sqm. Whereas roof covered area components measured as 1) Slab roof area = 836 sqm. 2) Cross metal sheet roof area = 2834 sqm. and 3) Godown roof area = 372 sqm.

Table no. 4.109 - c) Plastic and rubber, fiber industries. - 3) D - II Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Bhavika Plastics	0	0	9	9	0	446	0
2	Rubber Linings	0	2	0	9	0	111	0
3	Shridhar Rubber Products Pvt. Ltd.	0	4	21	4	134	0	45
4	Sunny FRP Products	3	4	9	9	0	156	45
5	Pradip Plastic Molders P. Ltd.	11	0	6	43	0	178	0
6	Pradip Plastic Molders P. Ltd.	22	0	0	0	223	89	0
7	Electro Fab	11	0	0	43	45	134	89
8	Hitch Plast Pvt. Ltd.	0	0	6	13	0	245	0
9	Hirkesh Rubber Products	0	1	2	0	0	156	0
	Total	48	11	54	129	401	1516	178
	Total	59		182		2096		

Above Table no. 109 gives detail about the rainwater harvesting potential of surface area and roof areas of 9 industrial units in the D- II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 9 industrial units open space and gardens occupies the total area of 497 sqm. and it provides the opportunity to get 59 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 390 sqm surface area and it provides the opportunity to get 182 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 9 industrial units maximum area occupies on roof area which is 4041 sqm areas and it's provide the opportunity to get 2096 cum. of water harvesting potential.

Table no. 4.110 - c) Plastic and rubber, fiber industries 3) D - II block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhavika Plastics	803	446	56	357	44
2	Rubber Linings	1278	111	9	1166	91
3	Shridhar Rubber Products Pvt. Ltd.	1663	178	11	1484	89
4	Sunny FRP Products	1533	201	13	1332	87
5	Pradip Plastic Molders P. Ltd.	913	178	20	734	80
6	Pradip Plastic Molders P. Ltd.	1095	312	29	783	71
7	Electro Fab	1095	268	24	827	76
8	Hitch Plast Pvt. Ltd.	1205	245	20	959	80
9	Hirkesh Rubber Products	1168	156	13	1012	87
10	Total in cum.	10751	2096	19	8655	81

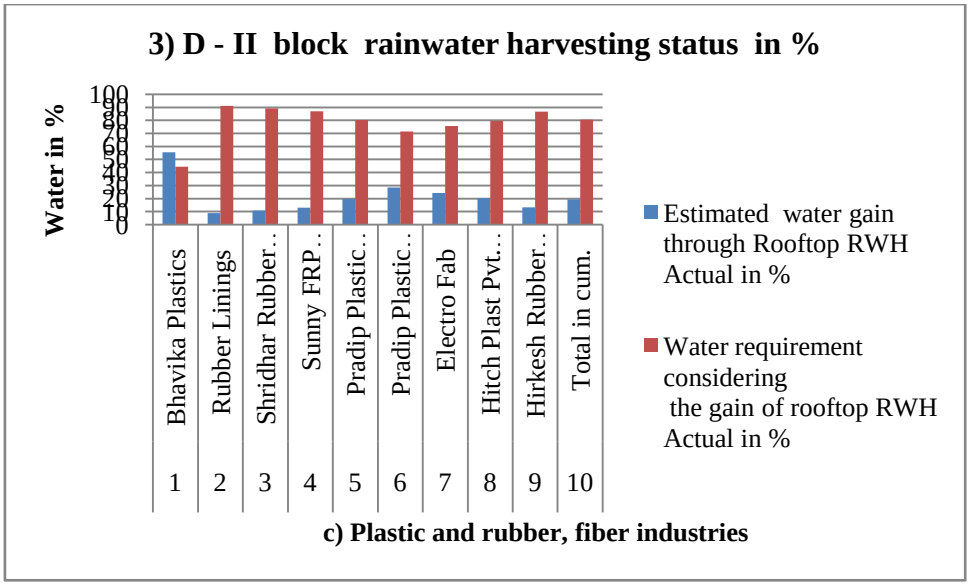

Figure no. 4.34

Above table no. 4.110 and graph no. 4.34 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of D-II block.

For all these 9 industrial units total annual water requirement from outside sources is 10751 cum. and estimated water gain through rooftop rainwater harvesting is 2096 cum which is 19 % therefore water requirement considering the gain of rooftop rainwater harvesting is 8655 which is 81 %

Table no. 4.111 - c) Plastic and rubber, fiber industries. 4) D - III Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Premier Plastics	0	186	0	14	372	0	0
2	Plastc Moduls	46	46	0	46	0	279	93
	Total	46	232	0	60	372	279	93
	Total	279		60		743		

In the plastic and rubber, fiber industries of D - III block surface area components measure to be 1) Open space = 46 sqm. 2) Garden = 232 sqm. 3) Parking = 0 sqm. and 4) Road = 60 sqm. Whereas roof covered area components measured as 1) Slab roof area = 372 sqm. 2) Cross metal sheet roof area = 279 sqm. and 3) Godown roof area = 93 sqm.

Table no. 4.112 - c) Plastic and rubber, fiber industries. - 4) D - III Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Premier Plastics	0	19	0	6	178	0	0
2	Plastc Moduls	6	5	0	21	0	134	45
	Total	6	24	0	28	178	134	45
	Total	30		28		357		

Above Table no. 4.112 gives detail about the rainwater harvesting potential of surface area and roof areas of 2 industrial units in the D - III block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 2 industrial units open space and gardens occupies the total area of 279 sqm. and it provides the opportunity to get 30 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 60 sqm surface area and it provides the opportunity to get 28 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 2 industrial units maximum area occupies on roof area which is 743 sqm areas and it's provide the opportunity to get 357 cum. of water harvesting potential.

Table no. 4.113 - c) Plastic and rubber, fiber industries 4) D - III block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	Premier	1095	178	16	917	84

	Plastics					
2	Plastc Moduls	1643	178	11	1464	89
3	Total in cum.	2738	357	13	2381	87

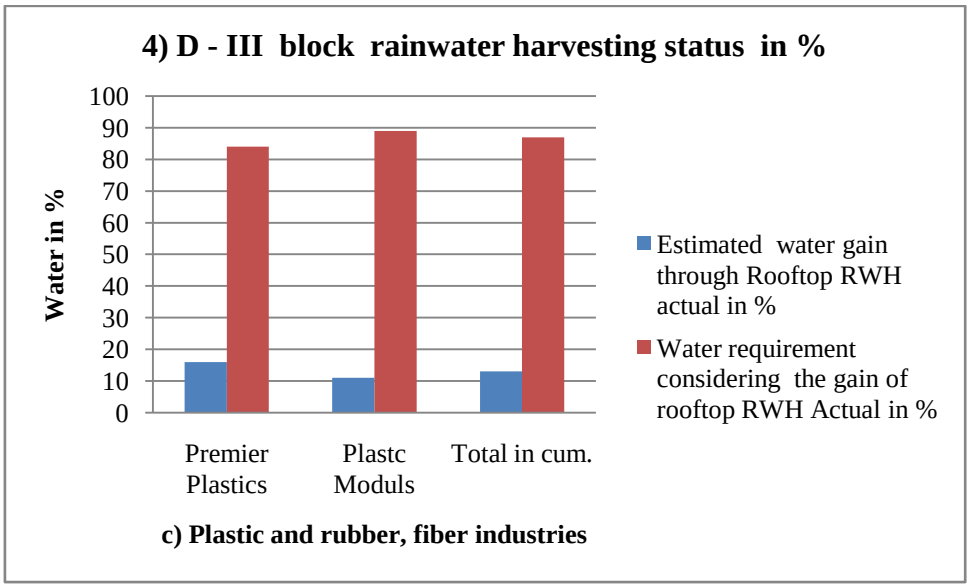

Figure no. 4.35

Above table no. 4.113 and graph no. 4.35 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of D-III block.

For all these 2 industrial units total annual water requirement from outside sources is 2738 cum. and estimated water gain through rooftop rainwater harvesting is 357 cum which is 13 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2381 which is 87 %

Table no. 4.114 - c) Plastic and rubber, fiber industries. - 5) F - II Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Bhagat Plastics	0	2	14	14	0	139	0
2	Pioneek Rubber	0	1	14	28	121	0	0
	Total	0	3	28	42	121	139	0
	Total	3		70		260		

In the plastic and rubber, fiber industries of F - II block surface area components measure to be 1) Open space = 0 sqm. 2) Garden = 3 sqm. 3) Parking = 28 sqm. and 4) Road = 42 sqm. Whereas roof covered area components measured as 1) Slab roof area =121 sqm. 2) Cross metal sheet roof area = 139 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.115 - c) Plastic and rubber, fiber industries. - 5) F - II Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Bhagat Plastics	0	0	6	6	0	67	0
2	Pioneek Rubber	0	0	6	13	58	0	0
	Total	0	0	13	19	58	67	0
	Total	0		32		125		

Above Table no. 4.115 gives detail about the rainwater harvesting potential of surface area and roof areas of 2 industrial units in the F - II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 2 industrial units open space and gardens occupies the total area of 3 sqm. and it provides the opportunity to get 0 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 70 sqm surface area and it provides the opportunity to get 32 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 2 industrial units maximum area occupies on roof area which is 260 sqm areas and it's provide the opportunity to get 125 cum. of water harvesting potential

Table no. 4.116 - c) Plastic and rubber, fiber industries 5) F - II block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	Bhagat Plastics	1570	67	4	1503	96
2	Pioneek Rubber	1241	58	5	1183	95
3	Total in cum.	2811	125	4	2686	96

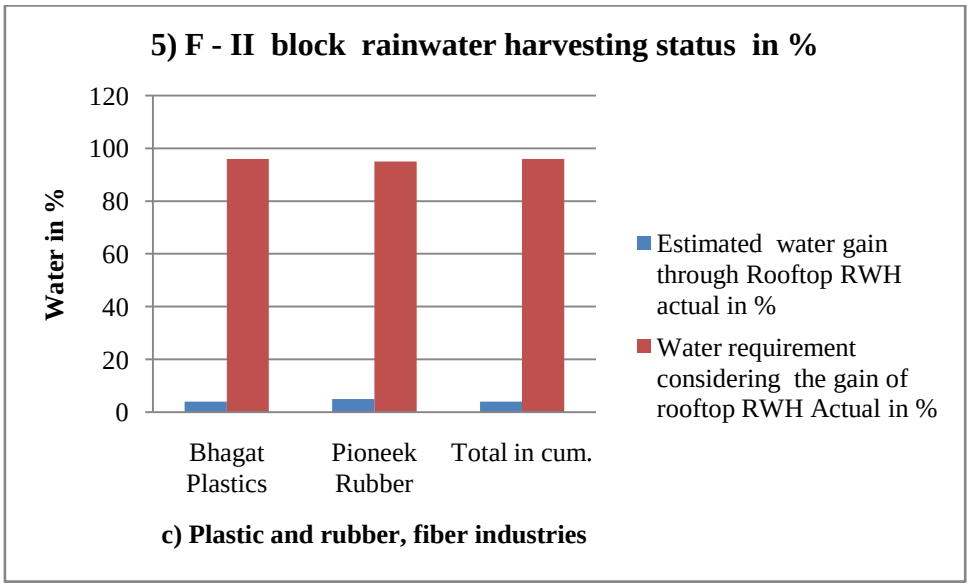

Figure no. 4.36

Above table no. 4.116 and graph no. 4.36 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of F-II block.

For all these 2 industrial units total annual water requirement from outside sources is 2811 cum. and estimated water gain through rooftop rainwater harvesting is 125 cum which is 4 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2686 which is 96 %

Table no. 4.117 - c) Plastic and rubber, fiber industries. - 6) J Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Crown Rubber Product	111	0	149	74	0	595	0
2	Policemical Fabi	56	23	56	16	669	0	0
3	Tej Plastics	0	7	35	74	0	1742	49
4	Multi Plast	0	28	49	130	0	871	46
5	Abhi Tech Fab P. Ltd.	74	0	297	0	0	557	0
6	Heramb Thermoplastics Pvt. Ltd.	93	0	0	0	0	372	0
7	Imperial Rubber Products	0	0	0	0	186	186	0
8	Polymers And Adhesves	14	14	35	65	0	272	0
	Total	348	72	620	359	855	4594	95
	Total	420		979		5544		

In the plastic and rubber, fiber industries of J block surface area components measure to be 1) Open space = 348 sqm. 2) Garden = 72 sqm. 3) Parking = 620 sqm. and 4) Road = 359sqm. Whereas roof covered area components measured as 1) Slab roof area = 855 sqm. 2) Cross metal sheet roof area = 4594 sqm. and 3) Godown roof area = 95 sqm.

Table no. 4.118 - c) Plastic and rubber, fiber industries. - 6) J Block - Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Crown Rubber Product	13	0	69	34	0	285	0
2	Policemical Fabi	7	2	26	7	321	0	0
3	Tej Plastics	0	1	16	34	0	836	23
4	Multi Plast	0	3	23	60	0	418	22
5	Abhi Tech Fab P.	9	0	137	0	0	268	0

	Ltd.							
6	Heramb Thermoplastics Pvt. Ltd.	11	0	0	0	0	178	0
7	Imperial Rubber Products	0	0	0	0	89	89	0
8	Polymers And Adhesves	2	1	16	30	0	130	0
	Total	42	7	286	166	410	2205	46
	Total	49		453		2661		

Above Table no. 4.118 gives detail about the rainwater harvesting potential of surface area and roof areas of 8 industrial units in the J block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 8 industrial units open space and gardens occupies the total area of 420 sqm. and it provides the opportunity to get 49 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 979 sqm surface area and it provides the opportunity to get 453 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 8 industrial units maximum area occupies on roof area which is 5444 sqm areas and it's provide the opportunity to get 2661 cum. of water harvesting potential.

Table no. 4.119 - c) Plastic and rubber, fiber industries 6) J block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Crown Rubber Product	1278	285	22	992	78

2	Policemical Fabi	1059	321	30	737	70
3	Tej Plastics	1095	860	78	235	22
4	Multi Plast	1168	440	38	728	62
5	Abhi Tech Fab P. Ltd.	730	268	37	462	63
6	Heramb Thermoplastics Pvt. Ltd.	1278	178	14	1099	86
7	Imperial Rubber Products	1168	178	15	990	85
8	Polymers And Adhesves	876	130	15	746	85
9	Total in cum.	8651	2661	31	5989	69

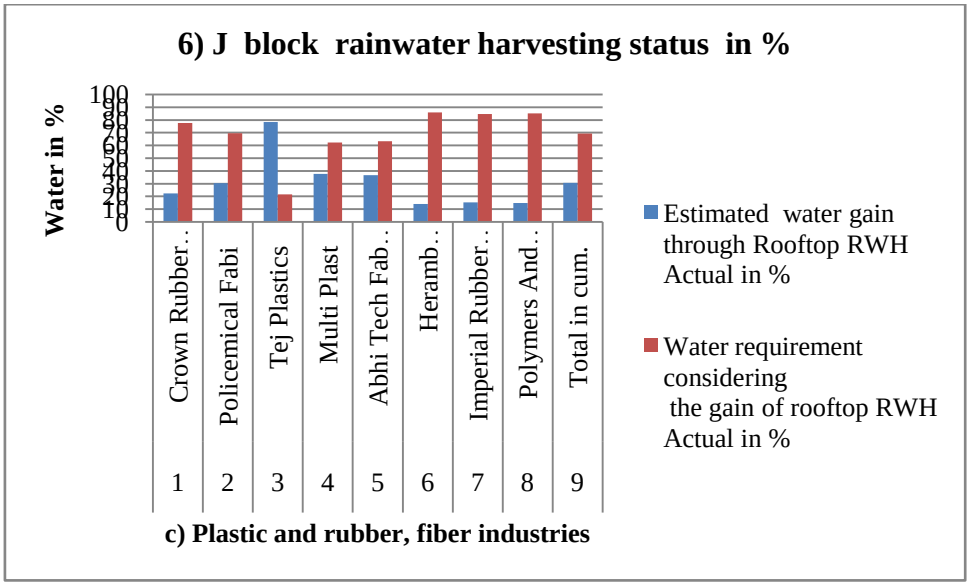

Figure no. 4.37

Above table no. 4.119 and graph no. 4.37 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of J block.

For all these 8 industrial units total annual water requirement from outside sources is 8651 cum. and estimated water gain through rooftop rainwater harvesting is 2661 cum which is 31 % therefore water requirement considering the gain of rooftop rainwater harvesting is 8989 which is 69 %

Table no. 4.120 - c) Plastic and rubber, fiber industries. - 7) H Block Surface And Roof Area In Sqm.								
Sr. No	**Name Of Industry**	**Surface Area In Sqm.**				**Roof Area In Sqm.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Anupama Rubber	0	0	19	0	372	0	0
2	Rohan Plastic Industries	0	0	35	0	669	0	0
3	Uma Plast Wark Pvt. Ltd.	19	37	37	84	11148	0	0
	Total	19	37	91	84	12189	0	0
	Total	56		174		12189		

In the plastic and rubber, fiber industries of H block surface area components measure to be 1) Open space = 19 sqm. 2) Garden = 37 sqm. 3) Parking = 91 sqm. and 4) Road = 84 sqm. Whereas roof covered area components measured as 1) Slab roof area = 12189 sqm. 2) Cross metal sheet roof area = 0 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.121 - c) Plastic and rubber, fiber industries. - 7) H Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Anupama Rubber	0	0	9	0	178	0	0
2	Rohan Plastic Industries	0	0	16	0	321	0	0
3	Uma Plast Wark Pvt. Ltd.	2	4	17	39	5351	0	0
	Total	2	4	42	39	5851	0	0
	Total	6		80		5851		

Above Table no. 4.121 gives detail about the rainwater harvesting potential of surface area and roof areas of 3 industrial units in the H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 3 industrial units open space and gardens occupies the total area of 56 sqm. and it provides the opportunity to

get 3 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 174 sqm surface area and it provides the opportunity to get 80 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 3 industrial units maximum area occupies on roof area which is 12189 sqm areas and it's provide the opportunity to get 5851 cum. of water harvesting potential.

Table no. 4.122 - c) Plastic and rubber, fiber industries 7) H block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Anupama Rubber	1825	178	10	1647	90
2	Rohan Plastic Industries	1643	321	20	1321	80
3	Uma Plast Wark Pvt. Ltd.	5110	5351	105	241	5
4	Total in cum.	8578	5851	68	2727	32

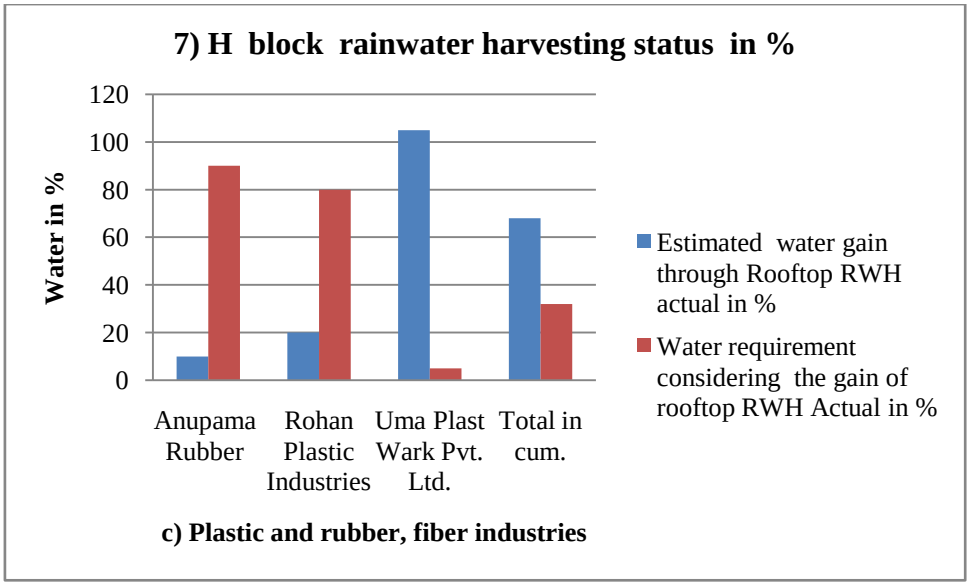

Figure no. 4.38

Above table no. 4.122 and graph no. 4.38 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of H block.

For all these 3 industrial units total annual water requirement from outside sources is 8578 cum. and estimated water gain through rooftop rainwater harvesting is 5851 cum which is 68 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2727 which is 32 %

Table no. 4.123 - c) Plastic and rubber, fiber industries. - 8) S Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Nest Fab	0	14	14	0	0	232	0
2	Harshal Fibereglass	46	0	0	0	0	279	0
3	Criative Polymers Pvt. Ltd	0	81	19	35	743	0	0
4	Rohit Rubber Product	0	5	14	28	0	93	0
5	Vinayak Plastic	46	37	0	37	0	279	93
6	Fabri Tech Engineering	223	15	167	520	0	780	0
	Total	316	152	214	620	743	1663	93
	Total	468		834		2499		

In the plastic and rubber, fiber industries of S block surface area components measure to be 1) Open space = 316 sqm. 2) Garden = 152 sqm. 3) Parking = 214 sqm. and 4) Road = 620 sqm. Whereas roof covered area components measured as 1) Slab roof area = 743 sqm. 2) Cross metal sheet roof area = 1663 sqm. and 3) Godown roof area = 93 sqm.

Table no. 4.124 - c) Plastic and rubber, fiber industries. - 8) S Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Nest Fab	0	1	6	0	0	111	0
2	Harshal Fibereglass	6	0	0	0	0	134	0
3	Criative Polymers Pvt. Ltd	0	8	9	16	357	0	0
4	Rohit Rubber Product	0	0	6	13	0	45	0
5	Vinayak Plastic	6	4	0	17	0	134	45
6	Fabri Tech Engineering	27	2	77	240	0	375	0
	Total	38	15	99	286	357	798	45
	Total	53		385		1200		

Above Table no. 4.124 gives detail about the rainwater harvesting potential of surface area and roof areas of 6 industrial units in the S block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 6 industrial units open space and gardens occupies the total area of 468 sqm. and it provides the opportunity to get 53 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 834 sqm surface area and it provides the opportunity to get 385 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 6 industrial units maximum area occupies on roof area which is

2499 sqm areas and it's provide the opportunity to get 1200 cum. of water harvesting potential.

Table no. 4.125 - c) Plastic and rubber, fiber industries 8) S block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Nest Fab	949	111	12	838	88
2	Harshal Fibereglass	913	134	15	779	85
3	Criative Polymers Pvt. Ltd	2008	357	18	1651	82
4	Rohit Rubber Product	1241	45	4	1196	96
5	Vinayak Plastic	2847	178	6	2669	94
6	Fabri Tech Engineering	1643	375	23	1268	77
7	Total in cum.	9600	1200	12	8400	88

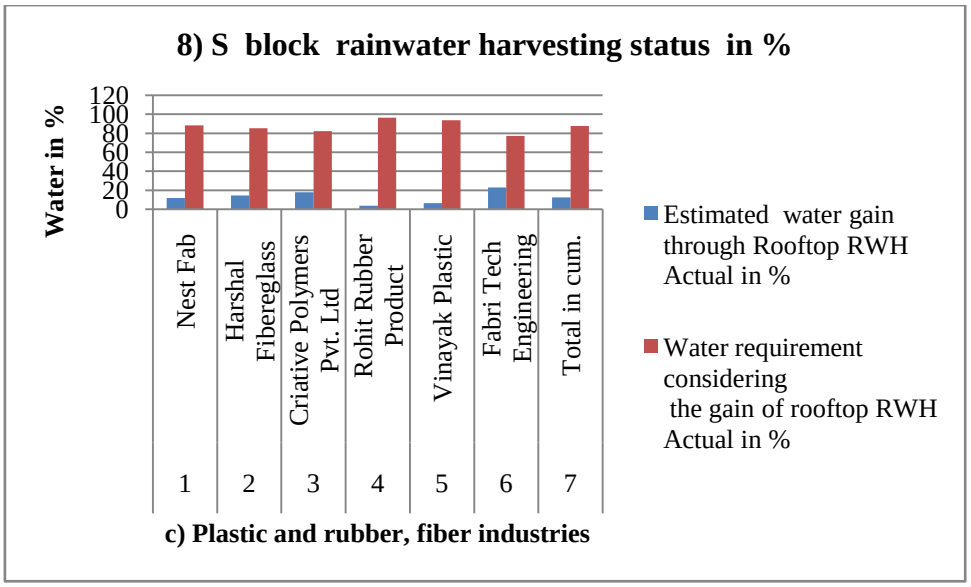

Figure no.4.39

Above table no. 4.125 and graph no. 4.39 gives detail about the rooftop rainwater harvesting status in the plastic and rubber, fiber industries of S block.

For all these 6 industrial units total annual water requirement from outside sources is 9600 cum. and estimated water gain through rooftop rainwater harvesting is 1200 cum which is 12 % therefore water requirement considering the gain of rooftop rainwater harvesting is 8400 which is 88 %

d) Metal and forge industries:

Table no. 4.126 - d) Metal and forge Industries. -1) Bhosari Genral Block Surface And Roof Area In Sqm.								
Sr. No	**Name Of Industry**	**Surface Area In Sqm.**				**Roof Area In Sqm.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Amol Engineers P. Ltd.	0	74	297	297	743	0	0
2	Pyramid Engineering	0	70	84	111	0	186	0
3	Shree Industries	0	0	42	21	0	223	0
4	Poona Udyog	0	0	56	14	0	149	0
5	Krupa Metal	0	0	0	111	892	0	892
6	Metal King	0	0	0	22	0	1561	669
7	Mahavir Steel	2230	0	0	193	0	502	3716
8	India Forge And Drop Stamping Ltd.	0	0	84	297	0	1486	0
9	Forge Auto Engineering P. Ltd.	186	0	0	0	372	0	0
	Total	2415	144	562	1068	2007	4106	5277
	Total	2559		1630		11390		

In the Metal and forge industries of Bhosari general block surface area components measure to be 1) Open space = 2415 sqm. 2) Garden = 144 sqm. 3) Parking = 562 sqm. and 4) Road = 1068 sqm. Whereas roof covered area components measured as 1) Slab roof area = 2007 sqm. 2) Cross metal sheet roof area = 4106 sqm. and 3) Godown roof area = 5277 sqm.

Table no. 4.127 - d) Metal and forge Industries - 1) Bhosari General Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Amol Engineers P. Ltd.	0	8	137	137	357	0	0
2	Pyramid Engineering	0	7	39	52	0	89	0
3	Shree Industries	0	0	19	10	0	107	0
4	Poona Udyog	0	0	26	6	0	71	0
5	Krupa Metal	0	0	0	52	428	0	428
6	Metal King	0	0	0	10	0	749	321
7	Mahavir Steel	268	0	0	89	0	241	1784
8	India Forge And Drop Stamping Ltd.	0	0	39	137	0	713	0
9	Forge Auto Engineering P. Ltd.	22	0	0	0	178	0	0
	Total	290	15	260	493	963	1971	2533
	Total	305		753		5467		

Above Table no. 4.127 gives detail about the rainwater harvesting potential of surface area and roof areas of 9 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 9 industrial units open space and gardens occupies the total area of 2559 sqm. and it provides the opportunity to get 305 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1630 sqm surface area and it provides the opportunity to get 753 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 9 industrial units maximum area occupies on roof area which is 11390 sqm areas and it's provide the opportunity to get 5467 cum. of water harvesting potential

Table no. 4.128 - d) Metal industries 1) Bhosari General block rainwater harvesting status in cum.						
Sr. No	**Name Of Industry**	**Total annual water require ment from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	Amol Engineers P. Ltd.	986	357	36	629	64
2	Pyramid Engineering	1168	89	8	1079	92
3	Shree Industries	1095	107	10	988	90
4	Poona Udyog	913	71	8	841	92
5	Krupa Metal	876	856	98	20	2
6	Metal King	1095	1070	98	25	2
7	Mahavir Steel	913	2025	222	1112	122
8	India Forge And Drop Stamping Ltd.	1460	713	49	747	51
9	Forge Auto Engineering P. Ltd.	1460	178	12	1282	88
10	Total in cum.	9965	5467	55	4497	45

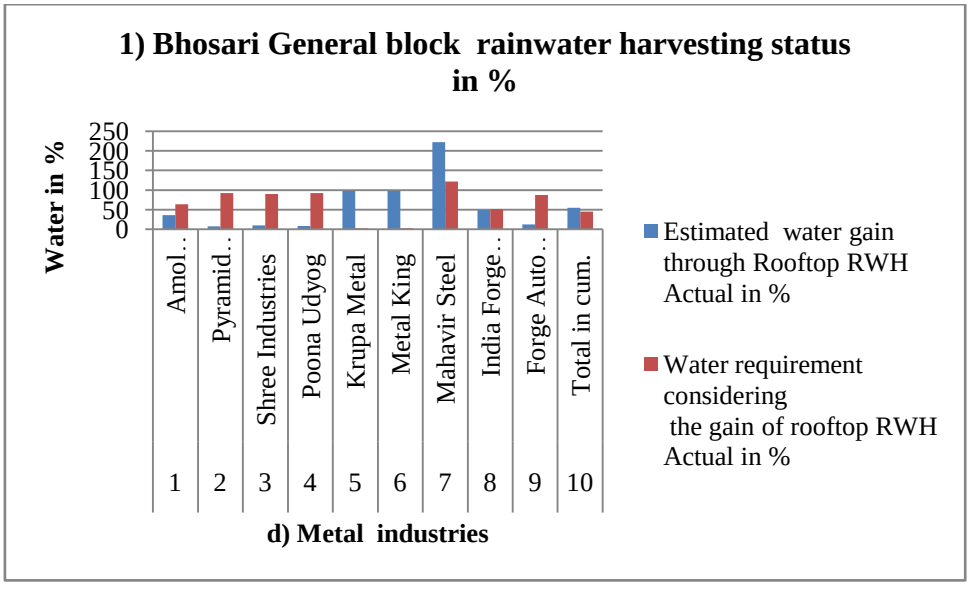

Figure no. 4.40

Above table no. 4.128 and graph no. 4.40 Gives detail about the rooftop rainwater harvesting status in the metal and forge industries of Bhosari general block.

For all these 9 industrial units total annual water requirement from outside sources is 9965 cum. and estimated water gain through rooftop rainwater harvesting is 5467 cum which is 55 % therefore water requirement considering the gain of rooftop rainwater harvesting is 4497 which is 45 %

Table no. 4.129 - d) Metal and forge Industries. - 2) D - II Block Surface And Roof Area In Sqm.								
Sr. No	**Name Of Industry**	**Surface Area In Sqm.**				**Roof Area In Sqm.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Shree Samartha Body Bildings	0	0	74	70	186	0	0
2	Ashoka Iron Industry	0	0	139	70	0	1115	0
3	Pune Bhat Metals	0	37	46	19	279	0	93
4	Nirmal Metal Costa	0	0	5	14	0	139	0
5	Autocraft Engineers	0	1	14	14	0	418	0
6	Trishul Forging	46	37	46	19	232	0	93
	Total	46	75	325	204	697	1672	186
	Total	122		530		2555		

In the Metal and forge industries of D - II block surface area components measure to be 1) Open space = 46 sqm. 2) Garden = 75 sqm. 3) Parking = 325 sqm. and 4) Road = 204 sqm. Whereas roof covered area components measured as 1) Slab roof area = 697 sqm. 2) Cross metal sheet roof area = 1672 sqm. and 3) Godown roof area = 186 sqm.

Table no. 4.130 - d) Metal and forge Industries - 2) D - II Block - Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Shree Samartha Body Bildings	0	0	34	32	89	0	0
2	Ashoka Iron Industry	0	0	64	32	0	535	0
3	Pune Bhat Metals	0	4	21	9	134	0	45
4	Nirmal Metal Costa	0	0	2	6	0	67	0

5	Autocraft Engineers	0	0	6	6	0	201	0
6	Trishul Forging	6	4	21	9	111	0	45
	Total	6	8	150	94	334	803	89
	Total	14		244		1226		

Above Table no. 4.130 gives detail about the rainwater harvesting potential of surface area and roof areas of 6 industrial units in the D - II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 6 industrial units open space and gardens occupies the total area of 122 sqm. and it provides the opportunity to get 14 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 530 sqm surface area and it provides the opportunity to get 244 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 6 industrial units maximum area occupies on roof area which is 11390 sqm areas and it's provide the opportunity to get 5467 cum. of water harvesting potential

Table no. 4.131 - d) Metal industries 2) D - II block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Shree Samartha Body Bildings	730	89	12	641	88
2	Ashoka Iron Industry	1460	535	37	925	63
3	Pune Bhat Metals	1351	178	13	1172	87

4	Nirmal Metal Costa	1095	67	6	1028	94
5	Autocraft Engineers	1241	201	16	1040	84
6	Trishul Forging	1168	156	13	1012	87
7	Total in cum.	7045	1226	17	5818	83

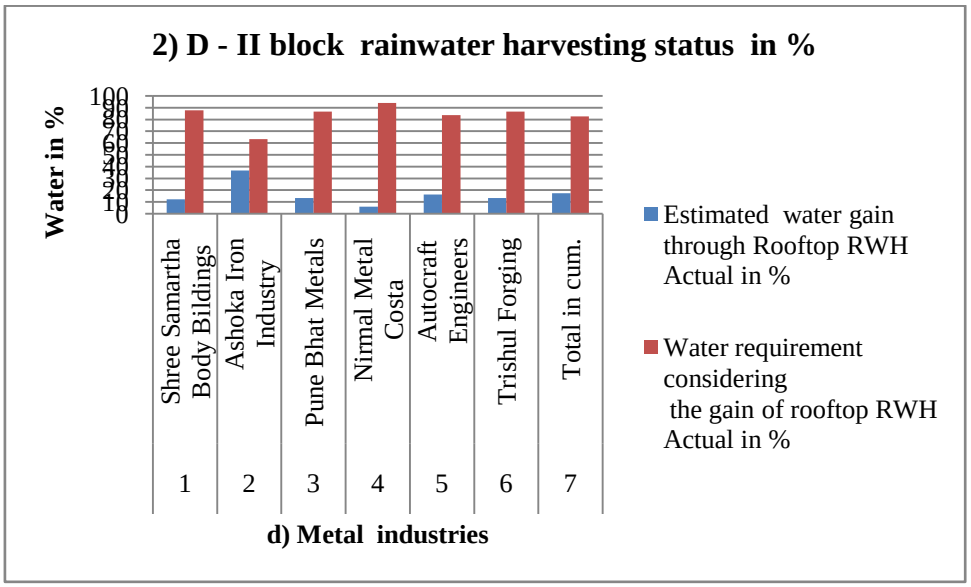

Figure no. 4.41

Above table no. 4.131 and graph no. 4.41 gives detail about the rooftop rainwater harvesting status in the metal and forge industries of D-II block.

For all these 6 industrial units total annual water requirement from outside sources is 7045 cum. and estimated water gain through rooftop rainwater harvesting is 1226 cum which is 17 % therefore water requirement considering the gain of rooftop rainwater harvesting is 5818 which is 83 %

Table no. 4.132 - d) Metal and forge Industries. - 3) F - II Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Quaility Heat Trade	167	56	418	186	0	780	186
2	anvin Engineers Pvt. Ltd	0	1	49	19	0	232	0
3	Unifrax pvt. Ltd.	0	35	56	0	0	279	0
4	Abhijeet Surface Cutting	0	2	14	19	0	139	0
5	Mogara Engineering	0	17	28	46	139	0	0

6	Ishwar Forge Pvt. Ltd.	0	2	14	14	0	232	0
	Total	167	113	578	283	139	1663	186
	Total	280		862		1988		

In the Metal and forge industries of F - II block surface area components measure to be 1) Open space = 167 sqm. 2) Garden = 113 sqm. 3) Parking = 578 sqm. and 4) Road = 283 sqm. Whereas roof covered area components measured as 1) Slab roof area = 139 sqm. 2) Cross metal sheet roof area = 1663 sqm. and 3) Godown roof area = 186 sqm.

Table no. 4.133 - d) Metal and forge Industries - 3) F - II Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Quaility Heat Trade	20	6	193	86	0	375	89
2	anvin Engineers Pvt. Ltd	0	0	23	9	0	111	0
3	Unifrax pvt. Ltd.	0	4	26	0	0	134	0
4	Abhijeet Surface Cutting	0	0	6	9	0	67	0
5	Mogara Engineering	0	2	13	21	67	0	0
6	Ishwar Forge Pvt. Ltd.	0	0	6	6	0	111	0
	Total	20	12	267	131	67	798	89
	Total	32		398		954		

Above Table no. 4.133 gives detail about the rainwater harvesting potential of surface area and roof areas of 6 industrial units in the F -II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 6 industrial units open space and gardens occupies the total area of 280 sqm. and it provides the opportunity to get 32 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and

roads occupies 862 sqm surface area and it provides the opportunity to get 398 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 6 industrial units maximum area occupies on roof area which is 1988 sqm areas and it's provide the opportunity to get 954 cum. of water harvesting potential.

Table no. 4.134 - d) Metal industries 3) F - II block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Quaility Heat Trade	1095	464	42	631	58
2	anvin Engineers Pvt. Ltd	1278	111	9	1166	91
3	Unifrax pvt. Ltd.	1570	134	9	1436	91
4	Abhijeet Surface Cutting	1132	67	6	1065	94
5	Mogara Engineering	986	67	7	919	93
6	Ishwar Forge Pvt. Ltd.	1205	111	9	1093	91
7	Total in cum.	7264	954	13	6309	87

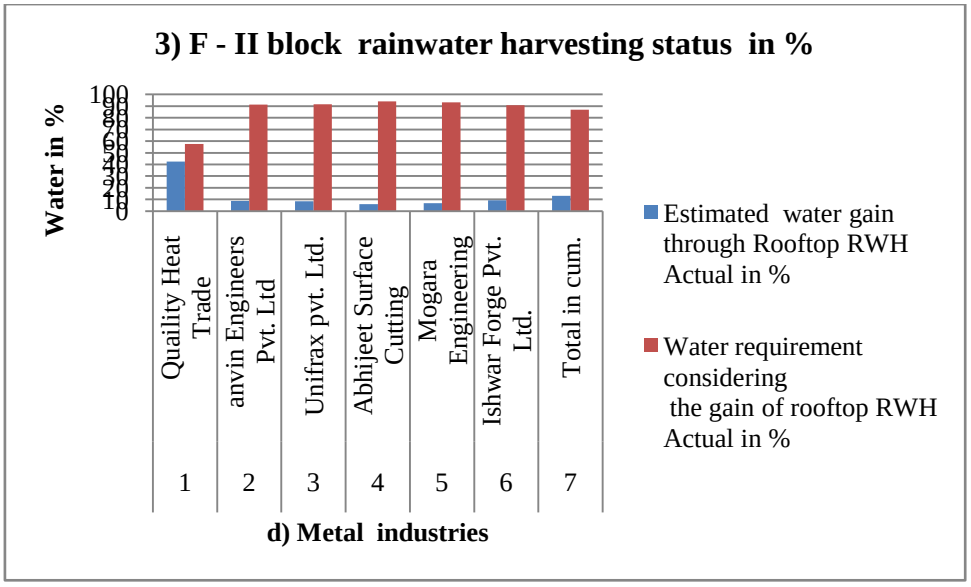

Figure no. 4.42

Above table no. 4.135 and graph no. 4.42 gives detail about the rooftop rainwater harvesting status in the metal and forge industries of F-II block.

For all these 6 industrial units total annual water requirement from outside sources is 7264 cum. and estimated water gain through rooftop rainwater harvesting is 954 cum which is 13 % therefore water requirement considering the gain of rooftop rainwater harvesting is 6309 which is 87 %

Table no. 4.135 - d) Metal and forge Industries. - 4) J Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Modern Metal Works	223	0	19	56	223	0	0
2	Jimcap Industries	0	14	35	46	3658	0	46
3	Engineers India	74	65	28	28	5284	0	81
4	Vaibhav Industries	0	5	35	28	0	2032	65
5	Om Sai Engineers	19	0	14	28	0	2206	70
6	Shree Engineering Associates	0	14	35	65	0	1742	81
7	Mahalaxmi Fabrication	28	70	5	70	0	1672	446
8	A S Engineers And Fabricators	5	14	81	35	0	3252	65
9	CSK Engineers And Fabricators	0	5	314	81	0	1545	0

10	Alukam Fabrication P. Ltd.	149	0	223	297	0	595	0
11	Kreativ Moltring P. Ltd.	45	13	20	33	446	669	0
12	Kalate Works	669	74	111	167	669	0	0
13	Almas Steel And Oil P. Ltd.	0	74	111	149	595	0	0
14	Durga Metal Art	0	0	0	0	372	0	0
15	Alok Fabrications	14	2	28	14	0	81	14
16	V K Forge	0	2	14	14	0	81	19
17	Vchil Industries	0	5	35	35	0	81	28
18	S S Engineering Works	0	5	35	14	0	871	28
19	Creative Fabritech	0	2	70	59	0	230	0
20	Siddharth Machanical Works	0	2	49	74	0	230	0
21	Guru Engineers	0	14	23	28	0	637	0
22	Arya Industries	0	5	49	46	0	146	35
23	Mechatherma Services India Pvt. Ltd.	0	14	28	65	0	574	0
	Total	1224	399	1360	1432	11246	16645	978
	Total	1623		2792		28868		

In the Metal and forge industries of J block surface area components measure to be 1) Open space = 1224 sqm. 2) Garden = 399 sqm. 3) Parking = 1360 sqm. and 4) Road = 1432 sqm. Whereas roof covered area components measured as 1) Slab roof area = 11246 sqm. 2) Cross metal sheet roof area = 16645 sqm. and 3) Godown roof area = 978 sqm.

Table no. 4.136 - d) Metal and forge Industries - 4) J Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Modern Metal Works	27	0	9	26	107	0	0
2	Jimcap Industries	0	1	16	21	1756	0	22

3	Engineers India	9	7	13	13	2536	0	39
4	Vaibhav Industries	0	0	16	13	0	975	31
5	Om Sai Engineers	2	0	6	13	0	1059	33
6	Shree Engineering Associates	0	1	16	30	0	836	39
7	Mahalaxmi Fabrication	3	7	2	32	0	803	214
8	A S Engineers And Fabricators	1	1	38	16	0	1561	31
9	CSK Engineers And Fabricators	0	0	145	38	0	741	0
10	Alukam Fabrication P. Ltd.	18	0	103	137	0	285	0
11	Kreativ Moltring P. Ltd.	5	1	9	15	214	321	0
12	Kalate Works	80	8	52	77	321	0	0
13	Almas Steel And Oil P. Ltd.	0	8	52	69	285	0	0
14	Durga Metal Art	0	0	0	0	178	0	0
15	Alok Fabrications	2	0	13	6	0	39	7
16	V K Forge	0	0	6	6	0	39	9
17	Vchil Industries	0	0	16	16	0	39	13
18	S S Engineering Works	0	0	16	6	0	418	13
19	Creative Fabritech	0	0	32	27	0	110	0
20	Siddharth Machanical Works	0	0	23	34	0	110	0
21	Guru Engineers	0	1	11	13	0	306	0
22	Arya Industries	0	0	23	21	0	70	17
23	Mechatherma Services India Pvt. Ltd.	0	1	13	30	0	275	0
	Total	147	41	628	662	5398	7989	469
	Total	188		1290		13857		

Above Table no. 4.136 gives detail about the rainwater harvesting potential of surface area and roof areas of 23 industrial units in the J block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 23 industrial units open

space and gardens occupies the total area of 1623 sqm. and it provides the opportunity to get 188 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 2792 sqm surface area and it provides the opportunity to get 1290 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 23 industrial units maximum area occupies on roof area which is 28868 sqm areas and it's provide the opportunity to get 13857 cum. of water harvesting potential.

Table no. 4.137 - d) Metal industries 4) J block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Modern Metal Works	511	107	21	404	79
2	Jimcap Industries	584	1778	304	1194	204
3	Engineers India	1387	2575	186	1188	86
4	Vaibhav Industries	548	1007	184	459	84
5	Om Sai Engineers	511	1093	214	582	114
6	Shree Engineering Associates	913	875	96	37	4
7	Mahalaxmi Fabrication	1168	1017	87	151	13
8	A S Engineers And Fabricators	913	1592	174	679	74
9	CSK Engineers And Fabricators	548	741	135	194	35
10	Alukam Fabrication P. Ltd.	365	285	78	80	22
11	Kreativ Moltring P. Ltd.	329	535	163	207	63
12	Kalate Works	475	321	68	153	32
13	Almas Steel And Oil P. Ltd.	913	285	31	627	69
14	Durga Metal Art	913	178	20	734	80
15	Alok Fabrications	621	46	7	575	93
16	V K Forge	767	48	6	719	94

17	Vchil Industries	767	52	7	714	93
18	S S Engineering Works	511	431	84	80	16
19	Creative Fabritech	548	110	20	437	80
20	Siddharth Machanical Works	803	110	14	693	86
21	Guru Engineers	694	306	44	388	56
22	Arya Industries	475	87	18	388	82
23	Mechatherma Services India Pvt. Ltd.	621	275	44	345	56
24	Total in cum.	15878	13857	87	2021	13

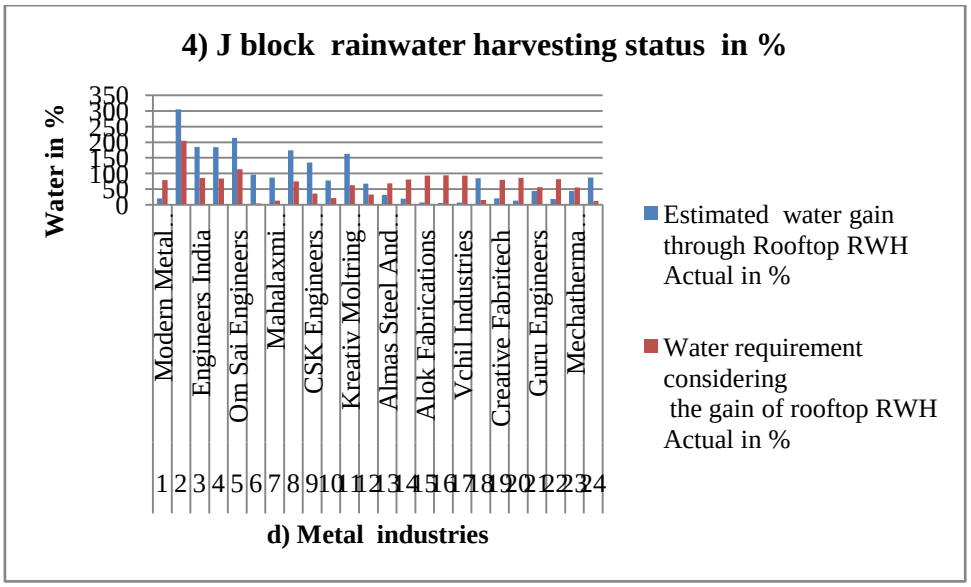

Figure no. 4.43

Above table no. 4.137 and graph no. 4.43 gives detail about the rooftop rainwater harvesting status in the metal and forge industries of J block.

For all these 23 industrial units total annual water requirement from outside sources is 15878 cum. and estimated water gain through rooftop rainwater harvesting is 13857 cum which is 87 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2021 which is 13 %

Table no. 4.138 - d) Metal and forge Industries. - 5) H Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Ace Metal Treters P. Ltd	0	46	0	19	0	279	93
2	Sushil Engineers	93	46	0	19	279	0	93
3	Mahalaxmi Still	0	0	2	14	0	139	0

	Corporation							
4	Balaji Steel Enterprises	0	2	5	0	0	372	0
5	Angel Steel Corporation	0	0	28	23	0	892	892
6	Artech Welders Pvt.Ltd	0	0	35	28	595	0	0
7	Automatic Components	348	81	0	14	0	920	0
8	Angel Steel Corporation	14	23	14	0	0	818	0
	Total	455	200	84	116	873	3419	1078
	Total	655		200		5370		

In the Metal and forge industries of H block surface area components measure to be 1) Open space = 455 sqm. 2) Garden = 200 sqm. 3) Parking = 84 sqm. and 4) Road = 116 sqm. Whereas roof covered area components measured as 1) Slab roof area = 873 sqm. 2) Cross metal sheet roof area = 3419 sqm. and 3) Godown roof area = 1078 sqm.

Table no. 4.139 - d) Metal and forge Industries - 5) H Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Ace Metal Treters P. Ltd	0	5	0	9	0	134	45
2	Sushil Engineers	11	5	0	9	134	0	45
3	Mahalaxmi Still Corporation	0	0	1	6	0	67	0
4	Balaji Steel Enterprises	0	0	2	0	0	178	0
5	Angel Steel Corporation	0	0	13	11	0	428	428
6	Artech Welders Pvt.Ltd	0	0	16	13	285	0	0
7	Automatic Components	42	8	0	6	0	441	0
8	Angel Steel Corporation	2	2	6	0	0	392	0
	Total	55	20	39	54	419	1641	517
	Total	75		93		2578		

Above Table no. 4.139 gives detail about the rainwater harvesting potential of surface area and roof areas of 8 industrial units in the H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 8 industrial units open space and gardens occupies the total area of 655 sqm. and it provides the opportunity to get 75 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 200 sqm surface area and it provides the opportunity to get 93 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 8 industrial units maximum area occupies on roof area which is 5370 sqm areas and it's provide the opportunity to get 2578 cum. of water harvesting potential.

Table no. 4.140 - d) Metal industries 5) H block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Ace Metal Treters P. Ltd	1643	178	11	1464	89
2	Sushil Engineers	1716	178	10	1537	90
3	Mahalaxmi Still Corporation	1095	67	6	1028	94
4	Balaji Steel Enterprises	1533	178	12	1355	88
5	Angel Steel Corporation	913	856	94	56	6
6	Artech Welders Pvt.Ltd	1460	285	20	1175	80
7	Automatic Components	1643	441	27	1201	73

8	Angel Steel Corporation	1643	392	24	1250	76
9	Total in cum.	11644	2578	22	9066	78

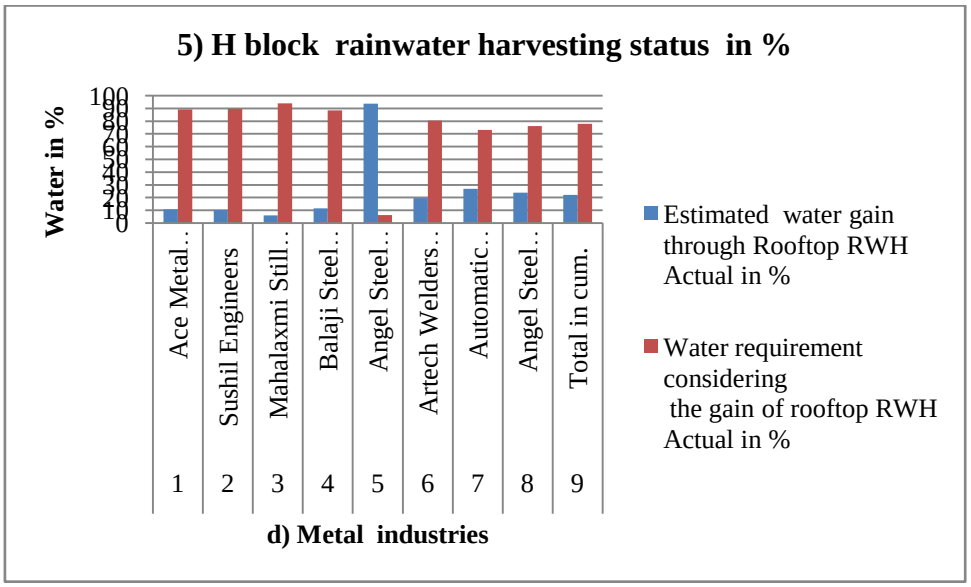

Figure no. 4.44

Above table no. 4.140 and graph no. 4.44 Gives detail about the rooftop rainwater harvesting status in the metal and forge industries of H block.

For all these 8 industrial units total annual water requirement from outside sources is 11644 cum. and estimated water gain through rooftop rainwater harvesting is 2578 cum which is 22 % therefore water requirement considering the gain of rooftop rainwater harvesting is 9066 which is 78 %

Table no. 4.141 - d) Metal and forge Industries. - 6) S Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Bhairav Metals	0	0	14	49	0	743	0
2	Bhairav Metals	0	0	0	0	372	0	186
3	KBK Fabricator	0	2	2	14	0	372	0
4	Metal Arts	0	0	14	19	0	372	0
5	A B Industries	46	0	46	0	465	0	0
6	Metal Arts	0	0	0	0	0	279	0
7	Metal Arts	186	0	0	0	37	0	93

						2		
8	Industrial Accessories Corporation	93	65	46	46	0	279	139
	Total	325	67	123	128	1208	2044	418
	Total	393		251		3670		

In the Metal and forge industries of S block surface area components measure to be 1) Open space = 325 sqm. 2) Garden = 67 sqm. 3) Parking = 123 sqm. and 4) Road = 128 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1208 sqm. 2) Cross metal sheet roof area = 2044 sqm. and 3) Godown roof area = 418 sqm.

Table no. 4.142 - d) Metal and forge Industries - 6) S Block - Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Bhairav Metals	0	0	6	23	0	357	0
2	Bhairav Metals	0	0	0	0	178	0	89
3	KBK Fabricator	0	0	1	6	0	178	0
4	Metal Arts	0	0	6	9	0	178	0
5	A B Industries	6	0	21	0	223	0	0
6	Metal Arts	0	0	0	0	0	134	0
7	Metal Arts	22	0	0	0	178	0	45
8	Industrial Accessories Corporation	11	7	21	21	0	134	67
	Total	39	7	57	59	580	981	201
	Total	46		116		1761		

Above Table no. 4.142 gives detail about the rainwater harvesting potential of surface area and roof areas of 8 industrial units in the S block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the

water loss made by evaporation and infiltration. For all these 8 industrial units open space and gardens occupies the total area of 393 sqm. and it provides the opportunity to get 46 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 251 sqm surface area and it provides the opportunity to get 116 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 8 industrial units maximum area occupies on roof area which is 3670 sqm areas and it's provide the opportunity to get 1761 cum. of water harvesting potential.

Table no. 4.143 - d) Metal industries 6) S block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhairav Metals	1533	357	23	1176	77
2	Bhairav Metals	730	268	37	462	63
3	KBK Fabricator	1351	178	13	1172	87
4	Metal Arts	1168	178	15	990	85
5	A B Industries	2190	223	10	1967	90
6	Metal Arts	1059	134	13	925	87
7	Metal Arts	1643	223	14	1420	86
8	Industrial Accessories Corporation	1825	201	11	1624	89
9	Total in cum.	11498	1761	15	9736	85

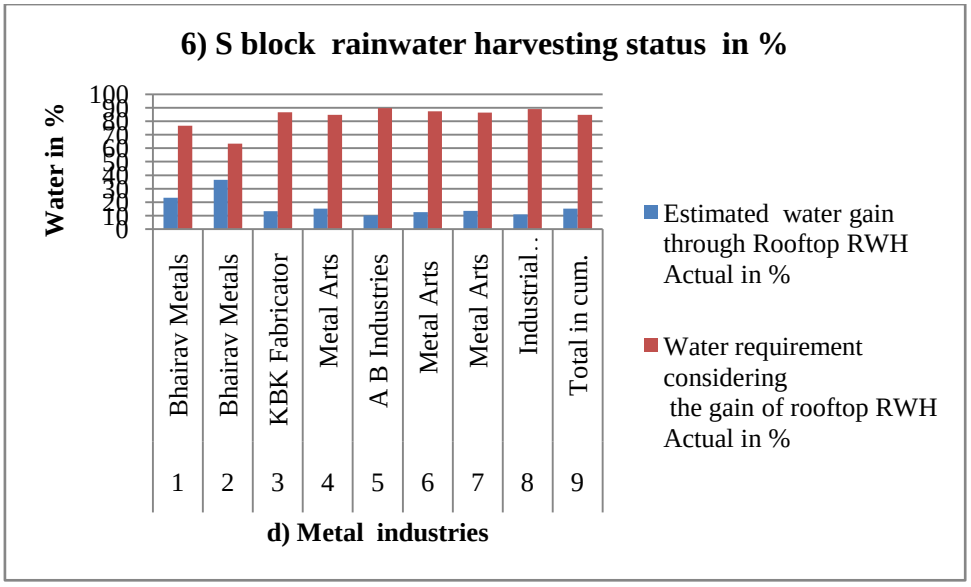

Figure no. 4.45

Above table no. 4.143 and graph no. 4.45 Gives detail about the rooftop rainwater harvesting status in the metal and forge industries of S block.

For all these 8 industrial units total annual water requirement from outside sources is 11498 cum. and estimated water gain through rooftop rainwater harvesting is 1761 cum which is 15 % therefore water requirement considering the gain of rooftop rainwater harvesting is 9736 which is 85 %

e) Chemical industries:

Table no. 4.144 - e) Chemical Industries -1) Bhosari Genral Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Subhaoh Chemical	20	22	20	33	446	0	0
2	Rathi Chemicals	0	0	56	7	0	743	0
3	J P Fine Chemical	186	0	186	0	186	93	0
4	Aqu Chemical	0	149	111	74	297	0	0
	Total	206	171	373	115	929	836	0
	Total	377		488		1765		

In the Chemical industries of Bhosari general block surface area components measure to be 1) Open space = 206 sqm. 2) Garden = 171 sqm. 3) Parking = 373 sqm. and 4) Road = 115 sqm. Whereas roof covered area components measured as 1) Slab roof area = 929 sqm. 2) Cross metal sheet roof area = 836 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.145 - e) Chemical Industries -1) Bhosari Genral Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Subhaoh Chemical	2	2	9	15	214	0	0
2	Rathi Chemicals	0	0	26	3	0	357	0
3	J P Fine Chemical	22	0	86	0	89	45	0
4	Aqu Chemical	0	15	52	34	143	0	0
	Total	25	17	172	53	446	401	0
	Total	42		225		847		

Above Table no. 4.145 gives detail about the rainwater harvesting potential of surface area and roof areas of 4 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 4 industrial units open space and gardens occupies the total area of 377 sqm. and it provides the opportunity to get 42 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 488 sqm surface area and it provides the opportunity to get 225 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 4 industrial units maximum area occupies on roof area which is 1765 sqm areas and it's provide the opportunity to get 847 cum. of water harvesting potential.

Table no. 4.146 - e) Chemical industries 1) Bhosari General block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water require ment from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Subhaoh Chemical	1351	214	16	1136	84
2	Rathi Chemicals	8030	357	4	7673	96
3	J P Fine Chemical	1278	134	10	1144	90
4	Aqu Chemical	1095	143	13	952	87
5	Total in cum.	11753	847	7	10906	93

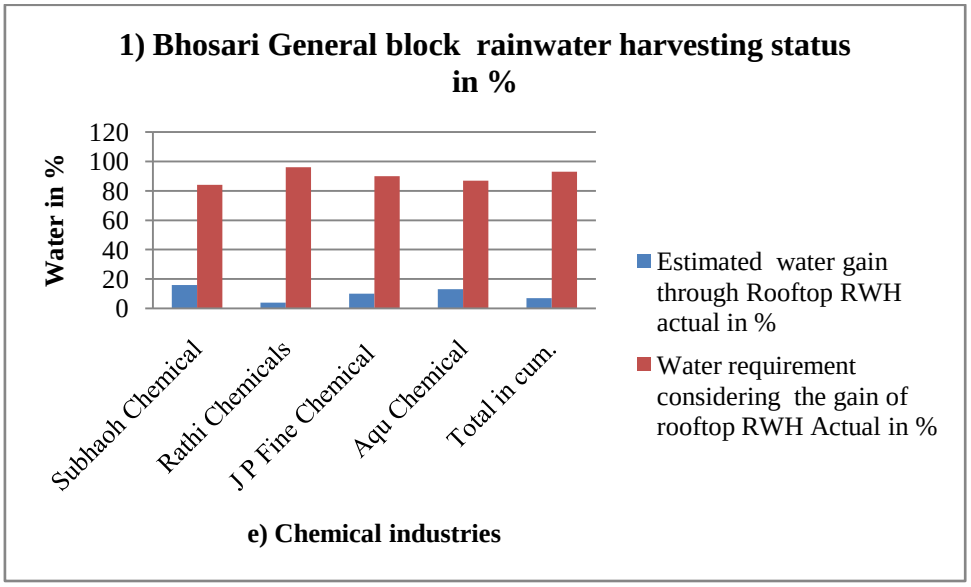

Figure no. 4.46

Above table no.4.146 and graph no. 4.46 gives detail about the rooftop rainwater harvesting status in the chemical industries of bhosari general block.

For all these 4 industrial units total annual water requirement from outside sources is 11753 cum. and estimated water gain through rooftop rainwater harvesting

is 847 cum which is 7 % therefore water requirement considering the gain of rooftop rainwater harvesting is 10906 which is 93 %

Table no. 4.147 - e) Chemical Industries - 2) Block Surface And Roof Area In Sqm.									
Blocks	**Sr. No**	**Name Of Industry**	**Surface Area In Sqm.**				**Roof Area In Sqm.**		
			Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
D - II Block	1	Surekha Chemical Industries	19	0	0	14	372	93	0
J Block	1	Central And Western (I) Chemicals	0	22	93	46	0	186	0
S Block	1	Manisha chemicles	0	1	5	14	0	372	0
Electronics Zone	1	Alok Chemicle P. Ltd.	186	0	93	0	186	0	0

In the Chemical industries of D –II, J , S and Electronics Zone blocks surface area components measure to be 1) Open space = 19, 0, 0, 186 sqm. respectviely 2) Garden = 0, 22, 1, 0 sqm. respectviely 3) Parking = 0, 93, 5, 93 sqm. respectviely and 4) Road = 14, 46, 14, 0 sqm. respectviely Whereas roof covered area components measured as 1) Slab roof area = 372, 0, 0, 186 sqm. respectviely 2) Cross metal sheet roof area = 93, 186, 372, 0 sqm. respectviely and 3) Godown roof area = 0 sqm. respectively.

Table no. 4.148 - e) Chemical Industries - 2) Block Rainwater Harvesting Potential									
Block	**Sr. No**	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
			Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
D - II Block	1	Surekha Chemical Industries	2	0	0	6	178	45	0
J Block	1	Central And Western (I) Chemicals	0	2	43	21	0	89	0
S Block	1	Manisha chemicles	0	0	2	6	0	178	0

Electron ics Zone	1	Alok Chemicle P. Ltd.	36	0	56	0	107	0	0

Above Table no. 4.148 gives detail about the rainwater harvesting potential of surface area and roof areas of industrial units in the D – II, J, S, Electronics Zone block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these industrial units open space and gardens occupies the total area of 19, 22, 1, 186 sqm. respectviely and it provides the opportunity to get 2, 2, 0, 36 cum. respectviely of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 14, 139, 19, 93 sqm surface area respectviely and it provides the opportunity to get 6, 64, 8, 56 cum. of water harvesting potential respectviely.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this industrial units maximum area occupies on roof area which is 465, 182, 372, 186 sqm areas respectviely and it's provide the opportunity to get 223, 89, 178, 107 cum. of water harvesting potential respectviely.

Table no. 4.149 - e) Chemical industries 2) Block rainwater harvesting status in cum.

Block	Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
				Actual in cum.	Actual in %	Actual in cum.	Actual in %
D - II Block	1	Surekha Chemical Industries	1095	223	20	872	80
J Block	1	Central And Western (I)	1351	89	7	1261	93

		Chemicals					
S Block	1	Manisha chemicles	1732	178	10	1553	90
Electronics Zone	1	Alok Chemicle P. Ltd.	1825	107	6	1718	94

Above table no. 4.149 gives detail about the rooftop rainwater harvesting status in the chemical industries of D-II, J, S and Electronics Zone block.

For all these industrial units total annual water requirement from outside sources is 1095, 1351, 1732 and 1825 cum. respectively and estimated water gain through rooftop rainwater harvesting is 223, 89, 178 and 107 cum which is 20,7, 10, and 6 % respectively therefore water requirement considering the gain of rooftop rainwater harvesting is 872, 1261, 1553 and 1718 cum which is 80, 93, 90 and 94 % respectively.

f) Water base industries:

Table no. 4.150 - f) Water base Industries -1) Bhosari Genral Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Vishal Ice Factory	0	0	28	56	21	743	0
2	Bharat Ice Factory	0	5	19	37	0	725	0
	Total	0	5	46	93	21	1468	0
	Total	5		139		1489		

In the water base industries of Bhosari general block surface area components measure to be 1) Open space = 0 sqm. 2) Garden = 5 sqm. 3) Parking = 46 sqm. and 4) Road = 93 sqm. Whereas roof covered area components measured as 1) Slab roof area = 21 sqm. 2) Cross metal sheet roof area = 1468 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.151 - f) Water base Industries -1) Bhosari Genral Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Garden	Parking	Open Space	Road	Slab	Cross metal sheet	Godown
1	Vishal Ice Factory	0	0	13	26	10	357	0
2	Bharat Ice	0	0	9	17	0	348	0

	Factory							
	Total	0	0	21	43	10	705	0
	Total	0		64		715		

Above Table no. 4.151 gives detail about the rainwater harvesting potential of surface area and roof areas of 2 industrial units in the Bhosari general block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 2 industrial units open space and gardens occupies the total area of 5 sqm. and it provides the opportunity to get 0 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 139 sqm surface area and it provides the opportunity to get 64 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 2 industrial units maximum area occupies on roof area which is 1489 sqm areas and it's provide the opportunity to get 175 cum. of water harvesting potential.

Table no. 4.152 - f) Water base industries 1) Bhosari General block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Vishal Ice Factory	7665	367	5	7298	95
2	Bharat Ice Factory	8030	348	4	7682	96
3	Total in cum.	15695	715	5	14980	95

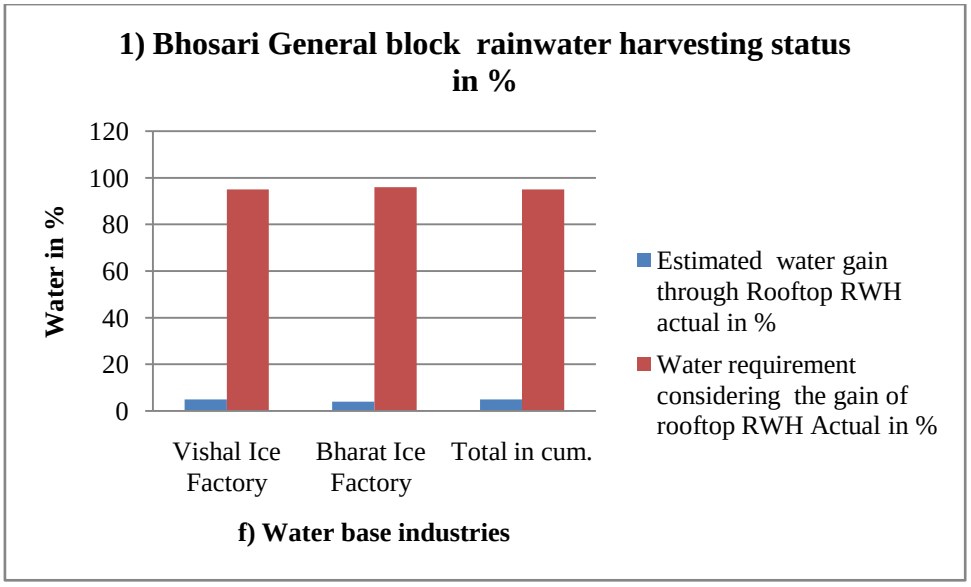

Figure no. 4.47

Above table no. 4.152 And graph no. 4.47 Gives detail about the rooftop rainwater harvesting status in the water base industries of Bhosari general block.

For all these 2 industrial units total annual water requirement from outside sources is 15695 cum. and estimated water gain through rooftop rainwater harvesting is 715 cum which is 5 % therefore water requirement considering the gain of rooftop rainwater harvesting is 14980 cum which is 95 %

Table no. 4.153 - f) Water base Industries -2) D - III Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Revos Aqua Systems Pvt. Ltd	0	0	46	0	0	279	0
2	Neel Distempers	186	35	14	14	279	186	146
	Total	186	35	60	14	279	465	146
	Total	221		74		890		

In the water base industries of D -III block surface area components measure to be 1) Open space = 186 sqm. 2) Garden = 35 sqm. 3) Parking = 60 sqm. and 4) Road = 14 sqm. Whereas roof covered area components measured as 1) Slab roof area = 279 sqm. 2) Cross metal sheet roof area = 465 sqm. and 3) Godown roof area = 146 sqm.

Table no. 4.154 - f) Water base Industries -2) D - III Block Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Garden	Parking	Open Space	Road	Slab	Cross metal sheet	Godown
1	Revos Aqua Systems Pvt. Ltd	0	0	21	0	0	134	0
2	Neel Distempers	22	4	6	6	134	89	70
	Total	22	4	28	6	134	223	70
	Total	26		34		427		

Above Table no. 4.154 gives detail about the rainwater harvesting potential of surface area and roof areas of 2 industrial units in the D - III block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 2 industrial units open space and gardens occupies the total area of 221 sqm. and it provides the opportunity to get 26 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 74 sqm surface area and it provides the opportunity to get 34 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 2 industrial units maximum area occupies on roof area which is 890 sqm areas and it's provide the opportunity to get 427 cum. of water harvesting potential.

Table no. 4.155 - f) Water base industries 2) D - III block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Revos Aqua Systems Pvt. Ltd	1460	134	9	1326	91
2	Neel Distempers	1351	293	22	1057	78
3	Total in cum.	2811	427	15	2384	85

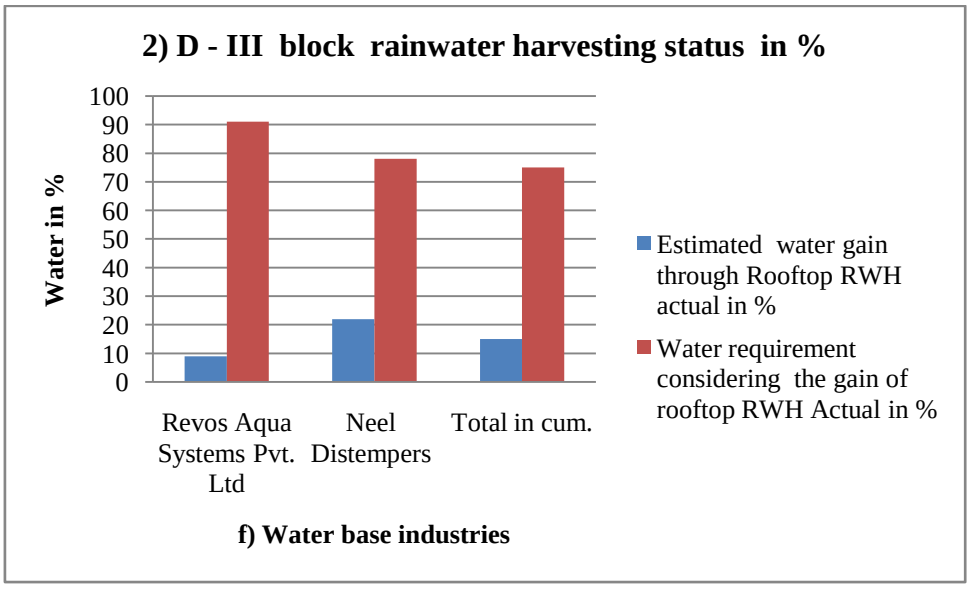

Figure no. 4.48

Above table no. 4.155 and graph no.4.48 gives detail about the rooftop rainwater harvesting status in the water base industries of D - III block.

For all these 2 industrial units total annual water requirement from outside sources is 2811 cum. and estimated water gain through rooftop rainwater harvesting is 427 cum which is 15 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2384 cum which is 85 %

Table no. 4.156 - f) Water base Industries - 3) S Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Shilpa Paints	0	0	19	81	0	372	0
2	Box Print Industries	0	1	2	14	0	372	0
3	Kwality Paints	0	49	28	0	0	650	0
4	Color Bond	0	46	9	19	929	0	0
	Total	0	96	58	114	929	1394	0
	Total	96		172		2323		

In the water base industries of S block surface area components measure to be 1) Open space = 0 sqm. 2) Garden = 96 sqm. 3) Parking = 58 sqm. and 4) Road = 114 sqm. Whereas roof covered area components measured as 1) Slab roof area = 929 sqm. 2) Cross metal sheet roof area = 1394 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.157 - f) Water base Industries - 3) S Block Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Garden	Parking	Open Space	Road	Slab	Cross metal sheet	Godown
1	Shilpa Paints	0	0	9	38	0	178	0
2	Box Print Industries	0	0	1	6	0	178	0
3	Kwality Paints	0	5	13	0	0	312	0
4	Color Bond	0	5	4	9	446	0	0
	Total	0	10	27	53	446	669	0
	Total	10		80		1115		

Above Table no. 4.157 gives detail about the rainwater harvesting potential of surface area and roof areas of 4 industrial units in the S block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the

water loss made by evaporation and infiltration. For all these 4 industrial units open space and gardens occupies the total area of 96 sqm. and it provides the opportunity to get 10 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 172 sqm surface area and it provides the opportunity to get 80 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 4 industrial units maximum area occupies on roof area which is 2323 sqm areas and it's provide the opportunity to get 1115 cum. of water harvesting potential.

Table no. 4.158 - f) Water base industries 3) S block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Shilpa Paints	1460	178	12	1282	88
2	Box Print Industries	1825	178	10	1647	90
3	Kwality Paints	2373	312	13	2060	87
4	Color Bond	2190	446	20	1744	80
5	Total in cum.	7848	1115	14	6733	86

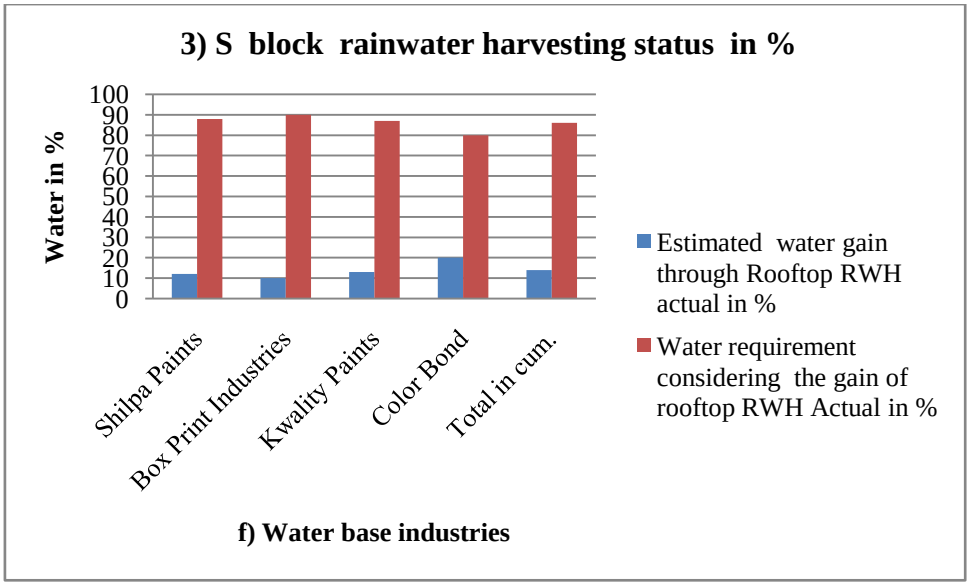

Figure no. 4.49

Above table no. 4.158 and graph no. 4.49 gives detail about the rooftop rainwater harvesting status in the water base industries of S block.

For all these 4 industrial units total annual water requirement from outside sources is 7848 cum. and estimated water gain through rooftop rainwater harvesting is 1115 cum which is 14 % therefore water requirement considering the gain of rooftop rainwater harvesting is 6733 cum which is 86 %

Table no. 4.159 - f) Water base Industries - 4) Block Surface And Roof Area In Sqm.

Block	Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
			Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
D - I Block	1	Punit Cement Pipe Industry	70	0	46	0	186	279	105
J Block	1	Water Tretment Enterprises	0	74	74	33	669	502	0
H Block	1	Corprate Dhobi Company	0	46	0	46	0	39000	93

In the water base industries of D –I, J, H block surface area components measure to be 1) Open space = 70,0, 0 sqm. respectively 2) Garden = 0, 74, 46 sqm. respectively 3) Parking = 46, 74, 0 sqm. respectively and 4) Road = 0, 33, 46 sqm. respectively .Whereas roof covered area components measured as 1) Slab roof area = 186, 669, 0 sqm. respectively 2) Cross metal sheet roof area = 279,502, 39000 sqm. respectively and 3) Godown roof area = 105,0, 93 sqm. respectively.

Table no. 4.160 - f) Water base Industries - 4) Block Rainwater Harvesting Potential									
Block	**Sr. No**	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
			Garden	**Parking**	**Open Space**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
D - I Block	1	Punit Cement Pipe Industry	8	0	21	0	89	134	50
J Block	1	Water Tretment Enterprises	0	8	34	15	321	241	0
H Block	1	Corprate Dhobi Company	0	5	0	21	0	18720	45

Above Table no. 4.160 gives detail about the rainwater harvesting potential of surface area and roof areas of industrial units in the D – I , J, H block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these industrial units open space and gardens occupies the total area of 70, 74, 46 sqm respectively. and it provides the opportunity to get 8, 8, 5 cum. of water harvesting potential respectively, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 46, 108, 46 sqm surface area and it provides the opportunity to get 21, 50, 21 cum. of water harvesting potential respectively.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this industrial units maximum area occupies on roof area which is 569, 1171, 39093 sqm areas and it's provide the opportunity to get 273, 562, 18765 cum. of water harvesting potential respectively.

Table no. 4.161 - f) Water base industries 4) Block rainwater harvesting status in cum.							
Block	**Sr. No**	**Name Of Industry**	**Total annual water requirement from outside sources**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
				Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**

			in cum.				
D - I Block	1	Punit Cement Pipe Industry	1484	273	18	1211	82
J Block	1	Water Tretment Enterprises	913	562	62	351	38
H Block	1	Corprate Dhobi Company	4088	18765	459	14677	359

Above table no. 4.161 gives detail about the rooftop rainwater harvesting status in the water base industries of D – I, J and H block.

For all these industrial units total annual water requirement from outside sources is 1484, 913 and 4088 cum. and estimated water gain through rooftop rainwater harvesting is 273, 562 and 18765 cum respectively which is 18, 62 and 459 % therefore water requirement considering the gain of rooftop rainwater harvesting is 1211, 351 and 14677 cum which is 82, 38 and 359 % respectively.

In H block observed 359 % excess availability of rooftop rainwater

g) Automotive industries:

Table no. 4.162 - g) Automotive Industries -1) F -II Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Shree Auto Industries	0	0	35	105	0	232	0
2	Suyog Auto Cast Pvt. Ltd.	0	5	35	14	0	186	0
3	Talbors Automotive components Ltd	0	14	28	0	325	0	0
4	Wonder Car	669	111	446	836	1486	0	669
5	Prachi Batteris Pvt.Ltd.	0	9	139	0	0	232	0
	Total	669	139	683	955	1812	650	669
	Total	808		1638		3131		

In the automotive industries of F – II block surface area components measure to be 1) Open space = 669 sqm. 2) Garden = 139 sqm. 3) Parking = 683 sqm. and 4) Road = 955 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1812 sqm. 2) Cross metal sheet roof area = 650 sqm. and 3) Godown roof area = 669 sqm

Table no. 4.163 - g) Automotive Industries -1) F -II Block Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Garden	**Parking**	**Open Space**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Shree Auto Industries	0	0	16	48	0	111	0
2	Suyog Auto Cast Pvt. Ltd.	0	0	16	6	0	89	0
3	Talbors Automotive components Ltd	0	1	13	0	156	0	0
4	Wonder Car	80	11	206	386	713	0	321
5	Prachi Batteris Pvt.Ltd.	0	1	64	0	0	111	0
	Total	80	14	315	441	870	312	321
	Total	94		756		1503		

Above Table no. 4.163 gives detail about the rainwater harvesting potential of surface area and roof areas of 5 industrial units in the F - II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 5 industrial units open space and gardens occupies the total area of 808 sqm. and it provides the opportunity to get 94 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 1638 sqm surface area and it provides the opportunity to get 756 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 5 industrial units maximum area occupies on roof area which is 3131 sqm areas and it's provide the opportunity to get 1503 cum. of water harvesting potential.

Table no. 4.164 - g) Automotive industries 1) F - II block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Shree Auto Industries	986	111	11	874	89
2	Suyog Auto Cast Pvt. Ltd.	1168	89	8	1079	92
3	Talbors Automotive components Ltd	1095	156	14	939	86
4	Wonder Car	1095	1035	94	60	6
5	Prachi Batteris Pvt.Ltd.	1460	111	8	1349	92
6	Total in cum.	5804	1503	26	4301	74

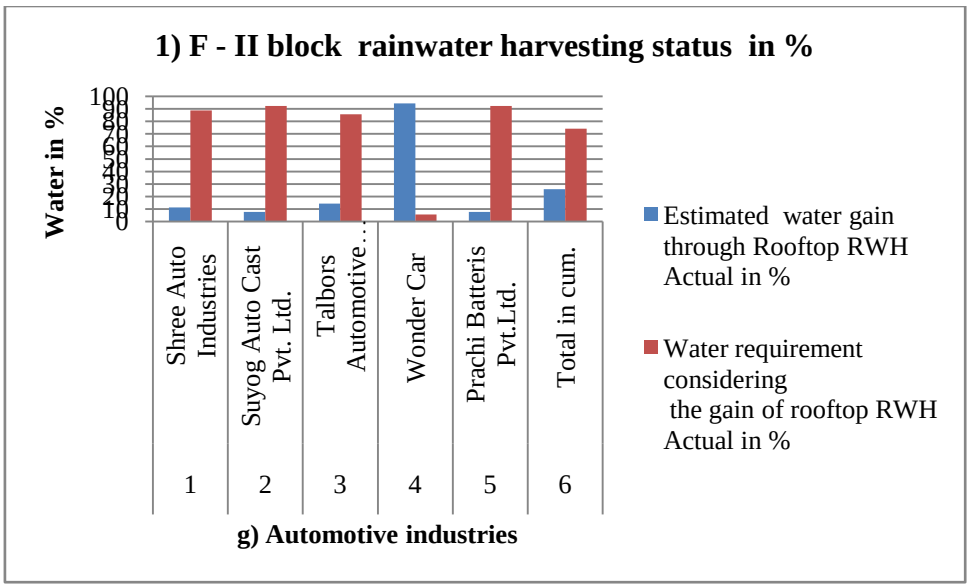

Figure no. 4.50

Above table no. 4.164 and graph no. 4.50 gives detail about the rooftop rainwater harvesting status in the automotive industries of F-II block.

For all these 5 industrial units total annual water requirement from outside sources is 5804 cum. and estimated water gain through rooftop rainwater harvesting is 1503 cum which is 26 % therefore water requirement considering the gain of rooftop rainwater harvesting is 4301 cum which is 74 %

Table no. 4.165 - g) Automotive Industries -2) J Block Surface And Roof Area In Sqm.								
Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Renuka Auto Crank	37	0	149	149	743	0	0
2	Panse Autocomps Pvt. Ltd.	223	111	111	56	0	669	0
3	Fab Auto Parts Pvt. Ltd.	0	0	93	0	372	186	0
4	Dyna Automotive Stamping P. Ltd.	93	46	93	0	0	2415	0
5	Automoblies Carporuting Ltd.	0	35	46	0	0	2787	0
6	Aristo Folls Mfg. Company	0	49	49	93	0	426	0
7	Lumax Auto Technologies Ltd.	0	5	35	46	453	0	0
	Total	353	246	576	344	1568	6484	0
	Total	599		920		8051		

In the automotive industries of J block surface area components measure to be 1) Open space = 353 sqm. 2) Garden = 246 sqm. 3) Parking = 576 sqm. and 4) Road = 344 sqm. Whereas roof covered area components measured as 1) Slab roof area = 1568 sqm. 2) Cross metal sheet roof area = 6484 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.166 - g) Automotive Industries -2) J Block Rainwater Harvesting Potential								
Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Garden	Parking	Open Space	Road	Slab	Cross metal sheet	Godown
1	Renuka Auto Crank	4	0	69	69	357	0	0
2	Panse Autocomps Pvt. Ltd.	27	11	52	26	0	321	0
3	Fab Auto Parts Pvt. Ltd.	0	0	43	0	178	89	0
4	Dyna Automotive	11	5	43	0	0	1159	0

	Stamping P. Ltd.							
5	Automoblies Carporuting Ltd.	0	4	21	0	0	1338	0
6	Aristo Folls Mfg. Company	0	5	23	43	0	205	0
7	Lumax Auto Technologies Ltd.	0	0	16	21	217	0	0
	Total	42	25	266	159	753	3112	0
	Total	67		425		3865		

Above Table no. 4.166 gives detail about the rainwater harvesting potential of surface area and roof areas of 7 industrial units in the J block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 7 industrial units open space and gardens occupies the total area of 599 sqm. and it provides the opportunity to get 67 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 920 sqm surface area and it provides the opportunity to get 425 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 7 industrial units maximum area occupies on roof area which is 8051 sqm areas and it's provide the opportunity to get 3865 cum. of water harvesting potential.

Table no. 4.167 - g) Automotive industries 2) J block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Renuka Auto Crank	803	357	44	446	56
2	Panse Autocomps Pvt. Ltd.	1059	321	30	737	70

3	Fab Auto Parts Pvt. Ltd.	1095	268	24	827	76
4	Dyna Automotive Stamping P. Ltd.	986	1159	118	174	18
5	Automoblies Carporuting Ltd.	730	1338	183	608	83
6	Aristo Folls Mfg. Company	548	205	37	343	63
7	Lumax Auto Technologies Ltd.	803	217	27	586	73
8	Total in cum.	6023	3865	64	2158	36

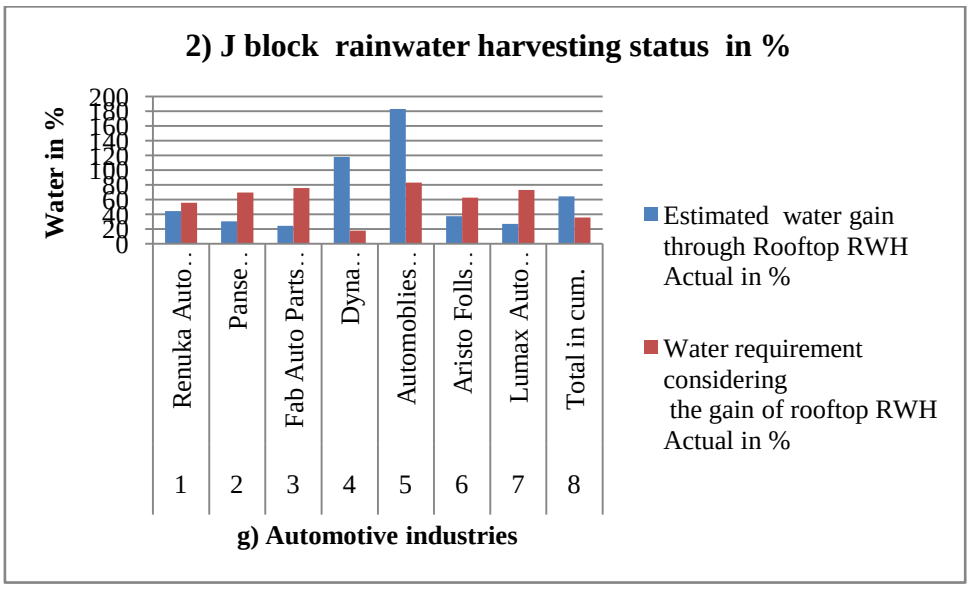

Figure no. 4.51

Above table no. 4.167 and graph no. 4.51 gives detail about the rooftop rainwater harvesting status in the automotive industries of J block.

For all these 7 industrial units total annual water requirement from outside sources is 6023 cum. and estimated water gain through rooftop rainwater harvesting is 3865 cum which is 64 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2158 cum which is 36 %

Table no. 4.168 - g) Automotive Industries -3) S Block Surface And Roof Area In Sqm.

Sr. No	Name Of Industry	Surface Area In Sqm.				Roof Area In Sqm.		
		Open Space	Garden	Parking	Road	Slab	Cross metal sheet	Godown
1	Autotech	0	0	0	0	27	0	0

	Engineering					9		
2	Genie Auto Ducts Pvt. Ltd.	93	0	23	14	0	372	0
3	Gaurav Auto Parts Mfg. Pvt. Ltd.	93	0	0	0	0	279	93
	Total	186	0	23	14	279	650	93
	Total	186		37		1022		

In the automotive industries of S block surface area components measure to be 1) Open space = 186 sqm. 2) Garden = 0 sqm. 3) Parking = 23 sqm. and 4) Road = 14 sqm. Whereas roof covered area components measured as 1) Slab roof area = 279 sqm. 2) Cross metal sheet roof area = 650 sqm. and 3) Godown roof area = 93 sqm.

Table no. 4.169 - g) Automotive Industries -3) S Block Rainwater Harvesting Potential

Sr. No	Name Of Industry	Surface Area RHP in Cum.				Roof Area RHP in Cum.		
		Garden	Parking	Open Space	Road	Slab	Cross metal sheet	Godown
1	Autotech Engineering	0	0	0	0	134	0	0
2	Genie Auto Ducts Pvt. Ltd.	11	0	11	6	0	178	0
3	Gaurav Auto Parts Mfg. Pvt. Ltd.	11	0	0	0	0	134	45
	Total	22	0	11	6	134	312	45
	Total	22		17		491		

Above Table no. 4.169 gives detail about the rainwater harvesting potential of surface area and roof areas of 3 industrial units in the S block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 3 industrial units open space and gardens occupies the total area of 186 sqm. and it provides the opportunity to get 22 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and

roads occupies 37 sqm surface area and it provides the opportunity to get 17 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 3 industrial units maximum area occupies on roof area which is 1022 sqm areas and it's provide the opportunity to get 491 cum. of water harvesting potential.

Table no. 4.170 - g) Automotive industries 3) S block rainwater harvesting status in cum.						
Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Autotech Engineering	548	134	24	414	76
2	Genie Auto Ducts Pvt. Ltd.	730	178	24	552	76
3	Gaurav Auto Parts Mfg. Pvt. Ltd.	913	178	20	734	80
4	Total in cum.	2190	491	22	1699	78

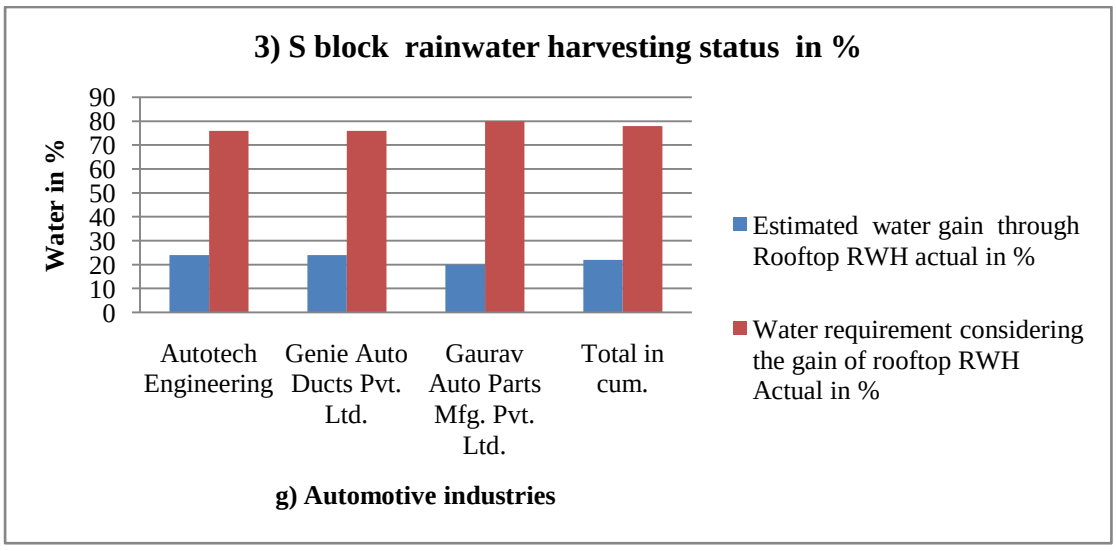

Figure no. 4.52

Above table no. 4.170 and graph no. 4.52 gives detail about the rooftop rainwater harvesting status in the automotive industries of S block.

For all these 3 industrial units total annual water requirement from outside sources is 2190 cum. and estimated water gain through rooftop rainwater harvesting is 491 cum which is 22 % therefore water requirement considering the gain of rooftop rainwater harvesting is 1699 cum which is 78 %

h) Pharamacuticuls industries:

Table no. 4.171 - h) Pharma industries -1) F -II Block Campus And Roof Area In Sqm.								
Sr. No	**Name Of Industry**	**Surface Area In Sqm.**				**Roof Area In Sqm.**		
		Open Space	**Garden**	**Parking**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Nullife Pharmaceuticals	0	5	9	81	0	372	0
2	Bombay Oxigen Corp. Ltd	0	14	28	81	0	372	0
	Total	0	19	37	163	0	743	0
	Total	19		199		743		

In the Pharamacuticuls industries of F-II block surface area components measure to be 1) Open space = 0 sqm. 2) Garden = 19 sqm. 3) Parking = 37 sqm. and 4) Road = 163 sqm. Whereas roof covered area components measured as 1) Slab roof area = 0 sqm. 2) Cross metal sheet roof area = 743 sqm. and 3) Godown roof area = 0 sqm.

Table no. 4.172 - h) Pharma industries -1) F -II Block Rainwater Harvesting Potential								
Sr. No	**Name Of Industry**	**Surface Area RHP in Cum.**				**Roof Area RHP in Cum.**		
		Garden	**Parking**	**Open Space**	**Road**	**Slab**	**Cross metal sheet**	**Godown**
1	Nullife Pharmaceuticals	0	0	4	38	0	178	0
2	Bombay Oxigen Corp. Ltd	0	1	13	38	0	178	0
	Total	0	2	17	75	0	357	0
	Total	2		92		357		

Above Table no. 4.172 gives detail about the rainwater harvesting potential of surface area and roof areas of 2 industrial units in the F - II block.

If we observe the data of surface area, the less runoff co-efficient of open space (0.20) and garden (0.17) results to minimize the harvesting potential due to the water loss made by evaporation and infiltration. For all these 2 industrial units open space and gardens occupies the total area of 19 sqm. and it provides the opportunity to get 2 cum. of water harvesting potential, where as other open surface area component namely parking and roads runoff co-efficient is 0.77 and parking and roads occupies 199 sqm surface area and it provides the opportunity to get 92 cum. of water harvesting potential.

In the roof area runoff co-efficient are 0.8 results to maximum the harvesting potential. For all this 2 industrial units maximum area occupies on roof area which is 743 sqm areas and it's provide the opportunity to get 357 cum. of water harvesting potential.

Table no. 4.173 - h) Pharama industries 1) F - II block rainwater harvesting status in cum.

Sr. No	Name Of Industry	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Nullife Pharmaceuticals	1278	178	14	1099	86
2	Bombay Oxigen Corp. Ltd	1168	178	15	990	85
3	Total in cum.	2446	357	15	2089	85

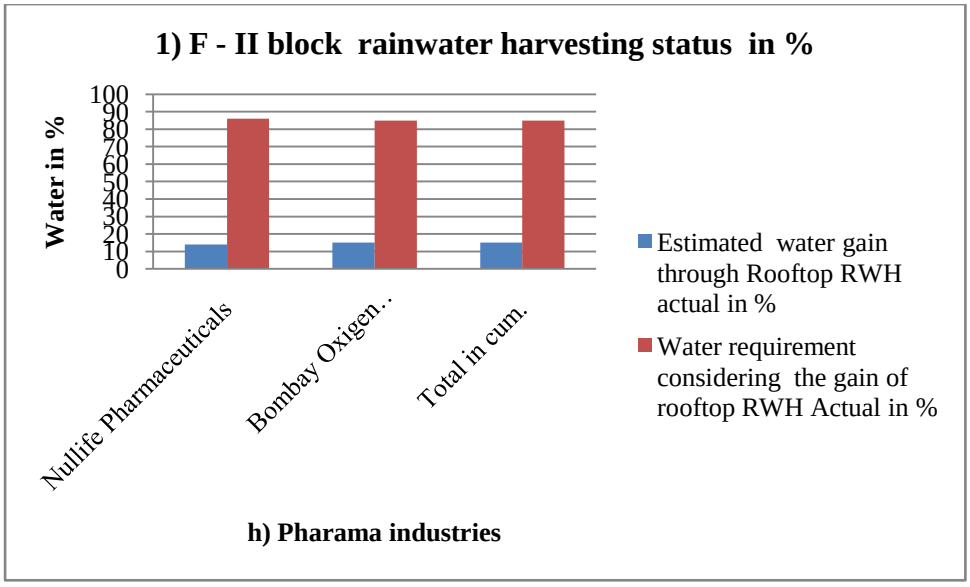

Figure no. 4.53

Above table no. 4.73 and graph no.4.53 gives detail about the rooftop rainwater harvesting status in the pharmacuticulas industries of F-II block.

For all these 2 industrial units total annual water requirement from outside sources is 2446 cum. and estimated water gain through rooftop rainwater harvesting is 357 cum which is 15 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2089 cum which is 85 %

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Chapter – V

SUMMARY AND CONCLUSION

1. Introduction.
2. Findings :
    - 2.1 Domestic water use
    - 2.2 Industrial water use
    - 2.3 Total rainwater harvesting potential
    - 2.4 Annual water use and rooftop rainwater harvesting status
3. Model for rooftop water gain and requirement for industries in block
4. Suggestions:
    - 4.1 Water management
    - 4.2 Surface rainwater harvesting and Groundwater recharge and Suggested scheme.
    - 4.3 Rooftop rainwater harvesting and annual water use

1. Introduction:

Increasing industrial water use has been the increase in conflict between society and the industry on issues ranging from to water scarcity. In areas where there is water scarcity, industries are under tremendous pressure from society and government alike to reduce water use. In India, The main sources of water for the industrial sector are groundwater and surface water. Selection of source of water depends on the availability of sufficient and regular supply and the cost of water from the source. Industrial sector require huge amount of water. Since the surface water supply from the any other source like municipal, and industrial development authority sources is not sufficiently guaranteed, industrial units to depend on groundwater.

With a view to optimize water usage we are looking at alternatives, which are sustainable, reliable and cost effective. Rainwater harvesting appeared as a potential source of supply. Rainwater harvesting provides the long-term answers to the problem of water scarcity.

The hypothesis stated for this study is "The rainwater harvesting in the industrial units of Pimpri – Chichwad MIDC will prove an alternative to the water need of industrial units" which has be supportively elaborated and interpreted by the many finding and conclusion driven the various chapter of this study. The chapter wise findings and conclusions were elaborated in the following ways.

2. Findings:

2.1 Domestic water use

A) Without water use in industrial process:

Table no. 5.1 - a) Block wise domestic water use status in service industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	4	17	3
2	D - I	0	3	1
3	D -II	0	7	10
4	D -III	0	4	8

5	F -II	0	2	0
6	J	0	7	1
7	H	0	0	4
8	S	0	1	10
9	Total	4	41	37

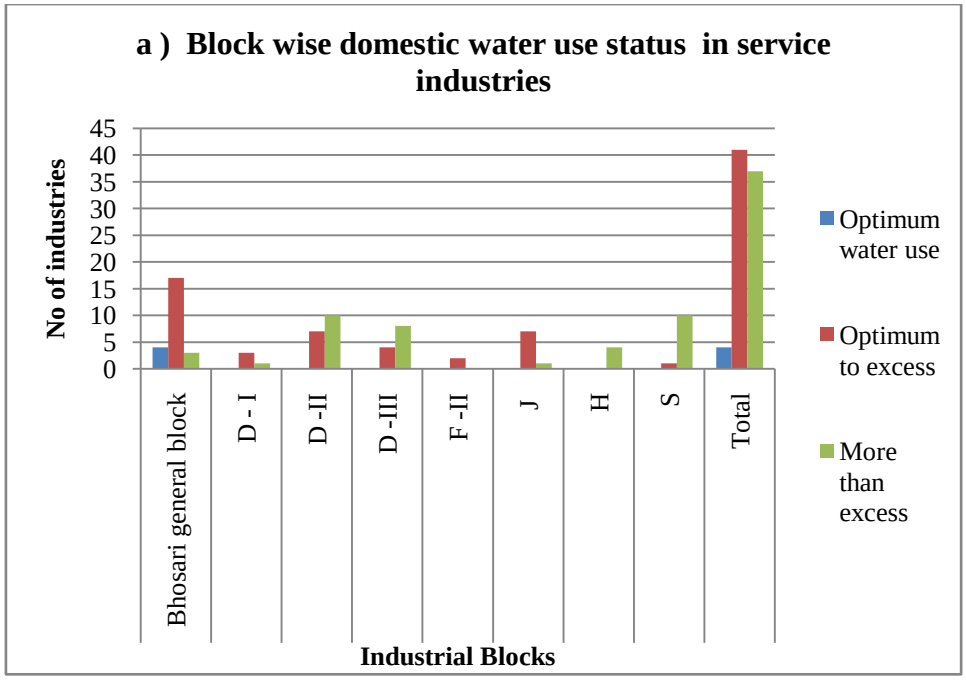


Figure no. 5.1

In the service industries there are total 8 blocks 82 industrial units. Among them the 4 industrial units are using optimum water, 41 units have their use optimum to excess and 37 units were using more than excess amount of water for domestic purposes.

Table no. 5.2 - b) Block wise domestic water use status in Manufacturing industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	12	20	6
2	D - I	0	1	2
3	D -II	0	2	9
4	F -II	1	10	11
5	J	18	40	8
6	H	0	2	22
7	S	0	7	28
8	Electronic Zone	7	6	4
9	Total	38	88	90

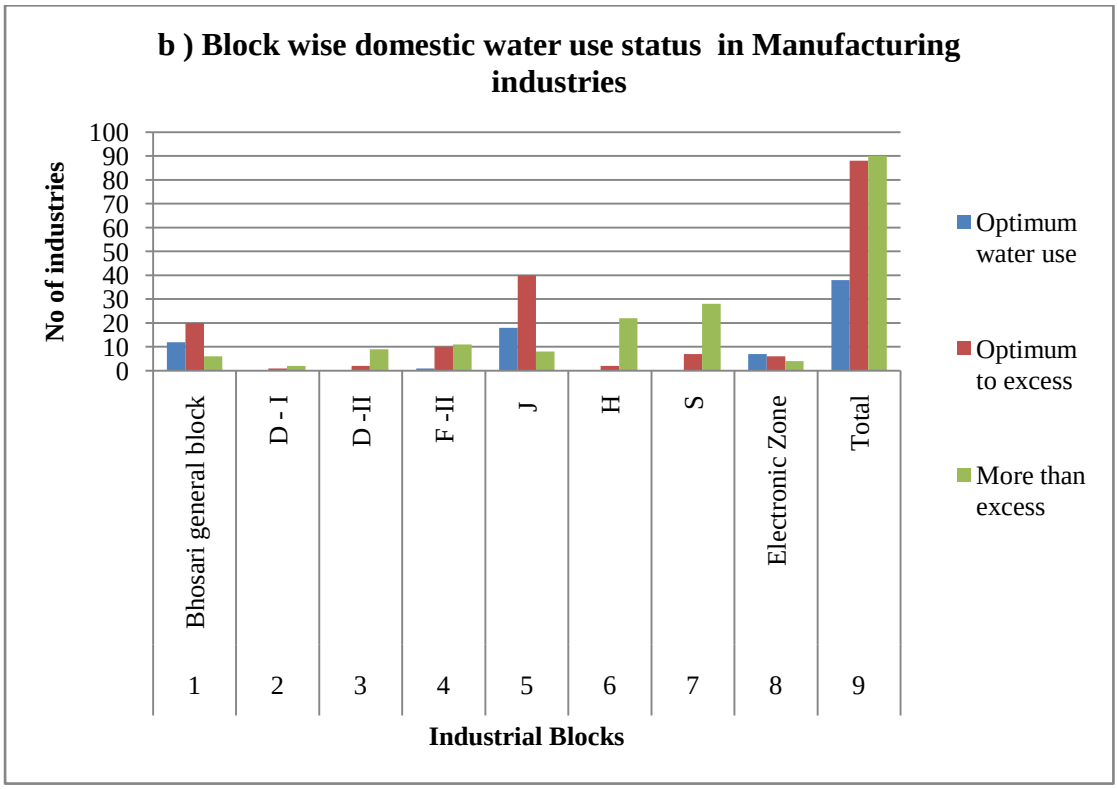


Figure no. 5.2

In the manufacturing industries there are total 8 blocks all 216industrial units. Among them the 38 industrial units are using optimum water, 88 units have their use optimum to excess and 90 units were using more than excess amount of water for domestic purposes.

Table no. 5.3 - c) Block wise domestic water use status in Packing Industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	0	5	0
2	D - I	1	2	0
3	D -III	0	1	0
5	J	0	0	1
6	H	0	0	1
7	Total	1	8	2

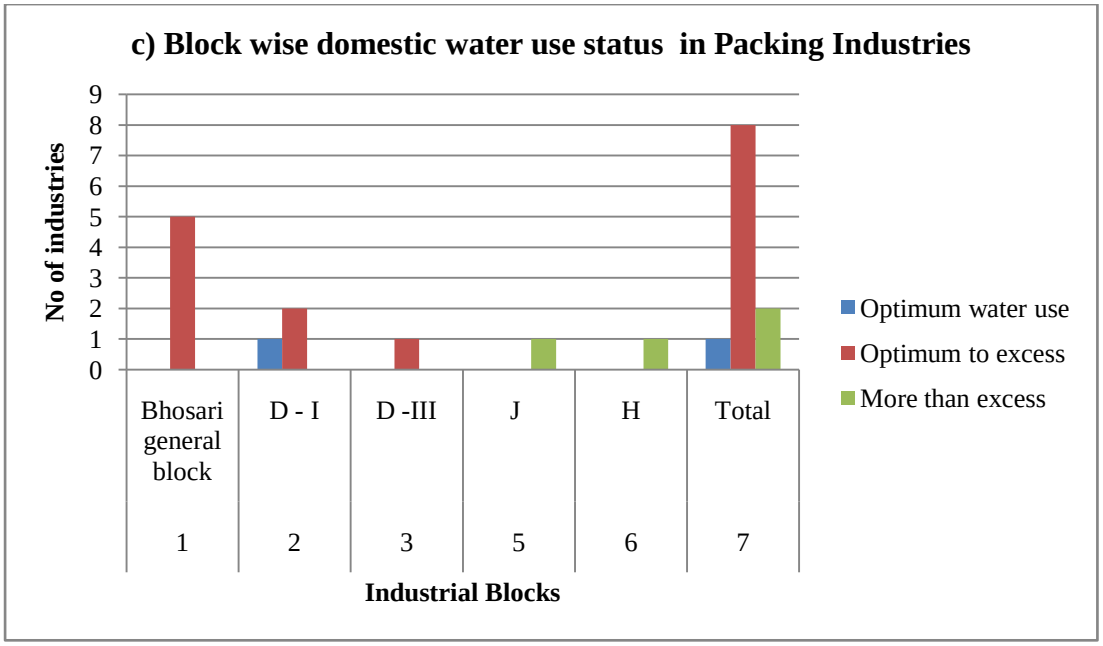


Figure no. 5.3

In the packing industries there are total 6 blocks all 11 industrial units. Among them the only 1 industrial units are using optimum water, 8 units have their use optimum to excess and only 2 units were using more than excess amount of water for domestic purposes.

B) Water use in industrial process:

Table no. 5.4 - a)Block wise domestic water use status in Manufacturing industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	10	26	18
2	D - I	0	8	7
3	D -II	0	12	14
4	D -III	0	9	4
5	F -II	1	3	7
6	J	14	68	12
7	H	1	2	25
8	S	0	4	42
9	Electronic Zone	3	5	1
10	Total	29	137	130

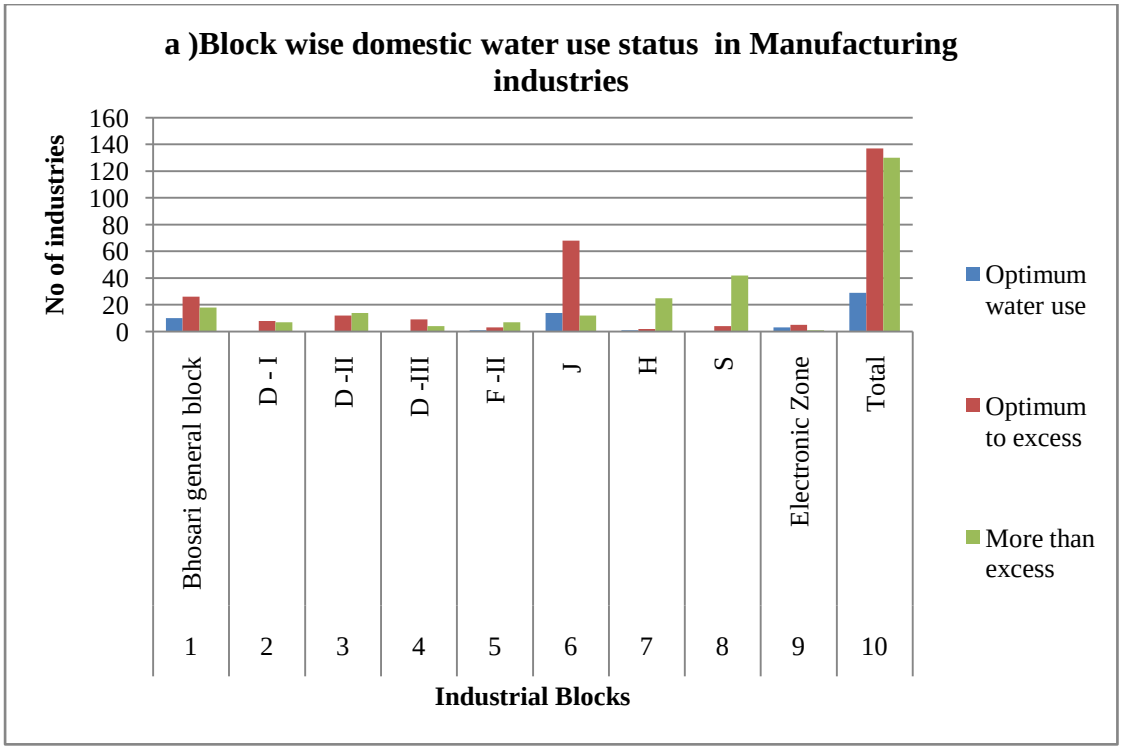


Figure no. 5.4

In the manufacturing industries there are total 9 blocks all 296 industrial units. Among them the 29 industrial units are using optimum water, 137 units have their use optimum to excess and 130 units were using more than excess amount of water for domestic purposes.

Table no. 5.5 - b) Block wise domestic water use status in Tool manufacturing industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	2	8	2
2	J	2	8	5
3	H	0	0	3
4	S	0	0	4
5	Electronic Zone	1	0	0
6	Total	5	16	14

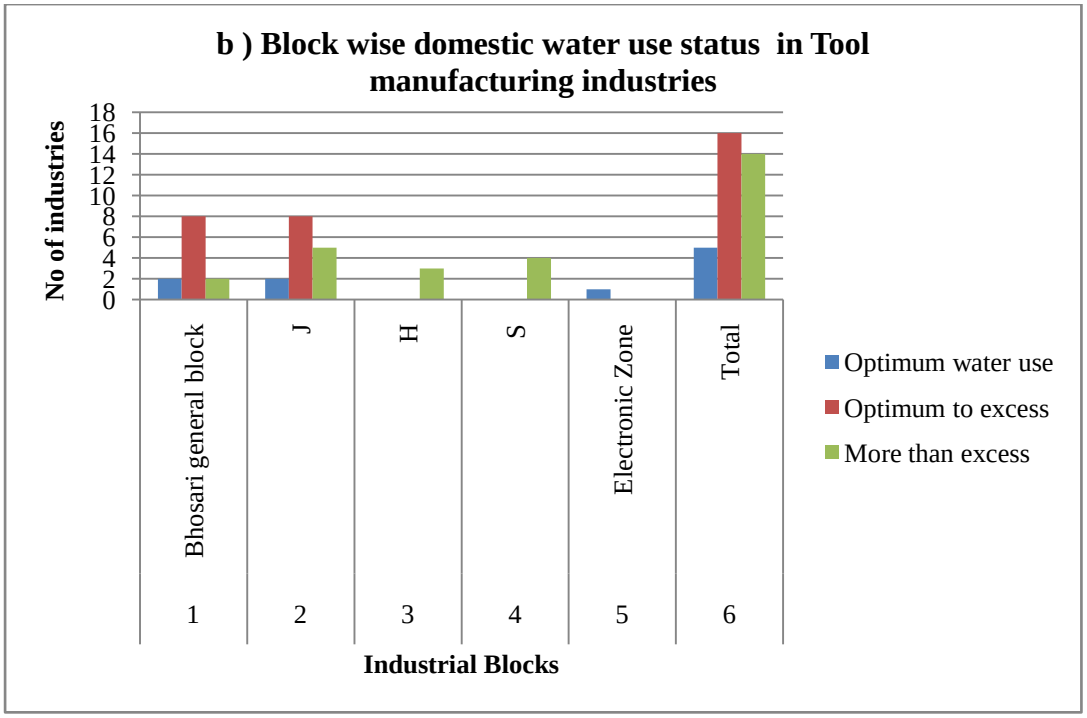


Figure no. 5.5

In the tool manufacturing industries there are total 5 blocks all 35 industrial units. Among them the 5 industrial units are using optimum water, 16 units have their use optimum to excess and 14 units were using more than excess amount of water for domestic purposes.

Table no. 5.6 - c) Block wise domestic water use status in Plastic and rubber, fiber industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	0	8	3
2	D - I	0	0	3
3	D -II	0	3	6
4	D -III	0	1	1
5	F -II	0	0	2
6	J	0	4	4
7	H	0	0	3
8	S	0	1	5
9	Total	0	17	27

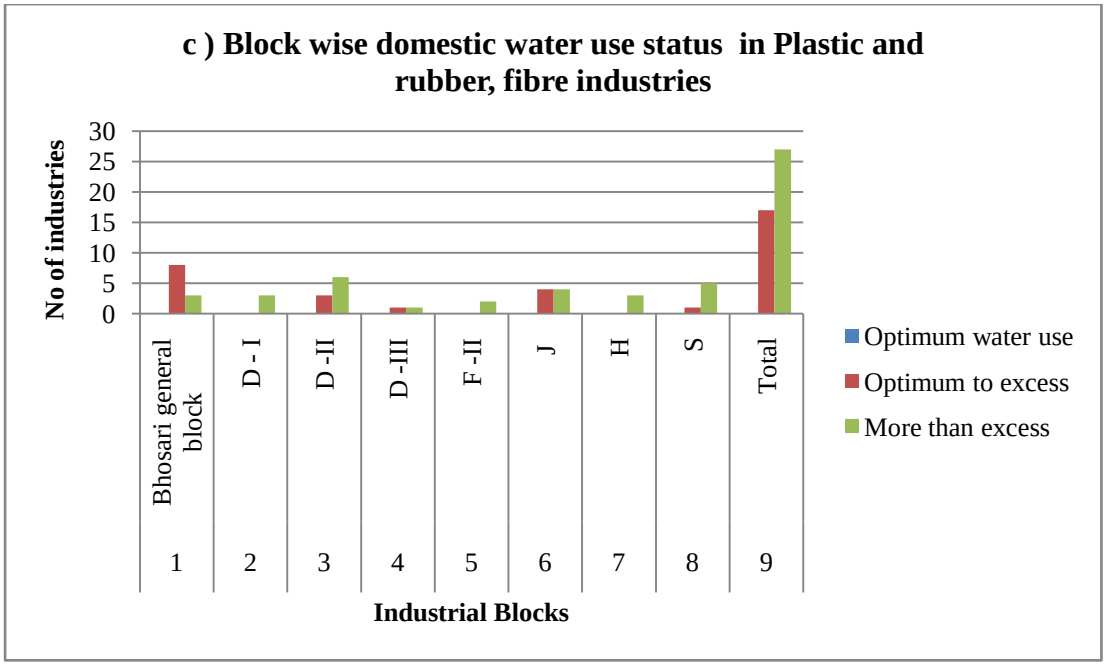


Figure no. 5.6

In the plastic and rubber, fiber industries there are total 8 blocks all 44 industrial units. Among them no one any industrial units are using optimum water, 17 units have their use optimum to excess and 27 units were using more than excess amount of water for domestic purposes.

Table no. 5.7 - d) Block wise domestic water use status in Metal and forge industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	1	4	4
2	D -II	0	5	1
3	F-II	0	1	5
4	J	6	14	3
5	H	0	0	8
6	S	0	1	7
7	Total	7	25	28

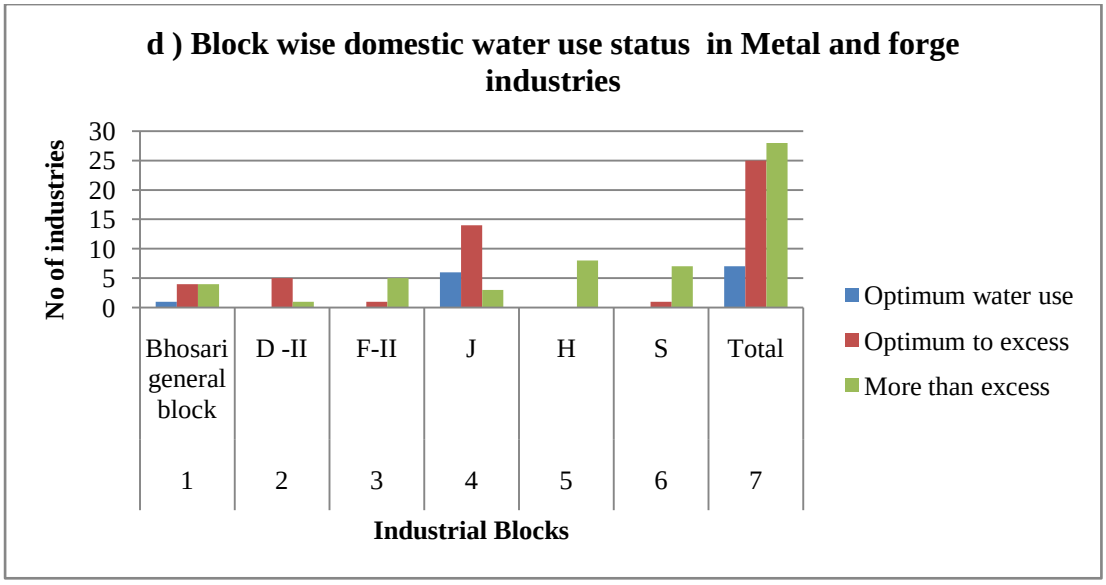


Figure no. 5.7

In the metal and forge industries there are total 6 blocks all 60 industrial units. Among them the 7 industrial units are using optimum water, 25 units have their use optimum to excess and 28 units were using more than excess amount of water for domestic purposes.

Table no. 5.8 - e) Block wise domestic water use status in Chemical industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	Bhosari general block	0	2	2
2	D -II	0	1	0
3	J	0	1	0
4	S	0	0	1
5	Electronics Zone	0	0	1
6	Total	0	4	4

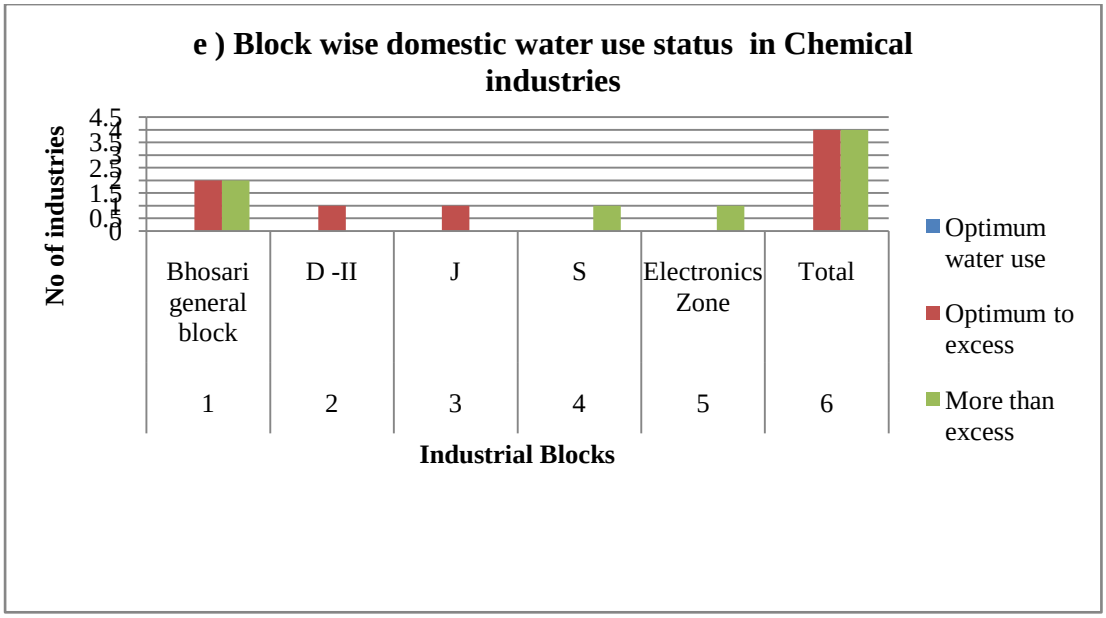


Figure no. 5.8

In the chemical industries there are total 5 blocks all 8 industrial units. Among them no one any industrial units are using optimum water, 4 units have their use optimum to excess and 4 units were using more than excess amount of water for domestic purposes.

Table no. 5.9 - f) Block wise domestic water use status in Water base industries				
Sr. No.	**Block**	**Optimum water use**	**Optimum to excess**	**More than excess**
1	Bhosari general block	0	0	2
2	D -III	0	1	1
3	S	0	1	3
4	D-I	0	1	0
5	J	0	1	0
6	H	0	0	1
7	Total	0	4	7

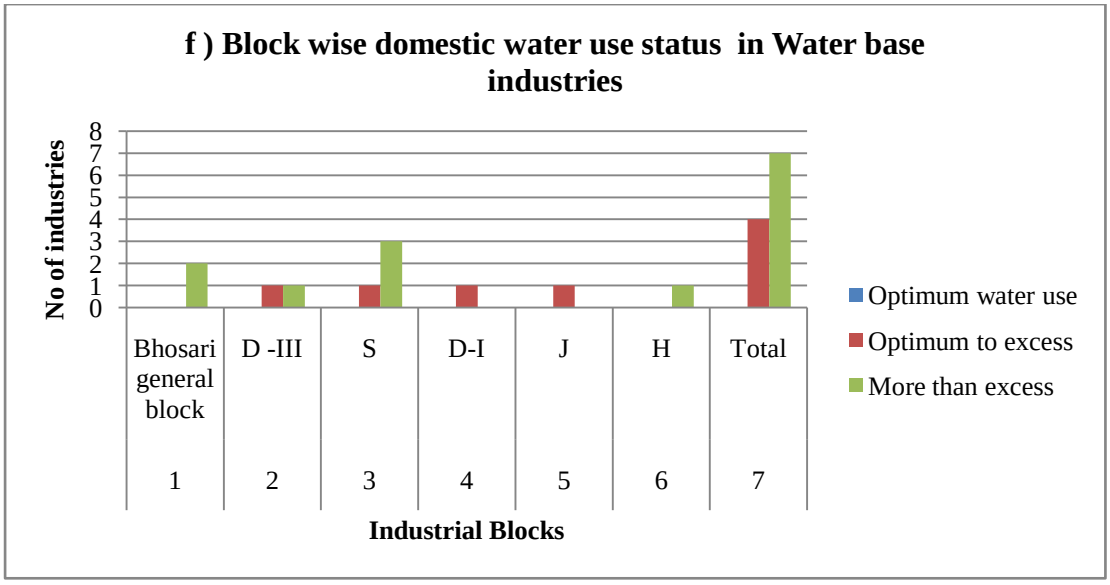


Figure no. 5.9

In the water base industries there are total 6 blocks all 11 industrial units. Among them no one any industrial units are using optimum water, 4 units have their use optimum to excess and 7 units were using more than excess amount of water for domestic purposes.

Table no. 5.10 - g) Block wise domestic water use status in Automotive industries

Sr. No.	Block	Optimum water use	Optimum to excess	More than excess
1	F - II	0	5	0
2	J	0	7	0
3	S	0	3	0
4	Total	0	15	0

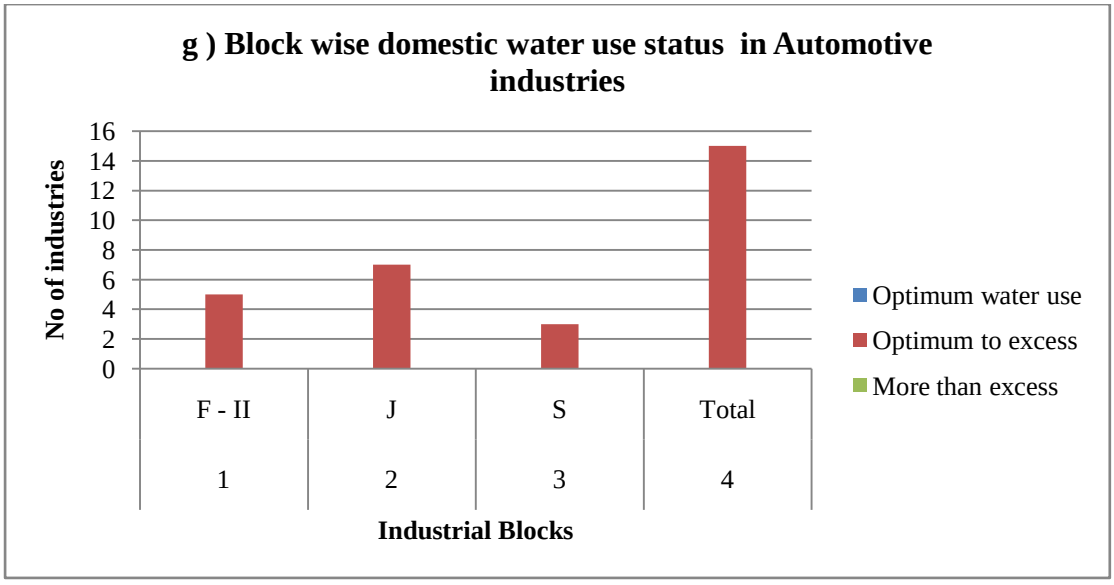


Figure no. 5.10

In the automotive industries there are total 3 blocks all 15 industrial units. Among them no one any industrial units are using optimum water, 15 units have their use optimum to excess and no one any units were using more than excess amount of water for domestic purposes.

Table no. 5.11 - h) Block wise domestic water use status in Pharma industries				
Sr. No.	**Block**	**Optimum water use**	**Optimum to excess**	**More than excess**
1	F - II	0	1	1

In the Pharmaceutical industries there are total 1 block 2 industrial units. Among them no one any industrial units are using optimum water, 1 units have their use optimum to excess and 1 units were using more than excess amount of water for domestic purposes.

2.2 Industrial water use

B) Water use in industrial process:

Table no. 5.12 - a) Block wise industrial water use in manufacturing industries in liter			
Sr. No.	**Block**	**Annual**	**Per Day**
1	Bhosari general block	25915000	71000
2	D - I	4708500	12900
3	D -II	8541000	23400

4	D -III	4672000	12800
5	F -II	3869000	10600
6	J	28725500	78700
7	H	16242500	44500
8	S	18279200	50080
9	Electronic Zone	3504000	9600
	Total	114456700	313580

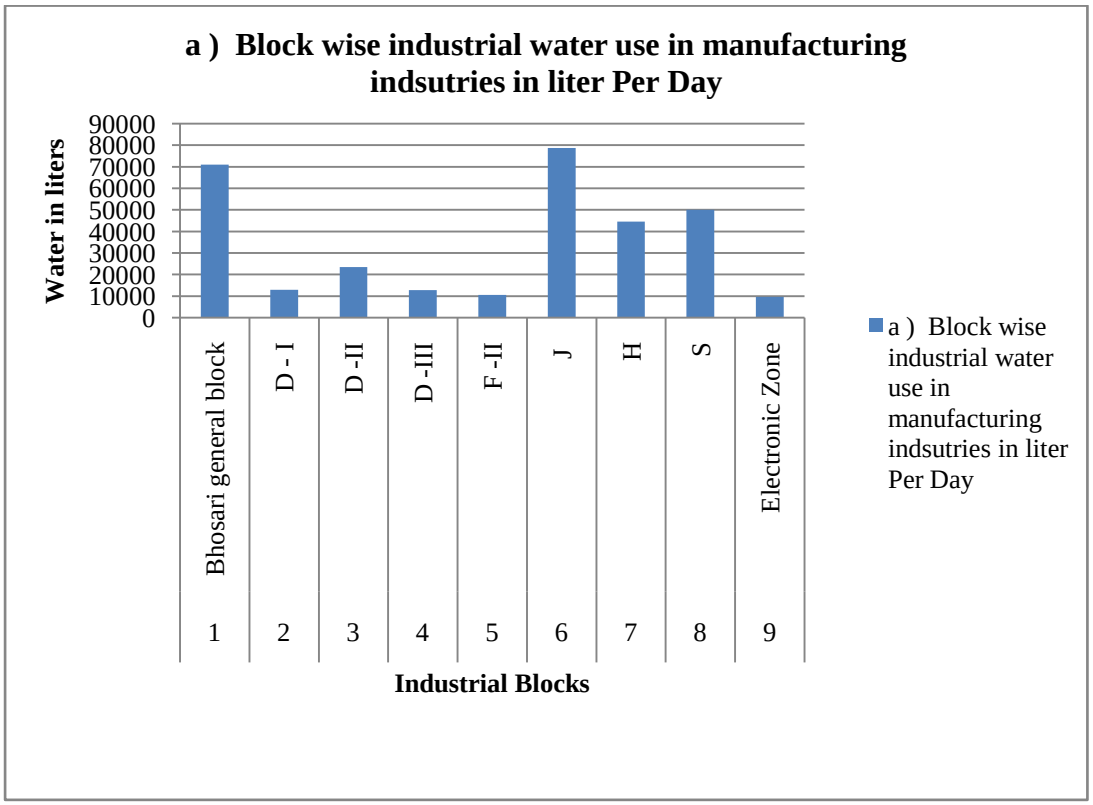


Figure no. 5.11

Above table no.5.12 and graph no. 5.11 is gives detail about industrial water use in manufacturing industries.

In the manufacturing industries there are total 9 blocks 296 industrial units. They are use annually 114456700 liter water in industrial process. J block using maximum water in industrial process which is 28725500 liters and electronics zone using minimum water in industrial process which is 3504000.

Table no. 5.13 - b) Block wise industrial water use in Tool manufacturing industries			
Sr. No.	**Block**	**Annual**	**Per Day**
1	Bhosari general block	3577000	9800
2	J	4672000	12800
3	H	1277500	3500
4	S	1569500	4300
5	Electronic Zone	438000	1200
	Total	11534000	31600

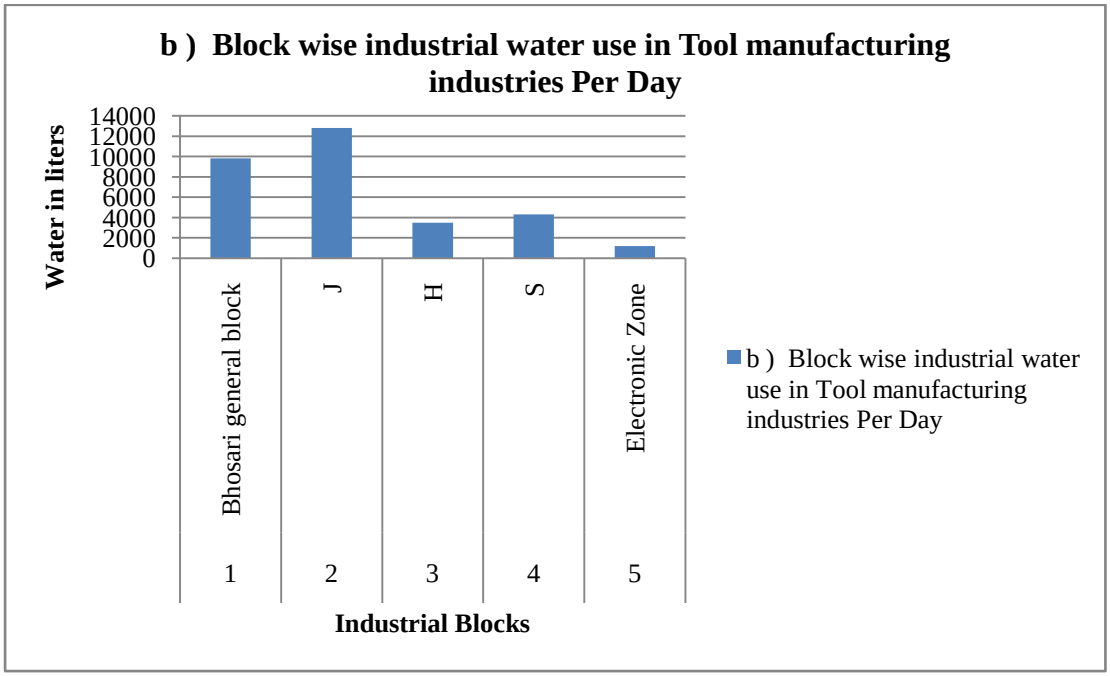


Figure no. 5.12

Above table no. 5.13 and graph no. 5.12 is gives detail about industrial water use in tool manufacturing industries.

In the tool manufacturing industries there are total 5 blocks 35 industrial units. They are use annually 11534000 liter water in industrial process. J block using maximum water in industrial process which is 4672000 liters and electronics zone using minimum water in industrial process which is 438000.

Table no. 5.14 - c) Block wise industrial water use in Plastic and rubber, fiber industries			
Sr. No.	**Block**	**Annual**	**Per Day**
1	Bhosari general block	4234000	11600

2	D - I	1642500	4500
3	D -II	3670000	10055
4	D -III	1095000	3000
5	F -II	803000	2200
6	J	3504000	9600
7	H	4927500	13500
8	S	2920000	8000
	Total	22796000	62455

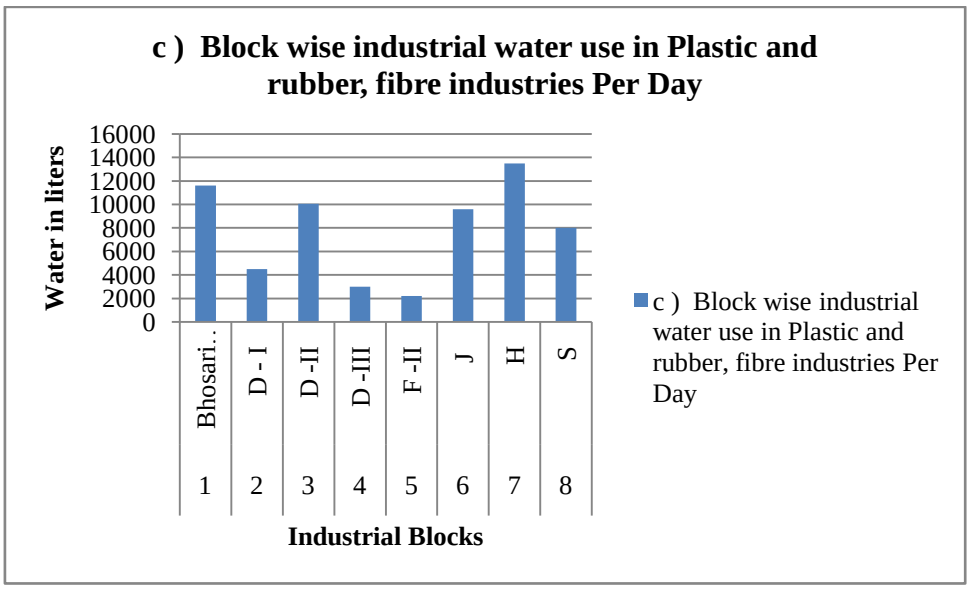


Figure no. 5.13

Above table no. 5.14 and graph no. 5.13 is gives detail about industrial water use in plastic and rubber, fiber industries.

In the plastic and rubber, fiber industries there are total 8 blocks 44 industrial units. They are use annually 11534000 liter water in industrial process. J block using maximum water in industrial process which is 4672000 liters and electronics zone using minimum water in industrial process which is 438000.

Table no. 5.15 - d) Block wise industrial water use in Metal and forge industries

Sr. No.	Block	Annual	Per Day
1	Bhosari general block	3431000	9400
2	D -II	1934500	5300
3	F-II	1788500	4900
4	J	6205000	17000
5	H	2920000	8000
6	S	3650000	10000

	Total	19929000	54600

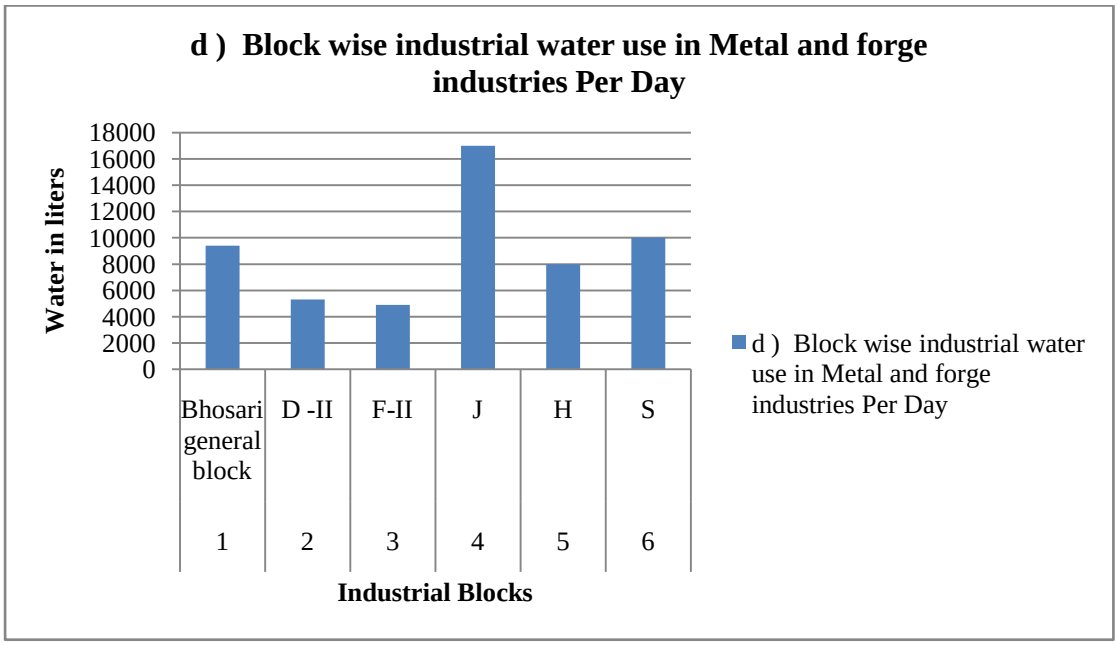


Figure no. 5.14

Above table no.5.15 and graph no. 5.14 is gives detail about industrial water use in metal and forge industries.

In the metal and forge industries there are total 6 blocks 60 industrial units. They are use annually 19929000 liter water in industrial process. J blocks using maximum water in industrial process which is 6205000 liters and F –II blocks using minimum water in industrial process s which is 1788500.

Table no. 5.16 - e) Block wise industrial water use in Chemical industries

Sr. No.	Block	Annual	Per Day
1	Bhosari general block	5730500	15700
2	D -II	365000	1000
3	J	547500	1500
4	S	563500	1544
5	Electronics Zone	730000	2000
	Total	7936500	21744

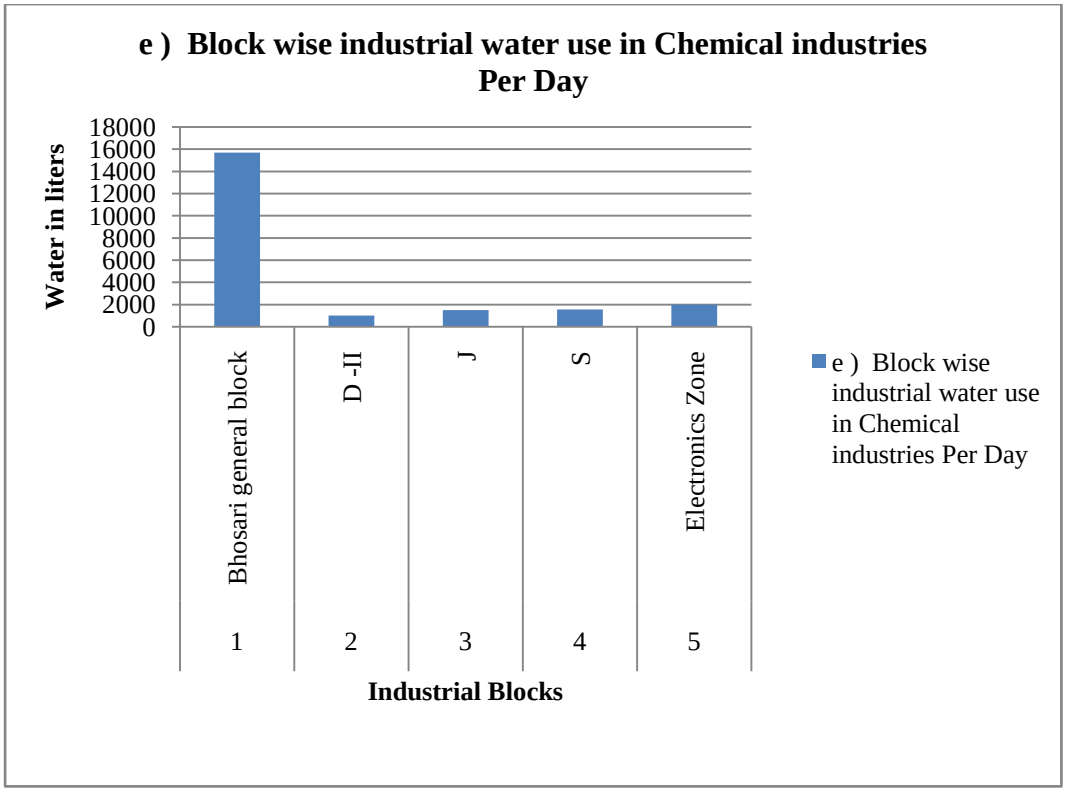


Figure no. 5.15

Above table no.5.16 and graph no. 5.15 is gives detail about industrial water use in chemical industries.

In the chemical industries there are total 5 blocks 8 industrial units. They are use annually 7936500 liter water in industrial process. Bhosari general blocks using maximum water in industrial process which is 5730500 liters and D –II blocks using minimum water in industrial process s which is 365000.

Table no. 5.17 - f) Block wise industrial water use in Water base industries in liters

Sr. No.	Block	Annual	Per Day
1	Bhosari general block	14600000	40000
2	D -III	1095000	3000
3	S	2555000	7000
4	D-I	754000	2066
5	J	365000	1000
6	H	2555000	7000
	Total	21924000	60066

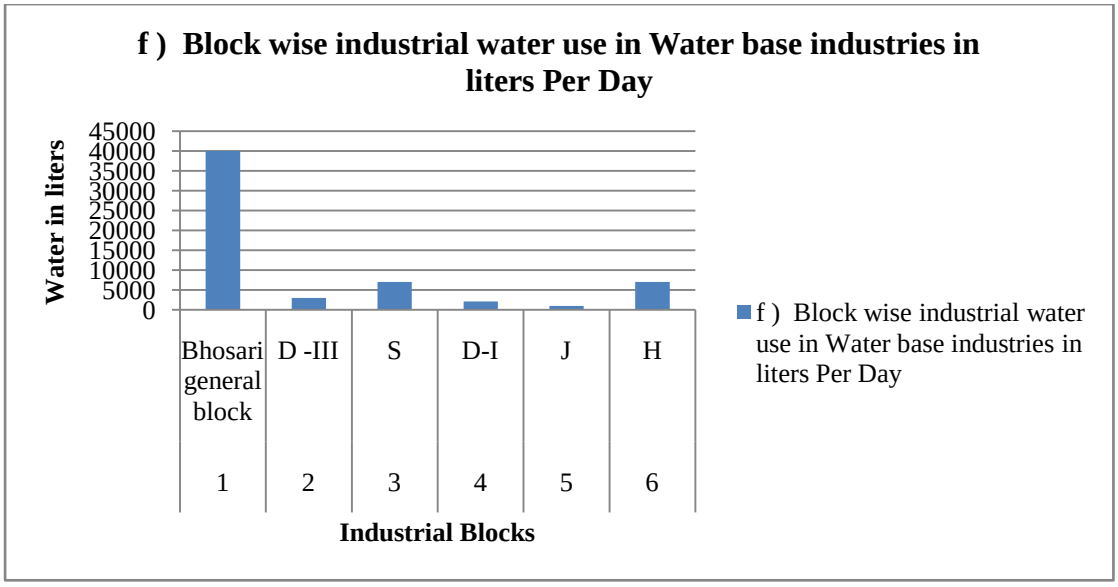


Figure no. 5.16

Above table no.5.17 and graph no. 5.16 is gives detail about industrial water use in water base industries.

In the water base industries there are total 6 blocks 11 industrial units. They are use annually 21924000 liter water in industrial process. Bhosari general blocks using maximum water in industrial process which is 14600000 liters and J blocks using minimum water in industrial process which is 365000.

Table no. 5.18 - g) Block wise industrial water use in Automotive industries in liters

Sr. No.	Block	Annual	Per Day
1	F - II	1642500	4500
2	J	2336000	6400
3	S	949000	2600
	Total	4927500	13500

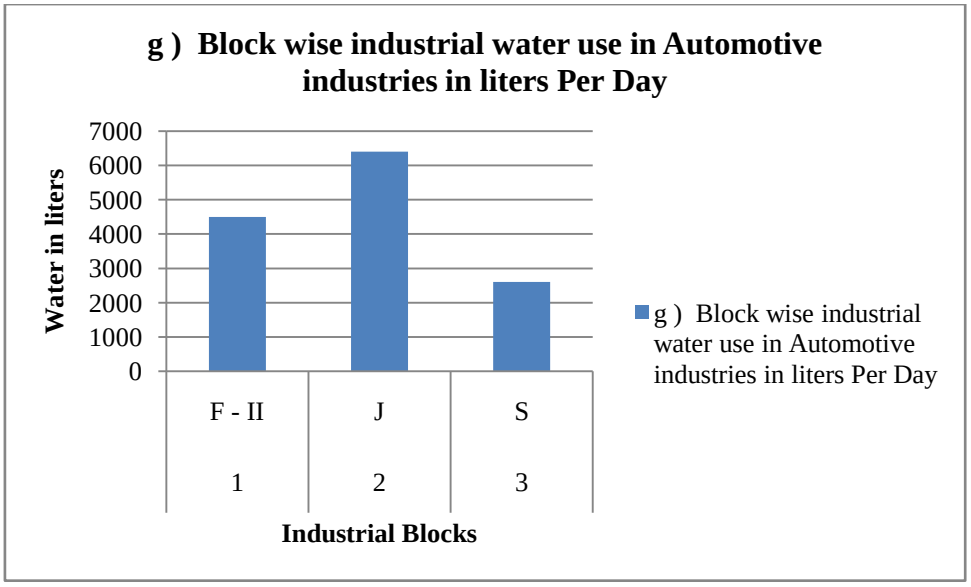


Figure no. 5.17

Above table no.5.18 and graph no. 5.17 is gives detail about industrial water use in automotive industries.

In the automotive industries there are total 3 blocks 15 industrial units. They are use annually 4927500 liter water in industrial process. F-II blocks using maximum water in industrial process which is 4927500 liters and S blocks using minimum water in industrial process which is 949000.

Table no. 5.19 - h) Block wise industrial water use in Pharma industries in liters			
Sr. No.	**Block**	**Annual**	**Per Day**
1	F - II	730000	2000
	Total	730000	2000

Above table no. 5.19 is gives detail about industrial water use in Pharmaceutical industries.

In the Pharmaceutical industries there are total 1 block 2 industrial units. They are use annually 730000 liter water in industrial process.

2.3 Total rainwater harvesting potential :

A) Without water use in industrial process:

Table no. 5.20 - a) Block wise rainwater harvesting potential in service industries (area in Sqm, Water in cum)					
Sr. No.	**Block**	**Total Surface Area**	**Total surface RWH**	**Total rooftop area**	**Total rooftop RWH**
1	Bhosari general block	9537	3443	45566	21872
2	D - I	525	112	1812	870
3	D -II	4707	1079	15431	7407
4	D -III	2795	952	4877	2341
5	F -II	216	78	14957	7180
6	J	1851	648	10758	5164
7	H	758	193	1802	865
8	S	718	265	4227	2029
9	Total	21107	6770	99430	47728

Above Table no. 5.20 gives detail about the rainwater harvesting potential of surface area and roof areas of 83 industrial units in the 8 blocks.

In the surface area, for all these 83 industrial units occupies the total surface area of 21107 sqm. and it provides the opportunity to get 6770 cum. of water harvesting potential.

In the roof area for all this 83 industrial units maximum area occupies on roof area which is 99430 sqm areas and it’s provide the opportunity to get 47728 cum. of water harvesting potential.

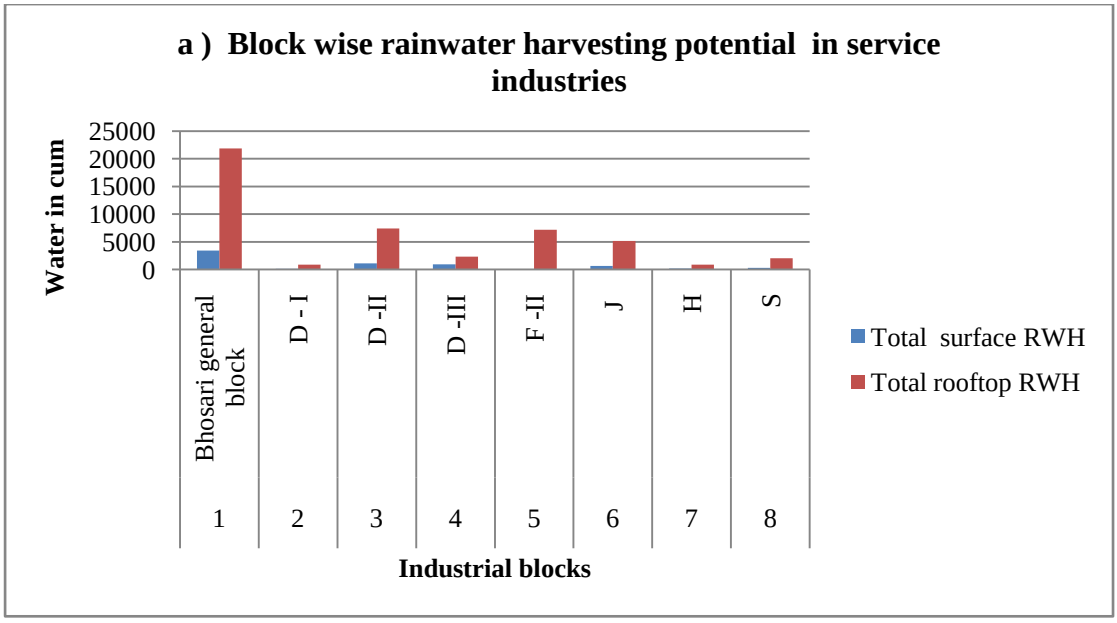


Figure no. 5.18

Above graph no. 5.18 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.21 - b) Block wise rainwater harvesting potential in Manufacturing industries (area in Sqm, Water in cum)

Sr. No.	Block	Total Surface Area	Total surface RWH	Total rooftop area	Total rooftop RWH
1	Bhosari general block	10729	4166	40278	13328
2	D - I	1089	402	2464	1183
3	D -II	1026	329	6475	3108
4	F -II	7506	2407	14084	6760
5	J	29455	9195	84662	40638
6	H	3891	1094	10898	5231
7	S	17262	5128	24424	11724
8	Electronic Zone	8919	3056	14493	8348
9	Total	79877	25777	197778	90320

Above Table no. 5.21 gives detail about the rainwater harvesting potential of surface area and roof areas of 240 industrial units in the 8 blocks.

In the surface area, for all these 240 industrial units occupies the total surface area of 79877 sqm. and it provides the opportunity to get 25777 cum. of water harvesting potential.

In the roof area for all this 240 industrial units maximum area occupies on roof area which is 197778 sqm areas and it's provide the opportunity to get 90320 cum. of water harvesting potential.

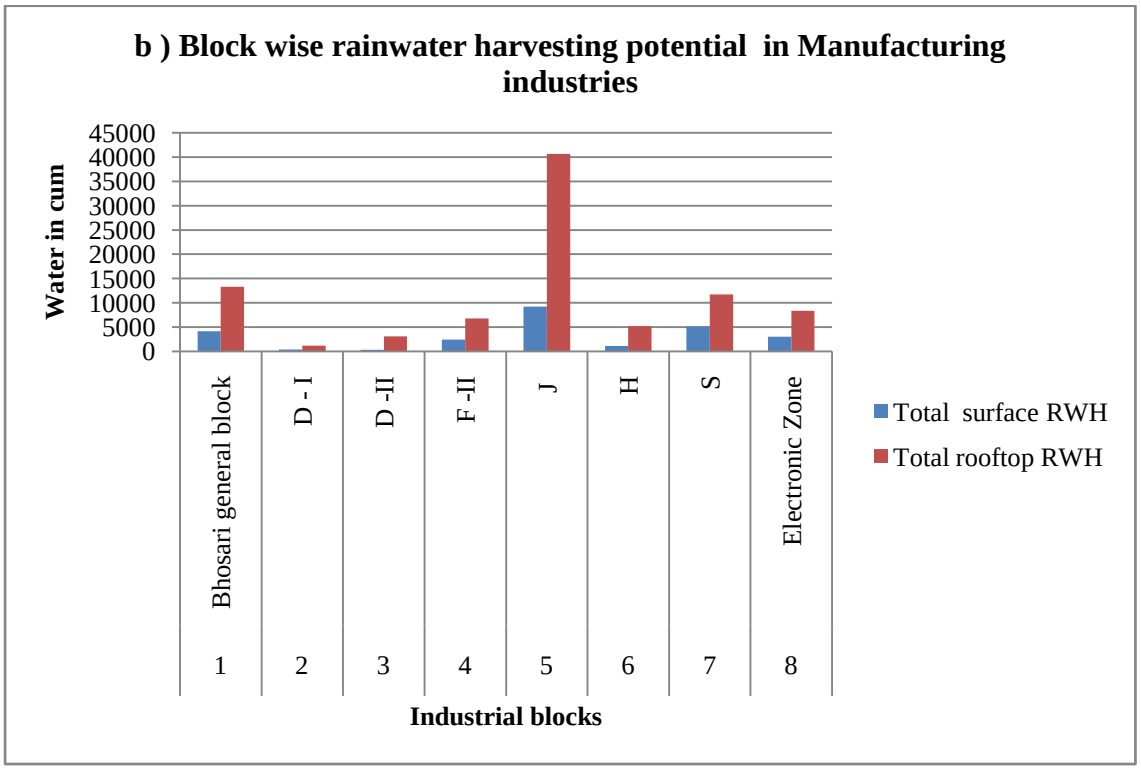


Figure no. 5.19

Above graph no. 5.19 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.22 - c) Block wise rainwater harvesting potential in Packing Industries (area in Sqm, Water in cum)

Sr. No.	Block	Total Surface Area	Total surface RWH	Total rooftop area	Total rooftop RWH
1	Bhosari general block	1260	541	5243	1579
2	D - I	194	76	1254	602
3	D -III	114	46	418	201

5	J	439	119	669	321
6	H	209	69	725	348
7	Total	2216	851	8309	3051

Above Table no. 5.22 gives detail about the rainwater harvesting potential of surface area and roof areas of 11 industrial units in the 6 blocks.

In the surface area, for all these 11 industrial units occupies the total surface area of 2216 sqm. and it provides the opportunity to get 851 cum. of water harvesting potential.

In the roof area for all this 11 industrial units maximum area occupies on roof area which is 8309 sqm areas and it's provide the opportunity to get 3051 cum. of water harvesting potential.

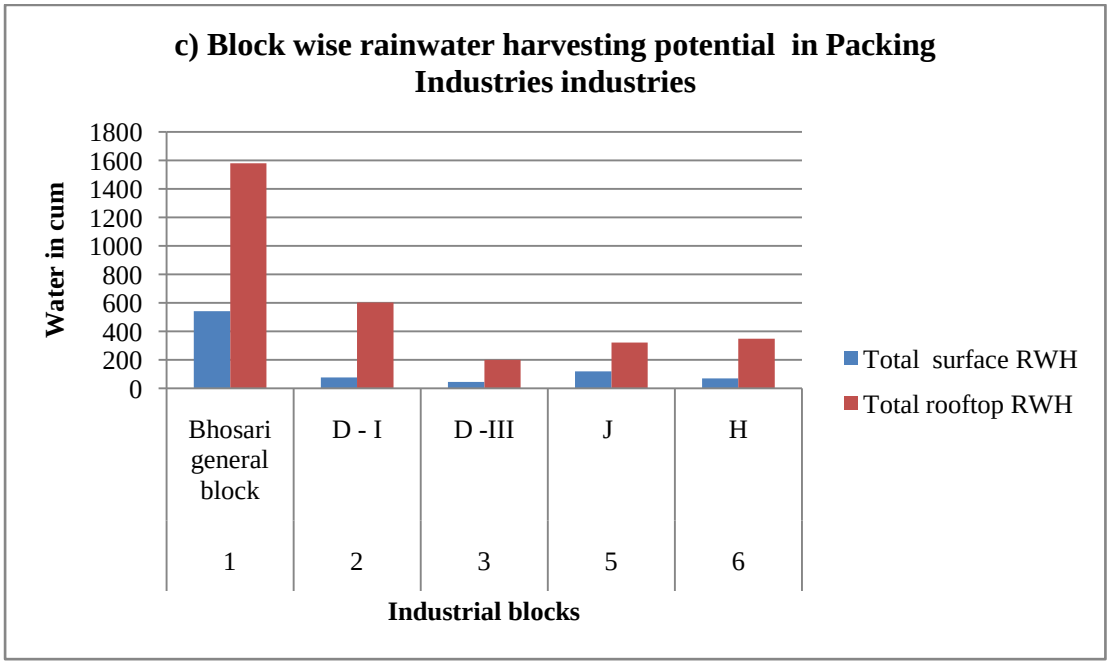


Figure no. 5.20

Above graph no. 5.20 gives detail about surface and rooftop rainwater harvesting potential in service industries.

B) Water use in industrial process:

Table no. 5.23 - a)Block wise rainwater harvesting potential in Manufacturing industries (area in Sqm, Water in cum)					
Sr. No.	**Block**	**Total Surface Area**	**Total surface RWH**	**Total rooftop area**	**Total rooftop RWH**
1	Bhosari general block	23245	7463	73791	35419
2	D - I	2038	512	8784	4216
3	D -II	3715	1072	13666	6560
4	D -III	2024	765	5138	2466
5	F -II	6596	1775	24993	11997
6	J	22301	7101	115831	55599
7	H	4115	945	15194	7293
8	S	7831	2355	17503	8401
9	Electronic Zone	2611	824	5667	3264
10	Total	74476	22812	280567	135215

Above Table no. 5.23 gives detail about the rainwater harvesting potential of surface area and roof areas of 296 industrial units in the 9 blocks.

In the surface area, for all these 296 industrial units occupies the total surface area of 74476 sqm. and it provides the opportunity to get 22812 cum. of water harvesting potential.

In the roof area for all this 296 industrial units maximum area occupies on roof area which is 280567 sqm areas and it’s provide the opportunity to get 135215 cum. of water harvesting potential

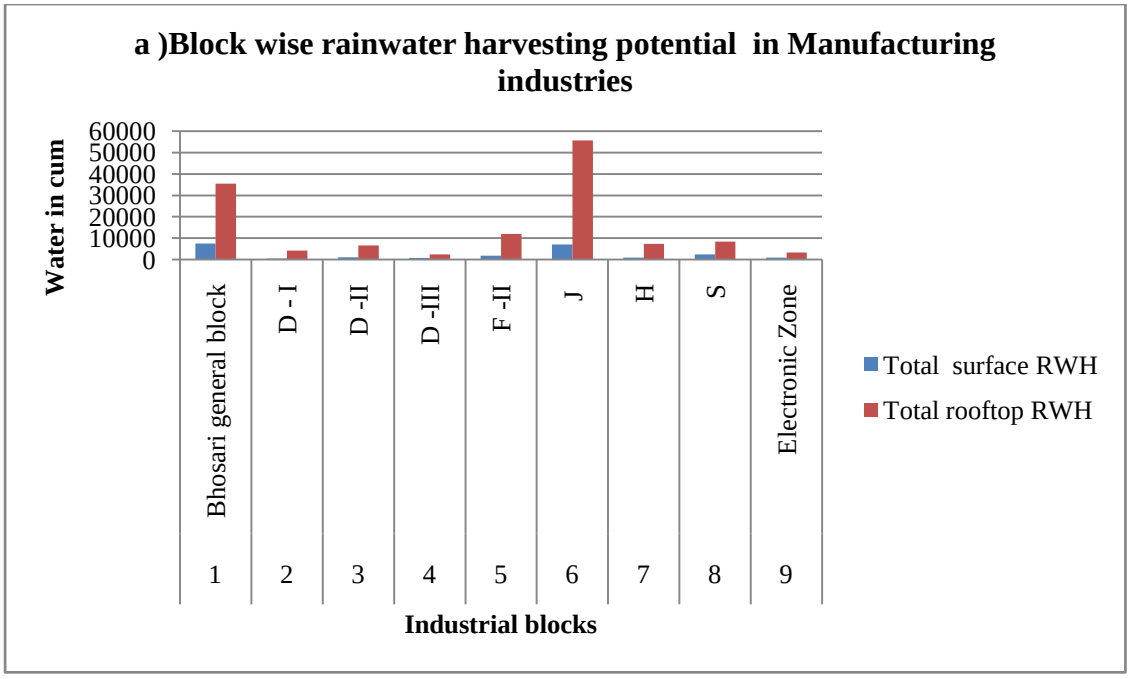


Figure no. 5.21

Above graph no. 5.21 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.24 - b) Block wise rainwater harvesting potential in Tool manufacturing industries (area in Sqm, Water in cum)					
Sr. No.	**Block**	**Total Surface Area**	**Total surface RWH**	**Total rooftop area**	**Total rooftop RWH**
1	Bhosari general block	2893	605	5528	2653
2	J	1557	532	10317	4952
3	H	274	65	1003	482
4	S	390	132	2062	990
5	Electronic Zone	465	84	465	268
6	Total	5579	1418	19375	9345

Above Table no. 5.24 gives detail about the rainwater harvesting potential of surface area and roof areas of 35 industrial units in the 5 blocks.

In the surface area, for all these 35 industrial units occupies the total surface area of 5579 sqm. and it provides the opportunity to get 1418 cum. of water harvesting potential.

In the roof area for all this 35 industrial units maximum area occupies on roof area which is 19375 sqm areas and it's provide the opportunity to get 9345 cum. of water harvesting potential

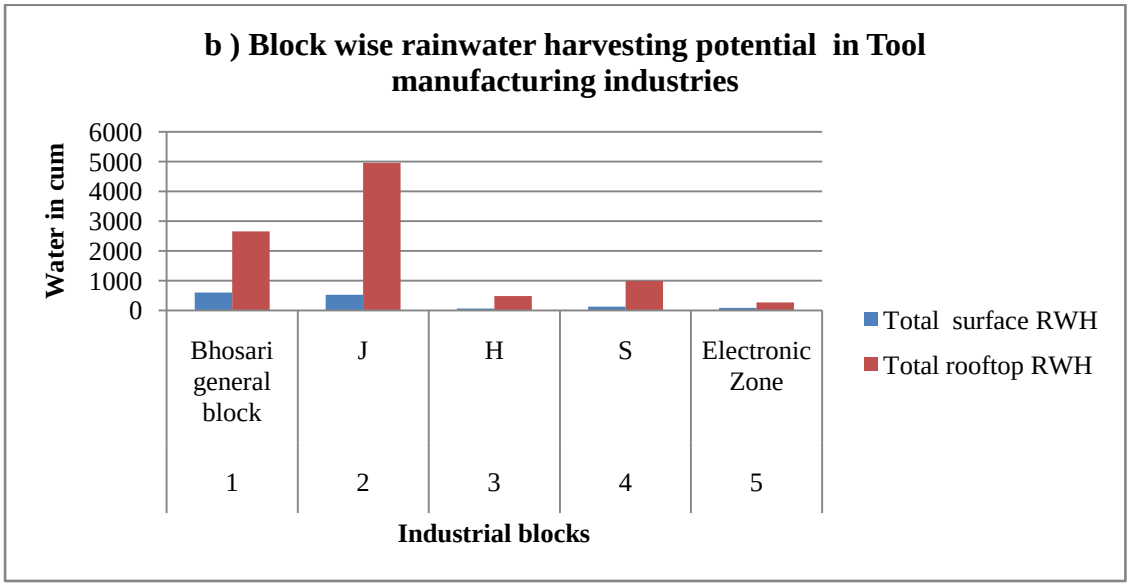


Figure no. 5.22

Above graph no. 5.22 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.25 - c) Block wise rainwater harvesting potential in Plastic and rubber, fiber industries (area in Sqm, Water in cum)

Sr. No.	Block	Total Surface Area	Total surface RWH	Total rooftop area	Total rooftop RWH
1	Bhosari general block	2339	855	6511	2697
2	D - I	1559	462	3088	1482
3	D -II	887	241	4041	2096
4	D -III	339	58	743	357
5	F -II	73	32	260	125
6	J	1399	502	5444	2661
7	H	230	86	12189	5851
8	S	1302	438	2499	1200
9	Total	8128	2674	34775	16469

Above Table no. 5.25 gives detail about the rainwater harvesting potential of surface area and roof areas of 44 industrial units in the 8 blocks.

In the surface area, for all these 44 industrial units occupies the total surface area of 8128 sqm. and it provides the opportunity to get 2674 cum. of water harvesting potential.

In the roof area for all this 44 industrial units maximum area occupies on roof area which is 34775 sqm areas and it's provide the opportunity to get 16469 cum. of water harvesting potential

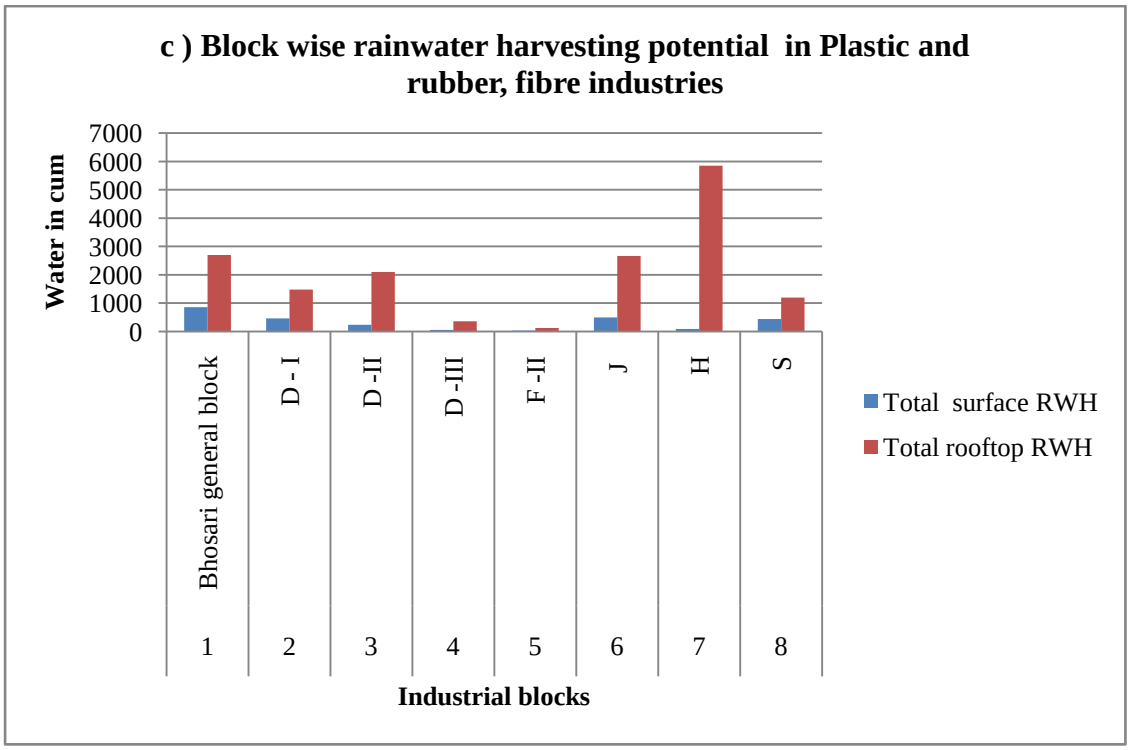


Figure no. 5.23

Above graph no. 5.23 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.26 - d) Block wise rainwater harvesting potential in Metal and forge industries (area in Sqm, Water in cum)

Sr. No.	Block	Total Surface Area	Total surface RWH	Total rooftop area	Total rooftop RWH
1	Bhosari general block	4189	1058	11390	5467
2	D -II	652	258	2555	1260
3	F-II	1142	430	1988	954
4	J	4415	1478	28868	13857

5	H	855	168	5370	2578
6	S	644	160	3670	1761
7	Total	11897	3552	53841	25877

Above Table no. 5.26 gives detail about the rainwater harvesting potential of surface area and roof areas of 60 industrial units in the 6 blocks.

In the surface area, for all these 60 industrial units occupies the total surface area of 11897 sqm. and it provides the opportunity to get 3552 cum. of water harvesting potential.

In the roof area for all this 60 industrial units maximum area occupies on roof area which is 53841 sqm areas and it's provide the opportunity to get 25877 cum. of water harvesting potential

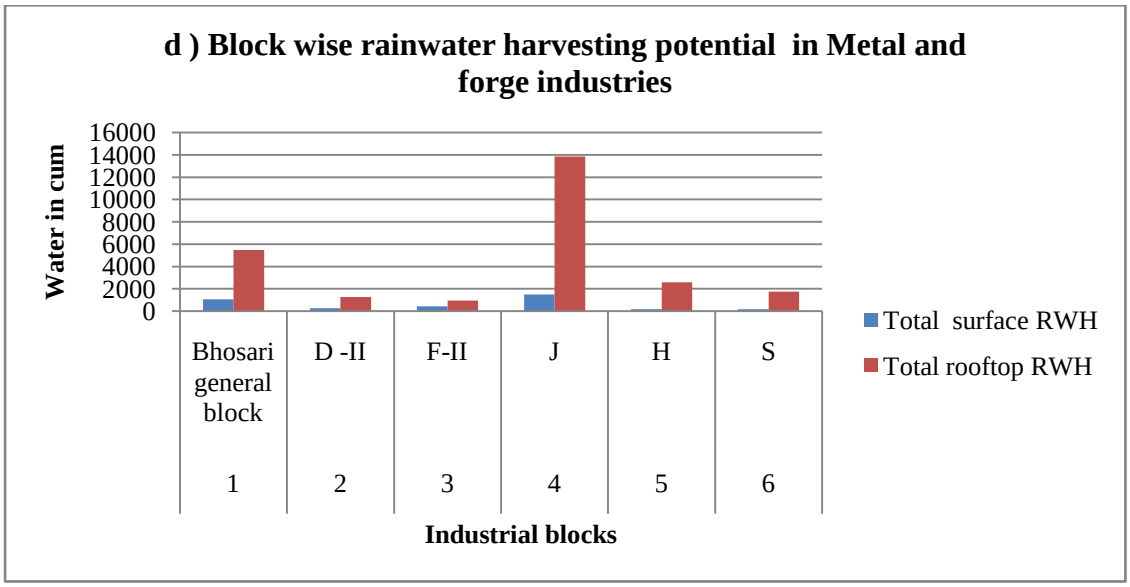


Figure no. 5.24

Above graph no. 5.24 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.27 - e) Block wise rainwater harvesting potential in Chemical industries (area in Sqm, Water in cum)					
Sr. No.	**Block**	**Total Surface Area**	**Total surface RWH**	**Total rooftop area**	**Total rooftop RWH**
1	Bhosari	865	267	1765	847

	general block				
2	D -II	33	8	465	223
3	J	161	66	186	89
4	S	20	8	186	89
5	Electronics Zone	279	92	186	107
6	Total	1358	441	2788	1355

Above Table no. 5.27 gives detail about the rainwater harvesting potential of surface area and roof areas of 8 industrial units in the 5 blocks.

In the surface area, for all these 8 industrial units occupies the total surface area of 1358 sqm. and it provides the opportunity to get 441 cum. of water harvesting potential.

In the roof area for all this 8 industrial units maximum area occupies on roof area which is 2788 sqm areas and it's provide the opportunity to get 1355 cum. of water harvesting potential

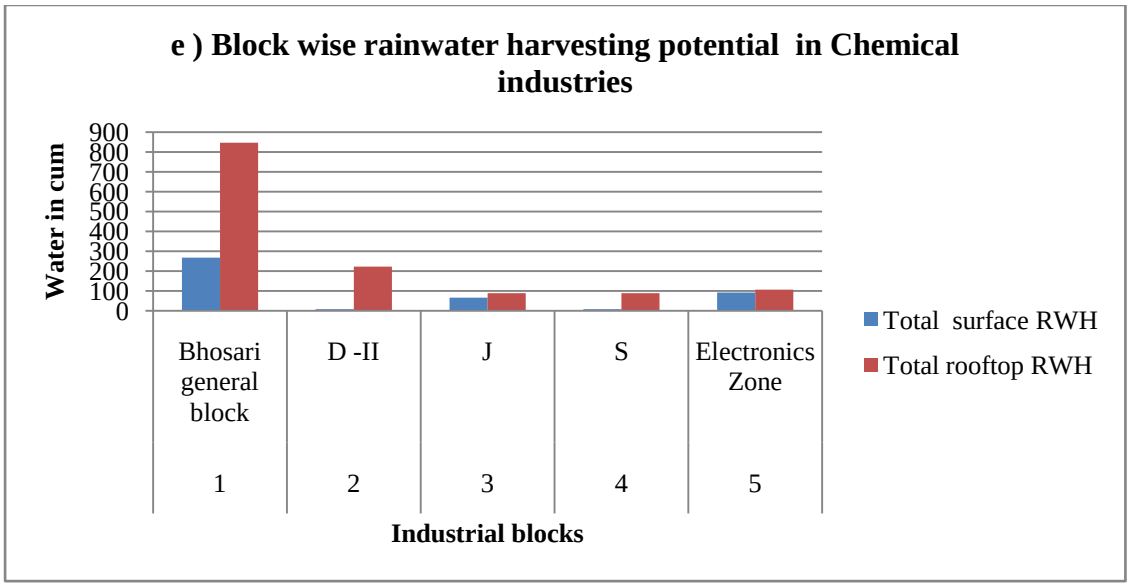


Figure no. 5.25

Above graph no. 5.25 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.28 - f) Block wise rainwater harvesting potential in Water base industries (area in Sqm, Water in cum)					
Sr. No.	**Block**	**Total Surface Area**	**Total surface RWH**	**Total rooftop area**	**Total rooftop RWH**
1	Bhosari general block	144	64	1489	715
2	D -III	295	60	890	427
3	S	268	90	2323	1115
4	D-I	116	29	569	273
5	J	182	58	1171	562
6	H	92	26	39093	18765
7	Total	1097	327	45535	21857

Above Table no. 5.28 gives detail about the rainwater harvesting potential of surface area and roof areas of 11 industrial units in the 6 blocks.

In the surface area, for all these 11 industrial units occupies the total surface area of 1097 sqm. and it provides the opportunity to get 327 cum. of water harvesting potential.

In the roof area for all this 11 industrial units maximum area occupies on roof area which is 45535 sqm areas and it's provide the opportunity to get 21857 cum. of water harvesting potential

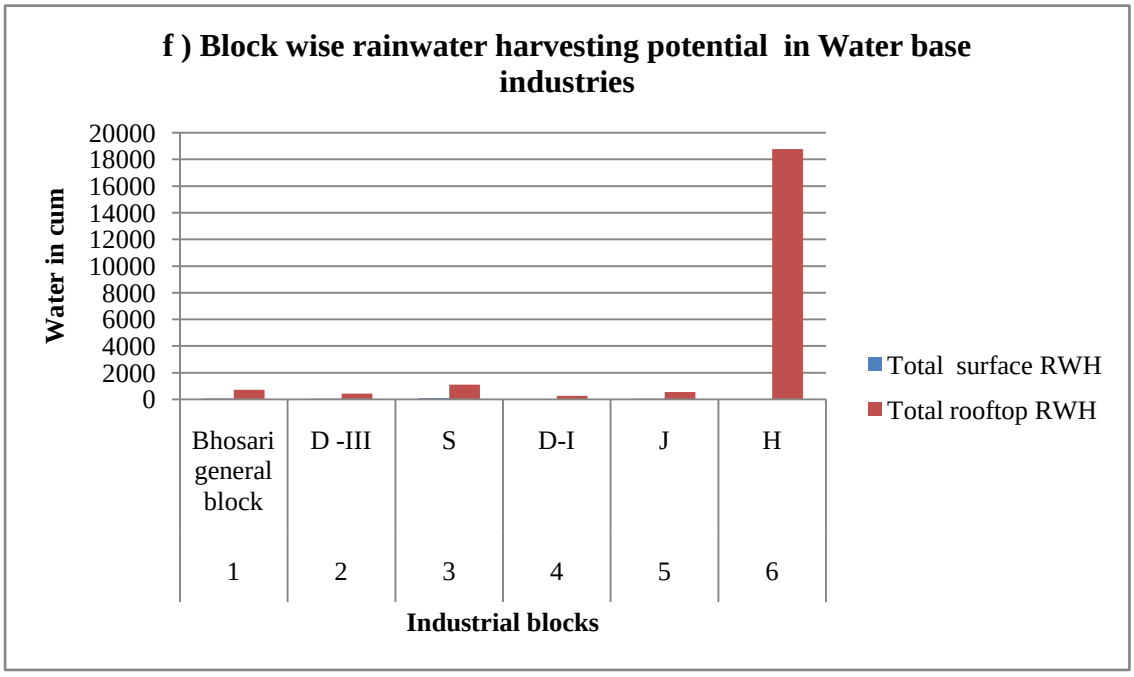


Figure no. 5.26

Above graph no. 5.26 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.29 - g) Block wise rainwater harvesting potential in Automotive industries (area in Sqm, Water in cum)					
Sr. No.	**Block**	**Total Surface Area**	**Total surface RWH**	**Total rooftop area**	**Total rooftop RWH**
1	F - II	2446	850	3131	1503
2	J	1519	492	8051	3865
3	S	223	39	1022	491
4	Total	4188	1381	12204	5859

Above Table no. 5.29 gives detail about the rainwater harvesting potential of surface area and roof areas of 15 industrial units in the 3 blocks.

In the surface area, for all these 15 industrial units occupies the total surface area of 4188 sqm. and it provides the opportunity to get 1381 cum. of water harvesting potential.

In the roof area for all this 15 industrial units maximum area occupies on roof area which is 12204 sqm areas and it's provide the opportunity to get 5859 cum. of water harvesting potential

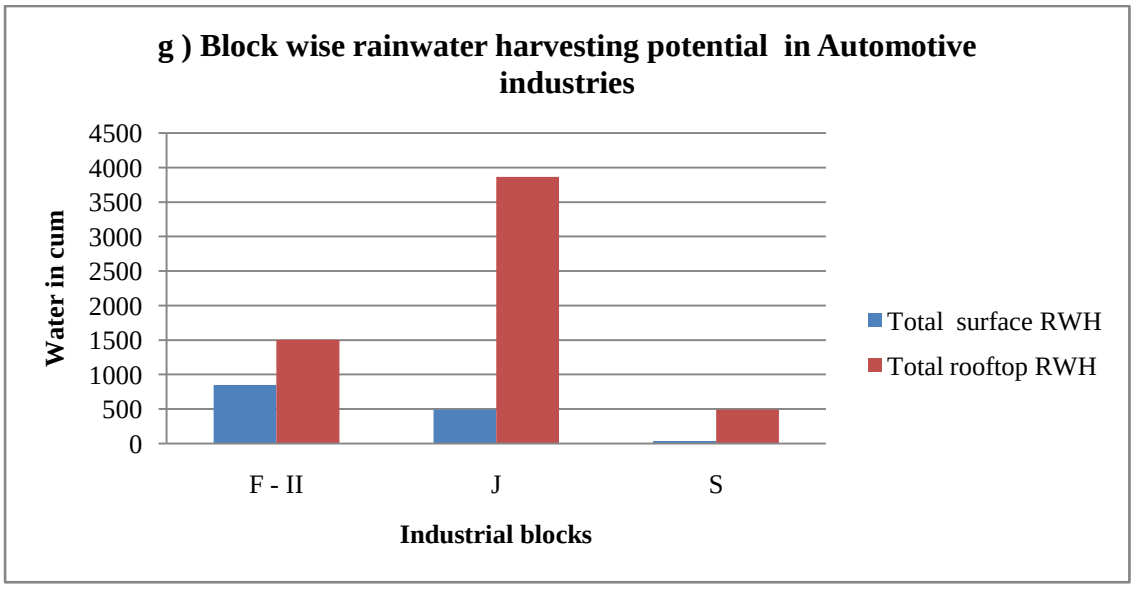


Figure no. 5.27

Above graph no. 5.27 gives detail about surface and rooftop rainwater harvesting potential in service industries.

Table no. 5.30 - h) Block wise rainwater harvesting potential in Pharma industries (area in Sqm, Water in cum)					
Sr. No.	**Block**	**Total Surface Area**	**Total surface RWH**	**Total rooftop area**	**Total rooftop RWH**
1	F - II	218	94	743	357

Above Table no. 5.30 gives detail about the rainwater harvesting potential of surface area and roof areas of 2 industrial units in the 1 blocks.

In the surface area, for all these 2 industrial units occupies the total surface area of 218 sqm. and it provides the opportunity to get 94 cum. of water harvesting potential.

In the roof area for all this 2 industrial units maximum area occupies on roof area which is 743 sqm areas and it's provide the opportunity to get 357 cum. of water harvesting potential

2.4 Annual water use and rooftop rainwater harvesting status:

A) Without water use in industrial process:

Table no. 5.31 - a) Block wise water requirement and rooftop rainwater harvesting potential status in service industries						
Sr. No.	**Block**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	Bhosari general block	15914	21872	137	5958	37
2	D - I	3796	870	23	2926	77
3	D -II	12483	7407	59	5076	41
4	D -III	7556	2341	31	5215	69
5	F -II	1789	7180	401	5391	301
6	J	3285	5164	157	1879	57
7	H	3942	865	22	3077	78

8	S	10366	2029	20	8337	80
9	Total	59131	47728	81	11403	19

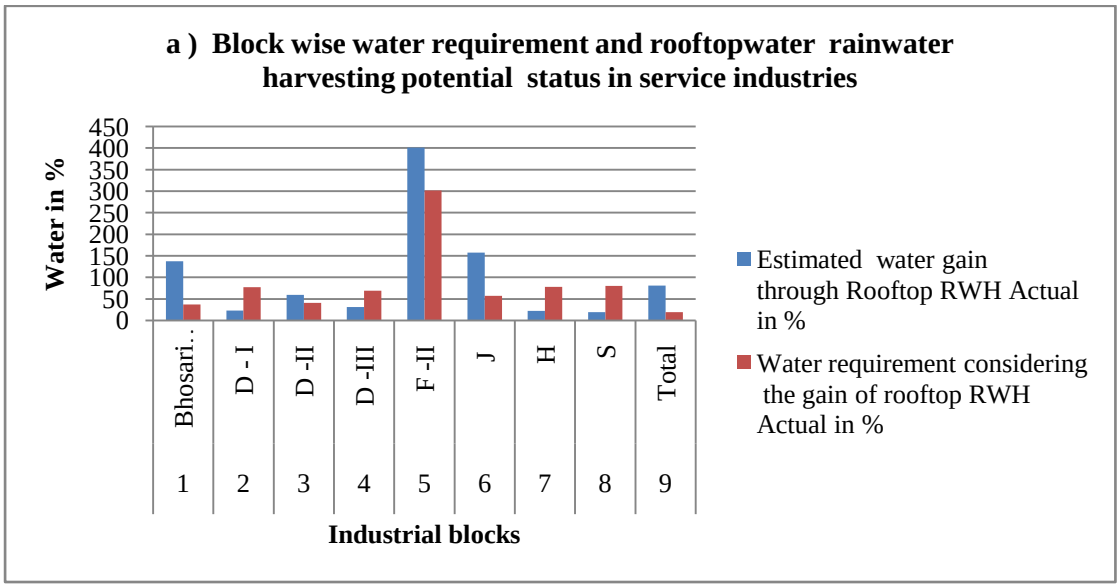


Figure no. 5.28

Above table no. 5.31 and graph no. 5.28 gives detail about the rooftop rainwater harvesting status of 8 blocks in the service industries.

For all these 8 blocks 83 industrial units total annual water requirement from outside sources is 59131 cum. and estimated water gain through rooftop rainwater harvesting is 47728 cum which is 81 % therefore water requirement considering the gain of rooftop rainwater harvesting is 11403 cum which is 19 %.

Table no. 5.32 - b) Block wise water requirement and rooftop rainwater harvesting potential status in Manufacturing industries

Sr. No.	Block	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhosari general block	30806	13328	43	17478	57
2	D - I	2008	1183	59	825	41
3	D -II	8395	3108	37	5287	63
4	F -II	13804	6760	49	7044	51
5	J	24382	40638	167	16256	67
6	H	27886	5231	19	22655	81
7	S	42961	11724	27	31237	73

8	Electronic Zone	15038	8348	56	6690	44
9	Total	165280	90320	55	74960	45

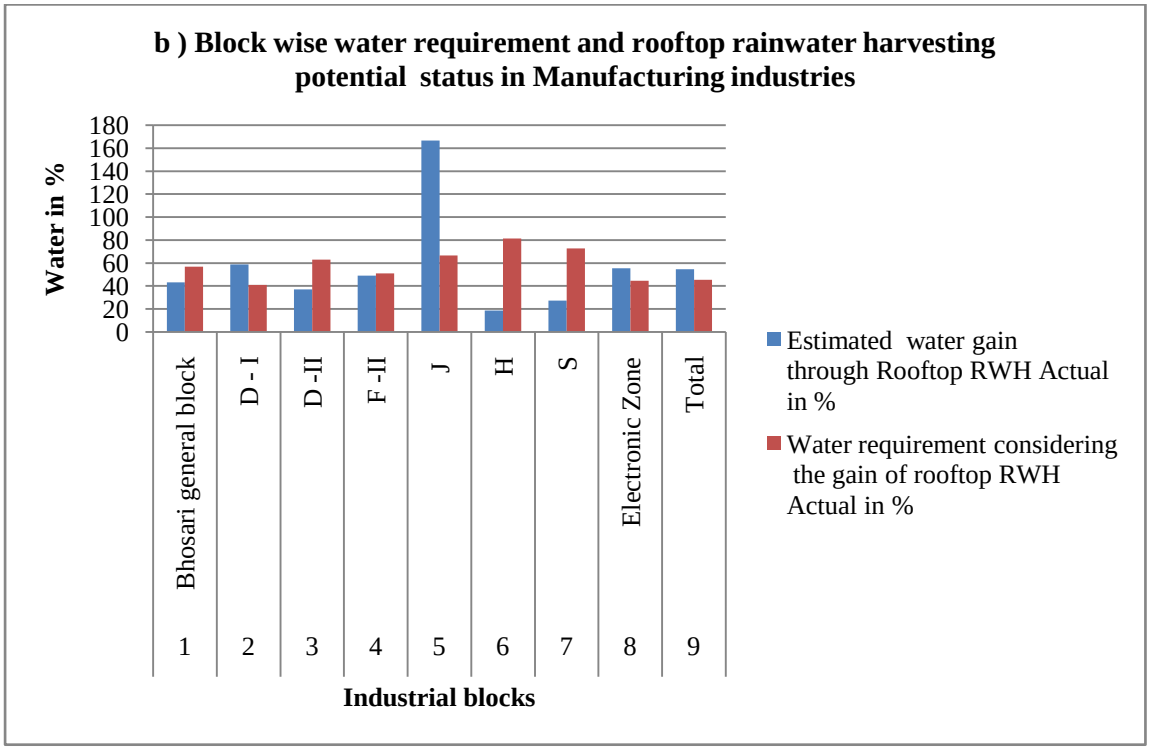


Figure no. 5.29

Above table no. 5.32 and graph no. 5.29 gives detail about the rooftop rainwater harvesting status of 8 blocks in the manufacturing industries.

For all these 8 blocks 240 industrial units total annual water requirement from outside sources is 165280 cum. and estimated water gain through rooftop rainwater harvesting is 90320 cum which is 55 % therefore water requirement considering the gain of rooftop rainwater harvesting is 74960 cum which is 45 %.

Table no. 5.33 - c) Block wise water requirement and rooftop rainwater harvesting potential status in Packing Industries

Sr. No.	Block	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhosari	3541	1579	45	1962	55

	general block					
2	D - I	1533	602	39	931	61
3	D -III	1278	201	16	1077	84
5	J	365	321	88	44	12
6	H	1095	348	32	747	68
7	Total	7812	3051	39	4761	61

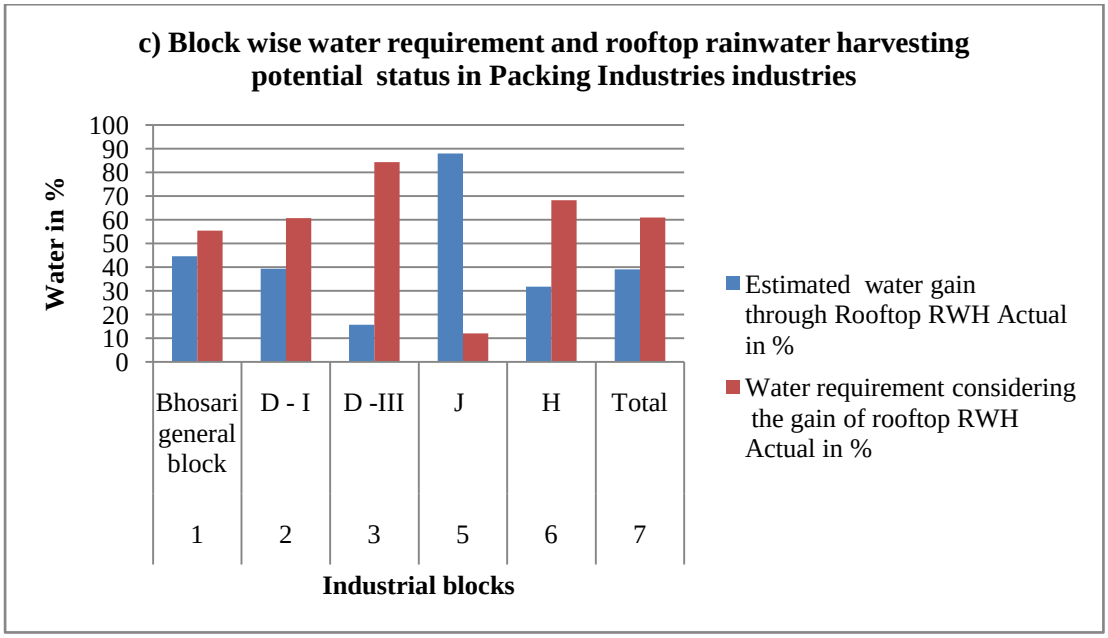


Figure no. 5.30

Above table no. 5.33 and graph no. 5.30 gives detail about the rooftop rainwater harvesting status of 6 blocks in the packing industries.

For all these 6 blocks 11 industrial units total annual water requirement from outside sources is 7812 cum. and estimated water gain through rooftop rainwater harvesting is 3051 cum which is 39 % therefore water requirement considering the gain of rooftop rainwater harvesting is 4761 cum which is 61 %.

B) Water use in industrial process:

Table no. 5.34 - a)Block wise water requirement and rooftop rainwater harvesting potential status in Manufacturing industries						
Sr. No.	**Block**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	Bhosari general block	69131	35419	51	33712	49
2	D - I	16133	4216	26	11917	74
3	D -II	27339	6560	24	20779	76
4	D -III	14162	2466	17	11696	83
5	F -II	12082	11997	99	85	1
6	J	72015	55599	77	16416	23
7	H	48582	7293	15	41289	85
8	S	68686	8401	12	60285	88
9	Electronic Zone	11717	3264	28	8453	72
10	Total	339847	135215	40	204632	60

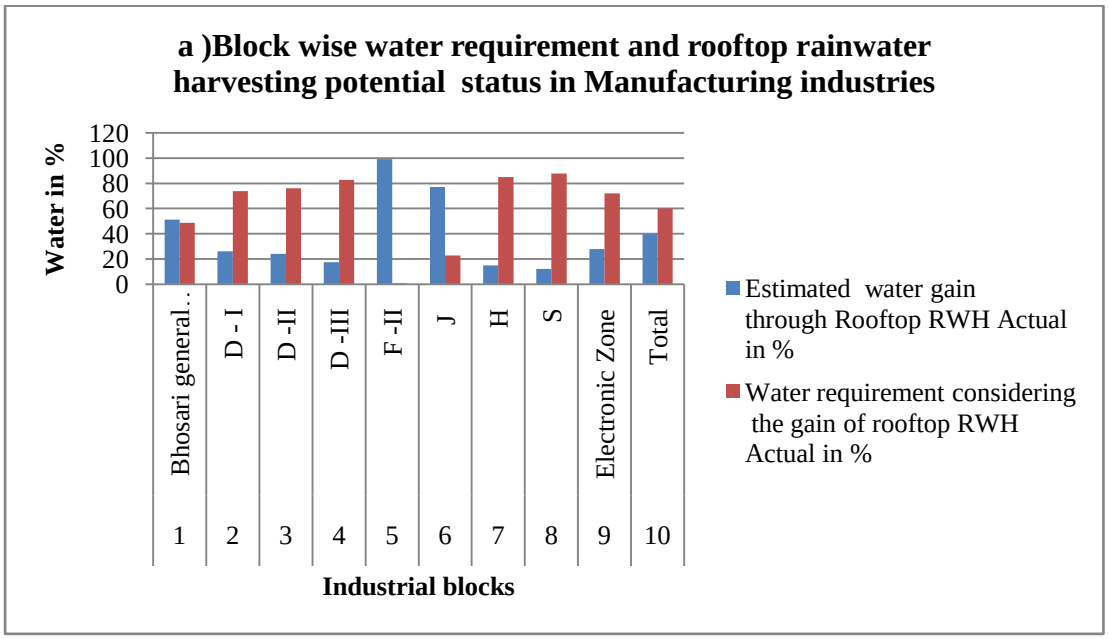


Figure no. 5.31

Above table no. 5.34 and graph no. 5.31 gives detail about the rooftop rainwater harvesting status of 9 blocks in the manufacturing industries.

For all these 6 blocks 296 industrial units total annual water requirement from outside sources is 339847 cum. and estimated water gain through rooftop rainwater harvesting is 135215 cum which is 40 % therefore water requirement considering the gain of rooftop rainwater harvesting is 204632 cum which is 60 %.

Table no. 5.35 - b) Block wise water requirement and rooftop rainwater harvesting potential status in Tool manufacturing industries						
Sr. No.	**Block**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**
1	Bhosari general block	11790	2653	23	9137	77
2	J	12009	4952	41	7057	59
3	H	4818	482	10	4336	90
4	S	5767	990	17	4777	83
5	Electronic Zone	1533	268	17	1265	83
6	Total	35917	9345	26	26572	74

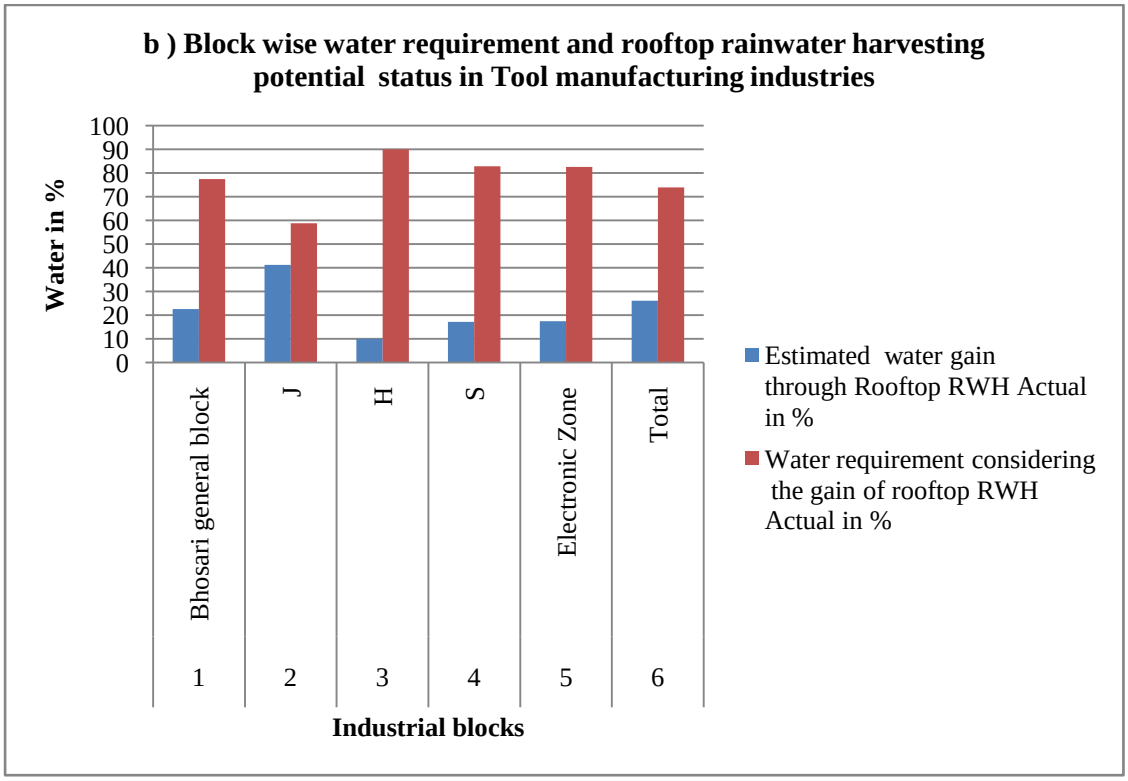


Figure 5.32

Above table no. 5.35 And graph no. 5.32 Gives detail about the rooftop rainwater harvesting status of 5 blocks in the tool manufacturing industries.

For all these 5 blocks 35 industrial units total annual water requirement from outside sources is 35917 cum. and estimated water gain through rooftop rainwater harvesting is 9345 cum which is 26 % therefore water requirement considering the gain of rooftop rainwater harvesting is 26572 cum which is 74 %.

Table no. 5.36 - c) Block wise water requirement and rooftop rainwater harvesting potential status in Plastic and rubber, fiber industries

Sr. No.	Block	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhosari general block	13432	2697	20	10735	80
2	D - I	4818	1482	31	3336	69
3	D -II	10751	2096	19	8655	81
4	D -III	2738	357	13	2381	87
5	F -II	2811	125	4	2686	96
6	J	8651	2661	31	5990	69
7	H	8578	5851	68	2727	32
8	S	9600	1200	13	8400	88
9	Total	61379	16469	27	44910	73

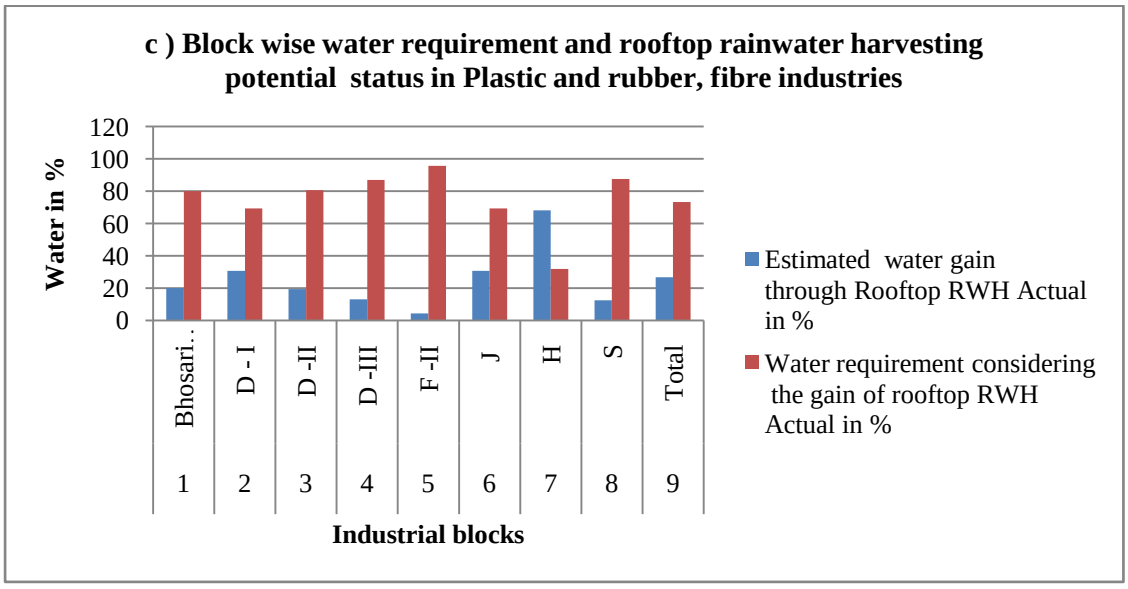


Figure no. 5.33

Above table no. 5.36 And graph no. 5.33 Gives detail about the rooftop rainwater harvesting status of 8 blocks in the plastic and rubber, fiber industries.

For all these 8 blocks 44 industrial units total annual water requirement from outside sources is 61379 cum. and estimated water gain through rooftop rainwater harvesting is 16469 cum which is 27 % therefore water requirement considering the gain of rooftop rainwater harvesting is 44910 cum which is 73 %.

Table no. 5.37 - d) Block wise water requirement and rooftop rainwater harvesting potential status in Metal and forge industries

Sr. No.	Block	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhosari general block	9965	5467	55	4498	45
2	D -II	7045	1260	18	5785	82
3	F-II	7264	954	13	6310	87
4	J	15878	13857	87	2021	13
5	H	11644	2578	22	9066	78
6	S	11498	1761	15	9737	85
7	Total	63294	25877	41	37417	59

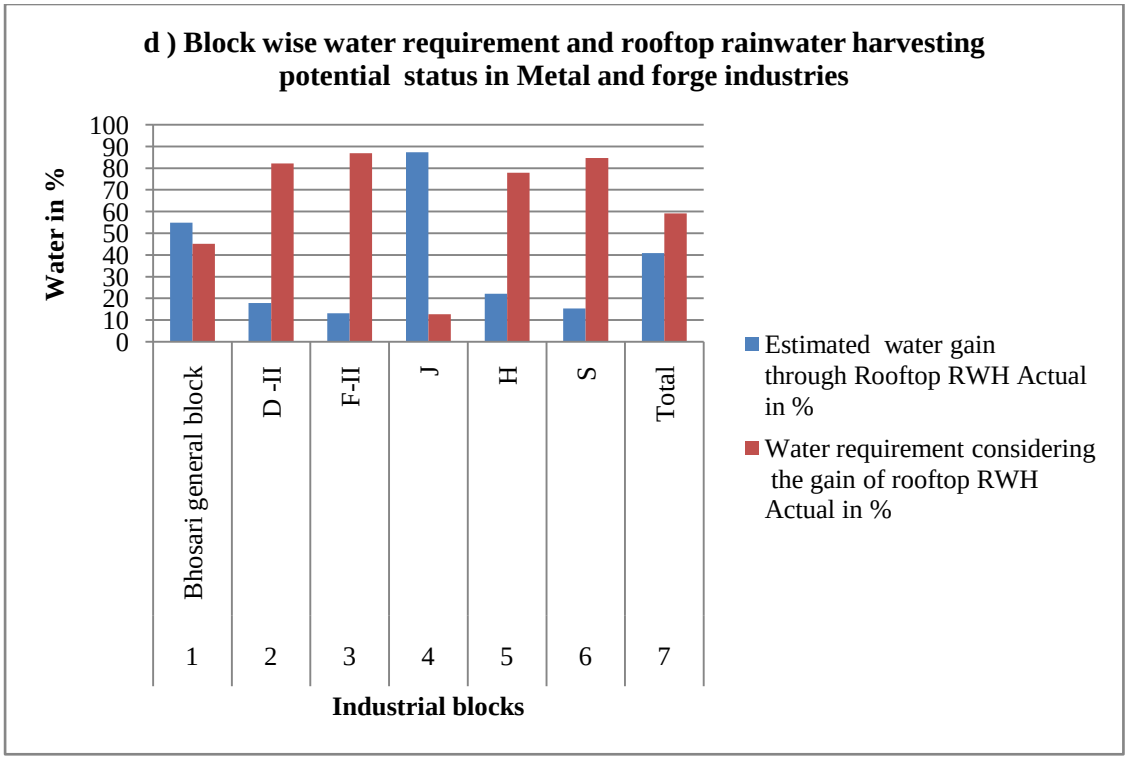


Figure no. 5.34

Above table no. 5.37 and graph no. 5.34 Gives detail about the rooftop rainwater harvesting status of 6 blocks in the metal and forge industries.

For all these 6 blocks 60 industrial units total annual water requirement from outside sources is 63294 cum. and estimated water gain through rooftop rainwater harvesting is 25877 cum which is 41 % therefore water requirement considering the gain of rooftop rainwater harvesting is 37417 cum which is 59 %.

Table no. 5.38 - e) Block wise water requirement and rooftop rainwater harvesting potential status in Chemical industries

Sr. No.	Block	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhosari general block	11753	847	7	10906	93
2	D -II	1095	223	20	872	80
3	J	1351	89	7	1262	93
4	S	1732	89	5	1643	95
5	Electronics Zone	1825	107	6	1718	94
6	Total	17756	1355	8	16401	92

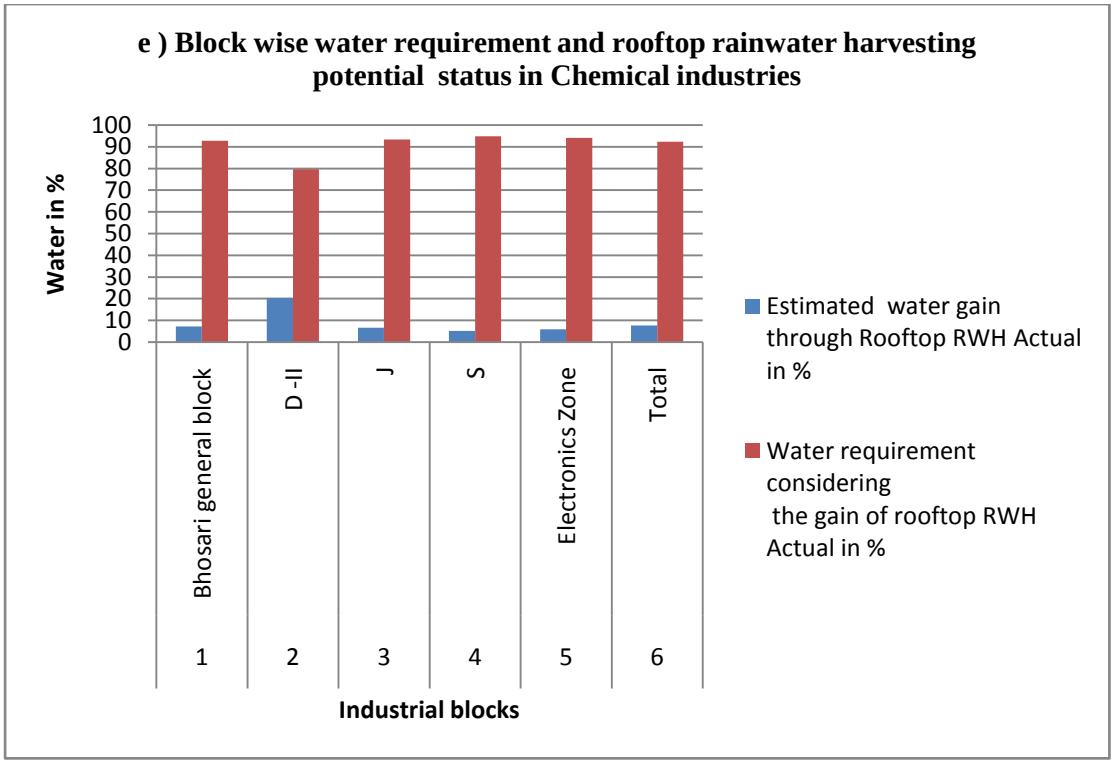


Figure no. 5.35

Above table no. 5.38 and graph no. 5.35 gives detail about the rooftop rainwater harvesting status of 6 blocks in the chemical industries.

For all these 5 blocks 8 industrial units total annual water requirement from outside sources is 17756 cum. and estimated water gain through rooftop rainwater harvesting is 1355 cum which is 8 % therefore water requirement considering the gain of rooftop rainwater harvesting is 16401 cum which is 92 %.

Table no. 5.39 - f) Block wise water requirement and rooftop rainwater harvesting potential status in Water base industries

Sr. No.	Block	Total annual water requirement from outside sources in cum.	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	Actual in %	Actual in cum.	Actual in %
1	Bhosari general block	15695	715	5	14980	95
2	D -III	2811	427	15	2384	85
3	S	7848	1115	14	6733	86

4	D-I	1484	273	18	1211	82
5	J	913	562	62	351	38
6	H	4088	18765	459	14677	359
7	Total	32839	21857	67	10982	33

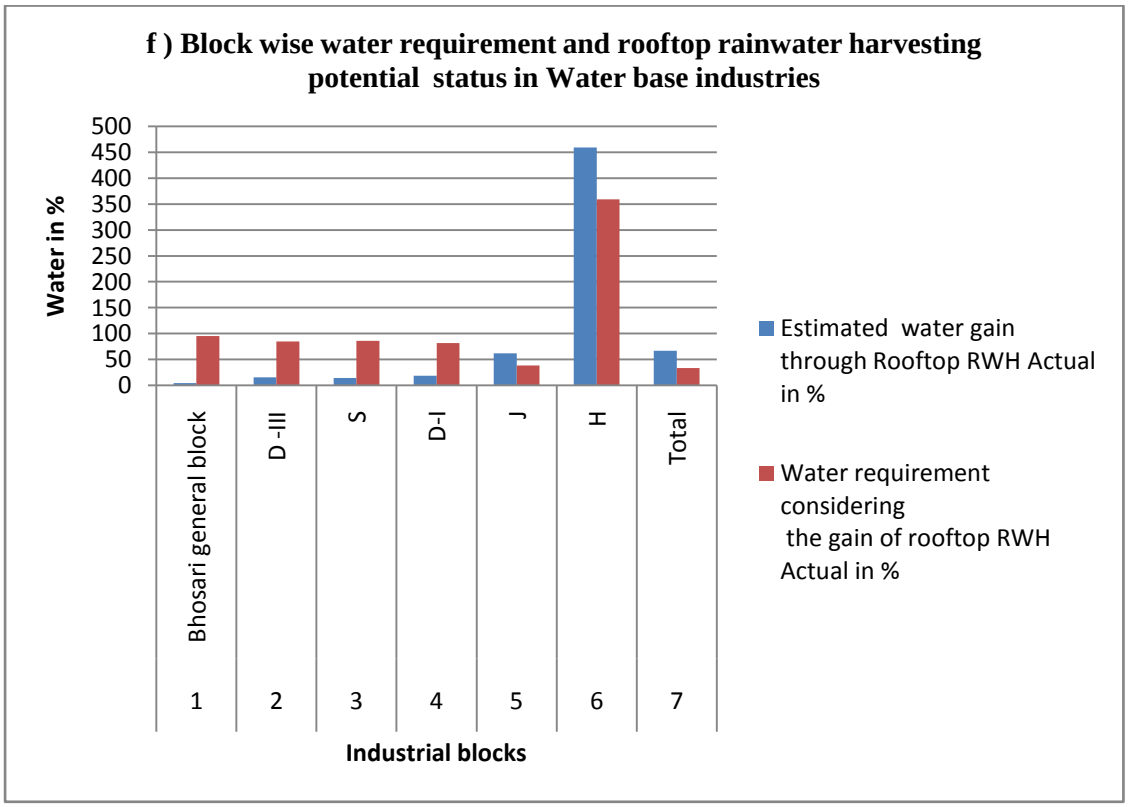


Figure no. 5.36

Above table no. 5.39 And graph no. 5.36 Gives detail about the rooftop rainwater harvesting status of 6 blocks in the water base industries.

For all these 6 blocks 11 industrial units total annual water requirement from outside sources is 32839 cum. and estimated water gain through rooftop rainwater harvesting is 21857 cum which is 67 % therefore water requirement considering the gain of rooftop rainwater harvesting is 10982 cum which is 33 %.

Table no. 5.40 - g) Block wise water requirement and rooftop rainwater harvesting potential status in Automotive industries						
Sr. No.	**Block**	**Total annual water requirement**	**Estimated water gain through Rooftop RWH**		**Water requirement considering the gain of rooftop RWH**	
			Actual in	**Actual in**	**Actual in**	**Actual in**

		from outside sources in cum.	cum.	%	cum.	%
1	F - II	5804	1503	26	4301	74
2	J	6023	3865	64	2158	36
3	S	2190	491	22	1699	78
4	Total	14017	5859	42	8158	58

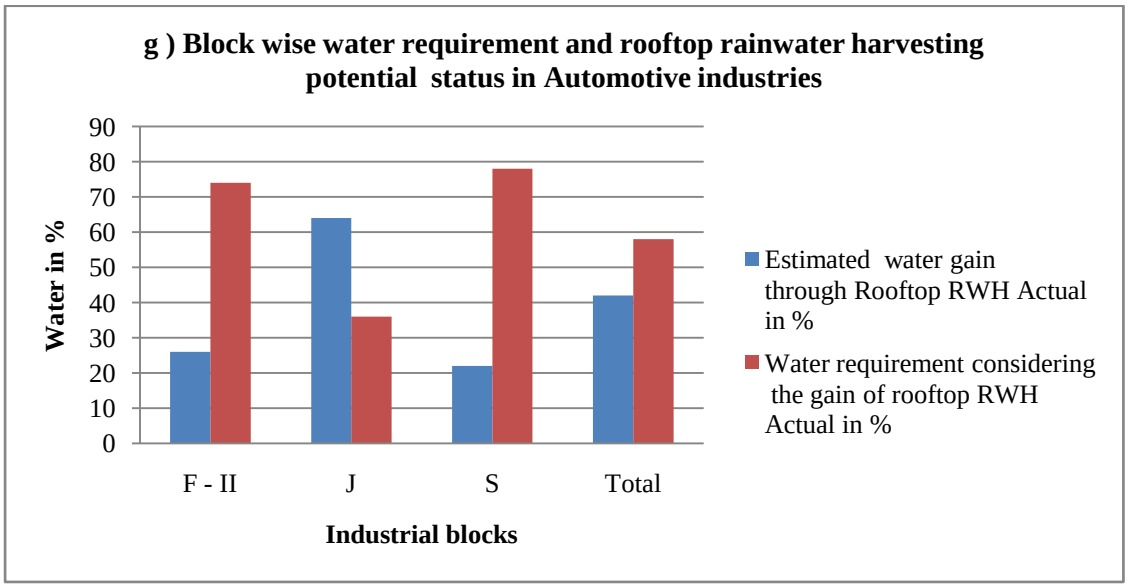


Figure no. 5.37

Above table no. 5.40 and graph no. 5.37 gives detail about the rooftop rainwater harvesting status of 3 blocks in the automotive industries.

For all these 3 blocks 15 industrial units total annual water requirement from outside sources is 14017 cum. and estimated water gain through rooftop rainwater harvesting is 5859 cum which is 42 % therefore water requirement considering the gain of rooftop rainwater harvesting is 8158 cum which is 58 %.

Table no. 5.41 - h) Block wise water requirement and rooftop rainwater harvesting potential status in Pharma industries						
Sr. No.	Block	Total annual water requirement from outside sources in	Estimated water gain through Rooftop RWH		Water requirement considering the gain of rooftop RWH	
			Actual in cum.	**Actual in %**	**Actual in cum.**	**Actual in %**

		cum.				
1	F - II	2446	357	15	2089	85

Above table no. 5.41 gives detail about the rooftop rainwater harvesting status of 1 block in the pharmaceutical industries.

For all these 1 blocks 2 industrial units total annual water requirement from outside sources is 2446 cum. and estimated water gain through rooftop rainwater harvesting is 357 cum which is 15 % therefore water requirement considering the gain of rooftop rainwater harvesting is 2089 cum which is 85 %.

3. Model for rooftop water gain and requirement for industries in block

3.1 Without water use in industrial process

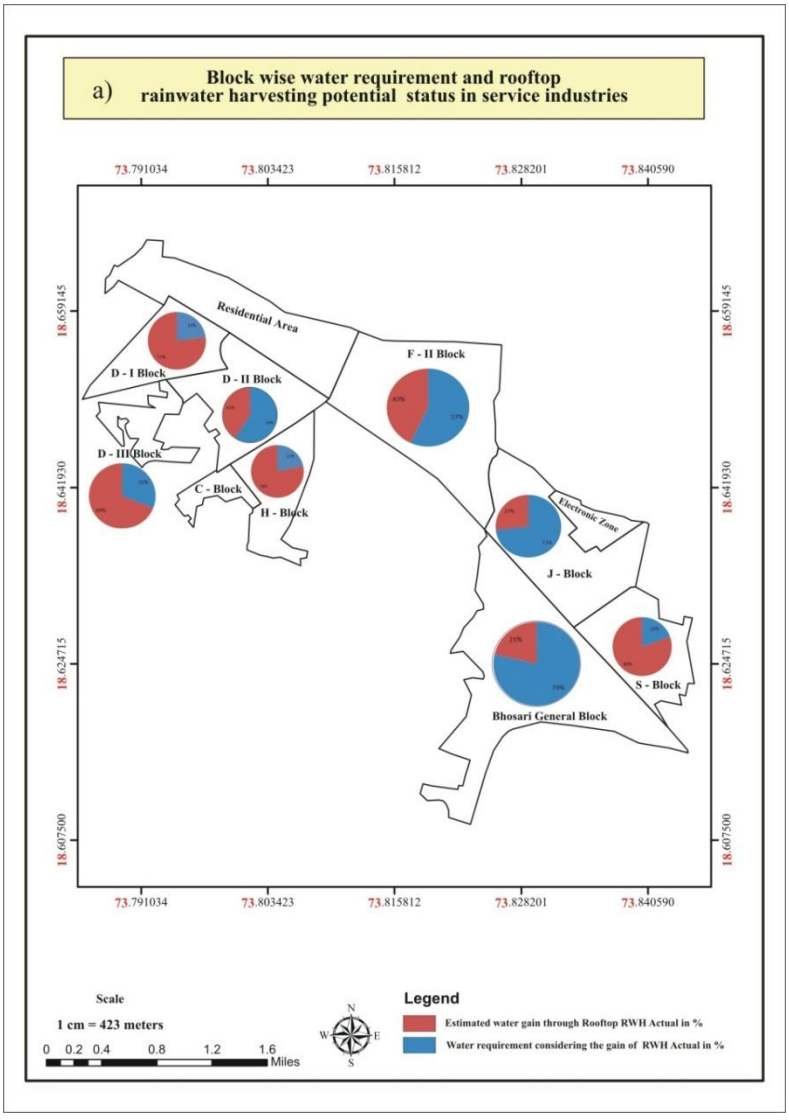
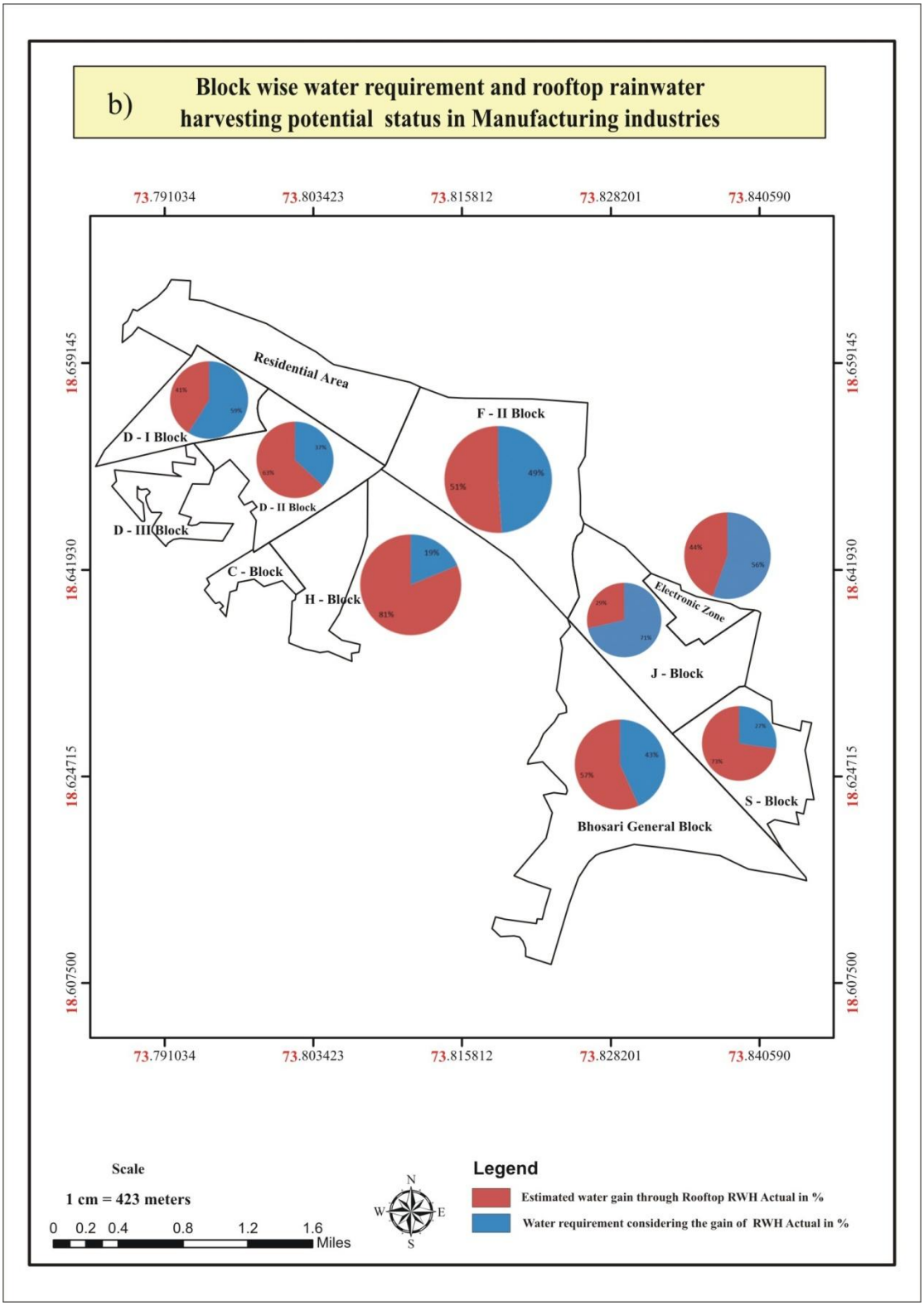


Figure No. 5.38



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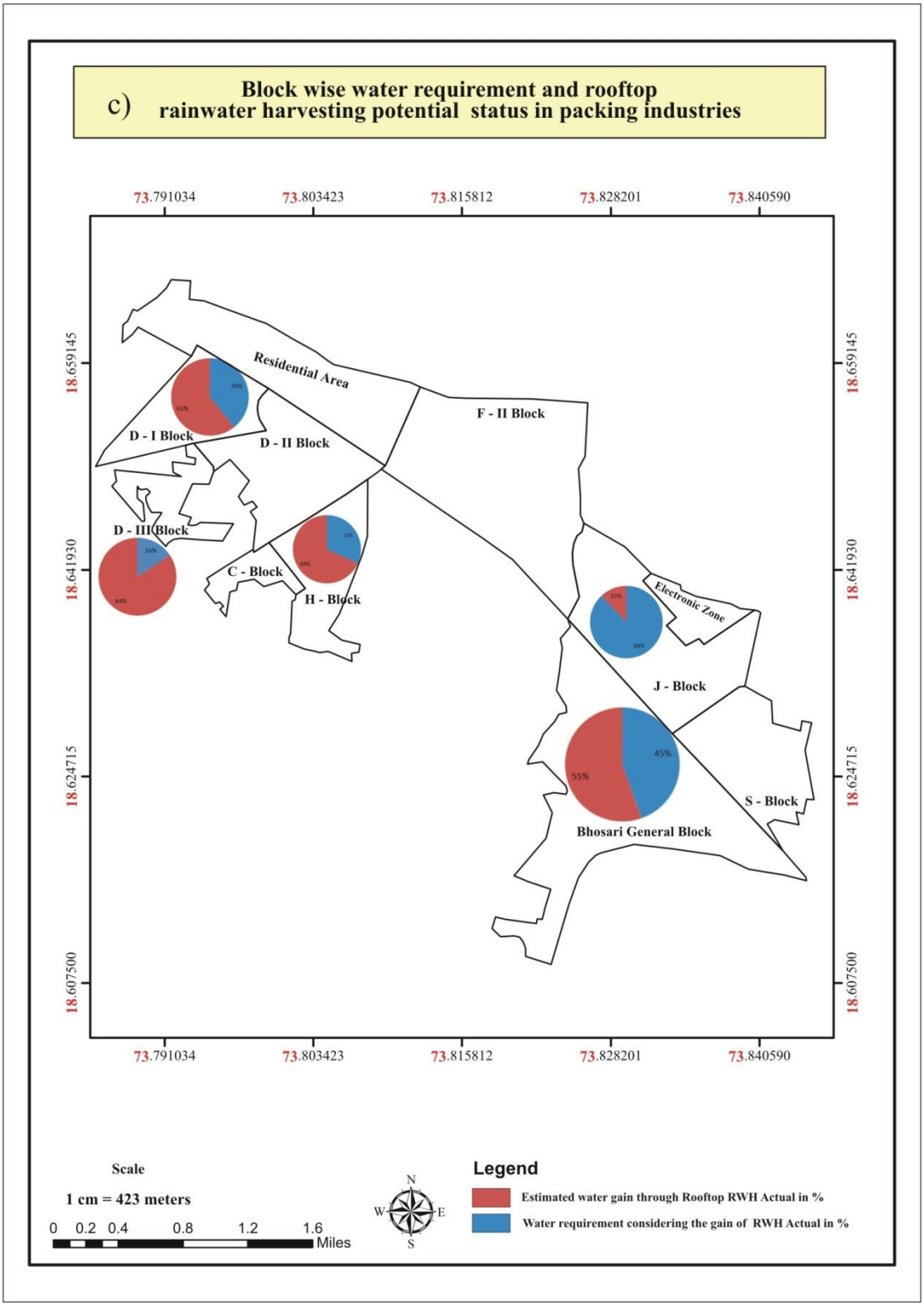


Figure No. 5.40

3.2 Water use in industrial Process –

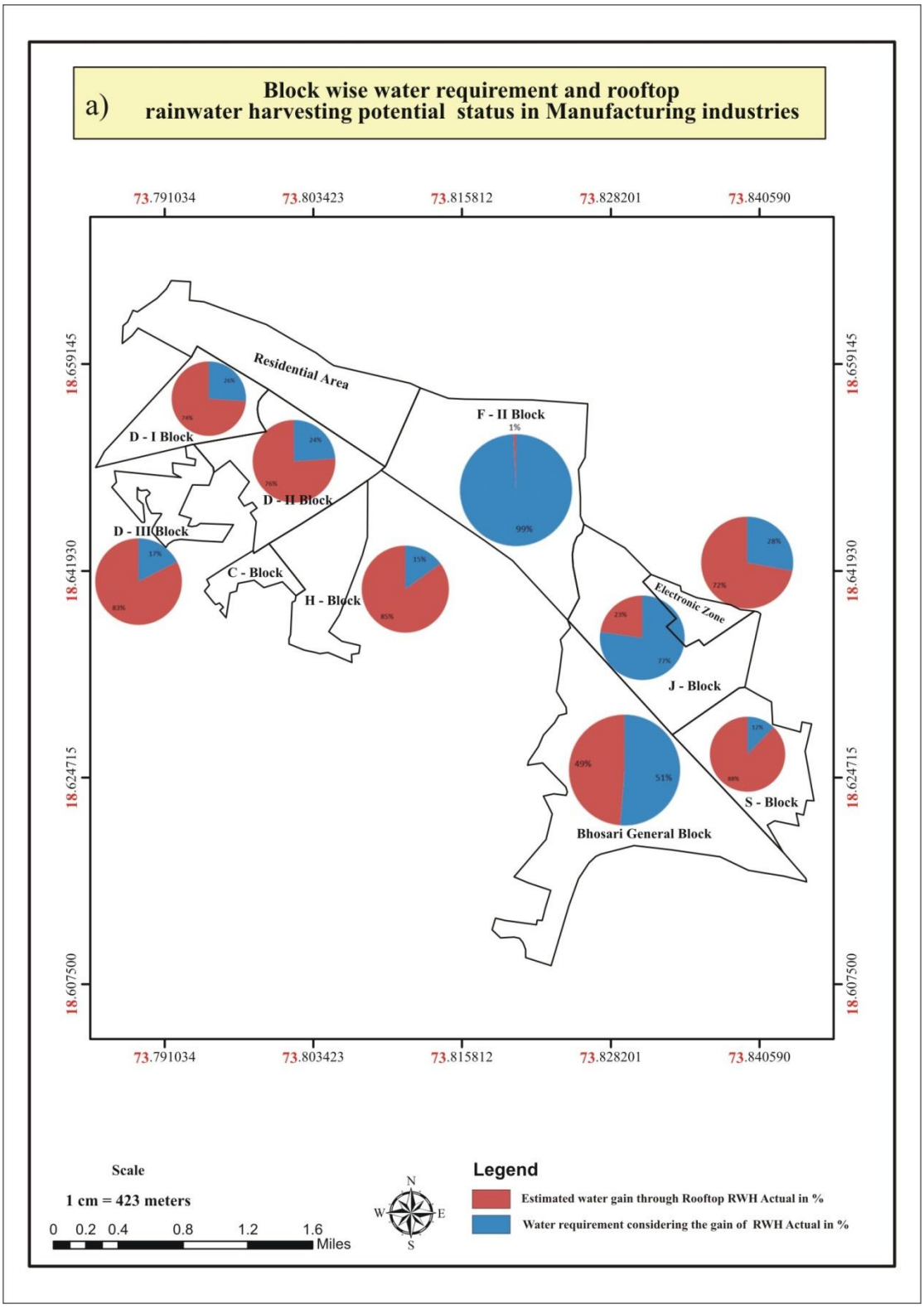


Figure No. 5.41

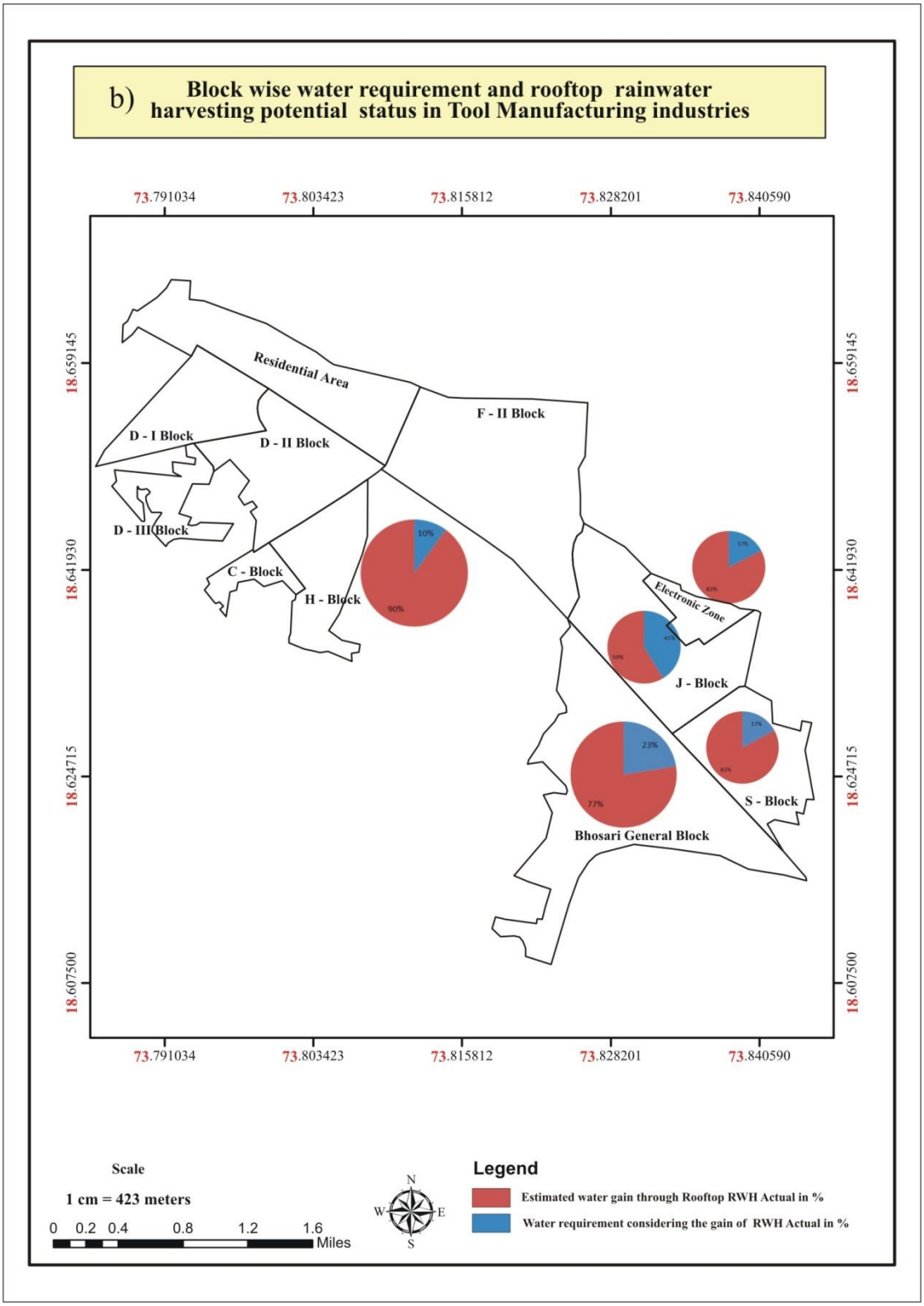
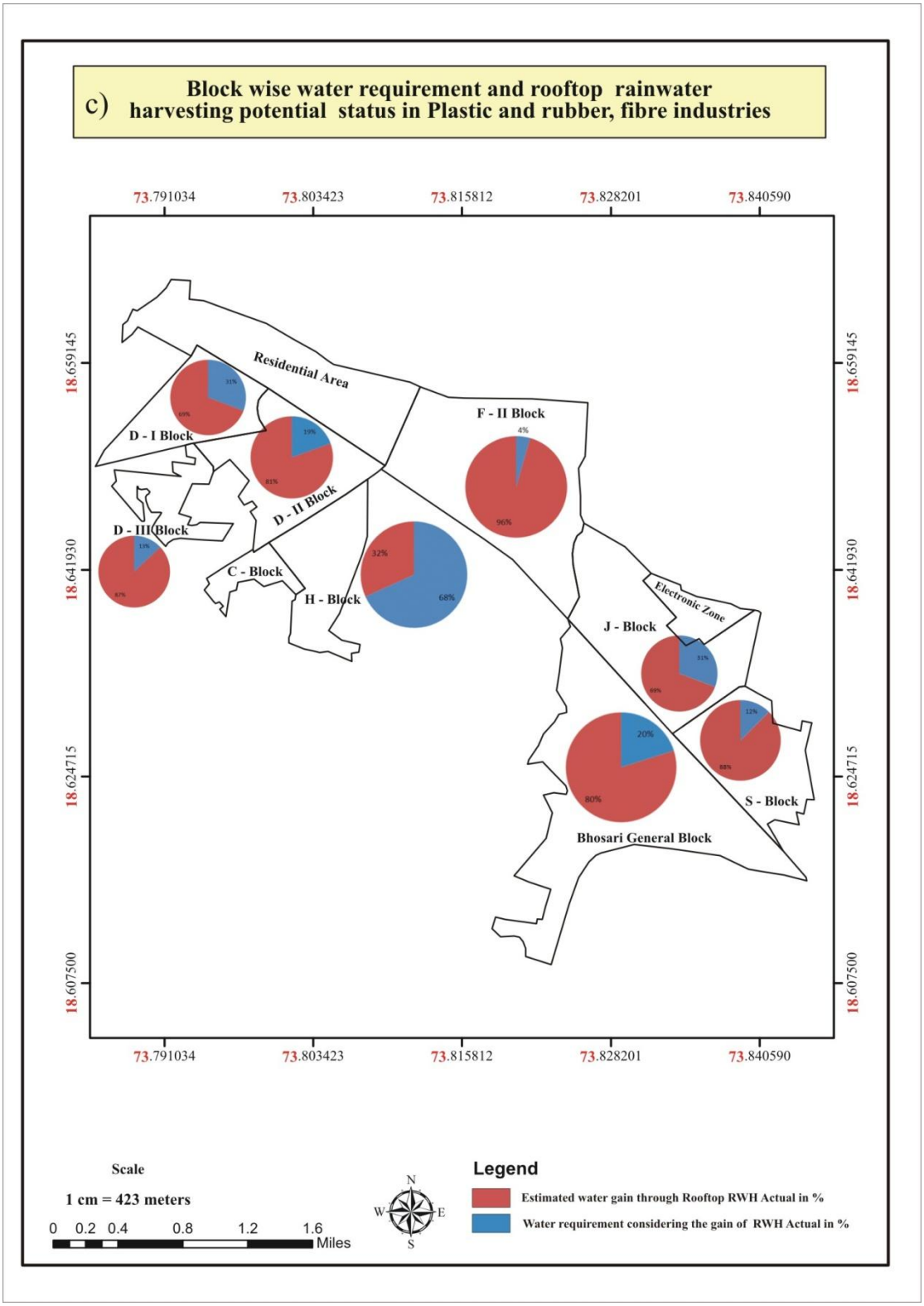


Figure No. 5.42



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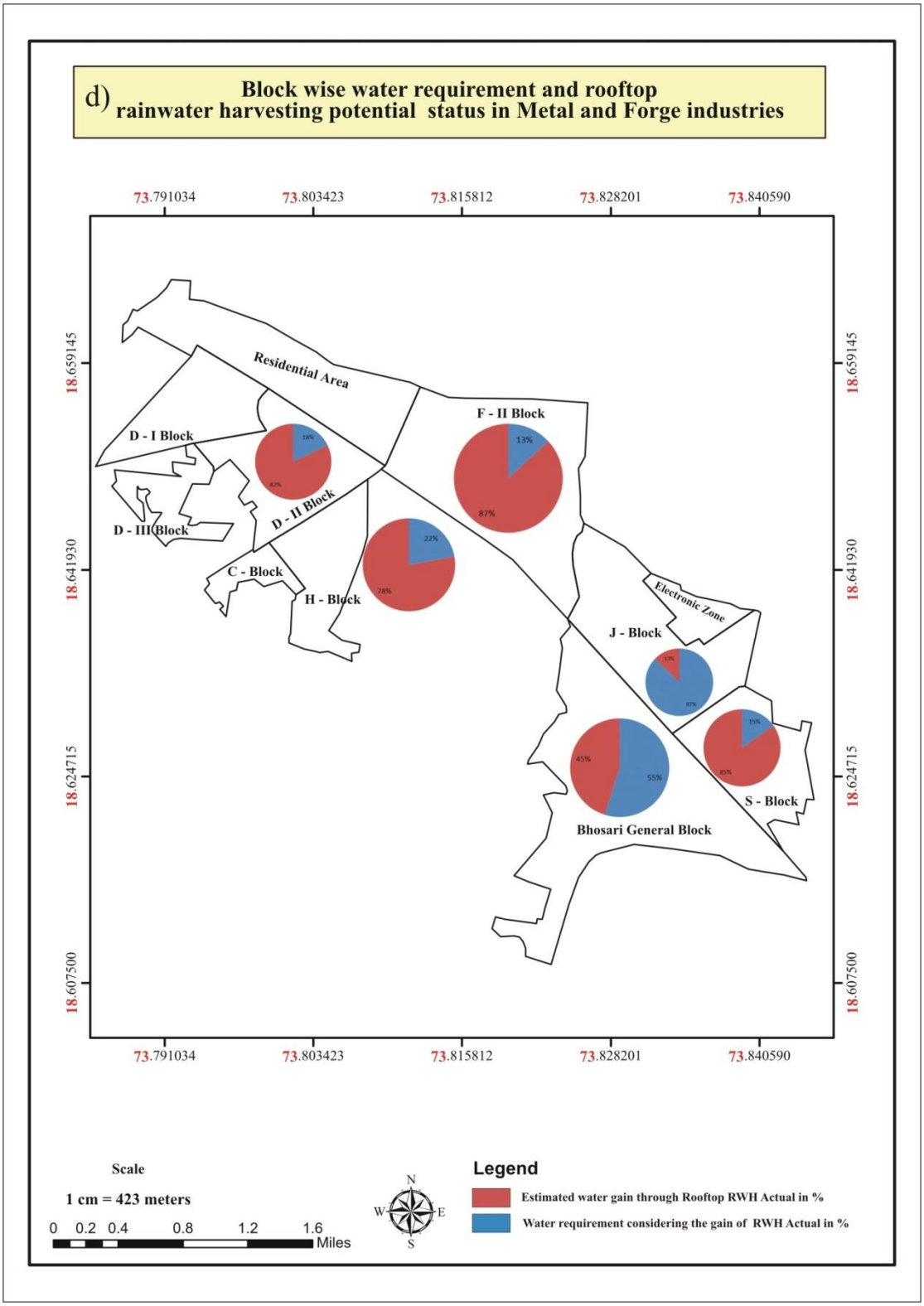

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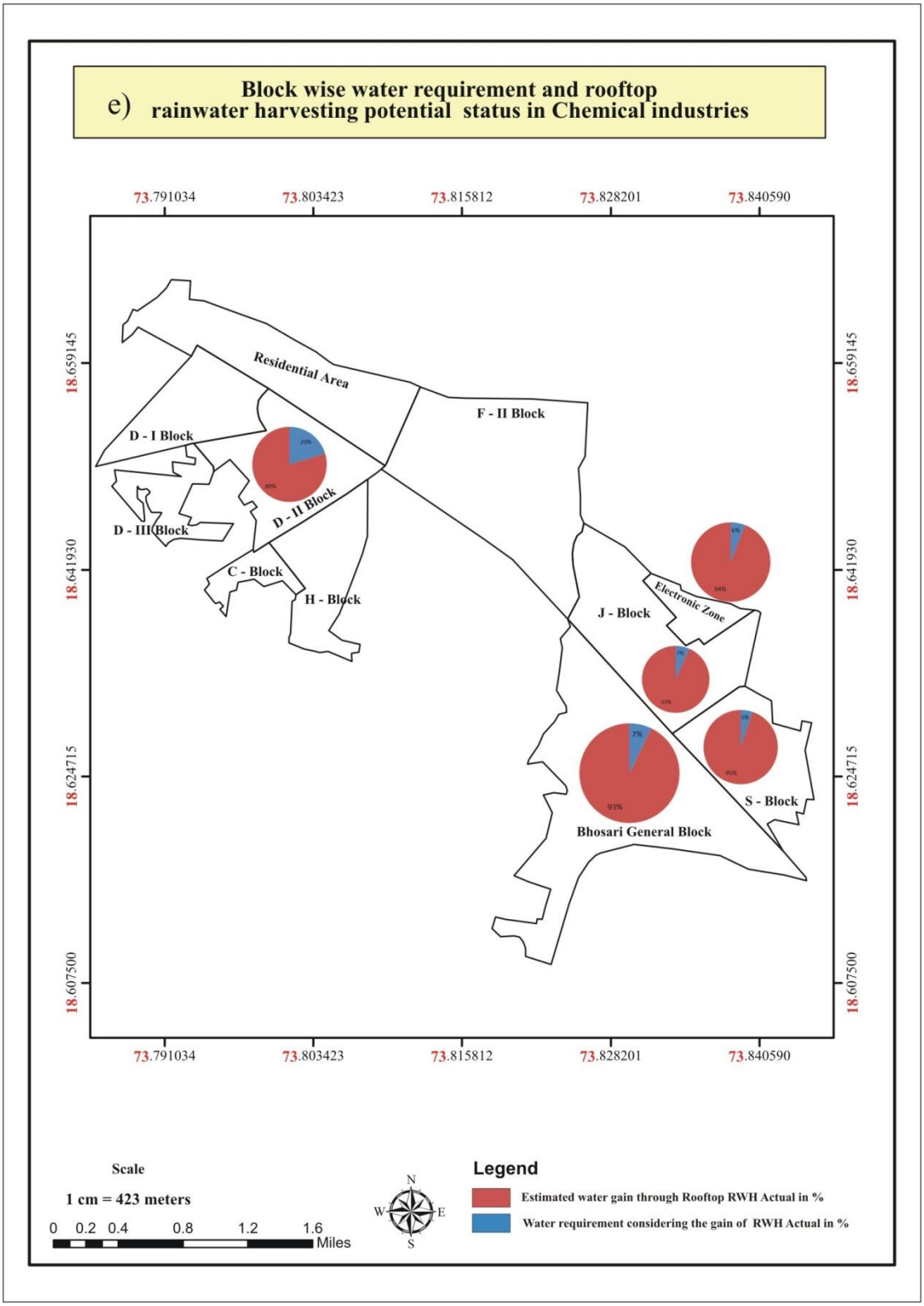

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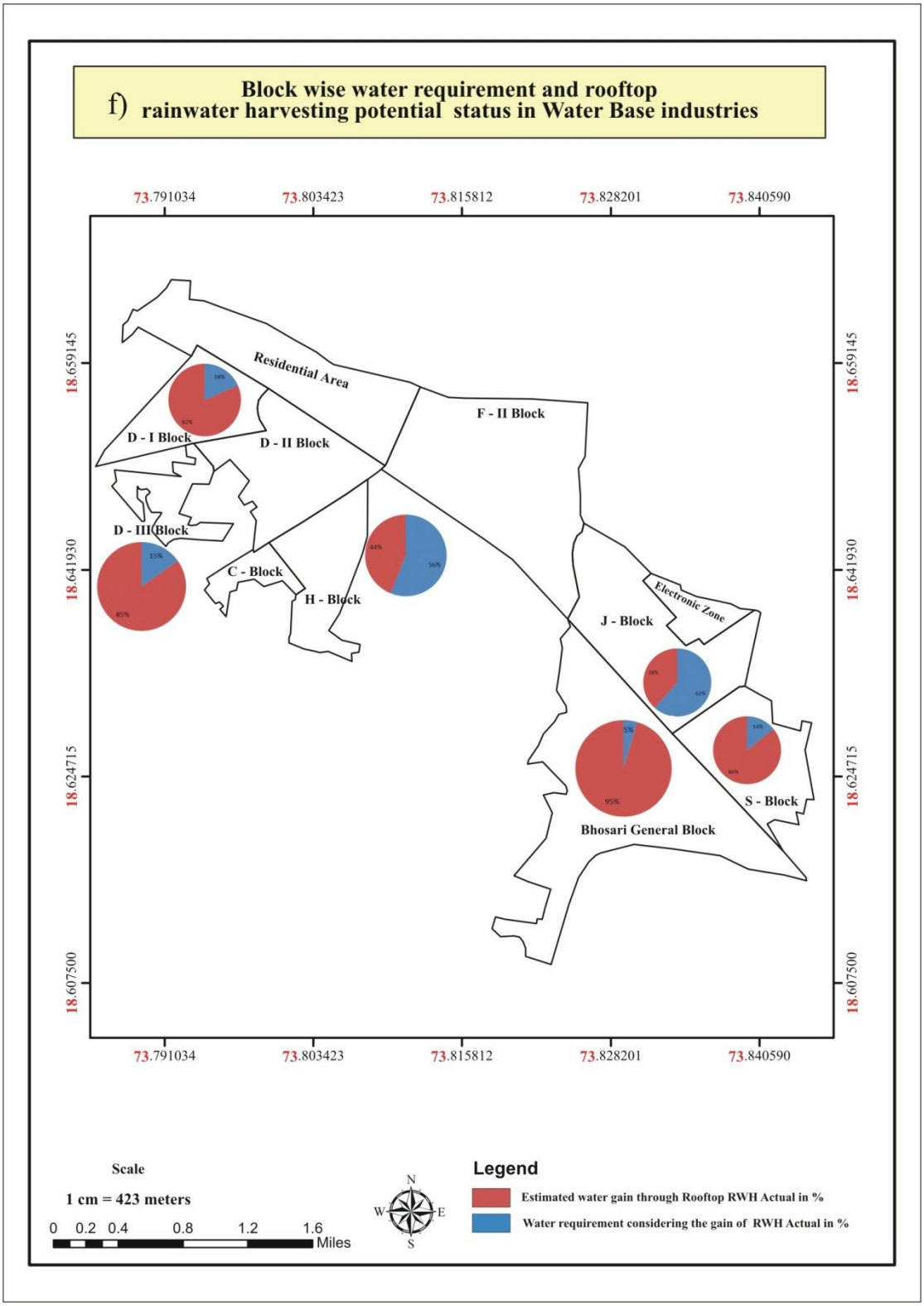
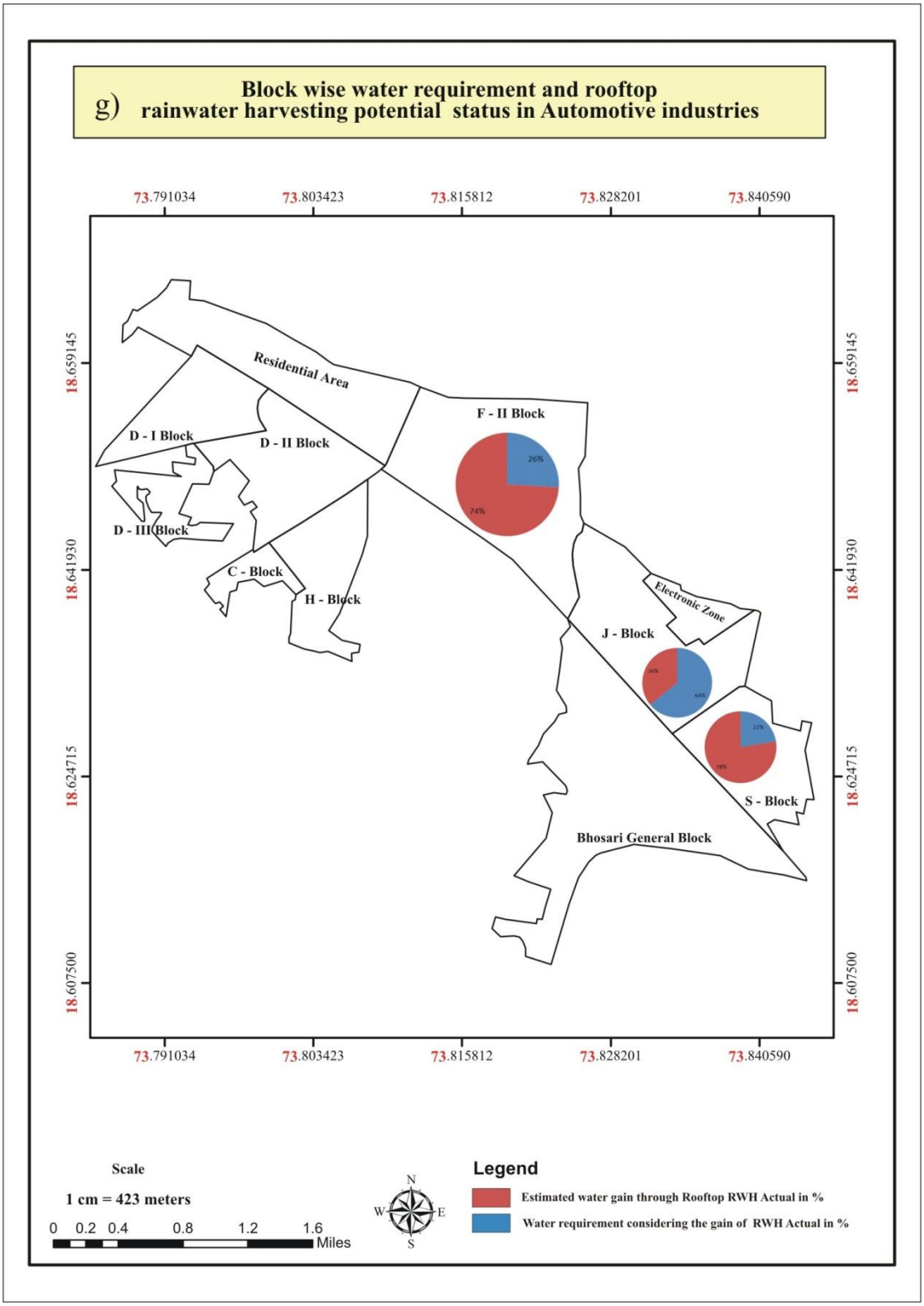


Figure No. 5.46



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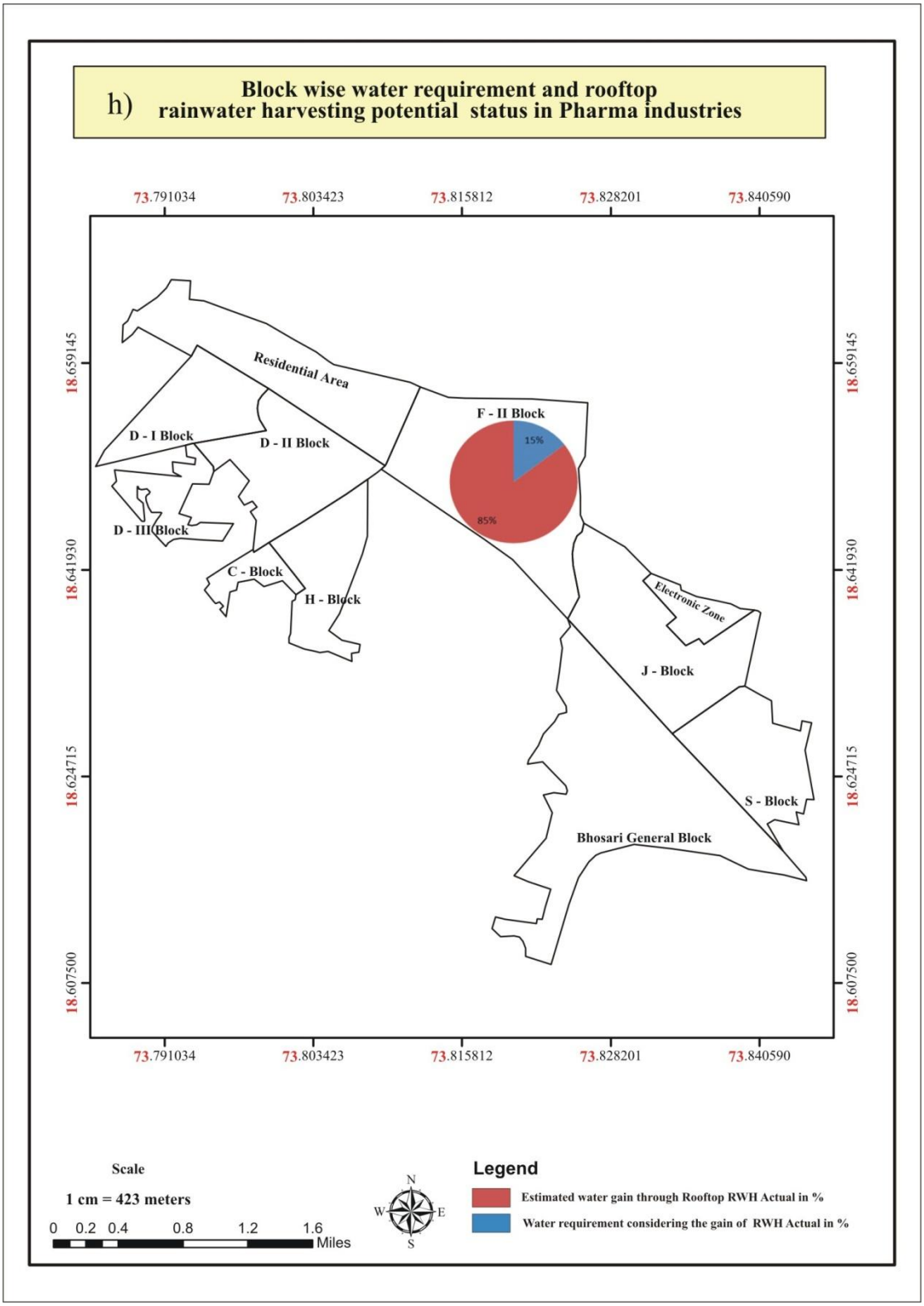


Figure No. 5.48

4. Suggestions:

4.1Water management :

The water is an important and essential requirement of industrial growth. The Pimpri Chinchwad industrial area receives the water supply from Pawana dam which is located in Mawal Tahashil of the Pune district. MIDC has constructed water supply Scheme at Ravet and Chinchwad to provide 144 MLD of water to this industrial area, total water supply pipe line network is 150 km. As the industries are growing rapidly it is urgent need of time to look in the issue of accurate management of water in the industrial units.

Table no. 5.42 - Domestic water use in Pimpri Chinchwad MIDC

Classification	Sr. No.	Industrial Sector	Optimum water use	Optimum to excess	More than excess
A) Without water use in industrial process	1	Service industries.	4	41	37
	2	Manufacturing Industries.	38	88	90
	3	Packing industries	1	8	2
B) water use in industrial process	1	Manufacturing industries.	29	137	130
	2	Tool manufacturing industries.	5	16	14
	3	Plastic and rubber, fiber industries.	0	17	27
	4	Metal and forge industries.	7	25	28
	5	Chemical industries	0	4	4
	6	Water base industries.	0	4	7
	7	Automotive industries.	0	15	0
	8	Pharmaceutical industries	0	1	1
	9	Total	84	356	340

Above table no. 5.42 gives details about domestic water use in Pimpri chinchwad MIDC industrial units. 84 industrial units are using optimum water, 356 industrial

units have their use optimum to excess water and 340 industrial units were using more than excess amount of water for domestic purpose. If we observe the data of water utilization, management and its associated problems following suggestion are mandatory.

1) To develop the awareness of domestic water utilization in the worker and implement the control on Extra and excess use by Workers .also none of automatic flushing system observe in industry that's why flushing is uncontrolled. This observation indicates the flushing cannot be save water and excess or extra use of water is increasing as compare to requirement.

2) Many industries do not have any recycling of used water. Why water requirement is increasing in industry.
3) Prepare the water management system and to develop water use awareness in worker, apply of automatic flushing system in domestic water uses. In industrial process water supply should be optimized by regulatory mechanism. Then these industries fulfill the water utilization.
4) Water use in industrial process is uncontrolled. Industry does not prepare regulatory mechanism of water use in process. Some industry use traditional method of water use which is ineffective wastage of water in huge amount. They should be control the water uses in industrial process by using advance technique.
5) Demand for water is continuously increasing in industries. After making a single utilization of water, it is disposed of without utilizing it for a second use. Such strategies may be determined for industrial areas in the country so that their demand is also fulfilled and availability of water is also maintained. For this, pressure will have to be built on industries for reuse of water. A limit for taking water from water sources may be fixed so that reuse and recycling gain importance. Stress has to be laid on conservation of rain water. Industrial units can use rain water in different forms. This water supply can be complementary to the traditional supply of water and it would save water. It can also be implemented through study of water management.

4.2- Surface rainwater harvesting and Groundwater recharge:

Table no. 5.43 - Surface rainwater harvesting potential of MIDC in cum			
Classification	**Sr. No.**	**Industrial Sector**	**Total surface RWH**
A) Without water use in industrial process	1	Service industries.	6770
	2	Manufacturing Industries.	25777
	3	Packing industries	851
B) water use in industrial process	1	Manufacturing industries.	22812
	2	Tool manufacturing industries.	1418
	3	Plastic and rubber, fiber industries.	2674
	4	Metal and forge industries.	3552
	5	Chemical industries	441
	6	Water base industries.	58
	7	Automotive industries.	1381
	8	Pharmaceutical industries	94
		Total	65828

Above table no. 5.43 gives detail about surface rainwater harvesting potential in Pimpri chinchwad MIDC industrial area.

With reference to surface rainwater harvesting we consider open space, garden, parking and road area in each industrial unit. For all this 783 industrial units surface area provides the opportunity to get 65828 cum. of water harvesting potential. Direct usage of surface rainwater is very difficult and inconvenience task. That's why we suggest use surface rainwater for artificial groundwater recharge.

Following methods are suggested for artificial groundwater recharge in industrial unit's campus.

1) Recharge through trench.
2) Borewell recharge.

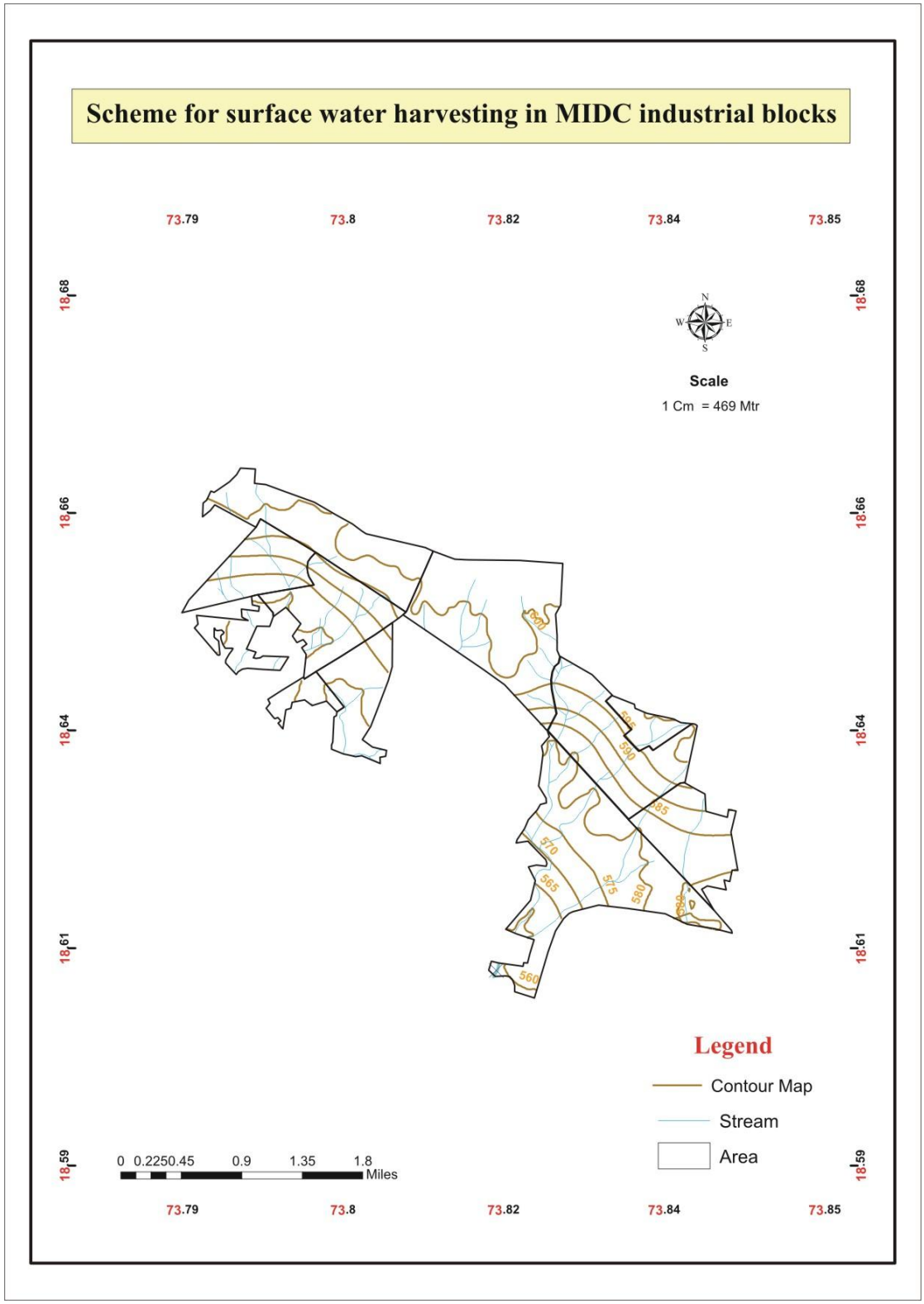
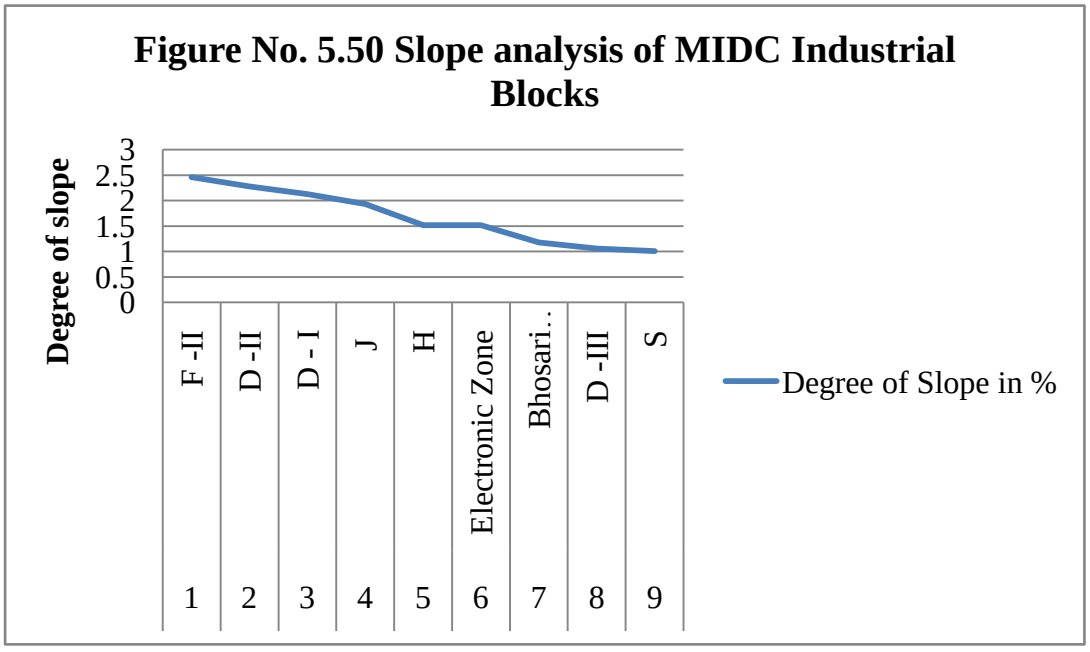


Figure No. 5.49

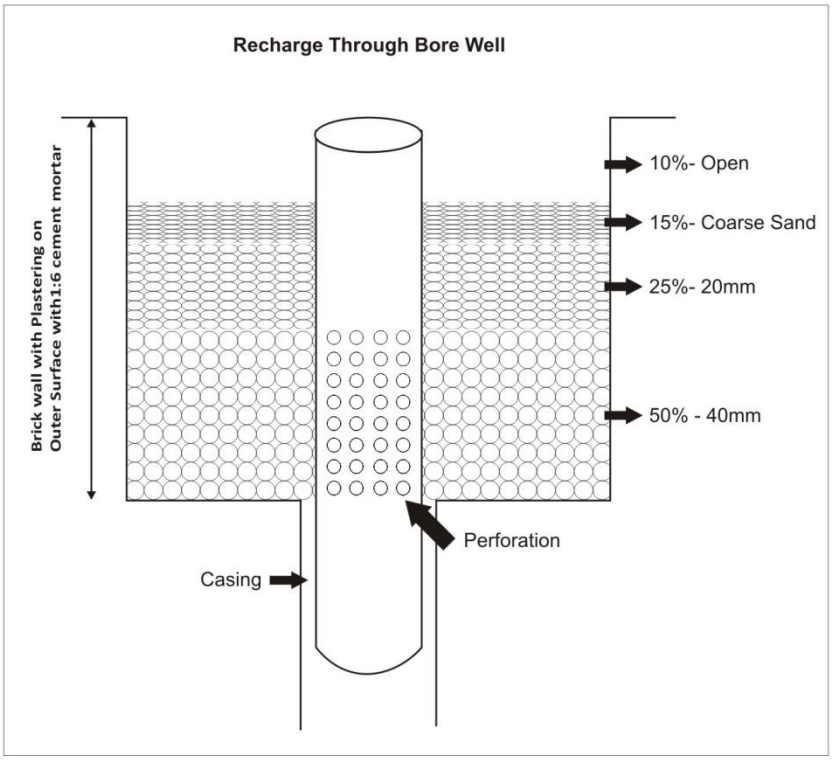
Table No. 5.44 Slope analysis of MIDC Industrial Blocks		
Sr. No.	**Block**	**Degree of Slope in %**
1	F -II	2.46
2	D -II	2.28
3	D - I	2.13
4	J	1.93
5	H	1.52
6	Electronic Zone	1.52
7	Bhosari general block	1.18
8	D -III	1.06
9	S	1.01

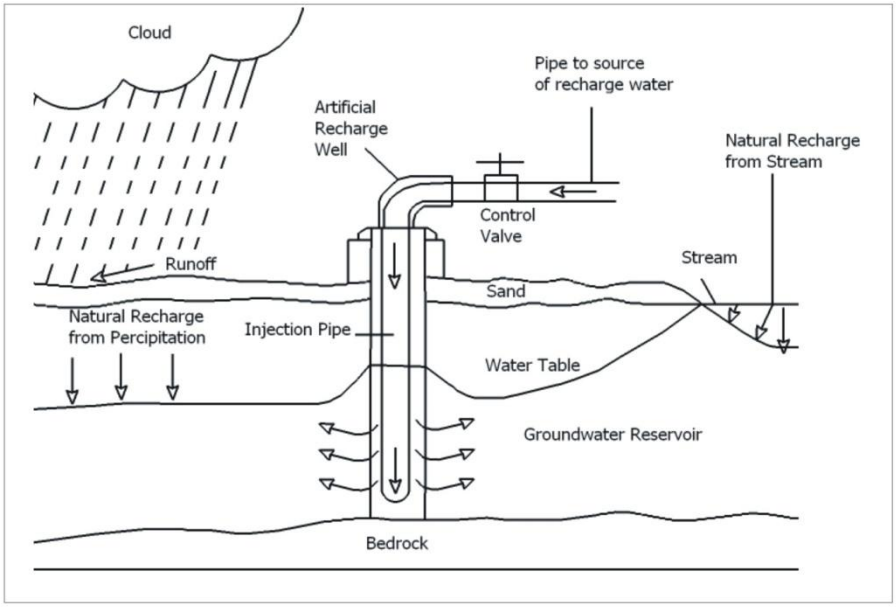


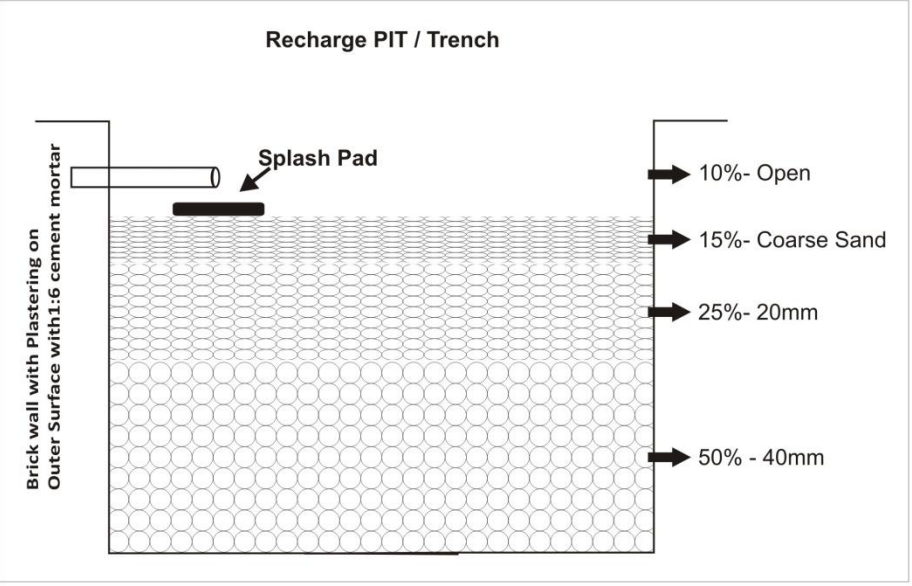
Suggested scheme For Surface Rainwater Harvesting as follow –

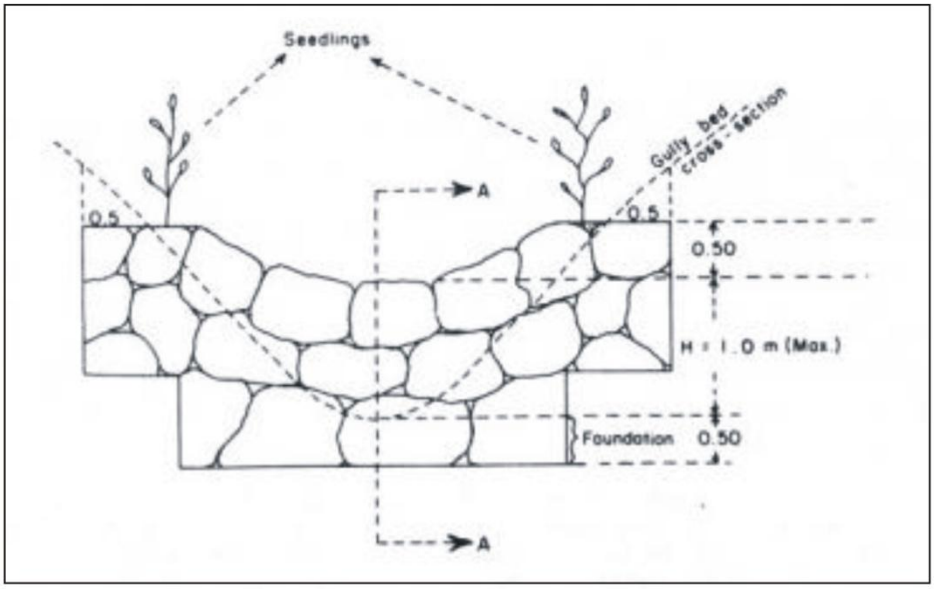
Table No. 5.45 Slope and suggested scheme		
Degree of slope	Blocks	Scheme
0.0 to 1.50	Bhosari general block, D-III and S blocks	Borewell Recharge , Recharge Pit, and Plantation
1.50 to 3.00	F-II, D-II, D-I, J, H	Recharge dug, Contour Trench, Loose bolder structure, Recharge pit

Figure No. 5.51, Suggested scheme diagrams









Loose bolder structure

4.3- Rooftop rainwater harvesting and annual water use:

Table no. 5.46 - Rooftop rainwater harvesting potential and status of MIDC in cum					
Classification	**Sr. No.**	**Industrial Sector**	**Total annual water requirement from outside sources in cum.**	**Estimated water gain through Rooftop RWH**	**Water requirement considering the gain of rooftop RWH**
A) Without water use in industrial process	1	Service industries.	59131	47728	11403
	2	Manufacturing Industries.	165280	90320	74960
	3	Packing industries	7812	3051	4761
B) water use in industrial process	1	Manufacturing industries.	339847	135215	204632
	2	Tool manufacturing industries.	35917	9345	26572
	3	Plastic and rubber, fiber industries.	61379	16469	44910
	4	Metal and forge industries.	63294	25877	37417
	5	Chemical industries	17756	1355	16401
	6	Water base industries.	32839	21857	10982
	7	Automotive industries.	14017	5859	8158
	8	Pharmaceutical industries	2446	357	2089
	9	Total	799718	357433	442285

Above table no. 5.44 gives detail about rooftop rainwater harvesting potential in Pimpri chinchwad MIDC industrial area.

With reference to rooftop rainwater harvesting we consider cross metal sheet and cement concrete slab roof area in each industrial unit. For all this 783 industrial units roof area provides the opportunity to get 357433 cum. of water harvesting potential. We can store this water in underground tank for direct use in industry.

If we observe rooftop rainwater harvesting data total annual water requirement from outside sources is 799718 cum and estimated water gain through rooftop

rainwater harvesting is 357433 which is 45 % therefore water requirement considering the gain of rooftop rainwater harvesting is 442285 which is 55 %

Around 45 % water requirement fulfill through rainwater harvesting in industries. It means rainwater harvesting is alternative to industrial water need.

***

BIBLIOGRAPHY

Research article and reports, Books and website

1) Water harvesting and sustainable supply in India - R. N. Athavale,Centre for Environment Education.

2) Manual on artificial recharge of ground water, CGWA Sept- 2007.

3) Measures for Ensuring Sustainability of Rainwater Harvesting By Prepared by Water for Asian Cities Programme, India – UN-HABITAT & Directorate of Urban Administration & Development Government of Madhya Pradesh.

4) Rainater harvesting in urban areas- industries By – S.Vishwnath, Bangalore.

5) Rainwater Harvesting as an Alternative Water Supply in the Future By – Che-Ani A.I, Shaari N, M.F.M. Zain,European Journal of Scientific Research ISSN 1450-216X Vol.34 No.1 (2009), pp.132-140.

6) Rainwater Harvesting in the Water-scarce Regions of India: Potential and Pitfalls By- Mr. Dinesh Kumar, Ankit Patel1 and O.P. Singh IWMI-TATA Water Policy Program, Hyderabad, India, Benaras Hindu University, Varenasi, India.

7) Rainwater harvesting, alternative to the water supply in indian urban areas: the case of Ahmedabad in gujarat by - akil amiraly, nathalie prime, joginder p. Singh

8) Rainwater Harvesting at N.I.T. Rurkela, By – Ranjit Kumar Sharma , Department of civil engineering- 2010.

9) Roof – top rainwater harvesting technique in anurban area – a case study from India. By- Dr. S. K. Sharmageological Research Institute 24 National Road, Dehradun 248001, India.

10) Roof top rain water harvesting system in deccan plateau region, andhra pradesh, india By - R. Amarnath Babu (M.Tech in Environmental Management)

11) Select case studies rain water harvesting and artificial recharge - Central Ground Water Board , Ministry of Water Resources, New Delhi , May 2011.

12) Rainwater Harvesting (RWH) in Nepal A case study on social acceptability and performance evaluation of RWH schemes implemented in Syangja and

Tanahun districts ,Rosan Dahal, Jeevan Ban, Susmita Makaju, Ram Sundar Shrestha and Nancy Dwa, In partial fulfillment of final year project of the degree of Bachelors in Civil Engineering in the Institute of Engineering in Western Regional Campus, Pokhara, Nepal , November 2010

13) New technology for Very-low-cost Domestic roof water harvesting, April 2002 Development Technology Unit, School of Engineering, University of Warwick.

14) A Guide: Rain Barrel Water Harvesting By Terry Sprouse, Amy McCoy, Joaquin Murrieta – Water resource research centre – the university of Arizona

15) General guidelines For Water audit & water conservation- Central water commission,

Evaluation of water utilization directorate, December 2005, New Delhi.

16) Central ground water board ministry of water resources Guide on artificial recharge to ground water, New Delhi, May, 2000.

17) Rainwater harvesting for large site developments - s.vishwanath.

18) Domestic rain water harvesting system: a model for rural development, Sachin Panhalkar, Department of Geography, Shivaji University, Kolhapur, MS, India, International journal of science and nature, I.J.S.N., VOL. 2(3) 2011: 861-867 ISSN 2229 – 6441.

19) Rainwater harvesting and utilization - Blue drop series, Book 3: Project Managers & Implementing Agencies.

20) Conservation of water and related land resources- Peter E. Black, Brian L. fisher, Lewis publishers, Boca Raton London New York Washington, D.C.

21) Design of water conservation system through rain water harvesting: an excel sheet approach - learnium school, new Delhi, India – 2007.

22) Ground water - H. M. Raghunath, New age international (P) Ltd, Publishers, 2003.

23) Harvesting rainwater for landscape use - Patricia h. Waterfall, extension agent, university of arizona cooperative extension/low 4 program, second edition, october 2004, revised 2006.

24) India's waters – Advances in development and management, - Maheshchandra Chaturvedi , CRC press.

25) Manual on artificial recharge of ground water – Government of India, Ministry of water resources, Central ground water board, September – 2007.

26) Potential of water harvesting as a strategic tool for drought mitigation- Bharat r. Sharmaand vladimir u. Smakhtin.

27) Rainwater harvesting: A lifeline for human well-being- UNEP.

28) Rainwater Harvesting as an Alternative Water Supply in the Future - Che-Ani A.I, Shaari N, A. Sairi, M.F.M. Zain , European Journal of Scientific Research, ISSN 1450-216X Vol.34 No.1 (2009), pp.132-140.

29) Rainwater Harvesting in the Water-scarce Regions of India: Potential and Pitfalls - M. Dinesh Kumar1, Ankit Patel1 and O.P. Singh, IWMI-TATA Water Policy Program, Hyderabad, India Benaras Hindu University, Varenasi, India

30) Rainwater harvesting and reuse through farm ponds - K.V. Rao, B.Venkateswarlu, K.L.Sahrawath, CRIDA Central research institute for dryland agriculture, Hyderabad.

31) Rainwater harvesting, alternative to the water supply In indian urban areas: the case of ahmedabad in Gujarat - Akil amiraly, nathalie prime, joginder p. Singh.

32) Roof – top rainwater harvesting technique in an urban area – a case study from India.Dr. S. K. Sharma, Geological Research Institute, 24 National Road, Dehradun 248001, India.

33) Ground water assessment development and management – K. R. Karanath, Tata McGraw-Hill, 2008.

34) Proceeding of - National Seminar on Rainwater Harvesting and Water Management 11-12 Nov. 2006, Nagpur.

35) Sustainable urban water supply in south India: Desalination, efficiency improvement, or rainwater harvesting? - Veena Srinivasan,1 Steven M. Gorelick and Lawrence Goulder, water resources research, vol. 46, 2010.

36) Water conservation, management and analysis – Madireddi V. Subba Rao, Readworthy Publication, New Delhi.

37) Water management in India – What works, what doesn't – Mr. Dnesh kumar, ISBN: 978-81-212-1033-1, Gyan Publishing house, New Delhi.

38) Water management in India- P.C. Bancil, ISBN: 81-8269-097-0, Concept publishing company, New Delhi, 2004.

39) Water resource management ,Thrust and challenges - G. Chandrakumar, N, Mukundan , ISBN: 81-7625- 643-9, Sarup and sons New Delhi.

40) Water resources, conservation and management- S.N. Chatterjee, ISBN: 978-81-269- 0968-4, Atlantic Publishers and distributor, Chennai, 2008.

41) Geography of Water Resources – R.K.Gurjar ,B.C. Jat (Rawat Publication ,Delhi)

42) General Guidelines for water audit and water conservation – Center water commission – GOV-India 2005.

43) Rainwater harvesting and artificial recharge - CGWB- 2011

44) Integrated water recourse management Vol. I, II – CWRDM – Alliied Publishers Pvt. Ltd.

45) Water Management in India – M.Dinesh Kumar (Gyan Pub. Delhi)

46) Water Management in India - P.C. Bancil (concept pub. Company, New Delhi) 2004.

47) Manual of rainwater harvesting and conservation By Govt. Of India, Consultancy services organization central public works department, New Delhi. In 2002.

48) http://www.indiawaterportal.org

49) http://www.rainwaterharvesting.org

50) http://www.pcmcindia.gov.in

51) http://www.maharashtradirectory.com

52) http://www.midcindia.org

53) https://gsda.maharashtra.gov.in

54) https://wrd.maharashtra.gov.in

55) http://www.cgwb.gov.in

56) http://www.indiaenvironmentportal.org.in

57) https://www.academia.edu

58) https://www.sciencedirect.com

59) https://scholar.google.co.in

60) Many more eBooks website

ABBREVIATIONS

Cum	Cubic meter
Sqm	Square Meter
Sq.ft.	Square Feet
Lit	Liter
RWH	Rainwater Harvesting
RHP	Rainwater harvesting potential
Gen	General

APPENDIX

Interview arrangement

A) Basic information-

a) Name of Industry	
b) Address	
c) Industry type	
d) Labor	

B) Area information in sq.ft. –

a) Campus area in sq.ft.					
1) Built up area	Parking	Godown	Other	Total	
2) Open space	Open space	Pond area	Garden	Total	
3) Road	Open road	Mottled road	Concert road	Paver block Road	Total

b) Roof area in sq.ft				
1) Roof Pattern	Plane		Cross	
2) Roof Area in Sqft	Plane		Cross	
	Covered With Rcc	Covered with Metal Sheet	Covered With Rcc	Covered with Metal Sheet

C) Water use information-

a) Source of water	PCMC / MIDC	Bore well	Other

	Sr. No	Process	Water use
b) Water use in Industrial Process	1		
	2		
	3		
	4		
	5		
	6		
		Total	

	Sr. no	Process	Water use in liters
c) Domestic Water use in industry	1	Drinking	
	2	Toilets	
	3	Wash room	
	4	Garden	
	5	Cleaning	
	6	Other	
		Total	

d) Water Tanker Information						
Sr. No.	Month	Tanker Quantity	Water quantity	Industrial use	Domestic use	Total
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

D) Observations of water management-

Observations of water management					
Water Management	Extra / Excess use of water		Recycling of used water	No. Pipeline/ Tank linkages	Method Of Garden Irrigation
Planed Or Unplanned	Domesti c uses	Use in Industrial Process			Drip Sprinkler Traditional

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