Shri S.K. Shah and Shrikrishna O.M. Arts College, Modasa

Green Auditing Report

Shri S.K. Shah and Shrikrishna O.M. Arts College, Modasa

Managed By: The M. L. Gandhi Higher Education Society

College Campus, Dhansura Road, Modasa-383315,Gujarat

A Green Auditing Report Committee

Dr. P. R. Sinh – Coordinator

Associate Prof., Home science

Team Members

Data Collection – Plantation Survey- Audit

1. MADARI GAVARIBEN JANANATH
2. NINAMA MAHIMABAHEN KIRANBHAI
3. PATEL DIMPALBEN ARVINDBHAI
4. PATELIYA SIMABEN DAHYABHAI
5. RABARI RAJESHVARIBEN KARSANBHAI
6. VANKAR BHUMIKABEN HASMUKHBHAI

DATA COLLECTION – LAND USE SURVEY- AUDIT

1. DAMOR LAXMIBEN BATHIJI
2. CHAUHAN BHUMIKABEN NARPATSINH
3. BAMANIYA BHAVIKABAHEN HALABHAI
4. MACHHAR NISHIKABEN ALPESHBHAI
5. MALIK ZUVERIYABANU MOHDTAREEQ
6. PATNI DAKSHABEN SANTOSHBHAI

DATA COLLECTION – ENERGY SURVEY- AUDIT

1. BARIYA NETALBEN ARAVINDBHAI
2. CHAUHAN PAYALBEN RATILAL
3. KOTVAL DURGABEN PUNAMBHAI
4. PANDOR PAYALBEN KANTIBHAI
5. PATEL AMITAKUMARI RAJESHBHAI
6. PATEL HANIBEN PRAFULBHAI

DATA ANALYSIS – REPORT WRITING PHOTOGRAPHY

1. DARJI MANSIBEN RAJENDRAKUMAR
2. JETHRA SOHANABANU MOHAMMEDHANIF
3. KHERADA NAMIRA AMINHUSEN
4. MK MUSKANBANU IRSADBHAI MISTRI BENAZIR MANZOORAHEMAD

DATA COLLECTION – PHOTOGRAPHY

1. CHAUDHARI AMIBEN VISHNUBHAI
2. GODHA KOMALBEN KALABHAI
3. FANESA DIVYA VIKRAMBHAI
4. PANDYA ANJALIBAHEN MAHENDRABHAI

GREEN AUDIT

Certificate

This is to certify that a "Green Audit" for Shri S.K. Shah and Shrikrishna O.M. Arts College, Modasa has been conducted in August-September 2021 to assess the green initiatives planning and efforts implemented in the college campus like Green campus management, Plantation, Rain water harvesting, Conservation of Energy.

This Green Audit is also aimed to assess the impact of green initiatives for maintenance of Eco-friendly Campus.

Place: College Campus, Modasa

Date: 23th October 2021

Dr. P.R. Sinh
Coordinator

Principal
Shri S.K.Shah & Shrikrishna
O.M. Arts College,Modasa (Aravalli)

Dr. D.H. Joshi
Principal

Concept

The term ‘Green audit’ means differently to different people. Terms like ‘assessment’, ‘survey’ and ‘review’ are also used to describe similar activities. Furthermore, some organizations/Institutions believe that an ‘environmental audit’ addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Green Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

The ICC defines Environmental Auditing as:

“A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safe guarding the environment and natural resources in its operations/projects.”

The outcome of Green Audit should be established with concrete evidence that the measures undertaken and facilities in the institution under green auditing.

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CHAPTERS **PAGE NO.**

1. INTRODUCTION:-

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyse environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit.

❖ ABOUT US COLLEGE

The **M. L. Gandhi Higher Education Society** was started **Shri S.K. Shah and SHrikrishna O.M. Arts College,** Modasa in 1960. It was at that time only Arts College in the whole district of Aravalli, where majority of population is schedule tribe, schedule cast and a few economically backward communities. It was one of the best of its kind in Aravalli District. . Our College has excellent infrastructure and congenital environment, which provides students a platform to exhibit their potentiality in the field of higher education. In the competitive environment of higher education, the institute has maintained its repute firmly. The institute boasts of big classrooms, well-equipped laboratories, prosperous library, huge sports campus, well designed and maintained botanical garden, biodiversity and highly qualified & well experienced faculty members. Besides education our students won so many championships in sports as well as cultural competitions such as drama, music and dance. The results of University examinations were excellent even 100%.

The taluka of Modasa is situated on 23^0 28'N latitude and 73^0 18'E longitude on the bank of river Mazum.The region of Modasa is flat and consists of mostaly sandy plains, although north and north eastern parts near Modasa are covered by the range of Aravalli hills.The total area of the taluka is 862.16 sq.km, total forest area is 6583.51 and total population is 2, 22,791.

♦ COLLEGE DETAILS:

- **ESTABLISHED IN 1960**
- **GRANT-IN-AID ONLY ONE ARTS COLLEGE IN ARVALLI DISTRICT AND AFFILIATED WITH THE HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN:**
- **IMPARTS EDUCATION UP TO B.A. LEVEL:**

  MAIN SUBJECTS: SANSKRIT, ENGLISH, GUJARATI, HINDI, PSYCHOLOGY, ECONOMICS, HOME SCIENCE (SEM V-VI)
- **M.A. LEVEL: SANSKRIT, ENGLISH, GUJARATI, HIINDI,**
- **PH. D. LEVEL: SANSKRIT, GUJARATI**
- **AWARDED "B+" GRADE BY NAAC IN 2007. (1ST CYCLE)**

♦ VISION AND OUR GOAL

VISION

THE TRUE KNOWLEDGE EMANCIPATES, EMPOWERS AND ELEVATES.

OUR GOAL

TO PROVIDE STUDENTS WITH AN ENVIRONMENT FOR THE ALL-ROUND DEVELOPMENT OF THEIR MENTAL, PHYSICAL, AESTHETIC, SOCIAL, AND SPIRITUAL POTENTIALS, TOGETHER WITH THE ATTITUDES OF INTEGRITY, HARD-WORK, HONESTY, FAIRNESS AND TOLERANCE, SO THAT THEY GIVE OF THEIR VERY BEST. EXCELLENCE IN THESE FIELDS IS TO BE INTERPRETED IN TERMS OF PUTTING THE SKILLS DEVELOPED IN EACH AT THE SERVICE OF THE SOCIALLY DISCRIMINATED GROUPS IN OUR COUNTRY WITH A VIEW TO SETTING UP A SOCIETY WHERE ALL HAVE EQUAL OPPORTUNITY AS CHILDREN OF GOD.

♦ OBJECTIVES

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

- To introduce and aware students to real concerns of environment and its Sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use of the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requiring high cost.
- To bring out a status report on environmental compliance

♦ PHYSICAL INFRASTRUCTURE IN COLLEGE CAMPUS:

- **AN OUTSTANDING CAMPUS:** 18.29 ACRES CAMPUS AREA
- **TOTAL BUILT UP AREA:** 3000 SQ. MT.
- **GREEN CAMPUS**
- **BOTANICAL GARDEN**
- **14 COLLEGES + 01 ENGLISH MEDIUM SCHOOL**

♦ CAMPUS INFRASTRUCTURE AND LAYOUT

CAMPUS INFRASTRUCTURE:

- Pleasant, eco friendly environment.
- Big, spacious and well furnished class-rooms
- **Laboratories:**
  The College has well equipped and well managed laboratories for General Science, Foot and Nutrition and Clothing and Textile. Generally, all the required equipment's for each subject are available in good functioning condition.
- **Library:**
  A well-maintained and spacious library having the latest reference and text books on different subjects. Audio-visual e-lecture facility available. The library also provides some magazines & articles related to their fields and help the students to update on the courses, examination and competitive examination. Poor Boys Library scheme is also available.
- Audio-visual Seminar hall with smart board , LED display-LCD projector , internet facilities and DTH facilities .
- **U. G. C. Network Resource Centre with internet facilities.**
- **Hostels:**
  There are two hostels in the college campus. These hostels are maintained by the management directly. The hostels have spacious and airy rooms. The hostels are situated in a very educational and eco-friendly environment in the college campus itself. There are large playgrounds adjoining the hostels and hence the students residing in the hostels get ample space for recreational activities. As the hostels are in the internal parts of the college campus, complete safety of the students is assured. The students can avail the hostel facility at a very nominal rate per term. The management has appointed enough staff for the maintenance of the hostels. There are 2 rectors, 1 Lady Superintendent (Resident), 1 clerk, 2 sweepers, a kitchen contractor and several servants for the mess.

- **Canteen:**
  The College has a well-furnished Canteen within the campus. The canteen is the most preferred place for every students and much time is spent around here. In addition to satisfying one's hunger and thirst, lot of serious discussion on topics of current interest happen here. Many are found here revising their interpersonal and communicative skills over a cup of tea. The Canteen offers delicious delicacies of different types to the taste of all.

- **Auditorium Hall:**
  The Hall having capacity of 1200 students with facilities of stage, green room, change room.

- **Sports Campus:**
  Well equipped and maintained huge sports campus, which includes several grounds for different games like Cricket, Hockey, Valley Ball, Basket Ball, Kho-Kho and Tennis Court.

- **DELL (Digital Equiped Language Lab)**
- **Lab and classroom contain A.V facility**
- **Mike system**
- **CCTV cameras**
- **Dr. babasaheb ambedkar open university Study Center**
- **IGNOU Study Center**
- **Museum and Art Gallery**
- **Ramanlal Soni Research Center**
- **Other Facilities: Common Xerox Center, Canteen, Telephone Booth and SBI ATM.**

- **SEMINAR HALL**

  The college has a seminar hall, equipped with audio-visual facilities for the smooth conduct of seminars, conferences and other activities.

- **CONFERENCE ROOM**

  There is a conference room aimed at providing space for the policy making bodies of the college.

- **MULTI-PURPOSE ROOM**

  The multi-purpose administrative room, which has the offices of the Assistant Director, Vice Principal, the Coordinators of IQAC, Academics and space for executive meetings and presentations.

- **LANGUAGE LAB**

  There is a language lab in the college which facilitates the students to fine tune their communication skills. It also doubles up as the venue for Add-On Courses. like Graphic Designing and Animation as well as for training programs in SPSS.

- **COMPUTER LABS**

  There are two well-equipped computer labs.

- **BOTANICAL GARDEN**

Botanical Garden: Well designed & maintained botanical garden in campus.

2. PRE AUDIT STAGE:-

♦ SCOPE AND GOALS OF GREEN AUDIT

A clean and healthy environment aids in effective learning and provides a conductive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who is the part of economical, financial, social, environmental factor. It is necessary to conduct green audit in college campus because students become aware of the green audit, its advantages to save the planet and they become good citizen. Thus Green audit becomes necessary at the college level.

♦ BENEFITS OF GREEN AUDIT

- More efficient resource management
- To provide basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid- waste and water recycling
- To create plastic free campus and evolve health consciousness
- Recognize the cost saving methods through waste minimizing and managing
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and improving environmental standards
- Benchmarking for environmental protection initiatives
- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the college and itsenvironment
- Enhancement of college profile
- Developing an environmental ethic and value systems in youngsters
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college

♦ METHODOLOGY

In preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements.

Following steps were taken for data collection:

- The team went to each department, centers, Library, canteen etc.
- Data about the general information was collected by observation and interview.
- The power consumption of appliances was recorded by taking an average value in some cases.

♦ SURVEY FORM

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarise the present status of environment management in the campus:

Water management

Energy Conservation

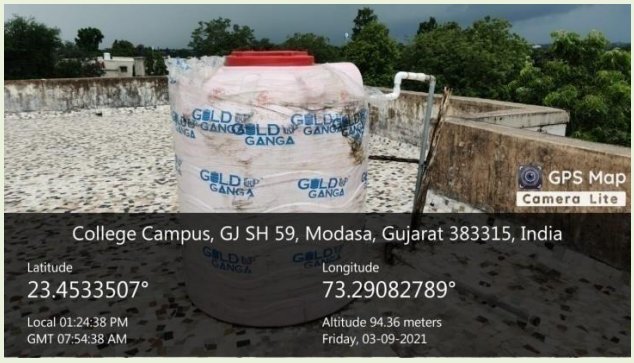
Waste management

Green area management

Audit of carbon footprint

A) AUDIT OF WATER MANAGEMENT

1. List uses of water in your college.
2. What are the sources of water in your college?
3. How does your college store water?
4. If there is water wastage, specify why.
5. How can the wastage be prevented / stopped?
6. What are the uses of waste water in your college?
7. What happens to the water used in your labs? Whether it gets mixed with ground water?
8. Number of water coolers?
9. Number of water taps?
10. Number of bath rooms in staff rooms, common, hostels?
11. Number of toilet, urinals?
12. Does your college harvest rain water?
13. Is there any water management plan in the college?
14. Are there any water saving techniques followed in your college? What are they?
15. Please share Some IDEA for how your college could save more water.



B) AUDIT OF ENERGY MANAGEMENT

1. List the usage of energy in your college. (Electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others).
2. Electricity bill
3. Is there generator facility in the college?
4. How many CFL bulbs has your college installed?
5. How many tube lights, fans are installed in your college?
6. How many air conditioners are installed in your college?
7. How many electrical equipments including weighing balance are installed your college? Mention the use (Hours used/day for how many days in a month)
8. How many TV, CCTV and computers are there in your college?

C) AUDIT OF WASTE MANAGEMENT

1. Which of the following are found near your college?
   Municipal dump yard, Garbage heap, Public convenience, Sewer line, Stagnant water, Open drainage, Bus / Railway station, Market / Shopping complex / Public halls
2. Does your college generate any waste? (E-waste, Hazardous waste (toxic), Solid waste, Dry leaves, Canteen waste, Liquid waste, Glass, Unused equipment, Medical waste if any, Napkins, Others (Specify))
3. Is there any waste treatment system in the college?
4. How is the waste generated in the college managed, by composting or recycling or reusing or by other methods?
5. Do you use recycled paper in College?

D) AUDIT OF GREEN CAMPUS MANAGEMENT

1. Is there a garden in your college?
2. Do students spend time in the garden?
3. List the numbers of each plants species in the garden.

4. List the species planted by the students, with numbers.
5. Whether you have displayed scientific names of the trees in the campus?
6. Is there any plantation in your campus? If yes specify area and type of plantation.
7. Is there any medicinal garden in your college? If yes how much area?
8. Who is in charge of gardens in your college?
9. Are you using any type of recycled water in your garden?
10. Do you have any composting pit in your college?
11. What do you doing with the vegetables harvested?
12. Is there any botanical garden in your campus? If yes give details of campus flora.
13. Give the number and names of the medicinal plants in your college campus.
14. Any threatened plant species planted/conserved?
15. Is there a nature club in your college? If yes what are their activities?
16. What is the type of vegetation in the surrounding area of the college?
17. Is there any nature awareness program conducted in the campus?
18. What is the involvement of students in the green cover maintenance?
19. What is the total area of the campus under tree cover? Or under tree canopy?
20. Share your ideas for further improvement of green cover.

E) AUDIT OF CARBON FOOTPRINT

1. Total Number of vehicles used by the students of the college.
2. Mention the usage of cycles, two wheelers and cars.
3. Number of persons using common transportation
4. Number of parent-teacher meetings in a year?
5. Number of visitors with vehicles per day?
6. Number of generators used per day (hours). Give the amount of fuel used per day.
7. Suggest the methods to reduce the quantity of use of fuel used by the students / teacher-non teaching staff of the college.

3. POST AUDIT STAGE:-

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner. Green audits form a part of a process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit. The essence of any green audit is to find out how well the environmental management and environmental equipment are performing. Each of these components is crucial in ensuring that the campus environmental performance meets the goals set in its green policy. The individual functioning and the success of integration will all play a role in the degree of success or failure of the campus environmental performance

♦ KEY FINDINGS AND OBSERVATIONS

A) WATER

- Main water uses in the campus: gardening, recreation, toilet, laboratory, cleaning, canteen, drinking, hostel, washing, office uses.
- Rain water harvesting and bore wale are main sources water in the campus.
- Storage water: ground water storage, wet lands, ponds and tanks.
- Water wastage mainly during urinals and toilets.
- Water wastage can be prevented by: wisely flush, washing vehicles, long showers and in the kitchen.
- Water is used in many different ways such as distilled and deionized water in laboratory
- Water coolers: Yes
- Water taps: Yes
- Bathrooms and toilets in staff rooms, common, hostels:Yes
- Water management plan: Pressure system, Two Well and Tube well.
- Reasons for water wastage: leakages from taps, over use of water and overflow of water from motors

B) ENERGY

- Usage of energy through electricity, microwave.
- No generators : 01
- No CFL bulbs : 71
- Total number of tube lights : 179
- Total number of fans : 183
- Total number of computers : 125
- Total number of air conditioners : 02
- Total number of TV : 03
- Total number of rooms : 21
- Total number of staff room : 02
- Total Refrigerator : 01

C) WASTE

- Following all are far from the college area: Municipal dump yard, Garbage heap, Public convenience, Sewer line, Stagnant water, Open drainage, Public halls
- College generates e-waste, Solid waste, dry leaves, canteen waste, liquid waste, glass and unused equipment.
- There is a composting system to reduce canteen waste and electronic waste such as computers, electrical parts reduced by selling of it.
- Plastic waste dispose by selling
- Solid waste as food waste, damage furniture, paper waste send to municipal waste collection centre.
- No treatment for laboratory wastes
- Waste water treatment plant is under the pipeline condition to treat the lab and other waste water.
- Glassware waste as broken glass wares from the laboratory send to municipal waste collection centers

D) GREEN CAMPUS

- Garden area inside the college –Yes
- Total number of plant species identified – 384
- Total campus area – 18.29 ACRES
- Treated water from waste water treatment is used in pouring the plants of garden.
- The college has one composting pit inside the campus.
- There is a Nature Club in the campus. Awareness program, plastic free zone, Ozone Day celebration, World Environment Day and other activities are held in the college.

Celebration of World Sparrow Day

The house sparrow, a charming bird that thrives around human settlements, is witnessing a sharp decline in various parts of the country. Unfortunately, this issue has transcended political and national boundaries, affecting numerous countries worldwide. Consequently, the decline of the sparrow population has become a matter of deep concern and is being actively discussed by academicians, social workers, researchers, and the general public.

Given this alarming trend, there is a growing sentiment that the government should implement appropriate measures to protect the environment, including safeguarding the sparrows. Nonetheless, the responsibility to care for our environment does not rest solely on the government. Since we all equally share and benefit from the various components and amenities of the environment, it is incumbent upon every student and citizen to contribute to its welfare.

In an effort to play our part in this important cause, the 'NSS Unit' of Shri S.K. Shah and Shrikrishna O.M. Arts College will celebrate “World Sparrow Day” on March 20th. This event aims to raise awareness about the plight of the house sparrow and encourage collective action to ensure its conservation.

Save Water Day Celebration

On March 20, Shri S.K. Shah and Shrikrishna O.M. Arts College celebrated Save Water Day with great enthusiasm and dedication. The event aimed to raise awareness about the importance of water conservation and to encourage sustainable practices among students, faculty, and the local community.

Event Highlights:

Awareness Rally: Following the inauguration, students participated in an awareness rally around the college campus and nearby areas. They carried banners and placards with slogans like "Save Water, Save Life," "Every Drop Counts," and "Conserve Water, Conserve Future." The rally aimed to spread the message of water conservation to the wider community.

Expert Talks and Workshops: Several sessions were organized where experts shared their knowledge and experiences related to water conservation techniques. Workshops on rainwater harvesting, greywater recycling, and efficient water use in households and agriculture were conducted. These sessions provided practical insights and motivated participants to adopt water-saving measures.

Competitions: To engage students creatively, various competitions were held, including poster making, essay writing, and slogan writing, all centered around the theme of water conservation. The participants showcased their talent and expressed their views on the importance of saving water.

Plantation Drive: A tree plantation drive was also organized as part of the celebration. Students and faculty members planted saplings around the campus, symbolizing the commitment to nurturing the environment. Trees play a significant role in maintaining the water cycle, and this activity underscored the interconnection between trees and water conservation.

Pledge Ceremony: Towards the end of the day, a pledge ceremony was conducted where everyone present took an oath to conserve water in their daily lives. The pledge highlighted personal responsibility and the collective effort needed to address water scarcity issues.

Environment Day

Celebrating Environment Day on June 5th at Shri S.K. Shah and Shrikrishna O.M. Arts College was an enriching experience marked by various insightful activities and initiatives. The event aimed to raise awareness about environmental conservation and sustainability among students and faculty.

The day started with a report highlighting current environmental issues and their impact on our planet. Students actively participated in discussions, presentations, and workshops focused on practical solutions and individual contributions towards a greener future.

Various campaigns were launched, including tree-planting drives, waste management workshops, and awareness sessions on reducing plastic usage. These activities not only educated but also inspired everyone to take proactive steps towards preserving our environment.

Guest speakers and experts shared their knowledge, emphasizing the importance of collective responsibility in tackling environmental challenges. The college community pledged to continue these efforts beyond the event, ensuring a lasting impact on campus and in the wider community.

Overall, the celebration of Environment Day at Shri S.K. Shah and Shrikrishna O.M. Arts College fostered a sense of environmental consciousness and commitment to sustainable practices, reinforcing the college's dedication to nurturing responsible global citizens.


1.Slogan Compitition 2. Poster Compitition
3. Making of Short Video 4. Making of nest
For Conservation of Sparrow


GANDHI SEVA RATNA AWARD


Modasa, GJ, भारत
Sabarkantha, Modasa, 383315,
Lat 23.453268, Long 73.291539
08/06/2022 11:55 AM


હું ઇનોવેટર હું


શ્રી એસ.કે.શાહ એન્ડ
શ્રી કૃષ્ણ ઓ.એમ.આર્ટ્સ કોલેજ,મોડાસા
Climate Change Youth
Outreach Program
Date : 26/09/2022 to 30/09/2022
GPS Map Camera
Modasa, GJ, India
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2nd GUJARAT BN NCC, HIMATNAGAR
TREE
PLANTATION
DRIVE
वृक्ष रोपण अभियान


Galaxy S20 5G


GPS Map Camera
शिनावाद, गुजरात, भारत
F9JX+762, शिनावाद, गुजरात 383315, भारत
Lat 23.480602°
Long 73.39782°
07/01/24 12:07 PM GMT +05:30
Google


GPS Map Camera
Shinavad, Gujarat, India
F9JX+68X, Shinavad, Gujarat 383315, India
Lat 23.480989°
Long 73.398531°
05/01/24 01:36 PM GMT +05:30
Google

PLANTS FOUND IN THE CAMPUS:

SR NO	BOTANICAL NAME	FAMILY	V.N.
1	*Annona squamosa* L.	Annonaceae	Sitaphal
2	*Annona reticulata* L.		Ramphal
3	*Artabotrys hexapetalus* (L.f.)Bhandari.		Lilo Champo
4	*Polyalthia longifolia* (Sonn.)Thw.		Asopalav
5	*Cissampelos pareira* L.	Menispermaceae	Venivel
6	*Cocculus hirsutus* (L.) Diels		Vevdi
7	*Cocculus villosus* DC.		Vevdi
8	*Tinospora cordifolia* (Willd.)Hook.&. Thoms.		Gudajvel
9	*Argemone mexicana* L.	Papaveraceae	Darudi
10	*Brassica campestris* L. Var.Sarson	Brassicaceae	Sarsav
11	*Brassica juncea* (L.) Czern &Coss.		Rai
12	*Cadaba fruticosa* (L.) Druce.	Capparaceae	Teliohemkand
13	*Capparis decidua* (Forsk.)Edgew.		Kerado
14	*Capparis sepiaria* L.		Kanther
15	*Capparis spinosa* L.		Kantalo kanther
16	*Capparis horrida* L.		Govind fal
17	*Cleome gynandra* L.		Ghandhatu
18	*Cleome viscosa* L.		Pilitilvan
19	*Crateva nurvala* Buch.		Vayvarno

20	*Hybanthus enneaspermus* (L.)F.Muell.	Violaceae	
21	*Polygala chinensis* L.	Polygalaceae	Pilibhonysan
22	*Polygala erioptera* DC.		Bhonyasn
23	*Polycarpaea corymbosa* (L.)Lam.	Caryophyllaceae	----------
24	*Portulaca grandiflora* HK.f.	Portulacaceae	Chini gulab
25	*Portulaca oleracea* L.		Motiluni
26	*Portulaca tuberosa* Roxb.		Dholi luni
27	*Portulaca quadrifida* L.		Ziniluni
28	*Bergia capensis* L.	Elatinaceae	Jaljambro
29	*Bergia suffruticosa* (Del.)Fenzl.		Gandharo okhrad
30	*Abelmoschus esculentus* (L.)Moench.	Malvaceae	Bhinda
31	*Abutilon indicum* (L.) Sw.		Khapat, Kanski
32	*Abutilon fruticosum* Guill. Perr.		Zini khapat
33	*Gossypium herbaceum* L.		Kapas
34	*Gossypium arboreum* L. var. *Neglectum* L.		Deshi kapas
35	*Gossypium herbaceum* L. var.*Acerifolium* (Guill & Perr.) Che.		Kapas
36	*Hibiscus rosa-sinensis* L.		Jasud
37	*Hibiscus lobatus* (Murr.)O.Ktze.		Tali
38	*Pavonia odorata* Willd.		Sugandh Bala

39	*Sida cordata* (Burm.f) Borss.		Bhoyabala
40	*Sida acuta* Burm.f.		Bala
41	*Sida cordifolia* L.		Bala
42	*Sida ovata* Forsk.		Bala
43	*Sida retusa* L.		Bala
44	*Sida rhombifolia* L.		Bala
45	*Sida spinosa* L.		Bala
46	*Thespesia populnea* (L.)Soland.		Paras piplo
47	*Adansonia digitata* L.	Bombacaceae	Rukhdo
48	*Bombax ceiba* L.		Shimlo
49	*Dombeya acutangula* L.	Sterculiaceae	Bhadraksh
50	*Guazuma ulmifolia* Lam.		Khoto rudraksh
51	*Pterospermum acerifolium* Willd.		Kanak champo
52	*Waltheria indica* L.		---------
53	*Corchorus aestuans* L.	Tiliaceae	Chhunchh
54	*Corchorus capsularis* L.		Bor chhunchh
55	*Corchorus olitorius* L.		Nani chhunchh
56	*Corchorus depressus* (L.)Stocks.		Bahuphali
57	*Corchorus trilocularis* L.		Tridhari chhunchh
58	*Grewia villosa* Willd.		Parekhado
59	*Grewia hirsuta* Vahl, Symb.		Khad dhamni
60	*Triumfetta rhomboidea* Jacq.		Zipti

61	*Triumfetta pentandra* A.		Zipti
62	*Triumfetta rotundifolia* Lam.		Zipto
63	*Tribulus terrestris* L.	Zygophyllaceae	Gokhru
64	*Oxalis corniculata* L.	Oxalidaceae	Navari
65	*Impatiens balsmina* L.	Balsaminaceae	Tanmaniyoo
66	*Aegle marmelos* (L.) Corr.	Rutaceae	Bili
67	*Citrus limon* (L.) Burm.		Limbu
68	*Limonia acidissima* L.		Kotha
69	*Murraya koenigii* (L.) Spr.		Mitho limdo
70	*Murraya paniculata* (L.) Jacq.		Kamini
71	*Ailanthes excelsa* Roxb.	Simaroubaceae	Moto arduso
72	*Balanites aegyptiaca* (L.) Del.	Balanitaceae	Ingoriyo
73	*Azadirachta indica* A.Juss.	Meliaceae	Limdo
74	*Melia azedarach* L.		Bakam limdo
75	*Zizyphus nummularia* (Burm.f.)W.&A.	Rhamnaceae	Chanibor
76	*Ampelocissus latifolia* (Roxb.)Planch.	Vitaceae	Jangli draksh
77	*Cayratia carnosa* (Lam.)Gagnep.		Khat khatumbo
78	*Cardiospermum halicacabum* L.	Sapindaceae	Kagdolio
79	*Dodonaea viscosa* (L.) Jacq.		Jakhami
80	*Sapindus laurifolius* Vahl.Symb.		Aritha
81	*Lannea coromandelica* (Houtt.)		Moyno

	Merrill.		
82	*Mangifera indica* L.	Anacardiaceae	Ambo
83	*Moringa oleifera* L.	Moringaceae	Sargavo
84	*Abrus precatorius* L.	Fabaceae	Chanothi
85	*Alysicarpus monilifer* (L.) DC.		Samervo
86	*Alysicarpus longifolius* (Rottl.Ex. Spreng.) W. & A.		Moto samervo
87	*Alysicarpus bupleurifolius* (L.)DC.		Khad samervo
88	*Alysicarpus scarious* (Rottl. Ex.Spreng.) Grah. A.Socki.		Ruchhalo samervo
89	*Arachis hypogaea* L.		Magfali
90	*Butea monosperma* (Lam.)Taub.		Khakhro / Kesudo
91	*Cajanus cajan* (L.) Millsp.		Tuver
92	*Clitoria ternatea* L.		Garni
93	*Crotolaria orixensis* Willd.		Tripani, fatakiyo
94	*Crotolaria burshia* Buch. Ham.		Kharsani
95	*Crotolaria retusa* L.		Gughro
96	*Crotolaria juncea* L.		Shun
97	*Dalbergia latifolia* Roxb.		Sisam
98	*Dalbergia sissoo* Roxb.		Moto sisam
99	*Derris indica* (L.) Bennet. Syn.(*Pongamia pinnata* Pierre.)		Karanj
100	*Dolichos falcatus* L.		Valor
101	*Indigofera cordifolia* Heyne.		Gali

102	*Indigofera linifolia* Banker.		Bethi gali
103	*Indigofera linnaei* Ali.		Fatakiya / Bhoyan gali
104	*Indigofera tinctoria* L.		Gali
105	*Medicago sativa* L.		Lachko
106	*Melilotus alba* L.		Jangali methi
107	*Mucana prurita* HK.f.		Kuvech
108	*Pisum sativum* L.		Vatana
109	*Rhyncosia minima* (L.) DC.		Nanikamalvel
110	*Sesbania grandiflora* (L.)Poiret.		Agathio
111	*Sesbania sesban* (L.) Merr. Sub. Sp. *sesban* var. *Sesban*Gill.		Shevari
112	*Tephrosia purpurea* (L.) Pers.		Sarpankho
113	*Trigonella foenum- graecum* L.		Methi
114	*Zornia gibbosa* Span.		Samarapani
115	*Bauhinia acuminata* L.	Caesalpiniaceae	Kanchan
116	*Bauhinia purpurea* L.		Dev kanchanar
117	*Caesalpinia bonducella* Fleming.		Sagargota
118	*Caesalpinia crista* L.		Karkas
119	*Caesalpinia pulcherrima* (L.)Svt.Obs.		Galtoro
120	*Cassia auriculata* L.		Aval
121	*Cassia fistula* L.		Garmalo

122	*Cassia occidentalis* L.		Kasundro
123	*Cassia tora* L.		Kuvandio
124	*Cassia pumila* Lam.		Bethi chimed
125	*Delonix elata* (L.) Gamble.		Sandsro
126	*Delonix regia* (Boj.) Raf.		Gulmohar
127	*Parkinsonia aculeata* L.		Rambaval
128	*Peltophorum pterocarpum* (DC.) Baker.		Tamrafali
129	*Tamarindus indica* L.	Caesalpiniaceae	Amli
130	*Acacia auriculiformis* A.Cunn.	Mimosaceae	Australian baval
131	*Acacia nilotica* (L.) Del.		Baval
132	*Albizia lebbeck* (L.) Bth.		Siris
133	*Mimosa hamata* Willd.		Kaibaval
134	*Mimosa pudica* L.		Lajamani
135	*Parkia biglandulosa* W. & A.		Chanduphal
136	*Pitchecellobium dulce* (Roxb.)Bth.		Gorasamli
137	*Prosopis chilensis* (Molina)Stun.		Gando baval
138	*Samanea saman* (Jacq.) Merrill.		Rato sarasdo
139	*Rosa indica* L.	Rosaceae	Gulab
140	*Rosa alba* L.		Indian white rose
141	*Kalanchoe laciniata* DC.	Crsaaulaceae	----------
142	*Kalanchoe pinnata* (Lam.) Pers.		Panphuti
143	*Anogeissus latifolia* (Roxb.)Wall.	Combretaceae	Dhav

144	*Combretum coccineum* Lam.		Madhvel
145	*Quisqualis indica* L.		Madhumalti
146	*Terminalia arjuna* (Roxb.) W.& A.		Arjunsadad
147	*Terminalia catappa* L.		Badam
148	*Callistemon lanceolatus* DC.	Myrtaceae	Bottle brush
149	*Eucalyptus citriodora* HK.f.		Neelgiri
150	*Psidium guajava* L.		Jamfal
151	*Syzygium cumini* (L.) Skeels.		Jambu
152	*Ammannia baccifera* L.	Lythraceae	Jalagio
153	*Ammannia multiflora* Roxb.Hort.		Zinoagio
154	*Lawsonia inermis* L.		Mendhi
155	*Ludwigia parviflora* Roxb.	Onagraceae	----------
156	*Ludwigia perennis* L.		Panlavang
157	*Passiflora edulis* Sims.	Passifloraceae	Krishna kamal
158	*Passiflora foetida* L.		“
159	*Carica papaya* L.	Caricaceae	Papaya
160	*Citrullus colocynthis* (L.)Schrad.	Cucurbitaceae	Kadva indravarna
161	*Coccinia grandis* (L.) Voigt.Hort.		Tindora
162	*Ctenolepis cerasiformis* (Stocks.) HK.f.		Ankhfutamani
163	*Momordica charantia* L.		Karela
164	*Momordica dioica* Roxb.		Kankoda

165	*Mukia maderaspatana* (L.)M.Roem.		Chanak chibhadi
166	*Trichosanthes cucumerina* L.		Jangli parval
167	*Opuntia elatior* Mill.	Cactaceae	Fafdo thor
168	*Mollugo pentaphylla* L.	Molluginaceae	
169	*Mollugo nudicaulis* Lam.		
170	*Trianthema portulacastrum* L.	Aizoaceae	Satodo
171	*Coriandrum sativum* L.	Apiaceae	Kothmir
172	*Alangium salvifolium* (L.f.)Wang.	Alangiaceae	Ankol
173	*Anthocephalus indicus* A.Rich.	Rubiaceae	Kadamba
174	*Borreria stricta* (L.f.) Schum.		Ganthiyu
175	*Gardenia jasminoides* L.		Gandharaj
176	*Hamelia patens* Jacq.		
177	*Ixora arborea* Roxb.		Naveri
178	*Ixora coccinea* L.		Rati nevari
179	*Mitragyna parvifolia* (Roxb.)Korth.		Kadamb
180	*Oldenlandia corymbosa* L.		Pitpapdo
181	*Xeromphis spinosa* (Thunb.)Keay.		Mindhal
182	*Acanthospermum hispidum* DC.	Asteraceae	
183	*Artemisia maritima* L.		Kirmani
184	*Bidens biternata* (Loar.) Merr.B.		Kokadi
185	*Blumea eriantha* DC.		Kapuriyo kalhar

186	*Blumea lacera* (Burm.f.) DC.		Kapuriyo
187	*Chrysanthemum indicum* L.		Guldaoudi
188	*Echinops echinatus* Roxb.		Utkanto
189	*Eclipta prostrata* (L.) L.Mant.		Bhangro
190	*Grangea maderaspatana* (L.)Poir.		Zinki mundi
191	*Helianthus annus* L.		Suryamukhi
192	*Launaea procumbens* (Roxb.) R. & R.		Moti bhopatri
193	*Launaea sarmentosa* (Willd.)Alst.		Nani bhopatri
194	*Parthenium hysterophorus* L.		
195	*Sphaeranthus indicus* L.		Gorakhmundi
196	*Tagetes erecta* L.		Galgota
197	*Tridax procumbens* L.		Pardesi bhangro
198	*Vernonia anthelmintia* (L.)Willd.		Kaligiri
199	*Vernonia cinerea* (L.) Less.		Shadevi
200	*Xanthium strumarium* L.		Gokhru
201	*Plumbago zeylanica* L.	Plumbaginaceae	Safed chitrak
202	*Anagallis arvensis* L. Var.Coerulea L.	Primulaceae	
203	*Madhuca indica* J.F.	Sapotaceae	Mahudo
204	*Manilkara hexandra* (Roxb.)Dab.		Rayana
205	*Manilkara zapota* (L.) Van.		Chikoo

206	*Mimusops elengi* L.		Bakul
207	*Jasminum flexile* Vahl. Symb.	Oleaceae	Jui
208	*Jasminum multiflorum* (Burm.f.) Andr.		Bat mogro
209	*Nyctanthes arbortristis* L.		Parijatak
210	*Alstonia scholaris* (L.) R.Br.	Apocynaceae	Saptaparni
211	*Carissa congesta* Wt. Icon. T.		Karamda
212	*Catharanthus pusillus* (Murr.)G.Don.		Morali
213	*Catharanthus roseus* (L.) G.Don.		Barmasi
214	*Ervatamia divaricata* (L.)Burkill.		Taggar
215	*Nerium indicum* Mill.		Lal Karen
216	*Plumeria rubra* L.		Khad champo
217	*Plumeria acutifolia* Poir.		Champo
218	*Rouvolfia tetraphylla* L.		Sarpagandha
219	*Thevetia peruviana* (Pers.)Merill.		Pili karen
220	*Calotropis gigantea* (L.) R.Br.	Asclepiadaceae	Moto akdo
221	*Calotropis procera* (Ait.) R.Br.		Nano akdo
222	*Dregea volubilis* (L.f.) Bth.		Moti dodi
223	*Pergularia daemia* (Forsk.)Chiov.		Chamar dudheli
224	*Tylophora indica* (Burm.f.)Merill.		Damvel
225	*Cryptostegia grandiflora* R.Br.	Periplocaceae	Rubber vel

226	*Hemidesmus indicus* (L.) R.Br.		Dudhi
227	*Enicostema hyssopifolium* (Willd.) Verdoon.	Gentianaceae	Kadavinai
228	*Cordia dichotoma* Forst. F.Prodr.	Ehretiaceae	Vadgundo
229	*Cordia gharf* (Forsk.)E.&A.		Nana gunda
230	*Cordia sebestena* L.		Gunda
231	*Coldenia procumbens* L.	Boraginaceae	Okhrad
232	*Heliotropium indicum* L.		Hathi sundho
233	*Heliotropium ovalifolium* Forsk.		Nani hathi sundhi
234	*Trichodesma amplexicaule* Roth.		Undhafati
235	*Convolvulus microphyllus* (Roth.) Sieb.	Convolvulaceae	Dholi sahankhvali
236	*Evolvulus alsinoides* (L.) L.		Kali shankhavali
237	*Ipomoea obscura* (L.) Ker-Gawl.		Vad fudardi
238	*Ipomoea pes-tigridis* L.		Vagpadi
239	*Ipomoea quamoclit* L.		Kamini
240	*Ipomoea eriocarpa* R.Br.		Bodi fudardi
241	*Ipomoea fistulosa* Mart.		Besharmi
242	*Merremia gangetica* (L.)Cufod.		Underkani
243	*Cuscuta chinensis* Lam.	Cuscutaceae	Amarvel
244	*Cuscuta reflexa* Roxb.	Cuscutaceae	Amarvel
245	*Capsicum annum* Roxb.	Solanaceae	Marchi

246	*Cestrum diurnum* L.		Din ka raja
247	*Cestrum nocturnum* L.		Rat ni rani
248	*Datura innoxa* Mill.		Kalo dhanturo
249	*Datura metel* L.		Dhanturo
250	*Physalis minima* L.		Popti
251	*Solanum indicum* L.		Ubhi ringni
252	*Solanum melongena* L.		Ringan
253	*Solanum nigrum* L.		Piludi
254	*Solanum surattense* Burm.f.		Bho ringni
255	*Withania somnifera* (L.) Dunal.		Ashvagandha
256	*Lindernia ciliata* (Colsm.)Pennell.	Scrophulariaceae	Bhit chalti
257	*Lindernia oppositifolia* (Retz.)Mukerjee.		Nani bhit chalti
258	*Striga angustifolia* (D.Don).Saldhana.		Dholo agio
259	*Striga gesneroides* (Willd.)Vatke.		Rato agio
260	*Bignonia unguis* Cati Rehd.	Bignoniaceae	Nakhvel
261	*Millingtonia hortensis* L.		Desi buch
262	*Tecoma stans* (L.) H.B. & K.		Pili limbdi
263	*Pedalium murex* L.	Pedaliaceae	Ubhi gokharu
264	*Sesamum laciniatam* Klein		Vagadau tal
265	*Martynia annum* L.	Martyniaceae	Vinchhudo
266	*Adhatoda vasica* (L.) Nees.	Acanthaceae	Arduso
267	*Blepharis repens* (Vahl.) Roth.		Zinkuuntingon

268	*Hygrophila auriculata* (Schum.) Heine.		Kantashelio
269	*Justicia procumbens* L.		
270	*Lapidagathis trinervis* Wall.		Harancharo
271	*Peristrophe bicalyculata* (Retz.) Nees.		Kalianghedi
272	*Rungia pectinata* (L.) Nees.		Khadselio
273	*Ruellia tuberosa* L.		Fatakado
274	*Thunbergia erecta* (Bth.)T.Anders.		Mohan
275	*Clerodendrum inerme* (L.)Gaertn.	Verbenaceae	Vad Mendi
276	*Clerodendrum multiflorum* (Burm.f.) O.Ktze.		Arni
277	*Duranta repens* L.		Damyanti
278	*Gmelina arborea* Roxb.		Saven
279	*Lantana camara* L.		Indradhanu
280	*Phyla nodiflora* (L.) Greene.		Ratvelio
281	*Tectona grandis* L.		Sag
282	*Vitex negundo* L.	Verbenaceae	Nagod
283	*Leucas aspera* (Willd.) Spr.	Lamiaceae	Kubi
284	*Leucas cephalotes* (Roxb. Ex.Roth.) Spr.		Dosino kubo
285	*Leucas urticaefolia* R.Br.		Kubo
286	*Mentha piperita* L.		Vilayati Fudina
287	*Mentha spicata* L.		Fudino

288	*Moschosma polystachyum* (L.)Bth.		Avachi Bavchi
289	*Ocimum gratissimum* L.		Ramtulsi
290	*Ocimum sanctum* L.		Tulsi
291	*Ocimum basilicum* L.		Damro
292	*Boerhavia chinensis* (L.) Druce	Nyctaginaceae	Satodi
293	*Boerhavia diffusa* L.		Satodi
294	*Boerhavia verticillata* Poir.		Punarnava
295	*Bougainvillea glabra* DC.		Boganvel
296	*Bougainvillea spectabilis* Willd.		"
297	*Mirabilis jalapa* L.		Gulbas
298	*Achyranthes aspera* L.	Amaranthaceae	Anghedi
299	*Aerva sanguinolenta* (L.) Bl.Bljdr.		Gorakh ganjo
300	*Amaranthus lividus* L.		Tandaljo
301	*Amaranthus spinosus* L.		Katalo dhimdo
302	*Amaranthus viridis* L.		Dhimdo
303	*Celosia argentea* L.		Lapadi
304	*Digera muricata* (L.) Mant.		Kanegro
305	*Gomphrena globosa* L.		Batau
306	*Chenopodium album* L.	Chenopodiaceae	Chilni bhagi
307	*Basella rubra* L.	Basellaceae	Poi
308	*Antigonon leptopus* H. & Arn.	Polygonaceae	Ice cream
309	*Polygonum glabrum* Willd.		Okharad

310	*Dendrophthoe falcata* (L.f.)Etting.	Loranthaceae	Vando
311	*Santalum album* L.	Santalaceae	Chandan
312	*Acalypha wilkesiana*	Euphorbiaceae	
313	*A. hispida*		Ranchalo dudro
314	*Acalypha indica* L.		Vaichikanto
315	*Breynia retusa* (Dennst.) Alst.		Kamboi
316	*Chrozophora prostrata* Dalz.		Betho okhrad
317	*Croton bonplandianum* Baill.		Croton
318	*Drypetes roxburghii* (Wall.)Hurus.		Putranjivi
319	*Emblica officinalis* Gaertn.		Amla
320	*Euphorbia dracunculoides* Lam.		Ubhi dudheli
321	*Euphorbia hirta* L.		Nagla dudheli
322	*Euphorbia milli* Ch.		
323	*Euphorbia neriifolia* L.		Thor
324	*Euphorbia pulcherrima* L.		Lalpatti
325	*Euphorbia heterophylla* L.		Nani lalpatti
326	*Jatropha curcus* L.		Ratanjot
327	*Jatropha podagrica* Hook.		
328	*Jatropha gossypifolia* L.		Lal erandi
329	*Phyllanthus fraternus* Webster.		Bhonyamli
330	*Phyllanthus virgatus* J.G. Forst.		Moti Bhoi amli
331	*Ricinus communis* L.		Erand

332	*Holoptelia integrifolia* (Roxb.)Planch.	Ulmaceae	Kanjo
333	*Pilea microphylla* (L.) Liebm.		Chanapatti
334	*Ficus asperrima* Roxb.	Moraceae	Bhoi umbro
335	*Ficus bengalensis* L.		Vad
336	*Ficus racemosa* L.		Umaro
337	*Ficus hispida* L.f.		Dedhumaro
338	*Ficus elastica* L.		Rubber plant
339	*Ficus carica* L.		Anjir
340	*Ficus tsiela* Roxb.		Pipli
341	*Morus alba* L.		Shetur
342	*Casuarina equisetifolia* L.	Casuarinaceae	Sharu
343	*Zingiber officinale* Rosc.	Zingiberaceae	Aadu
344	*Musa paradisiaca* L.	Musaceae	Kela
345	*Canna indica* L.	Cannaceae	Kena
346	*Crinum asiaticum* L.	Amaryllidaceae	Nagdaman
347	*Pancratium triflorum* Roxb.		
348	*Agave americana* L.	Agavaceae	Ramban
349	*Polianthes tuberosa* L.		Gulchhadi
350	*Yucca gloriosa* L.		Yucca
351	*Aloe barbadensis* Mill.	Liliacae	Kunvarpatho
352	*Asparagus racemosus* Willd.		Satavari
353	*Gloriosa superba* L.		Kankasani
354	*Urginea indica* (Roxb.) Kanth.		Jangli Dungli

355	*Zephyranthes rosius*		
356	*Commelina bengalensis* L.	Commelinaceae	Motu sismuliu
357	*Commelina diffusa* Burm.f.		Nanu sismuliu
358	*Tradescntia zebrena* Hort.		
359	*Areca catechu* L.	Arecaceae	Supari
360	*Caryota urens* L.		Shiv jata
361	*Cocos nucifera* L.		Nariel
362	*Phoenix sylvestris* (L.) Roxb.		Khajuri
363	*Roystonea regia* (H.B. & K.) F.		Bottle pam
364	*Pandanus odoratissimus* L.f.	Pandanaceae	Kevro
365	*Alocasia indica* Schott.	Araceae	
366	*Colocasia esculenta* (L.) Schot.		Alavi
367	*Pothos scandens* L.		Money plant
368	*Lemna paucicostata* Hegelm.	Lamnaceae	
369	*Wolffia microscopia* (Griff.)Kurz.		
370	*Cyperus triceps* (Rottb.) Endl.	Cyperaceae	
372	*Cyperus rotundus* L.		Moth, Chido
373	*Scripus kysoor* Roxb.		
374	*Scleria stocksiana* L.		
375	*Aristida adscensionis* L.	Poaceae	Lapdu
376	*Andropogon annulatus* Forsk.		Jhinjavo
377	*Bothriochla pertusa* (L.) A.Camus.		Jinjvo
378	*Cenchrus biflorus* Roxb.		Motu Dharamnu

379	*Cenchrus ciliaris* L.		Jhino dhamramnu
380	*Chloris virgata* Sw.		
381	*Cynodon dactylon* Pers.		Dharo
382	*Eleusine indica* (L.) Gaertn.		Ukdo
383	*Setaria glauca* Beauv.		Ziptagrass
384	*Setaria tomentosa* (Roxb.)Kunth.		Kutra grass

- Total 384 plant species were collected in college campus.

❖ CARBON FOOTPRINT

- Number of persons using cycles - 200
- Number of persons using cars – 43
- Number of persons uses two wheelers – 305
- Number of persons using other transportations – 1500
- Expenditure for transportation per person per day (approx.)– Rs.20/-
- Parent-teacher meetings done in a year.

❖ LIST OF ECO FRIENDLY ACTIVITIES

- Planting and caring of trees in and around the campus.
- Timely disposal of wastes from the campus.
- Celebration of important days like World Environment Day, Ozone Day, with great importance.
- Management has decided to adopt green protocol
- Distribution of medicinal plant saplings among students
- Preparation and distribution of sapling during the monsoon season among the students.
- Bio Medical Waste is biggest challenge for Green environment, Address to this problem our Institute had taken inisetive district wise which collobration of Gemmi Govt.of Gujarat.

♦ MAJOR AUDIT OBSERVATIONS

- The environmental awareness initiatives are substantial.
- Installation of solar panels is adequate.
- The training in vegetable cultivation and composting are adequate.
- Gardens inside the college premises are found well maintained.
- Use of notice boards and signs are adequate to reduce over exploitation of natural resources.
- Programs on green initiatives have to be increased. Campus should have stringent actions for plastic free zone.
- Rain water harvesting systems, solar power generation, environmental education programs have to be strengthened.

♦ WATER AUDIT

- There is enough water consumption monitoring system in the college campus.
- The college has waste water treatment plant should maintain and function well.
- The waste water from canteen and kitchens are used for gardening.
- The college has to take actions to strengthen rain water harvesting. Measurement of quantity of water from the rain water harvesting should be done.
- Automatic switching system should install for pump sets used for overhead tank filling.
- Per day use of water should not be done in over wastage of water.
- Display boards against the misuse of water use are lacking.

♦ ENERGY AUDIT

- The communication process for awareness in relation to energy conservation is found inadequate.
- Assessment of electrical load calculation is yet to be done by the college.
- Objectives for reducing energy, water and fuel consumption should be done.
- The older generation and non energy efficient equipments should be replace with new energy efficient equipments.
- Regular monitoring of equipments and immediate rectification of any problems should be done as safety precaution in the campus.

ENERGY AUDIT

TUBELIGHT		WATTAGE		FAN		WATTAGE		COMPUTER	WATTAGE		BULB	WATTAGE		REFRIGERATOR	WATTAGE	A.C(5 STAR)	WATTAGE
REG	LED	REG	LED	REG.	EXHAUST	REGULAR AND EXHAUST	OLd		CFL	REG.	CFL	REG.	CFL				
0	179	0	20	183	0	0	0	125	65	0	71	0	9	1	250	2	450
3	0	120	0	2	0	106	0	0	0	0	0	0	0	0	0	0	0
1	1	40	20	2	1	186	0	0	0	2	1	50	0	0	0	0	0
6	1	240	20	9	0	477	0	0	0	3	1	45	15	0	0	0	0
2	0	80	0	1	0	53	0	1	65	0	0	0	0	0	0	0	0
2	0	80	0	4	0	212	0	4	260	0	0	0	0	0	0	0	0
1	0	40	0	1	0	53	0	1	65	0	0	0	0	0	0	0	0
11	2	440	40	6	0	318	0	0	0	0	0	0	0	1	295	0	0
1	1	40	20	1	1	133	0	2	130	0	0	0	0	0	0	0	0
9	1	360	20	7	1	451	0	0	0	0	0	0	0	0	0	0	0
3	0	120	0	2	0	106	0	1	65	0	0	0	0	0	0	0	0
0	0	0	0	2	0	106	0	0	0	0	0	0	0	0	0	0	0
3	0	120	20	3	1	239	0	1	65	0	0	0	0	1	295	0	0
5	1	200	20	3	1	239	0	0	0	0	0	0	0	0	0	0	0
1	0	40	0	1	1	133	0	0	0	0	0	0	0	0	0	0	0
2	0	80	0	2	1	186	0	0	0	0	0	0	0	0	0	0	0
1	0	40	0	5	0	265	0	0	0	0	0	0	0	0	0	0	0
4	0	160	0	4	2	372	0	0	0	0	0	0	0	0	0	0	0
0	1	0	20	1	0	53	0	1	65	0	0	0	0	0	0	0	0
1	1	40	20	2	0	106	0	1	65	0	0	0	0	0	0	0	0
4	3	160	60	1	3	293	0	0	0	0	0	0	0	0	0	0	0
5	4	200	80	1	3	293	0	0	0	0	0	0	0	0	0	0	0
6	1	240	20	0	3	240	0	0	0	0	0	0	0	0	0	0	0
1	0	40	0	0	0	0	0	0	0	0	0	0	0	1	295	0	0
1	0	40	0	1	0	53	0	0	0	1	0	15	0	0	0	0	0
2	0	80	0	1	1	133	0	0	0	1	0	15	0	0	0	0	0
2	0	80	0	1	1	133	0	0	0	0	0	0	0	0	0	0	0
1	0	40	0	1	0	53	0	0	0	0	0	0	0	0	0	0	0
8	0	320	0	2	0	106	0	0	0	0	0	0	0	0	0	0	0
4	0	160	0	4	3	452	0	0	0	0	0	0	0	0	0	0	0
1	0	40	0	2	0	106	0	0	0	0	0	0	0	0	0	0	0
1	1	40	20	2	0	106	0	0	0	0	0	0	0	0	0	0	0
4	1	160	20	7	2	531	0	0	0	0	0	0	0	0	0	0	0
4	5	160	100	5	0	265	0	0	0	0	0	0	0	0	0	0	0
0	5	0	100	9	0	477	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	110	0	0	0	0	0	0	0	0
3	0	120	0	1	0	133	0	17	5	0	0	0	0	0	0	0	0
4	2	160	40	4	0	212	0	4	260	0	0	0	0	0	0	0	0

1	2	40	40	2	0	106	0	3	195	0	0	0	0	0	0	1	1375
0	4	0	80	3	0	159	0	1	65	0	0	0	0	0	0	1	1375
3	0	120	0	2	0	106	0	0	0	0	0	0	0	0	0	0	0
5	3	200	60	10	0	530	0	0	0	0	0	0	0	0	0	0	0
5	0	200	0	7	0	371	0	0	0	0	0	0	0	0	0	0	0
4	2	160	40	8	0	424	0	0	0	0	0	0	0	0	0	0	0
9	1	360	20	12	0	636	0	6	390	0	0	0	0	0	0	0	0
0	10	0	200	8	0	424	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	169	0	0	0	0	0	0	0	0
0	4	0	80	6	0	318	0	26	0	0	0	0	0	0	0	0	0
1	0	40	0	2	0	106	0	0	0	0	0	0	0	0	0	0	0
1	0	40	0	0	0	0	0	0	0	2	0	30	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	**236**	**5440**	**1180**	**343**	**25**	**10560**	**0**	**194**	**2039**	**9**	**73**	**155**	**24**	**4**	**1135**	**4**	**3200**

WASTE AUDIT

- Solid waste management systems should be maintained.
- The college has proper communication with the local body for regular collection of solid waste from the campus.
- Implementation of sustainable projects to attain set environmental goals should to be place.
- Waste bins in the class rooms, veranda, canteen and campus are inadequate.
- Biogas plant should be established.
- Proper composting systems should be established.
- Green chemistry labs should be introduced.

GREEN CAMPUS AUDIT

- Regular planting of trees in the campus should be done.
- Display boards to identify plants.
- There are fruit trees in the college to attract birds.
- Registry for flora and fauna on the campus is lacking.

❖ AUDIT OF CARBON FOOT PRINT

- Encourage students and faculties to use cycles.

4. CONCLUSION AND RECOMMENDATION:-

❖ PREPARATION OF ACTION PLAN

Policies referring to college management and approaches towards the use of resources need to be considered. The college should have a green policy/environmental policy for its sustainable development. The environmental policy formulated by the management of the college should be implemented meticulously. The college should have a policy on awareness training programs and college also should have a procurement policy (the college's policy for purchasing materials).

❖ FOLLOW UP ACTION AND PLANS

Green Audits are exercises which generate considerable quantities of valuable management information. The time, effort and cost involved in this exercise are often considerable and in order to be able to justify this expenditure. It is important to ensure that the findings and recommendations of the audit are considered at the correct level within the campus and that action plans and implementation programs result from the findings. Audit follow up is part of the wider process of continuous improvement. Without follow-up, the audit becomes an isolated event which soon becomes forgotten in the pressures of management priorities and the passing of time.

❖ ENVIRONMENTAL EDUCATION

The following environmental education program may be implemented in the college before the next green auditing:-

- Training programs in solid waste management, liquid waste management, setting up of medicinal plant nursery, water management, vegetable cultivation, tree planting, energy management, landscape management, pollution monitoring methods, and rain water harvesting methods.
- Increase the number of display boards on environmental awareness such as save water, save electricity, no wastage of food/water, no smoking, switch off light and fan after use, plastic free campus etc.
- Activate and raise the environmental clubs.
- Set up model rainwater harvesting system, rainwater pits, vegetable garden, medicinal plant garden, paddy fields etc. for providing proper training to the students.
- Conduct exhibition of recyclable waste products.
- Implement chemical treatment system for waste water from the laboratories.
- Awareness on carbon consumption.
- Students and Staff members may be made totally aware of pollution caused by use of vehicles.
- The carbon consumption awareness programs on carbon emission at individual as well as social level will help to avoid air and noise pollution in the campus due to vehicles.

♦ RECOMMENDATIONS

The green audit assists in the process of testing performance in the environmental arena and is fast becoming an indispensable aid to decision making in a college. The green audit reports assist in the process of attaining an eco friendly approach to the sustainable development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices. A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of green campus and thus sustainable environment and community development. It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to management of the campus. An outside view, perspective and opinion often help staffs who have been too close to problems or methods to see the value of alternative approaches. A green audit report is a very powerful and valuable communications tool to use when working with various students who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur.

COMMON RECOMMENDATIONS

- Adopt an environmental policy for the college.
- Establish a purchase policy for environmental friendly materials.
- Introduce UGC Environmental course to all students.
- Conduct more seminars and group discussions on environmental education.
- Students and staff can be permitted to solve local environmental problems.
- Renovation of cooking system in the canteen to save gas.
- Establish water, waste and energy management systems.

CRITERIA WISE RECOMMENDATIONS WATER

- Remove damaged taps and install sensitive taps is possible.
- Establish rain water harvesting systems for each building.
- Maintain the water treatment systems.
- Awareness programs on water conservation to be conducted.
- Install display boards to control over exploitation of water.

ENERGY

- Employment of more solar panels and other renewable energy sources.
- Conduct more save energy awareness programs for students and staff.
- Replace computers and TVs with LED monitors.
- More energy efficient fans should be replaced.
- Observe a power saving day every year.
- Automatic power switch off systems may be introduced.

WASTE

- Establish a functional bio gas plant.
- A model solid waste treatment system to be established.
- Practice of waste segregation to be initiated.
- Establish a plastic free campus.
- Avoid paper plates and cups for all functions in the college.

GREEN CAMPUS

- Grow potted plants at both verandah and class rooms.
- Create automatic drip irrigation system during summerholidays.
- Not just celebrating environment day but making it a daily habit.
- Beautify the college building with indoor plants.
- Providing funds to the Nature Club for making campus greener.
- Encouraging students not just through words, but through action for making the campus greener.
- Conducting competitions among departments for making students, teaching-non teaching staffs more interested in making the campus greener.

CARBON FOOTPRINT

- Increase a system of car pooling among the staff to reduce the number of four wheelers coming to the college.
- Introduce college bus services to the students and staff members.
- Encourage students and staff member to use cycles.
- Establish a more efficient cooking system to save gas.
- Discourage the students using two wheelers for their commutation.

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- College Code No. 30 (D.P.)
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This is Certified to that Energy Audit Carried out by Students of the Institute Which is Certified by University External Examiner.

Date :24-07-2024

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CERTIFICATE

This is to certify that the project work entitled ENERGY AUDIT is carried out by students mentioned below, in partial fulfillment for the award of degree of Bachelor of Arts in Home Science during the academic year APRIL 2022. The project has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Arts.

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4847	F	DAMOR ARATIKUVARBA KALUBHAI	HOME SCI	BA0051821126
4848	F	DAMOR PINALBEN DAHYABHAI	HOME SCI	BA0051821127
4849	F	DAMOR SHAKUNTALABEN RAMABHAI	HOME SCI	BA0051821128
4850	F	DAMOR TALLIKABEN SHANABHAI	HOME SCI	BA0051821129
4851	F	KHANT KINJALBEN BABUBHAI	HOME SCI	BA0051821131
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PLACE: MODASA *DATE: 07-08-2018*

SIGNATURE OF GUIDE
PROF. DR. PIYUSH SINH

HEAD OF THE HOME SCIENCE DEPARTMENT ARTS COLLEGE, MODASA
SIGNATURE OF H.O.D

SIGNATURE OF EXAMINER

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PROJECT REPORT

Energy Audit

A Report Submitted To

GENARAL SCIENCE DEPARTMENT OF
SHRI S.K.SHAH AND SHRIKRISHNA O.M ARTS COLLEGE MODASA

Affiliated To

Hemchandracharya North Gujarat University, Patan Accredited By –

NAAC – " B+",Grade and (AAA) By 'A'

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Submitted By : **Project Guide :**

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Preface

Data collection for energy audit of the Shri S.K. Shah and Shrikrishna O.M. Arts College, Modasa Campus was conceded by team for the period of 15th June 2018 to 07 Aug 2018. This audit was over sighted to inquire about convenience to progress the energy competence of the campus. To drop of energy utilization whilst cultivate or humanizing comfort, health and safety were of prime anxiety. This audit required to recognize the mainly energy proficient appliances. Besides, several each day processes concerning common appliances have been provided which facilitate sinking the energy expenditure. The energy audit survey was completed by Dept. Of General Science. All data collected from each classroom, laboratory, every room. The work is completed by considering, how much tubes, fan, A.Cs, electronic instruments, etc in each room. How much was participation of each component in total electricity consumption.

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Acknowledgement

Head Department of General Science (Home Science) Shri S.K. Shah and Shrikrishna O.M. Arts College, Modasa is very much thankful to Principal D.H. Joshi, IQAC coordinator NAAC for motivating us for energy audit..

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Introduction:

A nation is trying to advance in quantity and quality to the spread of education among the common India and development of their intelligence. In India the entire field of education and other fields of intelligent activities had been monopolized by a handful of men before independence but today we are marching towards the desirable status of a developed nation with fast strides. But the development should be a sustained one. For achieving such an interminable development energy management is essential. As far as concerning electricity crisis, we are facing lack of electricity during office work. So, institutional management is taking design regarding production of electricity and saving electricity for eco- social aspect.

Energy requirement of India is growing and incomplete domestic fossil fuel treasury. The country has motivated strategy to enlarge its renewable energy resources and policy to establish the nuclear power plants. India increases the involvement of nuclear power to largely electrical energy development facility from 4.2% to 9%. India's industrial demand accounted for 35% of electrical power requirement, domestic household use accounted for 28%, agriculture 21%, commercial 9%, and public lighting and other miscellaneous applications accounted for the rest. Energy conservation means reduction in energy consumption without making any sacrifice of

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quantity or quality. A successful energy management program begins with energy conservation; it will lead to adequate rating of equipment's, using high efficiency equipment and change of habits which causes enormous wastages of energy. By observing all these study lack of electricity and huge electricity demands. It is necessary to plan to being self-sufficient in electricity requirement.

In the present study, college electricity audit has been done. In this study considered practical laboratory, instrument, Fans, air conditioners, Computers etc are considered in this study. We have studied total budget of the college, total economic investment of college on the electricity and total generation electricity from the solar wind hybrid electricity generation unit. Also, we have studied total saving of electricity and money from solar wind generation and requirement of solar energy. Also, it is studied that exact contribution of bulb, fans, computer, instruments etc. in the total requirement of electricity. We studied all these mentioned thinks by collecting exactly data form survey.

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Experimental and data collection:

All required data is collected by Department of Home Science. In building, in every room, how much fans, tubes, fans, computer, instrument AC, etc. will these is measured. According to survey following data is collected.

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Power Consumption of Electricity Board

Serial no	Month	Consumption Unit(KW)
1	Jan-18	**980**
2	Feb-18	**1320**
3	Mar-18	**1120**
4	Apri-18	**1130**
5	May-18	**1427**
6	June-18	**1527**
7	July-18	**804**
8	Aug-18	**904**
9	Spt-18	**950**
10	Oct-18	**1200**
11	Nov-17	**721**
12	Dec-17	**1195**
Total Power Consumption in yearly		**13478KW**
Average Power Consumption in Monthly		**1123.17KW**

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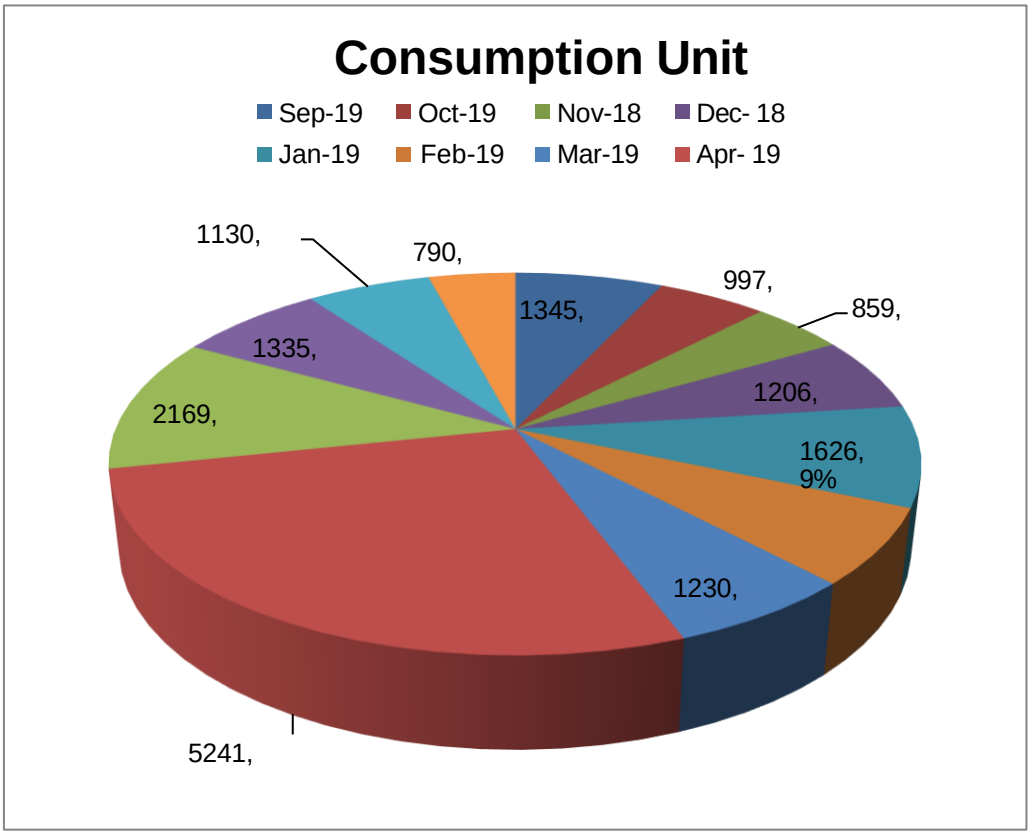
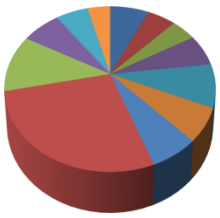


Graphically Representation of Electricity Distribution:-

Fig. Contribution of tube light, fan, computer, printer, AC and instrument in total use of energy by Graphical Representation

Power requirement met by renewable energy sources	Total power requirement	Renewable energy source	Renewable energy generated and used
15507.564 kW /Month (5 hrs/day)	480 units/Month	Hybrid Solar and Wind	480 units /Month



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Total requirement of electricity, generation of Electricity using renewable energy sources.-

Photograph of Renewable Energy Sources-

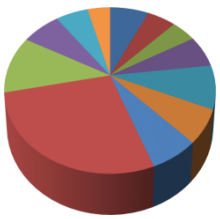

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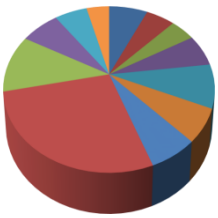
Fig- Solar Energy Generation system

Fig. Photograph of wind miles energy generation device

The hybrid energy generation devices contain a solar panel. The hybrid energy generation device generates 15 units per day. The college is now using 15 kW UPS and batteries for energy storage Save Energy (Dr, Anil Patel sir) : He gave information about solar energy and its importance for future generation, as well as he informed us about government scheme like solar rooftop scheme, energy light bill prepaid smart meter project.



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Conclusion:

In conclusion, data generated in energy audit are useful for to understand the energy distribution and utilization of college. The college needs maximum 1123.17 KW/Month of electricity. In other words college needs 13478 kW/Year and hybrid energy generation device generate the only 480 units/moths.

Recommendation:

1) Replace all CFL Tube light using LED Bulb, to save more power.
2) Replace CRT monitor using LED or LCD monitor.
3) Separate connection of office, Computer Lab. and classroom.

Results and discussion(Expected) :

As far concerning the energy audit, electricity audit is main concern regarding educational institution. We have collected data by considering the tube light, fan, computer, printer, A.C and instruments. The total required energy is **: 15507.564**.Energy Consumption through all device is **1123.17 kw /Month** and Hybrid Renewable source Generate **480 Unit/Month**.

SIGNATURE OF GUIDE
PROF. DR. PIYUSH SINH

HEAD OF THE SCIENCE DEPARTMENT
ARTS COLLEGE, MODASA
SIGNATURE OF H.O.D

SIGNATURE OF EXAMINER

Principal
Shri S.K.Shah & Shrikrishna
O.M. Arts College,Modasa (Aravalli)

June 2018

Bio-medicalWaste InventorizationofHealthcare Units

FINAL REPORT

STUDY AREA: ARAVALLI DISTRICT

Submitted to:

Gujarat Environment Management Institute
(An Autonomous Institute of Government of Gujarat)

Prepared and Submitted by:

SHRI S.K. SHAH AND SHRIKRISHNA O.M. ARTS COLLEGE

Address:College Campus, MODASA - 3833115

Contact Details:

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Shri S.K. Shah & Shrikrishna O.M. Arts College Modasa Dist.Aravalli

Principal
Shri S.K.Shah & Shrikrishna
O.M. Arts College,Modasa (Aravalli)

ACKNOWLEDGMENT

Dr. D. H. Joshi

Principal

Shri S.K. Shah and Shrikrishna O.M. Arts College, Modasa

Since 1968, the college has been bifurcated into two separate independent units and the present Shri S.K. Shah and Shrikrishna O.M. Arts College came into being afresh. The college, at present has physical, inner and psychic energy potentials required for any Academic Organization. Generally, the scenario of education lacks the understanding of the deeper layers of our reality. The system of education has been strong the externals, weak on the internals. But, as an academic institution, I dare say, we have a positive attitude experimentation and innovation. We encourage improved teaching learning practices. We appreciate an overgrowing sensitivity to community and global concern

Bio- Medical Waste Management is a crucial challenge faced by all hospitals and health

centres which lead become major issue for environment. We present this report on "Biomedical waste inventorization of Aravalli District", as a step towards sensitizing the hospital professionals and support staff and Society on management of bio-medical waste. This Report is the result of sincere and hard work of all the team members. We are grateful to Gujarat Environment Management Institute (GEMI), Gandhinagar for

sponsoring this project and showing faith in my entire team to undertake the task of preparing this report.

Prof. P. B. Garasiya

Project Coordinator

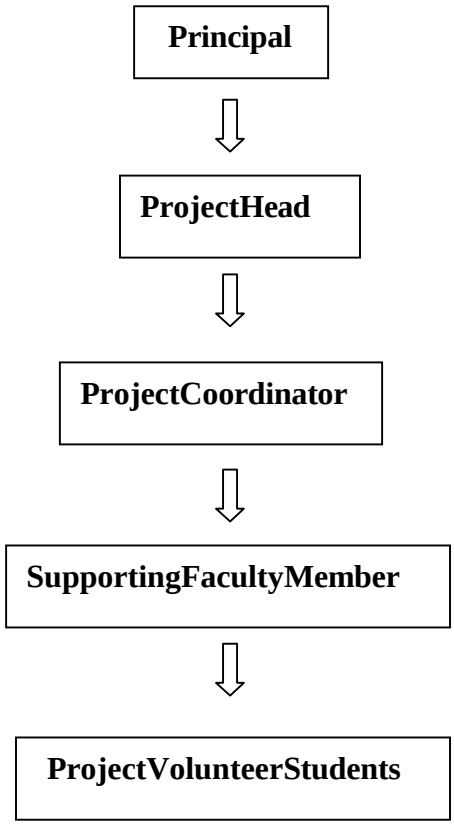
We are happy to submit the report of **"BIOMEDICAL WASTE INVENTORIZATION OF ARAVALLI DISTRICT**", all type health centre of Arvalli district, Gujarat. The work of **"BIOMEDICAL WASTE INVENT ORIZATION OF ARAVALL IDISTRICT**", of Arvalli district, Gujarat , given by the agency of Gujarat Environment Management Institute (GEMI) to our Shri S.K. Shah and Shrikrishna O.M. Arts College managed by The M L Gandhi Higher Education Society, Modasa, Arvalli district, Gujarat during the year2018-19. This surveyis completed under the guidance of our college Principal Dr. D. H. Joshi For this project work, we form the committee under my coordination. Three other member in this committee are Dr. P. R. Sinh, Associate professor in Home Scinece, Prof K. H. Patel, Assistant Professor in Home Scinece. Aravalli district having six taluka Modasa, Bayed, Bhiloda, Meghraj and Malpur. Each taluka having number of villages 676 Most of them are very interior. So to complete the survey was very difficult and more timing even though we were distributed work between our committee members in such a way that project work will complete within time as per taluka. We involve college student for the survey of this project work to finish smoothly. Our students including girls actively participated in this work. During this project work students and all our committee member benefited to interact with medical officers, laboratory technicians and other staff which are engaged with different health centre. We presented our work in this report as per Performa suggested by GEMI. Here we very much thankful to GEMI who has gave opportunity to Students to study the Environmental challenges in this field. I also thankful to our college principal Dr. D.H. Joshi, all committee members and volunteers students who were engaged with this project work actively participated.

Coordinator
Prof. P. B. Garasiya
(Associate professor)
(Shri S.K. Shah and Shrikrishna O.M. Arts College,Modasa)

“BIOMEDICALWASTEINVENTORIZATIONOFARAVALLIDISTRICT”,

PROJECTTEAM

DETAILSOFMANPOWER:ORGANOGRAM



List ofTeam(Faculty)

No	Name	Designation	Mob.No.
1	Dr. D. H. Joshi	Principal	9328865745
2	Dr. P. R. Sinh	Project Head	9727612356
3	Dr. P. B. Garasiya	Project Coordinator	9409075936
4	Dr. K. H. Patel	Project Cocordinator	6355343577
5	Shri C. V. Damor	Member	9978921574
6	Shri T. N. Ansari	Member	8200154747
7	Shri J. S. Upadhyay	Member	8160866190

ListofStudent'sTeam(Girls)

No	Name	Taluka	M.no.	Roll No.
1	CHAUHAN SHIVANI KAMLESHBHAI	MODASA	8980571066	7453
2	DAMOR ASHABEN RAMANBHAI	MODASA	9586283949	7454
3	DAMOR LILABAHEN BHAVANBHAI	DHANSURA	9726437292	7455
4	DAMOR SAJANBAHEN MANABHAI	BHILODA	9909706195	7456
5	DAMOR SAVITABEN SOMABHAI	MEGHRAJ	9727402247	7457
6	KAPADIYA VIBHABAHEN AMRUTBHAI	BHILODA	9898933749	7458
7	MAKVANA SEJALBEN KANTILAL	DHANSURA	8980919660	7459
8	MODHPATEL MANISHABAHEN RAMANLAL	BAYAD	9687125863	7460
9	PARMAR SHVETABEN VALJIBHAI	MALPUR	9925211901	7461
10	PUJARA PINKIBEN RAYSANGBHAI	BAYAD	9913120046	7462
11	PUNJARA RADHABEN BALUBHAI	BAYAD	8469791471	7463
12	RATHOD FALGUNIKUMARI RAMESHBHAI	DHANSURA	9638807291	7464
13	SOLANKI BHAVANABEN CHIMANBHAI	MEGHRAJ	9925646861	7465
14	SOLANKI MINAXIBEN BALVANTSINH	BHILODA	9408013923	7466
15	VANAKR SEJALBEN MATHURBHAI	BAYAD	9328446968	7467

Abbreviations

APCD	**-**	**Air Pollution Control Device**
BMWM Rules	**-**	**Bio-medical Waste Management Rules**
CBWTF	**-**	**Common Bio-medical Waste Treatment and Disposal Facility**
CO	**-**	**Carbon Monoxide**
CO2	**-**	**Carbon Dioxide DG - Diesel Generator**
EC	**-**	**Environmental Clearance**
EIA	**-**	**Environment Impact Assessment ETP- Effluent Treatment Plant**
GPCB	**-**	**Gujarat Pollution Control Board GPS- Global Positioning System**
HCFs	**-**	**Health Care Facilities HCU- Health Care Unit**
MoU	**-**	**Memorandum of Understanding**
NABL	**-**	**National Accreditation Board for Testing and Laboratories**
NOx	**-**	**Oxides of Nitrogen**
O2	**-**	**Oxygen**
PCC	**-**	**Pollution Control Committee**
PLC	**-**	**Programmable Logical Control**
SEIAA	**-**	**State Environment Impact Assessment Authority**
SLF	**-**	**Secured Landfill**
TSDF	**-**	**Treatment Storage and Disposal Facility**
TOC	**-**	**Total Organic Carbon**
VOCs	**-**	**Volatile Organic Compounds**

CHAPTER1

INTRODUCTIONTOBIO-MEDICALWASTE

Biomedical waste management has recently emerged as an issue of major concern not only to hospitals, nursing home authorities, but also to the environment. The bio-medical wastes generated from health care units depend upon a number of factors such as waste management methods, type of health care units, occupancy of healthcare units, specialization of healthcare units, ratio of reusable items in use, availability of infrastructure and resources, etc.

The proper management of biomedical waste has become a worldwide humanitarian topic today. Although hazards of poor management of biomedical waste have aroused the concern world over, especially in the light of its far-reaching effects on human health and the environment.

Now it is a well-established fact that there are many adverse and harmful effects to the environment, including human beings, which are caused by the “Hospital waste” generated during patient care. Hospital waste is a potential health hazard to the healthcare workers, public, and flora and fauna of the area. The problems of the waste disposal in the hospitals and other health-care institutions have become issues of increasing concern.

The Bio-Medical Waste (Management and Handling) Rules, 1998 are conferred by Section 6, 8, 25 of the Environment (Protection) Act, 1986 (29 of 1986).

In India, the Bio-medical Waste (Management and Handling) Rules, 1998 and further amendments were passed for the regulation of bio-medical waste management. On 28th March 2016, Biomedical Waste Management Rules, 2016 were also notified by the Central Government. Each state's Pollution Control Board or Pollution Control Committee will be responsible for implementing the new legislation.

SOURCES OF BIOMEDICALWASTE

Hospitals produce waste, which is increasing over the years in its amount and type. The hospital waste, in addition to the risk for patients and personnel who handle them also poses a threat to public health and environment.

Major Sources

- Government hospitals / Private hospitals / Nursing homes / Dispensaries
- Primary health centres
- Medical colleges and research centres / Paramedic services
- Veterinary colleges and animal research centres
- Blood banks / Mortuaries / Autopsy centres
- Biotechnology institutions
- Production units

Minor Sources

- Physicians / Dentists' clinics
- Animal houses / Slaughterhouses
- Blood donation camps
- Vaccination centres
- Acupuncturists / Psychiatric clinics / Cosmetic piercing
- Funeral services
- Institutions for disabled persons

ADVERSEEFFECTS

A major issue related to current Bio-Medical waste management in many hospitals is that the implementation of Bio-Waste regulation is unsatisfactory as some hospitals are disposing of waste in a haphazard, improper and indiscriminate manner. Lack of segregation practices results in mixing of hospital wastes with general waste making the whole waste stream hazardous. Inappropriate segregation ultimately results in an incorrect method of waste disposal.

Disposal of this waste is an environmental concern, as many medical wastes are classified as infectious or bio hazardous and could potentially lead to the spread of infectious disease. The most Common danger for humans is the infection which also affects other living organs in the region. Daily exposure to the waste (landfill) leads to accumulation of harmful substances or microbes in the person's body.

Biomedical waste may pose an injury and exposure risks via occupational contact with medical waste for doctors, nurses, janitorial, laundry and refuse workers. Further, there are opportunities for the general public to come into contact with medical waste, such as needles, used illicitly outside healthcare settings or biomedical waste generated via home health care.

1.3. CLASSIFICATION OF BMW

Table 1.1 Classification of Bio-medical Waste

Category	Type of waste	Type of bag or container	Treatment and disposal option
Yellow	Human tissues, organs, body parts, and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).	Yellow-colored, non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or Deep Burial
	Animal Anatomical Waste : Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.		
	Soiled Waste: Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components.		Incineration, plasma pyrolysis, or deep burial. In the absence of the above facilities, autoclaving or microwaving/hydroclaving followed by shredding or mutilation, or a combination of sterilization and shredding. Treated waste should be sent for energy recovery.
	Expired or Discarded Medicines: Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.	Yellow-colored, non-chlorinated plastic bags or containers	Expired cytotoxic drugs and items contaminated with cytotoxic drugs should be returned to the manufacturer or supplier for incineration at a temperature >1200°C. Alternatively, they can be sent to a common bio-medical waste treatment facility or a hazardous waste treatment, storage, and disposal facility for incineration at >1200°C, encapsulation, or plasma pyrolysis at >1200°C. All other discarded medicines should either be sent back to the manufacturer or disposed of by incineration.
Yellow	**Chemical Waste:** Chemicals used in production of biological and used or discarded disinfectants.	Yellow-colored containers or non-chlorinated plastic bags	Disposed of by Incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility .

	Chemical Liquid Waste: Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X - ray film developing liquid, discarded Formalin, infected secretions, aspirated body fluids , liquid from laboratories an d floor washings, cleaning, house - keeping and disinfecting activities etc.	Separate collection system leading To effluent treatment system	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms given in Schedule III.
	Discarded linen, mattresses, beddings contaminated with blood or body fluid.	Non-chlorinated yellow plastic bags or suitable packing material	Non-chlorinated chemical disinfection followed by incineration or plasma pyrolysis or energy recovery. In the absence of the above facilities, shredding or mutilation, or a combination of sterilization and shredding. Treated waste should be sent for energy recovery or incineration or plasma pyrolysis.
Red	Contaminated Waste (Recyclable) Wastes Generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes), and vacutainers (with their needles cut) and gloves.	Red-colored, non-chlorinated plastic bags or containers	Autoclaving or microwaving / hydroclaving followed by shredding or mutilation, or a combination of sterilization and shredding. Treated waste should be sent to registered or authorized recyclers, or for energy recovery, or plastics to diesel or fuel oil, or for road making, whichever is possible. Plastic waste should not be sent to landfill sites.
White (Transluce nt)	Waste sharps, including metals: Needles, syringes with fixed needles, needles from needle tip cutters or burners, scalpels, blades, or any other contaminated sharp object that may cause punctures and cuts. This includes both used, discarded, and contaminated metal sharps.	Puncture proof, Leak proof, tamper proof containers	Autoclaving or dry heat sterilization followed by shredding, mutilation, or encapsulation in a metal container or cement concrete; a combination of shredding and autoclaving; and then sent for final disposal to iron foundries (having consent to operate from the State Pollution Control Boards or Pollution Control Committees), sanitary landfills, or designated concrete waste sharp pits.

(Source:BMWRules,2016)

BIOMEDICAL WASTE MANAGEMENT PROCESS

There is a big network of Health Care Institutions in India. The hospital waste like body parts, organs, tissues, blood and body fluids along with soiled linen, cotton, bandage and plaster casts from infected and contaminated areas are very essential to be properly collected, segregated, stored, transported, treated and disposed of in safe manner to prevent nosocomial or hospital acquired infection.

1. Waste collection
2. Segregation
3. Transportation and storage
4. Treatment & Disposal
5. Transport to final disposal site
6. Final disposal

BIOMEDICAL WASTE TREATMENT ANDDISPOSAL

Health care waste is a heterogeneous mixture, which is very difficult to manage as such. But the problem can be simplified and its dimension reduced considerably if a proper management system is planned.

INCINERATION TECHNOLOGY

This is a high-temperature thermal process employing combustion of the waste under controlled conditions for converting them into inert material and gases. Incinerators can be oil-fired, electrically powered, or a combination thereof. Broadly, three types of incinerators are used for hospital waste: multiple hearth type, rotary kiln, and controlled air types. All the types can have Primary and secondary combustion chambers are used to ensure optimal combustion. These are refractory-lined.

NON-INCINERATION TECHNOLOGY

Non-incineration treatment includes four basic processes: thermal, chemical, irradiative, and biological. The majority of non-incineration technologies employ the thermal and chemical processes. The main purpose of the treatment technology is to decontaminate waste by destroying pathogens. Facilities should make certain that the technology could meet state criteria for disinfection.

AUTO CLAVING

- The autoclave operates on the principle of the standard pressure cooker.
- The process involves using steam at high temperatures.
- The steam generated at high temperature penetrates waste material and kills all the microorganisms.
- These are also of three types: Gravity type, Pre-vacuum type, and Retort type.

In the first type (Gravity type), air is evacuated with the help of gravity alone. The system operates with temperature of 121 deg. C. and steam pressure of15 psi. for 60-90 minutes. Vacuum pumps are used to evacuate air from the Pre vacuum autoclave system so that the time cycle is reduced to 30-60 minutes. It operates at about 132 deg. C. Retort type autoclaves are designed much higher steam temperature and pressure. Autoclave treatment has been recommended for microbiology and biotechnology waste, waste sharps, soiled and solid wastes. This technology renders certain categories (mentioned in the rules) of bio-medical waste innocuous and unrecognizable so that the treated residue can be land filled.

MICRO WAVEIRRADIATION

- The microwave is based on the principle of generation of high-frequency waves.
- These waves cause the particles within the waste material to vibrate, generating heat.
- This heat generated from within kills all pathogens.

CHEMICAL METHODS

- 1% hypochlorite solution can be used for chemical disinfection.

PLASMAPYROLYSIS

Plasma pyrolysis is a state-of-the-art technology for safe disposal of medical waste. It is an environment-friendly technology, which converts organic waste into commercially useful byproducts. The intense heat generated by the plasma enables it to dispose all types of waste including municipal solid waste, biomedical waste and hazardous waste in a safe and reliable manner. Medical waste is Pyrolyzed into CO, H2, and hydrocarbons when it comes in contact with the plasma-arc. These gases are burned and produce a high temperature (around $1200^{o}C$).

1.5. CHALLENGES IN BIO-MEDICAL WASTE MANAGEMENT

In India, there are a number of different disposal methods. For example, if body fluids are present, the material needs to be incinerated or put into an autoclave. Although this is the proper method, most medical facilities fail to follow the regulations. It is often found that biomedical waste is put into the ocean, where it eventually washes up on shore or in landfills due toimproper sorting done in the medical facility. Improper disposal can lead to many diseases in animals as well as humans. For example, animals, such as cows in Pondicherry, India, are consuming the infected waste and eventually, these infections can be transported to humans.

A major issue related to current bio-medical waste management in many hospitals is that the implementation of bio-waste regulations is unsatisfactory, as some hospitals are disposing of waste in a haphazard, improper, and indiscriminate manner. The lack of segregation practices results in the mixing of hospital wastes with general waste, making the entire waste stream hazardous. Inappropriate segregation ultimately leads to incorrect methods of waste disposal.

Inadequate bio-medical waste management will thus cause environmental pollution, unpleasant smells, and the growth and multiplication of vectors like insects, rodents, and worms. It may also lead to the transmission of diseases like typhoid, cholera, hepatitis, and AIDS through injuries from syringes and needles contaminated with human fluids.

Various communicable diseases which spread through water, sweat, blood, body fluids and contaminated organs should be prevented. The Bio Medical Waste scattered in and around the hospitals invites flies, insects, rodents, cats and dogs that are responsible for the spread of communication diseases like plague and rabies. Rag pickers in the hospital, sorting out the garbage are at a risk of getting tetanus and HIV infections. The recycling of disposable syringes, needles, IV sets and other articles like glass bottles, without proper sterilization, are responsible for Hepatitis, HIV, and other viral diseases. It becomes primary responsibility of Health administrators to manage hospital waste in most safe and eco-friendly manner.

The problem of bio-medical waste disposal in the hospitals and other healthcare establishments has become an issue of increasing concern, prompting hospital administration to seek new ways of scientific, safe and cost effective management of the waste and keeping their personnel informed about the advances in this area. The need of proper hospital waste management system is of prime importance and is an essential component of quality assurance in hospitals

1.6 OBJECTIVE OF THE PROJECT

- To prepare a detailed category wise inventory of the bio-medical waste generated within HCU's of Aravalli district. (only for Modasa, Meghraj, Malpur, Dhansura, Bayad and Bhiloda Taluka)
- To classify the waste as per different categories according to Bio-medical Waste Rules, 2016.
- To identify, study and document the current waste handling, management, and treatment and disposal practices.
- To submit a comprehensive report.

1.7 SCOPE OF THE WORK

- Preparation of list of Health Care Units (HCUs)as per Bio-medical Waste Rules, within the district
- Conducting an on-field (physical) survey of the HCUs as per the questionnaire provided by GEMI.
- Analysis of the survey in excel sheet format.
- To identify, study and document the current waste handling, management, and treatment and disposal practices.
- Generate the report as per the format provided by GEMI.

CHEPTER-2

LEGAL FRAME WORK (ABOUT BIO-MEDICAL WASTE RULES, 2016)

G.S.R. 343(E).-Whereas the Bio-Medical Waste (Management and Handling) Rules, 1998 was published *vide* notification numberS.O.630(E)datedthe20thJuly,1998,bytheGovernmentof IndiaintheerstwhileMinistryofEnvironmentandForests,providedaregulatoryframeworkfor management of bio-medical waste generated in the country; and whereas, to implement these rules more effectively and to improve the collection, segregation, processing, treatment and disposal of these bio-medical wastes in an environmentally sound management thereby, reducing the bio- medical waste generation and its impact on the environment, the Central Government reviewed the existing rules; and whereas, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government published the draft rules in the Gazette vide number G.S.R. 450 (E), dated the 3rd June, 2015 inviting objections or suggestions from the public within sixty days from the date on which copies of the Gazette containing the said notification were made available to the public, And whereas, The copies of the Gazette containing the said draft rules were made available to the public on the 3rd June 2015. and whereas the objections or comments received within the specified period from the public in respect of the said draft rules have been duly considered by the Central Government. Now, therefore, in exercise of the powers conferred by Sections 6, 8, and 25 of the Environment (Protection) Act, 1986 (29 of 1986), and in supersession of the Bio-Medical Waste (Management and Handling) Rules, 1998, except as respects things done or omitted to be done before such supersession, the Central Government hereby makes the following rules, namely:-

1. **Short Title and Commencement-**

(1) These rules may be called the Bio-Medical Waste Management Rules, 2016.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. **Application.-**

These rules shall apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste in any form including hospitals, nursing homes, clinics, Dispensaries, Veterinary institutions, Animal houses, Pathological laboratories, Blood banks, AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy)

hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.

(1) These rules shall not apply to,-

(a) Radioactive wastes as covered under the provisions of the Atomic Energy Act, 1962(33of 1962) and the rules made there under;

(b) Hazardous chemicals covered under the Manufacture, Storage, and Import of Hazardous Chemicals Act Chemicals Rules, 1989 made under the Act;

(c) Solid wastes covered under the Municipal Solid Waste(Management and Handling)Rules, 2000 made under the Act;

(d) The lead acid batteries covered under the Batteries (Management and Handling) Rules, 2001 made under the Act;

(e) Hazardous wastes covered under the Hazardous Wastes (Management Handling and Tran boundary Movement) Rules, 2008 made under the Act.

(f) Waste covered under the-Waste(Management and Handling)Rules,2011madeunderthe Act; and

(g) Hazardous micro organisms, genetically engineered microorganisms and cells covered under the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Micro organisms or Cells Rules, 1989 made under the Act.

3. **Definitions.-**In these rules, unless the context to the revise requires,-

(a) "Act" means the Environment (Protection)Act,1986(29of1986);

(b) "animal house" means a place where animals are reared or kept for the purpose of experiments or testing;

(c) "authorization" means permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, processing, disposal or another form of handling of bio-medical waste in accordance with these rules and guidelines issued by the Central Government or Central Pollution Control Board as the case may be;

(d) "authorized person" means an occupier or operator authorized by the prescribed authority to generate, collect, receive, store, transport, treat, process, dispose or handle bio-medical waste in accordance with these rules and the guidelines issued by the Central Government or the Central Pollution Control Board, as the case may be;

(e) "biological" means any preparation made from organisms or micro-organisms or product of metabolism and biochemical reactions intended for use in the diagnosis, immunization or the treatment of human beings or animals or in research activities pertaining thereto;

(f) "bio-medical waste" means any waste, which is generated during the diagnosis, treatment or Immunization of human beings or animals, or research activities pertaining thereto or in the production or testing of biological or in health camps, including the categories mentioned in Schedule I appended to these rules;

(g) "bio-medical waste treatment and disposal facility" means any facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment and disposal is carried out, and includes common bio-medical waste treatment facilities;

(h) “Form “means the Form appended to these rules;

(i) “handling” in relation to bio-medical waste includes the generation, sorting, segregation, collection, use, storage, packaging, loading, transportation, unloading, processing, treatment, destruction, conversion, or offering for sale, transfer, disposal of such waste;

(j) “health care facility” means a place where diagnosis, treatment or immunization of human beings or animals is provided irrespective of type and size of health treatment system, and research activity pertaining thereto;

(k) “major accident” means accident occurring while handling of bio-medical waste having potential to affect large masses of public and includes toppling of the truck carrying bio-medical waste, accidental release of bio-medical waste in any water body but exclude accidents like needle prick injuries, mercury spills.

(l) “management” includes all steps required to ensure that bio- medical waste is managed in such a manner as to protect health and environment against any adverse effects due to handling of such waste.

(m) "occupier" means a person having administrative control over the institution and the premises generating bio-medical waste, which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and clinical establishment, irrespective of their system of medicine and by whatever name they are called;

(n) "operator of a common bio-medical waste treatment facility" means a person who owns or Controls a Common Bio-medical Waste Treatment Facility (CBMWTF) for the collection,

reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste;

(o) “prescribed authority” means the State Pollution Control Board in respect of a State and Pollution Control Committees in respect of an Union territory;

(p) "Schedule" means the Schedule appended to these rules.

4. **Duties of the Occupier.-**It shall be the duty of every occupier to-

(a) take all necessary steps to ensure that bio-medical waste is handled without any adverse effect to human health and the environment and in accordance with these rules;

(b) make a provision within the premises for a safe, ventilated and secured location for storage of segregated biomedical waste in colored bag so containers in them anneals specified in Schedule I, to ensure that there shall be no secondary handling, pilferage of recyclables or inadvertent scattering or spillage by animals and the bio-medical waste from such place or premises shall be directly transported in the manner as prescribed in these rules to the common bio-medical waste treatment facility or for the appropriate treatment and disposal, as the case may be, in the manner as prescribed in Schedule I;

(c) pre-treat the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or Sterilization on-site in the manner as prescribed by the World Health Organization (WHO)or National AIDs Control Organization(NACO)guidelines and then sent to the common bio-medical waste treatment facility for final disposal;

(d) phase out use of chlorinated plastic bags, gloves and blood bags within two years from the date of notification of these rules;

(e) dispose of solid waste other than bio-medical waste in accordance with the provisions of respective waste management rules made under the relevant laws and amended from time to time;

(f) motto give treated bio-medical waste with municipal solid waste;

(g) provide training to all its health care workers and others, involved in handling of bio medical waste at the time of induction and thereafter at least once every year and the details of training programmes conducted, number of personnel trained and number of personnel not under gone any training shall be provided in the Annual Report;

(h) immunize all its health care workers and others, involved in handling of bio-medical waste for protection against diseases including Hepatitis B and Tetanus that are likely to be transmitted

by handling of bio-medical waste, in the manner as prescribed in the National Immunization Policy or the guidelines of the Ministry of Health and Family Welfare issued from time to time;

(i) establish a Bar- Code System for bags or containers containing bio-medical waste to be sent out of the premises or place for any purpose within one year from the date of the notification of these rules;

(j) ensure segregation of liquid chemical waste at source and ensure pre-treatment or neutralization prior to mixing with other effluent generated from health care facilities;

(k) ensure treatment and disposal of liquid waste in accordance with the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974);

(l) ensure occupational safety of all its health care workers and others involved in handling of biomedical waste by providing appropriate and adequate personal protective equipments;

(m) conduct health check up at the time of induction and at least once in a year for all its health care workers and others involved in handling of bio- medical waste and maintain the records for the same;

(n) maintain and update on day to day basis the bio-medical waste management register and display the monthly record on its website according to the bio-medical waste generated in terms of category and colour coding as specified in Schedule I;

(o) report major accidents including accidents caused by fire hazards, blasts during handling of biomedical waste and the remedial action taken and the records relevant thereto, (including nil report) in Form I to the prescribed authority **and also** along with the annual report;

(p) make available the annual report on its web-site and all the health care facilities shall make own website within two years from the date of notification of these rules;

(q) inform the prescribed authority immediately in case the operator of a facility does not collect the bio-medical waste within the intended time or as per the agreed time;

(r) establish a system to review and monitor the activities related to bio-medical waste management, either through an existing committee or by forming a new committee and the Committee shall meet once in every six months and the record of the minutes of the meetings of this committee shall be submitted along with the annual report to the prescribed authority and the healthcare establishments having less than thirty beds shall designate a qualified person to review and monitor the activities relating to bio-medical waste management within that establishment and submit the annual report;

(s) Maintain all records for operation of incineration, hydro or autoclaving, etc., for a period of five years.

(t) Existing incinerators to achieve the standards for treatment and disposal of bio-medical waste as specified in Schedule II for retention time in secondary chamber and Dioxin and Furans within two years from the date of this notification.

5. Duties of the operator of a common bio-medical waste treatment and disposal facility**.-**

It shall be the duty of every operator to-

(a) take all necessary steps to ensure that the bio-medical waste collected from the occupier is ransported, handled, stored, treated, and disposed of without any adverse effect to the human health and the environment, in accordance with these rules and guidelines issued by the Central Government or, as the case may be, the central pollution control board from time to time;

(b) Ensure timely collection of bio-medical waste from the occupier as prescribed under these rules;

(c) establish bar coding and global positioning system for handling of bio- medical waste within one year;

(d) inform the prescribed authority immediately regarding the occupiers which are not handing over the segregated bio-medical waste in accordance with these rules;

(e) provide training for all its workers involved in handling of bio-medical waste at the time of induction and at least once a year thereafter;

(f) Assist the occupier in training conducted by them for bio-medical waste management.;

(g) undertake appropriate medical examination at the time Find induction and at least once in a year and immunize all its workers involved in handling of bio-medical waste for protection against diseases, including Hepatitis B and Tetanus, that are likely to be transmitted while handling bio-medical waste and maintain the records for the same;

(h) ensure occupational safety of all its workers involved in handling of bio-medical waste by providing appropriate and adequate personal protective equipment;

(i) report major accidents including accidents caused by fire hazards, blasts during handling of biomedical waste and the remedial action taken and the records relevant thereto, (including nil report) in Form I to the prescribed authority **and also** along with the annual report;

(i) maintain a log book for each of its treatment equipment according to weight of batch; categories of waste treated; time, date and duration of treatment cycle and total hours of operation;

(k) allow occupier , who are giving waste for treatment to the operator, to see whether the treatment is carried out as per the rules;

(l) Shall display details of authorization, treatment, annual report, etc., on its website.

(m) after ensuring treatment by Autoclaving or microwaving, followed by mutilation or shredding, whichever is applicable, the recyclables from the treated bio-medical wastes such as plastics and glass, shall be given to recyclers having valid consent or authorization or registration from the respective State Pollution Control Board or Pollution Control Committee;

(n) Supply non-chlorinated, plastic-colored bags to the occupant on a chargeable basis, if required.

(o) common bio-medical waste treatment facility shall ensure collection of biomedical waste on holidays also;

(p) Maintain all records for the operation of incineration, hydrolysis, or autoclaving for a period of five years. And

(q) Upgrade existing incinerators to achieve the standards for retention time in the secondary chamber and dioxins and furans within two years from the date of this notification.

6. **Duties of authorities.-** The Authority specified in column (2) of Schedule-III shall perform the duties as specified in column (3) thereof in accordance with the provisions of these rules.

7. Treatment and disposal.-

(1) Bio-medical waste shall be treated and disposed of in accordance with Schedule I, and in compliance with the standards provided in Schedule-II by the health care facilities and common bio-medical waste treatment facility.

(2) Occupier shall hand over segregated waste as per the Schedule-I to common bio-medical waste treatment facility for treatment, processing and final disposal:

Provided that the lab and highly infectious bio-medical waste generated shall be pre-treated by equipment like autoclave or microwave.

(3) No occupier shall establish on-site treatment and disposal facility, if a service of ` common biomedical waste treatment facility is available at a distance of seventy-five kilometer.

(4) In cases where service of the common bio-medical waste treatment facility is not available, the Occupiers shall set up requisite biomedical waste treatment equipment like incinerator, autoclave or microwave, shredder prior to commencement of its operation, as per the authorization given by the prescribed authority.

(5) Any person including an occupier or operator of a common bio medical waste treatment facility, intending to use new technologies for treatment of bio medical waste other than those listed in Schedule I shall request the Central Government for laying down the standards or operating parameters.

(6) On receipt of a request referred to in sub-rule (5),the Central Government may determine the standards and operating parameters for new technology which may be published in Gazette by the Central Government.

(7) Every operator of common bio-medical waste treatment facility shall set up requisite biomedical waste treatment equipments like incinerator, autoclave or microwave, shredder and effluent treatment plant as a part of treatment, prior to commencement of its operation.

(8) Every occupier shall phase out use of non-chlorinated plastic bags within two years from the date of publication of these rules and after two years from such publication of these rules, the chlorinated plastic bags shall not be used for storing and transporting of bio-medical waste and the occupier or operator of a common bio-medical waste treatment facility shall not dispose of such plastics by incineration and the bags used for storing and transporting biomedical waste shall be in compliance with the Bureau of Indian Standards. Till the Standards are published, the carry bags shall be as per the Plastic Waste Management Rules, 2011.

(9) After ensuring treatment by autoclaving or micro waving followed by Mutilation or shredding, whichever is applicable, the recyclables from the treated bio-medical wastes such as plastics and glass shall be given to such recyclers having valid authorization or registration from the respective prescribed authority.

(10) The Occupier or Operator of a common bio-medical waste treatment facility shall maintain a record of recyclable wastes referred to in sub-rule(9) which are auctioned or sold and the same shall be submitted to the prescribed authority as part of its annual report. The record shall be open for inspection by the prescribed authorities.

(11) The handling and disposal of all the mercury waste and lead waste shall be in accordance with the respective rules and regulations.

8. Segregation, packaging, transportation and storage.-(1) No untreated bio-medical waste shall be mixed with other wastes.

(2) The bio-medical waste shall be segregated into containers or bags at the point of generation in accordance with Schedule I prior to its storage, transportation, treatment and disposal.

(3) The containers orbags referred toinsub-rule (2)shall be labeled as specified in ScheduleIV.

(4) Bar code and global positioning system shall be added by the Occupier and common bio-medical waste treatment facility in one year time.

(5) The operator of common bio-medical waste treatment facility shall transport the bio-medical waste from the premises of an occupier to any off-site bio-medical waste treatment facility only in the vehicles having label as provided in part 'A' of the Schedule IV along with necessary information as specified in part 'B' of the Schedule IV.

(6) The vehicles used for transportation of bio-medical waste shall comply with the conditions if any stipulated by the State Pollution Control Board or Pollution Control Committee in addition to the requirement contained in the Motor Vehicles Act, 1988 (59 of 1988), if any or the rules made there under for transportation of such infectious waste.

(7) Untreated human anatomical waste, animal anatomical waste, soiled waste and, bio technology waste shall not be stored beyond a period of forty –eight hours:

Provided that in case for any reason it becomes necessary to store such waste beyond such a period, the occupier shall take appropriate measures to ensure that the waste does not adversely affect human health and the environment and inform the prescribed authority along with the reasons for doing so.

Prescribed authority.-(1) The prescribed authority for implementation of the provisions of these rules shall be the State Pollution Control Boards in respect of States and Pollution Control Committees in respect of Union territories.

(2) The prescribed authority for enforcement of the provisions of these rules in respect of all health care establishments including hospitals, nursing homes, clinics, dispensaries, Veterinary institutions, animal houses, pathological laboratories, and blood banks of the Armed Forces under the Ministry of Defence shall be the Director General, Armed Forces Medical Services, who shall function under the supervision and control of the Ministry of Defence.

(3) The prescribed authorities shall comply with the responsibilities as stipulated in Schedule III of these rules.

9. **Procedure for authorization.-**Every occupier or operator handling bio-medical waste, Irrespective of the quantity, shall make an application in Form II to the prescribed authority, i.e.,

State Pollution Control Board and Pollution Control Committee, as the case may be, for grant of authorization and the prescribed authority shall grant the provisional authorization in Form III and the validity of such authorization for bedded health care facility and operator of a common facility shall be synchronized with the validity of the consents.

(1) The authorization shall be one time for non-bedded occupiers and the authorization in such cases shall be deemed to have been granted, if not objected by the prescribed authority within a period of ninety days from the date of receipt of duly completed application along with such necessary documents.

(2) In case of refusal of renewal, cancellation or suspension of the authorization by the prescribed authority, the reasons shall be recorded in writing:

Provided that the prescribed authority shall give an opportunity of being heard to the applicant before such refusal of the authorization.

(3) Every application for authorization shall be disposed of by the prescribed authority within a period of ninety days from the date of receipt of duly completed application along with such necessary documents, failing which it shall be deemed that the authorization is granted under these rules.

(4) In case of any change in the bio-medical waste generation, handling, treatment and disposal for which authorization was earlier granted, the occupier or operator shall intimate to the prescribed authority about the change or variation in the activity and shall submit a fresh application in Form II for modification of the conditions of authorization.

10. **Advisory Committee**.-

Every State Government or Union territory Administration shall constitutean Advisory Committee for the respective State or Union territory under the chairmanship of the respective health secretary to oversee the implementation of the rules in the respective state and to advice any improvements and the Advisory Committee shall include representatives from the Departments of Health, Environment, Urban Development, Animal Husbandry and Veterinary Sciences of that State Government or Union Territory Administration, State Pollution Control Board or Pollution Control Committee, urban local bodies or local bodies or Municipal Corporation, representatives from Indian Medical Association, common bio-medical waste treatment facility, and non-governmental organizations.

(2) Notwithstanding anything contained in sub-rule (1), the Ministry of Defence shall constitute the Advisory Committee (Defence) under the chairmanship of the Director General of Health.

Services of Armed Forces consisting of representatives from the Ministry of Defence, Ministry of Environment, Forest and Climate Change, Central Pollution Control Board, Ministry of Health and Family Welfare, Armed Forces Medical College or Command Hospital.

(1) The Central Pollution Control Board shall compile, review and analyse the information received and send this information, along with its comments or suggestions or observations tothe Ministry of Environment, Forest and Climate Change on or before 31st August every year.

(2) The Annual Reports shall also be available online on the websites of Occupiers, State Pollution Control Boards and Central Pollution Control Board.

14. Maintenance of records.-(1) Every authorized person shall maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal or another form of handling of bio-medical waste, for a period of five years, in accordance with these rules and guidelines issued by the Central Government or the Central Pollution Control Board or the prescribed authority as the case may be.

(2) All records shall be subject to inspection and verification by the prescribed authority or the Ministry of Environment, Forest and Climate Change at any time.

15. **Accident reporting.-** (1) In case of any major accident at any institution or facility or any other site while handling bio-medical waste, the authorized person shall intimate immediately to the prescribed authority about such accident and forward a report within twenty-four hours in writing regarding the remedial steps taken in Form I.

(2) Information regarding all other accidents and remedial steps taken shall be provided in the annual report in accordance with rule 13 by the occupier.

16. **Appeal.-**(1) Any person aggrieved by an order made by the prescribed authority under these rules may, within a period of thirty days from the date on which the order is communicated to him, prefer an appeal in Form V to the Secretary (Environment) of the State Government or Union territory administration.

(2) Any person aggrieved by an order of the Director General Armed Forces Medical Services under these rules may, within thirty days from the date on which the order is communicated to him, prefer an appeal in Form V to the Secretary, Ministry of Environment, Forest and Climate Change.

(3) The authority referred to in sub-para (1) and (2) as the case may be, may entertain the appeal after the expiry of the said period of thirty days, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

(4) The appeal shall be disposed of within a period of ninety days from the date of its filing.

17. **Site for common bio-medical waste treatment and disposal facility**.-

(1) Without prejudice to rule 5 of these rules, the department in the business allocation of land assignment shall be responsible for providing suitable site for setting up of common biomedical waste treatment and disposal facility in the State Government or Union territory Administration.

(2) The selection of site for setting up of such facility shall be made in consultation with the prescribed authority, other stakeholders and in accordance with guidelines published by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board.

18. **Liability of the occupier, operator of a facility**.-

(1) The occupier or an operator of a common bio-medical waste treatment facility shall be liable for all the damages caused to the environment or the public due to improper handling of bio-medical wastes.

(2) The occupier or operator of common bio-medical waste treatment facility shall be liable for action under section 5 and section 15 of the Act, in case of any violation.

SCHEDULEI
[Seerules3(e),4(b),7(1),7(2),7(5), 7(6) and 8(2)]
Part-1
Biomedicalwastescategoriesandtheirsegregation,collection,treatment,processingand disposal options

Category	Type of Waste	Type of Bagor Container to be used	Treatment and Disposal options
(1)	(2)	(3)	(4)
Yellow	**(a)Human Anatomical Waste:** Human tissues, organs, body parts and fetus below the viability period(as per the Medical Termination of PregnancyAct1971, Amended from time to time.)	Yellow coloured non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or Deep Burial
	(b) Animal Anatomical Waste: Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals, colleges, or animal houses.		
	(c) Soiled Waste: Items contaminated with blood, body fluids, like dressings, plaster casts, cottons, swabs, and		Incineration or Plasma Pyrolysis or deep burial. In the absence of these facilities, autoclaving or microwaving / hydroclaving followed by shredding or mutilation, or a combination of sterilization and shredding. Treated waste to be sent for energy recovery.

	Bag scontainingresidual or discarded blood and blood components.		Incineration or Plasma Pyrolysis or deep burial. In the absence of these facilities, autoclaving or microwaving / hydroclaving followed by shredding or mutilation, or a combination of sterilization and shredding. Treated waste to be sent for energy recovery.
	(d) **Expired or discarded medicines:** Pharmaceutical waste like antibiotics, cytotoxic	Yellow-colored non-chlorinated plastic bags or containers	Expired cytotoxic drugs and items contaminated with cytotoxic drugs should be returned back to the manufacturer or supplier for incineration at a temperature of >1200°C or to common bio-
	(e) **Chemical Waste:** Chemicals used in the production of biologicals and used or discarded disinfectants.	Yellow-colored containers or non-chlorinated plastic bags	Disposed of by incineration, plasma pyrolysis, or encapsulation in hazardous waste treatment, storage, and disposal facility..
	(f) **Chemical Liquid Waste:** Liquid waste generated due to the use of chemicals in the production of biological products and other uses.	Separate collection system leading to effluent treatment system	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other waste water. The combined discharges shall conform to the discharge norms given in Schedule III.

	(g) Discarded linen, mattresses, and beddings contaminated with blood or body fluids.	Non-chlorinated yellow plastic bags or suitable packing material	Non-chlorinated chemical disinfection, followed by incineration or plasma pyrolysis, or for energy recovery.
	(h) Microbiology, biotechnology, and other clinical laboratory waste: blood bags, laboratory cultures.	Autoclave-safe plastic bags or containers	Pre-treat to sterilize with non-chlorinated chemicals on-site as per National AIDS Control Organisation or World Health Organisation guidelines. Thereafter, proceed with incineration.
	Contaminated Waste (Recyclable) (a) Wastes generated from disposable items such as tubi	Red-colored non-chlorinated plastic bags or containers	Autoclaving or microwaving / hydroclaving, followed by shredding or mutilation, or a combination of sterilization and shredding. Treated waste to be sent to registered or authorized recyclers or for incineration.
	Waste sharps, including metals: needles, syringes with fixed needles, needles from needle-tip cutters or burners, scalpels, blades, or	Puncture-proof, leak-proof, tamper-proof containers	Autoclaving or dry heat sterilization followed by shredding or mutilation or encapsulation in a metal container or cement concrete; a combination of shredding cum autoclaving; and sent for final disposal to iron foundries.

	(a) Glassware: Broken or discarded and contaminated glass, including medicine vials and ampoules	Cardboard boxes with blue-colored marking	Disinfection (by soaking the washed glass waste after cleaning with detergent and sodium hypochlorite treatment) or thorough autoclaving or microwaving or hydroclaving, and then sent for recycling.
	(b) Metallic Body Implants	**Cardboard boxes with blue colored marking**	

Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio-medical waste treatment facility. This will be carried out with prior approval from the prescribed authority and as per the Standards specified in Schedule-III. The deep burial facility shall be located as per the provisions and guidelines issued by Central Pollution Control Board from time to time.

CHEPTER 3

ABOUTTHESTUDYAREA(ARAVALLI)

INTRODUCTION:

History of Arvalli

Before formation, Arvalli district was a part of Sabarkantha district and Sabarkantha district was also a part of "Mahikantha" political agency under British rule. Arvalli district has been in existence by the Gujarat Government's notification No. GHM/2013/69/M/PFR/139/2-1, Date 13/08/13 w.e.f 15/08/2013. There are six Talukas (Sub-districts) in Arvalli district named – Modasa, Bayad, Dhansura, Bhiloda, Malpur and Meghraj. Modasa is the Head Quarter ofArvalli. In Arvalli there are two tribal talukas- Meghraj and Bhiloda and world's oldestMountain range "Aravalli" passes through it.

Aravalli district is adistrict in the state ofGujaratin Indiathat came into being on August 15, 2013, becoming the 29th district of the state. Thedistrict has been carved out of theSabarkantha district. The district headquarters are at Modasa.

Geographyanddemographics

Aravallidistrict consists of Modasa, Malpur, Dhansura, Meghraj, Bhiloda and Bayadtalukas of former Sabarkantha district.Of these, Meghraj,Malpurand Bhiloda are tribaldominatedtalukas. The district includes 676villages and 306village panchayats with a total populationof1.27 Million and is the most literate tribal district in Gujarat

Modasa is a town and a municipality in Aravalli district in the Indian state of Gujarat. Modasa became headquarter so new Aravalli district, carved out from tribal-dominated areas of Sabarkantha. The new district was declared on January 26, 2013 and formed on August 15, 2013.

It is an economic centre for agricultural exports, at both the provincial and national levels. As a centre for the surrounding villages, Modasa acts as a transportation hub for both residents and tourists, and has two large hospitals. The city also provides a nucleus of doctors for the people of northern Gujarat and some migrants of southern Rajasthan.

Modasa has a Municipality city in district of Sabarkantha,Gujarat. The Modasa city is divided into 12 wards for which elections are held every 5 years. The Modasa Municipality has population of 67,648 of which 34,917 are males while 32,731 are females as per report released by Census India 2011.Population of Children with age of 0-6 is 8362 which is 12.36 % of total population of Modasa (M). In Modasa Municipality, Female Sex Ratio is of 937 against state average of 919. Moreover Child Sex Ratio in Modasa is around 872 compared to Gujarat state average of 890. Literacy rate of Modasa city is 87.17 % higher than state average of 78.03 %. In Modasa, Male literacy is around 92.92 % while female literacy rate is 81.10%.

Modasa Municipality has total administration over 13,917 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Municipality limits and impose taxes on properties coming under its jurisdiction.

Bayad is a Municipality city in district of Sabarkantha, Gujarat. The Bayad city is divided into 7 wards for which elections are held every 5 years. The Bayad Municipality has population of 17,886 of which 9,357 are males while 8,529 are females as per report released by Census India 2011.

Population of Children withage of 0-6 is1960 which is10.96%oftotalpopulation of Bayad (M). In Bayad Municipality, Female Sex Ratio is of 912 against state average of 919. Moreover Child Sex Ratio in Bayad is around 810 compared to Gujarat state average of 890. Literacy rate of Bayad cityis 82.86 % higherthan state average of 78.03 %. In Bayad, Male literacy is around 88.99% while female literacy rate is 76.24%.

Bayad Municipality has total administration over 3,814 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Municipality limits and impose taxes on properties coming under its jurisdiction.

Meghraj is a Census Town city in district of Sabarkantha, Gujarat. The Meghraj Census Town has population of 11,363 of which5,834aremaleswhile5,529are females as per report released by Census India 2011.

Population of Children with age of 0-6 is 1343 which is 11.82 % of total population of Meghraj (CT). In Meghraj Census Town, Female Sex Ratio is of 948 against state average of 919. Moreover Child Sex Ratio in Meghraj is around 784 compared to Gujarat state average of 890. Literacy rate of Meghraj city is 86.05 % higher than state average of 78.03 %. In Meghraj, Male literacy is around 92.68% while female literacy rate is79.23%.

Meghraj Census Town has total administration over 2,401 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Census Town limits and impose taxes on properties coming under its jurisdiction.

Bhiloda is a Census Town city indistrict of Sabarkantha, Gujarat.The Bhiloda Census Town has population of 16,074 of which 8,301 are males while 7,773 are females as per report released by Census India 2011.

Population of Children with age of 0-6 is 2011 which is 12.51 % of total population of Bhiloda (CT). In Bhiloda Census Town, Female Sex Ratio is of 936 against state average of 919. Moreover Child Sex Ratio in Bhiloda is around 874 compared to Gujarat state average of 890. Literacy rate of Bhiloda city is 83.50 % higher than state average of 78.03 %. In Bhiloda, Male literacy is around 90.86 % while female literacy rate is 75.73%.

Bhiloda Census Town has total administration over 3,464 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Census Town limits and impose taxes on properties coming under its jurisdiction.

Dhansura is a large village located in Dhansura of Sabarkantha district, Gujarat with total 2665 families residing. The Dhansura village has population of 12424 of which 6459 are males while 5965 are females as per Population Census2011.

In Dhansura village population of children with age 0-6 is 1304 which makes up 10.50 % of The total population of the village. the average sex ratio of Dhansura village is 924, which is higher than

Gujarat state average of 919. Child Sex Ratio for the Dhansura as per census is 829, lower than Gujarat average of 890.

Dhansura village has higher literacy rate compared to Gujarat. In 2011, literacy rate ofDhansura village was 84.03 % compared to 78.03 % of Gujarat. In Dhansura Male literacystands at 91.07 % while female literacy rate was76.50%.

Malpur is a Census Town cityin district of Sabarkantha, Gujarat. The MalpurCensus Town has population of 6,378 of which 3,291 are males while 3,087 are females as per report released by Census India 2011.Population of Children with age of 0-6 is 714 which is 11.19 % of total population of Malpur (CT). In Malpur Census Town, Female Sex Ratio is of 938 against state average of 919. Moreover Child Sex Ratio in Malpur is around 821 compared to Gujarat state average of 890. Literacy rate of Malpur city is 83.81 % higher than state average of 78.03 %. In Malpur, Male literacy is around 91.13 % while female literacy rate is 76.13%.

Malpur Census Town has total administration over 1,428 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Census Town limits and impose taxes on properties coming under its jurisdiction.

3.1 ListofRegisteredHCU'ssurveyed

SrNo	Nameof HCU	Taluka	Typeof HCU	SpecialityofHCU	Badded/Non Badded
1	Aaradhana clinic	Meghraj	Clinic/Dispensary	clinic	NB
2	Aarna Surgical Hospital	Modasa	Hospital	Surgical	B
3	Chinmay Eye Hospital	Modasa	Clinic/Dispensary	Optho	B
4	Dr.K.V.Shah	Modasa	Clinic/Dispensary	G P	B
5	GuruKrupa Clinic	Meghraj	Clinic/Dispensary	G.P	B
6	HariOm clinic	Meghraj	Clinic/Dispensary	Clinic	B
7	Jay Ambe clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
8	Jyoti Eye Hospital	Bayad	Hospital	Optho	B
9	Mehta Clinic	Meghraj	Clinic/Dispensary	B.H.M.S	B
10	Raj Clinic	Meghraj	Clinic/Dispensary	G.P	B
11	Shree Raj clinic	Dhansura	Clinic/Dispensary	B.H.M.S	B
12	Shreeji Dental clinic	Bhiloda	Clinic/Dispensary	Dental	B
13	Shri Hari Dental	Bayad	Clinic/Dispensary	Dental	B
14	Vatsalya Clinic	Malpur	Clinic/Dispensary	clinic	B
15	Aksheer clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
16	Ansh clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
17	Aya clinic	Bayad	Clinic/Dispensary	G P	B
18	Bhagyodaya clinic	Bhiloda	Clinic/Dispensary	Clinic/Dispensary	B

19	Devarsh clinic	Bhiloda	Clinic/Dispensary	G P	B
20	Dr.Jignesh patel	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
21	Dr. KiritR. Patel	Modasa	Clinic/Dispensary	G P	B
22	Dr.Solanki Ranjitsing k.	Modasa	Clinic/Dispensary	Clinic/Dispensary	B
23	Gayatri clinic	Bhiloda	Clinic/Dispensary	G P	B
24	Jivanyyout clinic	Modasa	Clinic/Dispensary	G P	B
25	Lifeline clinics	Modasa	Clinic/Dispensary	G P	B
26	Manan Clinic	Meghraj	Clinic/Dispensary	B.H.M.S	B
27	MantavyaDentelHospital	Dhansura	Hospital	Dental	B
28	Navdeep clinic	Modasa	Clinic/Dispensary	G P	B
29	Om clinic	Malpur	Clinic/Dispensary	G P	B
30	P HC	Bhiloda	Hospital	Multi-speciality	B
31	Pranali Hospital	Modasa	Hospital	E.N.T	B
32	Santram Clinic	Bhiloda	Clinic/Dispensary	G P	B
33	Sarvodayclinic	Bayad	Clinic/Dispensary	G P	B
34	Shiddhivinayak	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
35	ShreRamSeva sumdarclinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
36	Shreji Clinic	Modasa	Clinic/Dispensary	G P	B
37	Uma clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
38	UrbanHealthCenter	Modasa	Hospital	Multi-speciality	B
39	AksharHospital	Bhiloda	Hospital	ChildranHospital	B

40	Dr. Haresh S.Bhavsar	Bayad	Clinic/Dispensary	G P	B
41	Dr.KamleshbhaiS.	Modasa	Clinic/Dispensary	G P	B
42	Dr.RameshbhaiS.Gameti	Bhiloda	Clinic/Dispensary	Surgical	B
43	FaithHospital	Modasa	Hoapital	Nursing Home/Maternity	B
44	Gandhiclinic	Malpur	Clinic/Dispensary	G P	B
45	Gayatriclinic	Meghraj	Clinic/Dispensary	G P	B
46	GayatriClinic	Meghraj	Clinic/Dispensary	G.P	B
47	Gr.ChandrakantD.Jain	Modasa	Clinic/Dispensary	G P	B
48	Krupali clinic	Malpur	Clinic/Dispensary	G P	B
49	NutanDispesore	Malpur	Clinic/Dispensary	B.H.M.S	B
50	P HC	Bhiloda	Hospital	Multi-speciality	B
51	P.H.C.Gabat	Bayad	Clinic/Dispensary	G P	B
52	P.H.C.Gabat	Bayad	Hospital	G P	B
53	Primary Health center palla	Bhiloda	Clinic/Dispensary	G P	B
54	Ramani blood bank	Modasa	BooldBank	Pathological	B
55	Shamlaji Clinic	Bhiloda	Clinic/Dispensary	G P	B
56	Shree Sai Hospital	Bhiloda	Hospital	G P	B
57	Shreeji Eye Care	Modasa	Hoapital	Surgical	B
58	Shreeram Hospital	Bhiloda	Clinic/Dispensary	G P	B
59	Uma clinic	Bayad	Clinic/Dispensary	G P	B
60	Varadan Clinic	Malpur	Clinic/Dispensary	G P	B

61	Anand Clinic	Modasa	Clinic/Dispensary	G P	B
62	Ashiti clinic	Bayad	Clinic/Dispensary	G P	B
63	Ayush clinic	Malpur	Clinic/Dispensary	G P	B
64	Dharasti Hospital	Bhiloda	Hospital	Ortho paedic	B
65	Lifeline clinics	Malpur	Clinic/Dispensary	G P	B
66	Mena Clinic	Bhiloda	Clinic/Dispensary	G P	B
67	mooba Hospital	Bhiloda	Hospital	G P	B
68	P HC	Dhansura	Hospital	Multi-speciality	B
69	P HC	Modasa	Hospital	Multi-speciality	B
70	P H C Patel Dhundha	Meghraj	Hospital	Multi-speciality	B
71	sabar clinic	Bhiloda	Clinic/Dispensary	G P	B
72	Shakti Clinic	Bhiloda	Clinic/Dispensary	G P	B
73	Shivom clinic	Modasa	Clinic/Dispensary	G P	B
74	Vankar Mangalbhai Kalidas	Modasa	Clinic/Dispensary	Nursing Home/Maternity	B
75	Vision The Eye Care Hospital	Bayad	Hospital	Surgical,Dental	B
76	Vraj clinic	Bayad	Clinic/Dispensary	G P	B
77	Dev krupa clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
78	Ganesh Hospital	Bayad	Hospital	Multi-speciality	B
79	Govt. Ayurvedic Hospital	Meghraj	Hospital	MUlti-speciality	B
80	Jalaram Eye Hospital	Meghraj	Hospital	Ophthalmology	B
81	Jay Shree Clinic	Dhansura	Clinic/Dispensary	G P	B

82	Maa Hospital	Bhiloda	Hospital	Gynaec	B
83	P H C Tintoi	Modasa	Hospital	P HC	B
84	Dr.Vipul S. Sharma	Modasa	Clinic/Dispensary	G P	B
85	Japan clinic	Malpur	Clinic/Dispensary	G P	B
86	P HC	Dhansura	Hospital	Multi-speciality	B
87	P HC KASANA	Meghraj	Hospital	Multi-speciality	B
88	P. H. C. Sathamba	Bayad	Hospital	Multi-speciality	B
89	P. H. C. Vadagam	Dhansura	Hospital	G P	B
90	Patel Yogeshkumar N	Bhiloda	Clinic/Dispensary	G P	B
91	Primary Health center	Bayad	Hospital	P HC	B
92	Primary Health center Akrol	Dhansura	Hospital	G P	B
93	Primary Health Clinic	Modasa	Hospital	Multi-speciality	B
94	Punit Hospital	Modasa	Hospital	Multi-speciality	B
95	Radha Clinic	Bayad	Clinic/Dispensary	G P	B
96	Shree Gayatri Clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
97	Sir Dorabji Tata Trust Hospital	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
98	Amee Clinic	Modasa	Clinic/Dispensary	G P	B
99	Ashish clinic	Modasa	Clinic/Dispensary	G P	B
100	Dr. BhavinPatel	Modasa	Clinic/Dispensary	G P	B
101	Dr. BhogilalL	Modasa	Clinic/Dispensary	Nursing Home/Maternity	B
102	Dr. Dinish B. Prajapati	Modasa	Clinic/Dispensary	G P	B

103	Gayatri Orthopaedic Laboratory	Modasa	Laboratory	Orthopaedic	B
104	Gurudev Clinic	Modasa	Clinic/Dispensary	G P	B
105	Jalaram clinic	Dhansura	Clinic/Dispensary	G P	B
106	P H C	Bhiloda	Hospital	Multi-speciality	B
107	Pokar Ronakkumar J	Malpur	Clinic/Dispensary	G P	B
108	Snehal clinic	Modasa	Nursing Home/Maternity	Nursing Home/Maternity	B
109	Sub Center	Meghraj	Hoapital	P Hc	B
110	Avni clinic	Dhansura	Clinic/Dispensary	G P	B
111	Dharmi Orthopaedic	Modasa	Hospital	Orthopaedic	B
112	Dr. Mukesh R.Trivedi	Bayad	Clinic/Dispensary	G P	B
113	Joshi Hospital	Bhiloda	Hospital	Multi-speciality	B
114	P HC	Meghraj	Hospital	Multi-speciality	B
115	Ram gadhi	Meghraj	Hospital	P HC	B
116	Shreeji clinic	Malpur	Clinic/Dispensary	G P	B
117	Shreeji M Hospital	Modasa	Hospital	Gynaec	B
118	Akshar Hospital	Modasa	Nursing Home/Maternity	Nursing Home/Maternity	B
119	Ashirvad Child Hospital	Modasa	Hospital	Pediatric	B
120	Ashish Orthopaedic	Modasa	Hospital	Orthopaedic	B
121	Bhagyoday Hospital	Modasa	Hospital	Surgical	B
122	Children Anand Hospital	Modasa	Hospital	Pediatric	B
123	Dr. Dilipbhai G. Shah	Modasa	Hoapital	Nursing Home/Maternity	B

124	Dr. Govindbhai M.Patel	Modasa	Clinic/Dispensary	Physician	B
125	Dr. Vlaid M. Shah	Dhansura	Clinic/Dispensary	G P	B
126	Hari Om Clinic	Modasa	Clinic/Dispensary	G P	B
127	Janki Maternityand children Hospital	Bayad	Nursing Home/Maternity	Nursing Home/Maternity	B
128	Kheradi PH C	Bhiloda	Clinic/Dispensary	Multi-speciality	B
129	Krishna clinic	Malpur	Clinic/Dispensary	G P	B
130	Navchetana Hospital	Bhiloda	Hospital	G P	B
131	Navdeep Hosital	Bhiloda	Clinic/Dispensary	Clinic/Dispensary	B
132	Neelkanth Hospital	Malpur	Hospital	Gynaec	B
133	Patel Yogeshkumar N.	Modasa	clinic	Nursing Home/Maternity	B
134	Rajendra J. Gandhi	Modasa	Nursing Home/Maternity	Surgical	B
135	S.I. Davda Orthopadic	Bhiloda	Clinic/Dispensary	Orthopaedic	B
136	Sab Center Meghraj	Meghraj	Hospital	Multi-speciality	B
137	Shakti Children Hospital	Modasa	Hospital	Pediatric	B
138	Shree Maternity Home	Modasa	Nursing Home/Maternity	Gynaec	B
139	Volioly Hospital	Bayad	Hospital	G P	B
140	Ena Malany Hospital	Modasa	Hospital	Gynaec	B
141	Atmanayu care clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	B
142	Baby care childran Hospital	Modasa	Nursing	Pediatric	B
143	Bhakti maternity &Nursing	Modasa	Nursing Home/Maternity	Gynaec	B
144	Lotas Hospital	Modasa	Hospital	G P	B

145	Madhuram Hospital	Malpur	Hospital	G P	B
146	Rajvi Hospital	Bhiloda	Hospital	G P	B
147	Sad guru Clinic	Bhiloda	Clinic/Dispensary	G P	B
148	Sarvoday Hospital	Bhiloda	Hospital	Gynaec	B
149	Soham Hospital	Bhiloda	Hospital	ChildrenHospital	B
150	Pranami Clinic	Bayad	Clinic/Dispensary	G P	B
151	Alay Clinic	Bayad	Clinic/Dispensary	G P	B
152	Ankur Children Hospital	Modasa	Hospital	ChildrenHospital	B
153	Chirag Hospital	Modasa	Hospital	Gynaec	B
154	Munthan Hospital	Modasa	Hospital	Orthopaedic	B
155	Om Surgical Hospital	Modasa	Hospital	Surgical	B
156	Sawarpon Hospital	Modasa	Clinic/Dispensary	G P	B
157	Shanji Childran Hospital	Bayad	Hospital	Physician	B
158	Shif Matrrnim Hospital	Modasa	Hospital	Gynaec	B
159	Shreej iX-Rayclinic	Bayad	Clinic/Dispensary	G P	B
160	Sidhi Vinayak Hospital	Modasa	Hospital	Multi-speciality	B
161	Vardan Hospital	Modasa	Hospital	Pediatric	B
162	Vrundavan Hospital	Bhiloda	Hospital	Gynaec	B
163	Shree Navjivan Hospital	Meghraj	Hospital	Gynaec	B
164	Dhawal clinic	Bayad	Clinic/Dispensary	G P	B
165	Vishnu Orthopedic Hospital	Modasa	Hospital	Orthopaedic	B

166	Jatan Chipdren Hospital	Modasa	Hospital	Pediatric	B
167	Keshav Hospital Bayad	Bayad	Hospital	M.D.Physician	B
168	Meera Newborncare Hospital	Modasa	Hospital	Peadiatric	B
169	Patel Clinic	Dhansura	Clinic/Dispensary	G P	B
170	Aashirvad clinic	Modasa	Clinic/Dispensary	G P	B
171	Avkar Hospital	Modasa	Nursing Home/Maternity	Nursing Home/Maternity	B
172	Avkar Hospital	Modasa	Hospital	Nursing Home/Maternity	B
173	Dharati Hospital	Modasa	Hospital	Physician	B
174	Dr. Jaykumar S. Shah	Bhiloda	Clinic/Dispensary	G P	B
175	Healthy Recovery	Modasa	Clinic/Dispensary	G P	B
176	Mahalaxmi Hospital	Modasa	Hospital	Gynaec	B
177	Navjivan Hospital	Bayad	Hospital&Laboratory	Orthopaedic	B
178	Navjivan Hospital	Bhiloda	Clinic/Dispensary	Orthopaedic	B
179	Sapan Hospital Bayad	Bayad	Hospital	multi-speciality	B
180	Shri Rameye Hospital	Modasa	Hospital	optho	B
181	Shubhamclinic	Modasa	Hospital	Dental	B
182	Sparsh Heat Medical Hospital	Modasa	Hoapital	Nursing Home/Maternity	B
183	Vishwn Surgical Hospital	Bayad	Hospital	Surgical	B
184	Harsh Hospital	Bhiloda	Hospital	Gynaec	B
185	Deep Surgical	Modasa	Hospital	Surgical	B
186	General Orthopaedic Hospital	Bhiloda	Hospital	Orthopaedic	B

187	Dr. S. M.Saiyad	Modasa	Clinic/Dispensary	Orthopaedic	B
188	Ashta Hospital	Modasa	Hospital	Nursing Home/Maternity	B
189	Mamta hospital	Bhiloda	Hospital	Gynaec	B
190	meera Hospital	Bhiloda	Hospital	Physician	B
191	Aum Surgical Hospital	Bayad	NursingHome	Surgical	B
192	Ayushman Hospital	Modasa	Hospital	Surgical	B
193	C H C Bayad	Bayad	Hospital	Multi-speciality	B
194	C.H.C	Dhansura	Hospital	Multi-speciality	B
195	Decent Clinic	Modasa	Clinic/Dispensary	G P	B
196	Jayshivam Hospital	Bayad	Hospital	physician	B
197	Meghraj General Hospital	Meghraj	Hospital	Nursing Home/Maternity	B
198	Modasa health care	Modasa	Nursing Home/Maternity	Physician	B
199	Rephral Hospital	Malpur	Hospital	P HC	B
200	rajavi hospital	Modasa	Hospital	Pediatric	B
201	Sanjivani Hospital	Modasa	Hospital	Multi-speciality	B
202	Aastha Clinic	Bhiloda	Clinic/Dispensary	G P	B
203	Gayatri Surgical Hospital	Bayad	Hospital	Nursing,Gynaec,Surgical	B
204	Maitri Hospital	Bhiloda	Hospital	Surgical	B
205	Malhar Hospital	Bayad	Hospital	Pediatric	B
206	Sarvajanik Hospital	Modasa	Hospital	multi-speciality	B
207	All india movement forseva hospital	Bhiloda	Hospital	Multi-speciality	B

208	C H C Meghraj	Meghraj	Hospital	Multi-speciality	B
209	R.h & P.H.C. Medhasan	Modasa	Hospital	Multi-speciality	B
210	Cottege Hospital	Bhiloda	Hospital	G P	B
211	Shri mantfatehsionh Hospital	Bayad	Hospital	gynaec	B
212	Aavkar Dental Hospital	Bhiloda	Hospital	Dental	NB
213	Adharsh Aryaclinic	Dhansura	Clinic/Dispensary	clinic	NB
214	Advance Dentalcare	Modasa	Clinic/Dispensary	Dental	NB
215	Ami clinic	Malpur	Clinic/Dispensary	clinic	NB
216	Anand Clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	NB
217	Anand Hospital	Bayad	Hospital	Dental	NB
218	Arth Dental Clinic	Modasa	Clinic/Dispensary	Dental	NB
219	Asha Hospital	Modasa	Hospital	Dental	NB
220	Ashirvad clinic	Dhansura	Clinic/Dispensary	clinic	NB
221	Ashirvad Laboratory	Modasa	Laboratory	Pathological	NB
222	Ashish Pathology Laboratory	Modasa	Laboratory	Pathological	NB
223	Ashtha Laboratory	Modasa	Laboratory	Pathological	NB
224	Astha Clinic	Bayad	Clinic/Dispensary	B.H.M.S	NB
225	Astha Dental Clinic	Modasa	Clinic/Dispensary	Dental	NB
226	Balaji Dental	Modasa	Hospital	Dental	NB
227	Bansari Dental Clinic	Bayad	Clinic/Dispensary	Dental	NB
228	Bansi Pathological	Bhiloda	Laboratory	Pathological	NB

229	Bharatkumar J Shah	Modasa	Clinic/Dispensary	Clinic/Dispensary	NB
230	Bhavna Clinic	Modasa	Clinic/Dispensary	clinic	NB
231	Chintan Laboratory	Bhiloda	Laboratory	Laboratory	NB
232	Crony Dental Care	Modasa	Hospital	Dental	NB
233	Deep Dental Clinic	Dhansura	Clinic/Dispensary	Dental	NB
234	Delke Dental	Modasa	Hospital	Dental	NB
235	Diler Clinic	Modasa	Clinic	Clinic/Dispensary	NB
236	Divain Dental Hospital	Modasa	Hospital	Dental	NB
237	Dr.BharatC.Shah	Dhansura	Clinic/Dispensary	clinic	NB
238	Dr. Chandrakant	Modasa	Clinic/Dispensary	Clinic/Dispensary	NB
239	Dr. Gunvant L. Shah	Meghraj	Clinic/Dispensary	clinic	NB
240	Dr.Haresh I. Shah	Meghraj	Clinic/Dispensary	Clinic/Dispensary	NB
241	Dr. Hiralal N. Patel	Dhansura	Clinic/Dispensary	Clinic	NB
242	Dr. Ashish C. Chauhan	Dhansura	Clinic/Dispensary	clinic	NB
243	Dr. D. K. Maheshwar	Modasa	Clinic/Dispensary	Dental	NB
244	Dr. Kamlesh R. Patel	Bhiloda	Clinic/Dispensary	Clinic/Dispensary	NB
245	Dr. Nagar Meri	Dhansura	Clinic/Dispensary	clinic	NB
246	Dr. Narendra M. Patel	Dhansura	Clinic/Dispensary	clinic	NB
247	Dr. Naresh G.Patel	Modasa	Clinic/Dispensary	clinic	NB
248	Dr. Pramodkumar J Shah	Modasa	Clinic	clinic	NB
249	Dr.R. V. padvi	Meghraj	Clinic/Dispensary	clinic	NB

250	Dr. Shirish N	Dhansura	Clinic/Dispensary	clinic	NB
251	Gaytri clinic	Meghraj	Clinic/Dispensary	Clinic	NB
252	Gurudev Clinic Laboratory	Modasa	Laboratory	Pathological	NB
253	Gurukrupa Dental Hospital	Bayad	Hospital	Dental	NB
254	HARSH DENTAL CLINIC	Modasa	Clinic/Dispensary	Dental	NB
255	Hi-Techlaboratory	Modasa	Laboratory	Pathological	NB
256	Home Clinic	Malpur	Clinic/Dispensary	clinic	NB
257	Hospital	Modasa	Hospital	Multi-speciality	NB
258	Jalaram Dental clinic	Bhiloda	Clinic/Dispensary	Dental	NB
259	Jivandip clinic	Modasa	Clinic/Dispensary	clinic	NB
260	Jivandip Hospital	Modasa	Hospital	Dental	NB
261	Joshi Girishkumar Agrawal	Modasa	Clinic/Dispensary	clinic	NB
262	Krishna clinic	Bhiloda	Laboratory	Laboratory	NB
263	Krishna Laboratory	Modasa	Laboratory	Laboratory	NB
264	Laxmi laboratory	Modasa	Laboratory	Pathological	NB
265	Mansi Surgical Hospital	Modasa	Hospital	surgical	NB
266	Maruti pethologi Lob.	Bhiloda	Laboratory	Laboratory	NB
267	Matru chhaya clinic	Meghraj	Clinic/Dispensary	Clinic/Dispensary	NB
268	Navjivan clinic	Malpur	Clinic/Dispensary	B.H.M.S	NB
269	New Tech Laboratory	Modasa	Laboratory	Pathological	NB
270	Om Dental Clinic	Bhiloda	Clinic/Dispensary	Dental	NB

271	Om Dental Clinic	Bayad	Clinic/Dispensary	Dental	NB
272	Om X-Ray & Sonography clinic	Modasa	Clinic/Dispensary	clinic	NB
273	Parikshan Pathology Laboratory	Modasa	Laboratory	Pathological	NB
274	Parv Dental ckinic	Malpur	Clinic/Dispensary	Dental	NB
275	Prathana Dental clinic	Modasa	Hospital	Dental	NB
276	Roshan Dental Clinic	Modasa	Hospital	Dental	NB
277	Sabar Dairy Su ceulre	Meghraj	Veternary	Veternary	NB
278	Sagar Dental Clinic	Bhiloda	Clinic/Dispensary	Dental	NB
279	Sai Dental clinic	Meghraj	Clinic/Dispensary	Dental	NB
280	Sai laboratory	Modasa	Laboratory	Pathological	NB
281	Samrth Hospital	Modasa	Hospital	Proctologist	NB
282	Sanjivani Hospital	Modasa	Hospital	M D	NB
283	Sankalp clinic	Modasa	Laboratory	Pathological	NB
284	Saroj pathology Laboratory	Meghraj	Laboratory	Pathological	NB
285	Sarvoday Hospital Bhiloda	Bhiloda	Laboratory	Pathological	NB
286	Satyam Pathological	Modasa	Laboratory	Pathological	NB
287	Sevasadan clinic	Modasa	Clinic/Dispensary	clinic	NB
288	Shadha clinic	Modasa	Clinic/Dispensary	clinic	NB
289	Shafina Clinic	Modasa	Hospital	clinic	NB
290	Shiv clinic	Meghraj	Clinic/Dispensary	clinic	NB
291	Shiv Pathologi Laboratory	Modasa	Laboratory	Pathological	NB

292	Shraddha clinic	Malpur	Clinic/Dispensary	B.H.M.S	NB
293	ShreeImarina center	Modasa	Clinic/Dispensary	Radiolay clinc	NB
294	Shree Pathology Laboratory	Modasa	Laboratory	Pathological	NB
295	Shree Ram Clinic	Modasa	Clinic/Dispensary	clinic	NB
296	Shri Hari Clinic	Bayad	Clinic/Dispensary	Clinic/Dispensary	NB
297	Shri Ramclinic	Meghraj	Clinic/Dispensary	G P	NB
298	Smile care Dental clinic	Modasa	Clinic/Dispensary	Dental	NB
299	Sundaram Pathology Laboratory	Modasa	Laboratory	Pathological	NB
300	The Ghanchi Arogyamandal	Modasa	Hospital	Dental	NB
301	The smilky Pearldental	Bayad	Clinic/Dispensary	Dental	NB
302	Unic Laboratory	Modasa	Laboratory	Pathological	NB
303	Varga Laboratory	Malpur	Laboratory	Clinic/Dispensary	NB
304	Vedant Dental Hospital	Modasa	Hospital	Dental	NB
305	Vinayak Dental Clinic	Bayad	Hospital	Dental	NB
306	Yashvi Dental care	Modasa	Clinic/Dispensary	Dental	NB

3.2 SURVEYMETHODOLOGY

Before starting the biomedical waste in ventorization, survey lanning was made to carryout whole project.

Collection of background detain formation and list of HCU's

Shri S.K. Shah and Shrikrishna O.M. Arts College, Modasa is allotted to carry out survey of specific talukas Aravalli District are as follows

1. Modasa
2. Dhansura,
3. Bayad,
4. Malpur,
5. Megharaj
6. Bhiloda

Training to Survey team:

As the students who are chosen for Survey are from Shri S.K. Shah and Shri krishna O.M. Arts College, Modasa they were less aware about Biomedical Waste Management. So training become very necessary for the students those who are involved in the project. At first Project head and Project coordinators arranged a training session to make aware about the complete process of Biomedical Waste Management. Students were taught about biomedical waste management rules and their application in Collection, Storage, transportation and disposal of Biomedical waste. Communication with HCU representative also plays a very important role in collecting the data. Students are also taught about how to communicate and interact with HCU representative.

Planning the Survey

The aim of conducting the survey is to get the needed information as correct and as precise as possible. A survey form is providing by GEMI which cover the maximum information in shortest format and shortest time span. For work planning as soon we received work order from GEMI, planning for the work has been done. Shri S.K. Shah and Shri krishna O.M. Arts College, Modasa is conducting survey of Aravalli district taluka Modasa, Dhansura, Bayad, Malpur, Megharaj and Bhiloda, students were given chance to choose the place where they want to do survey. Depending upon the size of taluka, number of students is assigned to each taluka. Time line mentioned by GEMI was also kept in mind while planning whole work. Before executing any work, planning plays a vital role. An activity plan was also prepared to successfully carryout the project.

Conduting field survey

Team of well trained student groups were assigned different talukas for survey. At first students were well taught about thereto be surveyed by them. Themap of Modasa city is tributed among student groups to study their area. Also roads and areas which comes under Aravalli also listed out and given to students. Then students were told to conduct the reconnaissance survey in their area and approximately estimate number of hospitals lies in their area. Afterwards number of students was altered in the group deepening upon the number of HCU's in their area. The students who are working in talukas are also provided with maps and list of villages. Students were also trained to interact with the representative of the HCU's. Students showed their immense patience while collecting the data. They visited single HCU more than 2 times, in some cases more than 4 times due to poor response by the HCU representative.

Biomedical waste in ventorization of Aravalli District oad map for the entire project team: Project plan

- Priority of activities
  Formation of cell(6Taluka)

  (1)Modasa (2)Dhansura (3)Bayad (4)Malpur (5)Meghraj (6) Bhiloda

  - ✓ Invite the student for participation
  - ✓ Taluka wise One faculty Coordinator and 10 students
  - ✓ Construction team and allocate team leader
  - ✓ A meeting arranged by Project coordinator for providing guidance
  - ✓ Project Background
  - ✓ Objectives
  - ✓ Scope
  - ✓ Constraints

  Meeting held at the seminar hall of Arts College on 10-08-2018, 1-00PM above points discussed.

- Methodologies and Strategy
  - ✓ Decide survey area of project work
  - ✓ About the Study Area(District)
  - ✓ Details like Demography, Geography, Climate, AllHCUs
  - ✓ List of Registered Health Care Units (HCUs), list of non-registered HCUsidentified and List of HCUs surveyed
  - ✓ Get list of clinic and hospitals, Aravalli from authority.
  - ✓ Make list of clinic and hospitals Aravalli from GOG

Chapter4: Survey Compilation and Analysis

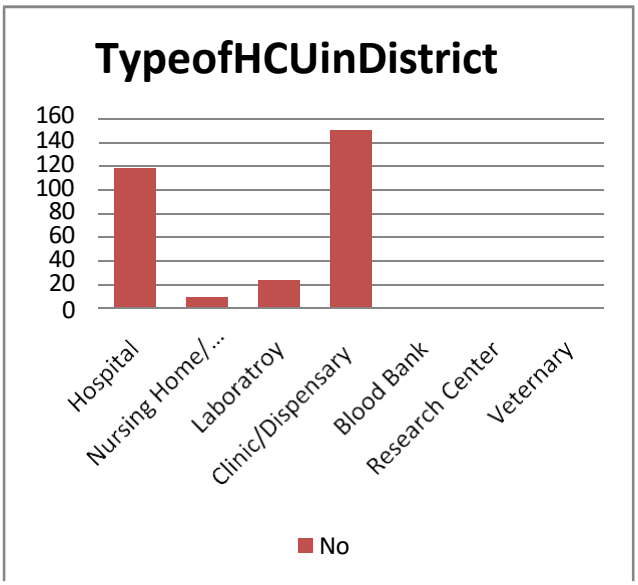
4.1 Survey brief

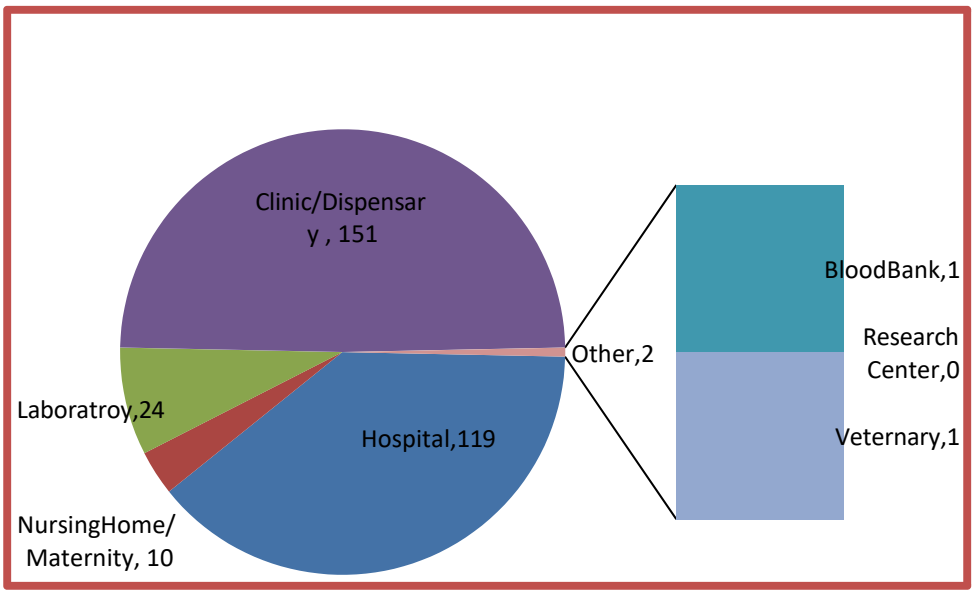
4.2 Table, I-chart/Bar chart Graphtec.

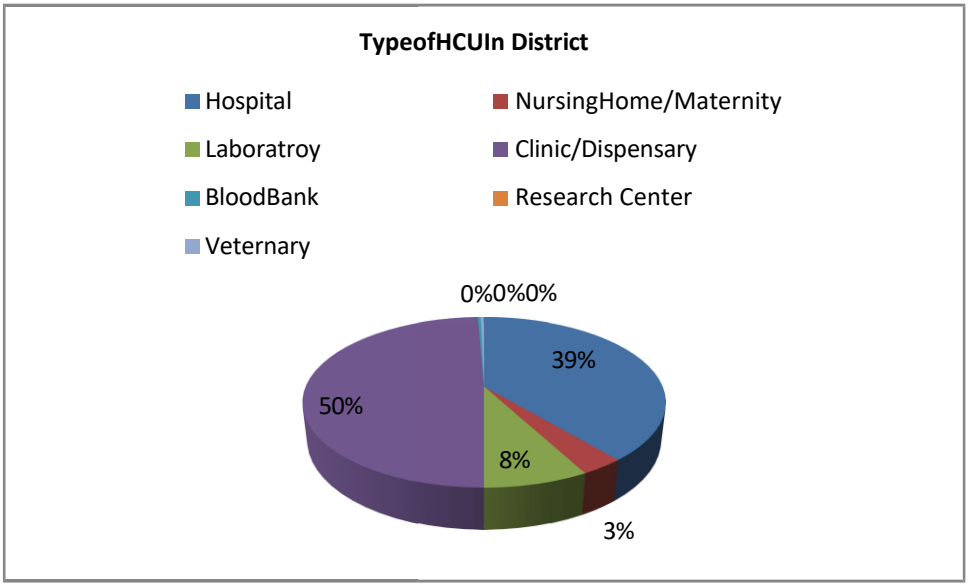
Graph and table section-A

Total306HCUsurveyedinAravallidistrict

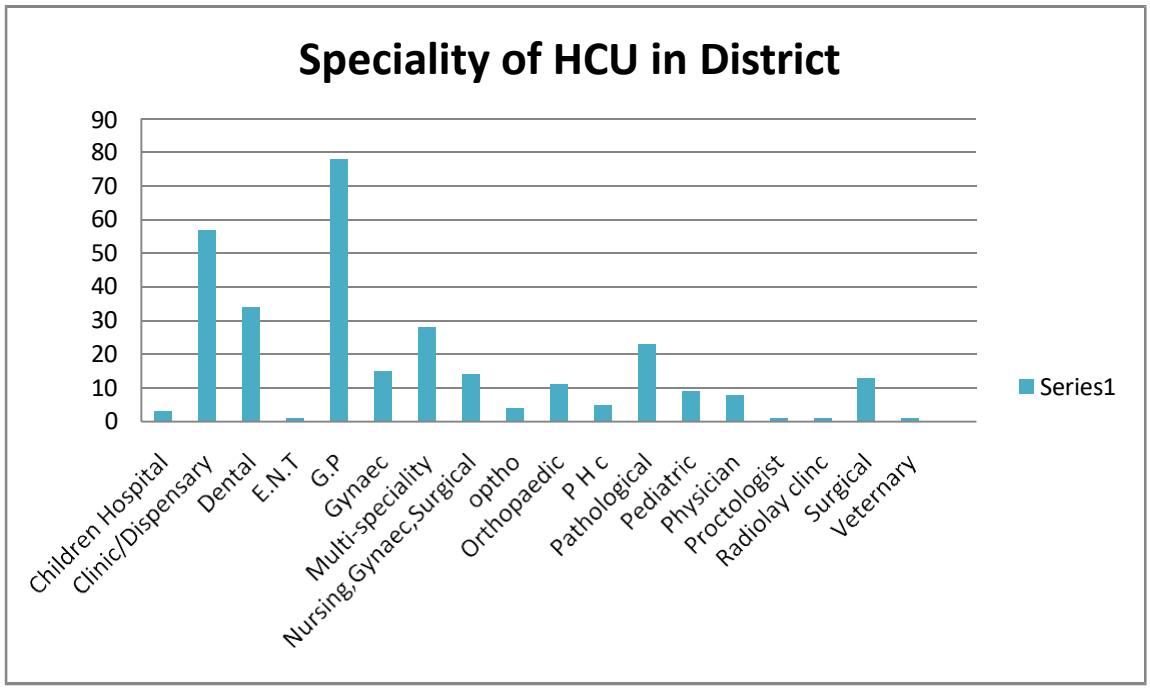
Type of HCU Dist	
TYPE	No
Hospital	119
Nursing Home/ Maternity	10
Laboratory	24
Clinic/Dispensary	151
Blood Bank	1
Research Center	0
Veternary	1
Total HCU in District	306

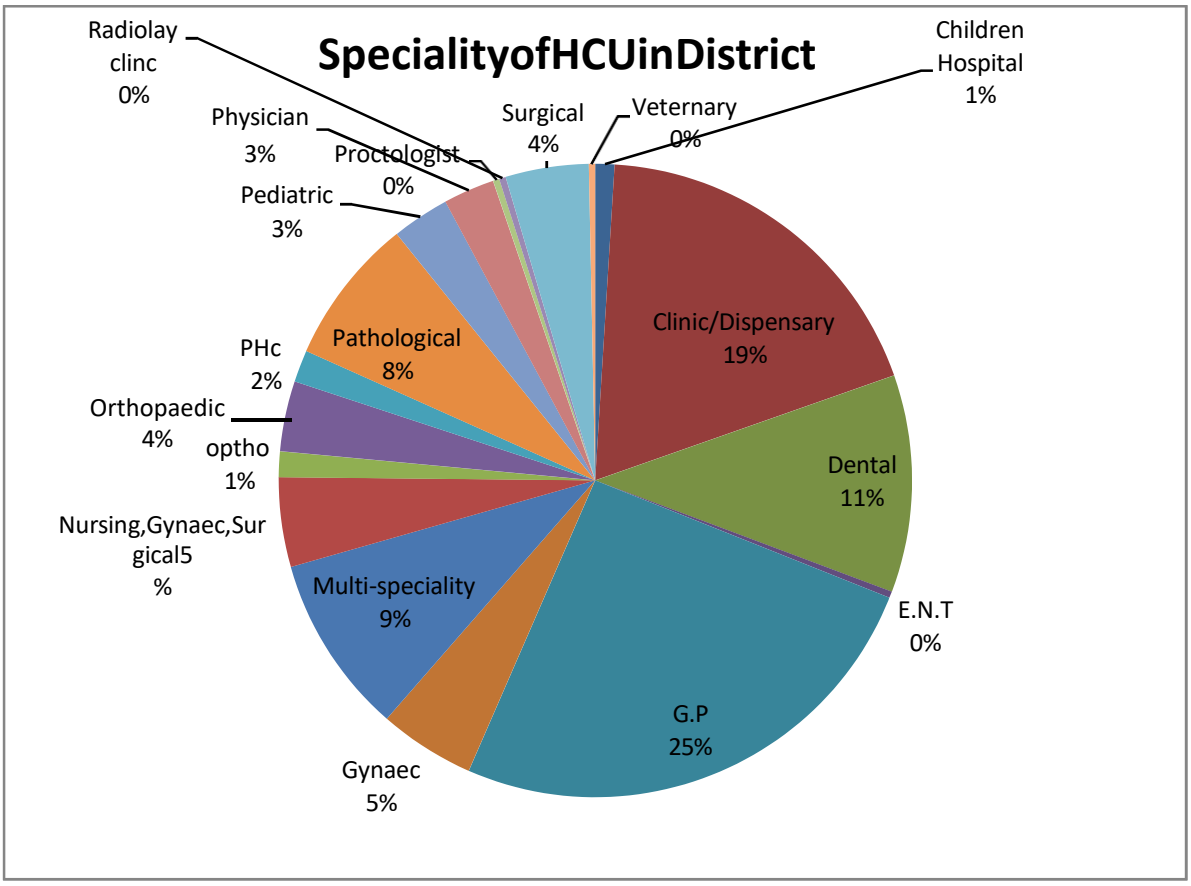

TypeofHCUinDistrict
160
140
120
100
80
60
40
20
0
Hospital
Nursing Home/...
Laboratroy
Clinic/Dispensary
Blood Bank
Research Center
Veternary
No

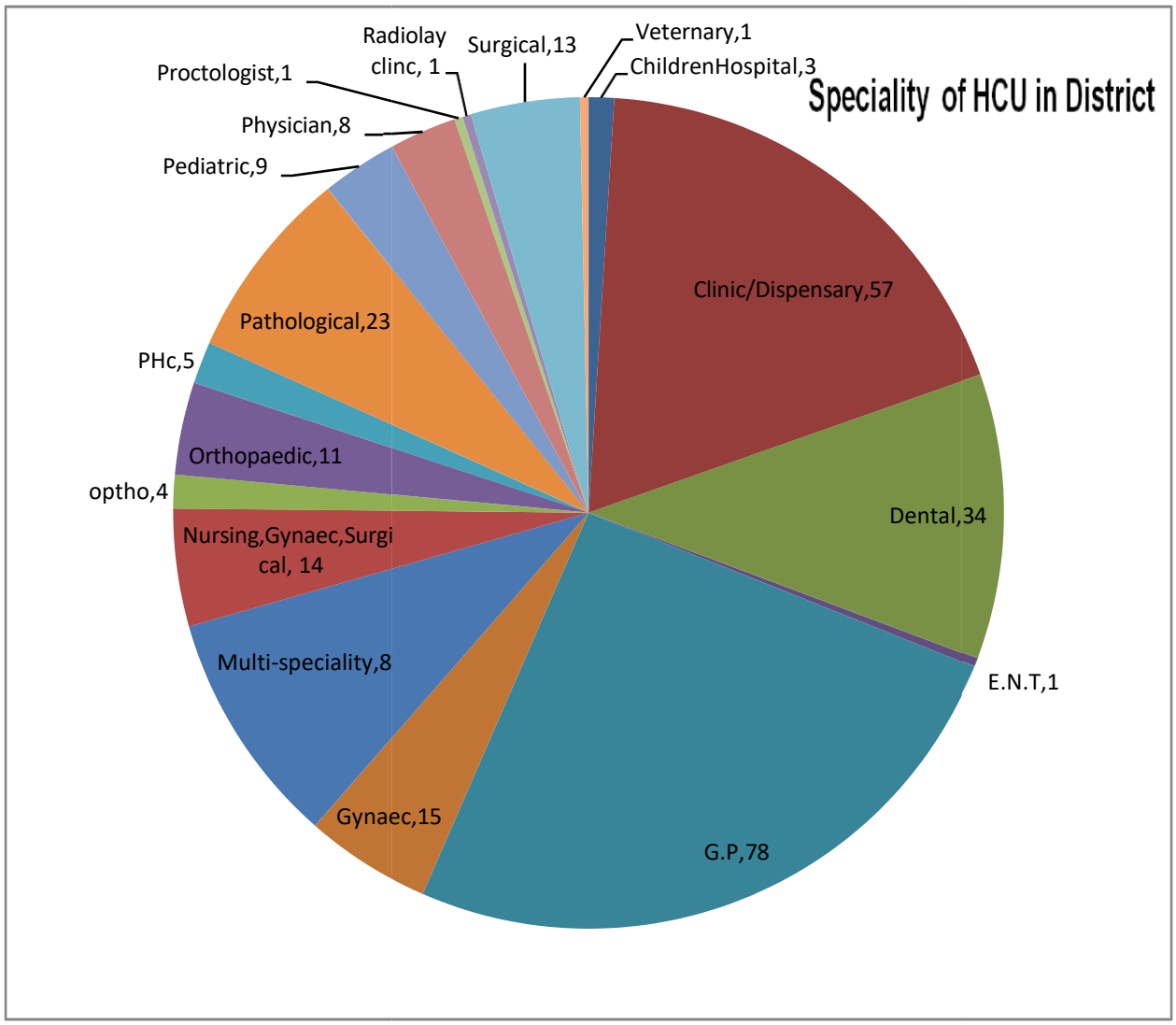

Clinic/Dispensar y , 151
Laboratroy,24
NursingHome/ Maternity, 10
Hospital,119
Other,2
BloodBank,1
Research Center,0
Veternary,1



Speciality	NoofHCU (306)
Children Hospital	3
Clinic/Dispensary	57
Dental	34
E.N.T	1
G.P	78
Gyneac	15
Multi-speciality	28
Nursing,Gynaec,Surgical	14
optho	4
Orthopedic	11
P Hc	5
Pathological	23
Pediatric	9
Physician	8
Proctologist	1
Radiolay clinc	1
Surgical	13
Veternary	1

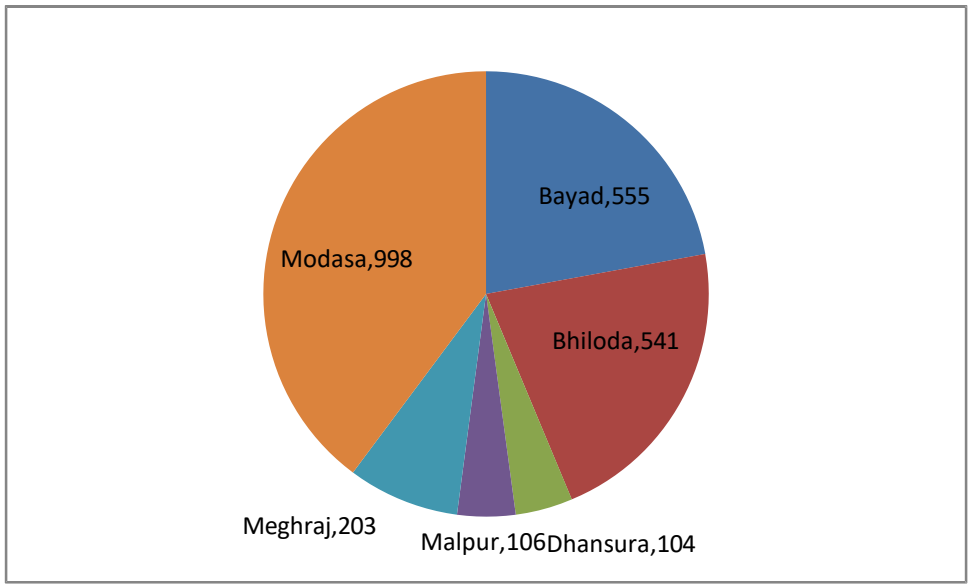

Speciality of HCU in District
90
80
70
60
50
40
30
20
10
0
Children Hospital
Clinic/Dispensary
Dental
E.N.T
G.P
Gynaec
Multi-speciality
Nursing,Gynaec,Surgical
optho
Orthopaedic
P H c
Pathological
Pediatric
Physician
Proctologist
Radiolay clinc
Surgical
Veternary
Series1


SpecialityofHCUinDistrict
Radiolay clinc 0%
Physician 3%
Proctologist 0%
Pediatric 3%
Surgical 4%
Veternary 0%
Children Hospital 1%
Clinic/Dispensary 19%
Dental 11%
E.N.T 0%
G.P 25%
Gynaec 5%
Multi-speciality 9%
Nursing,Gynaec,Surgical5 %
optho 1%
Orthopaedic 4%
PHc 2%
Pathological 8%



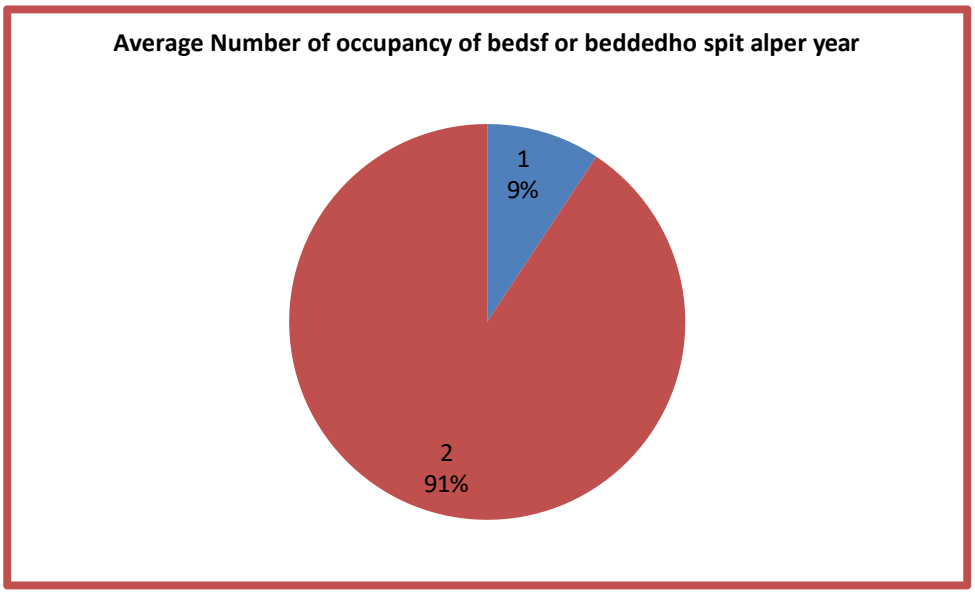
TalukaWise

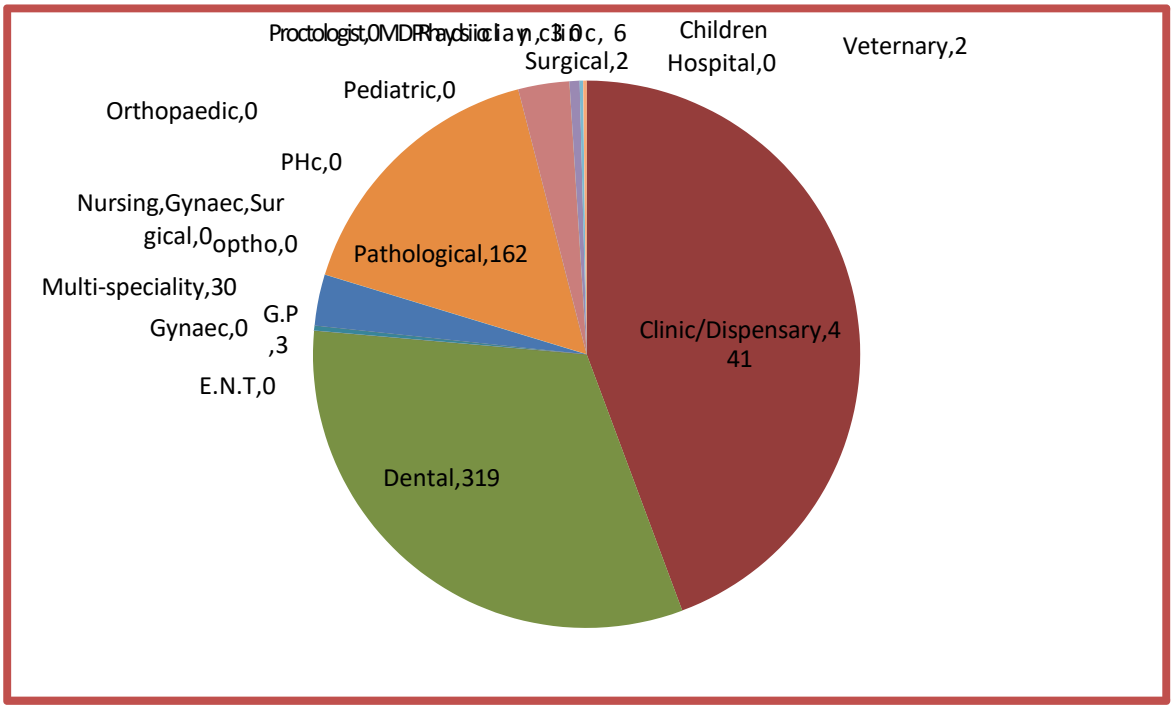
Taluka	NoofBeds
Bayad	555
Bhiloda	541
Dhansura	104
Malpur	106
Meghraj	203
Modasa	998
Total	2507



AverageNumberofoccupancyofbedsforbeddedhospitalperyear

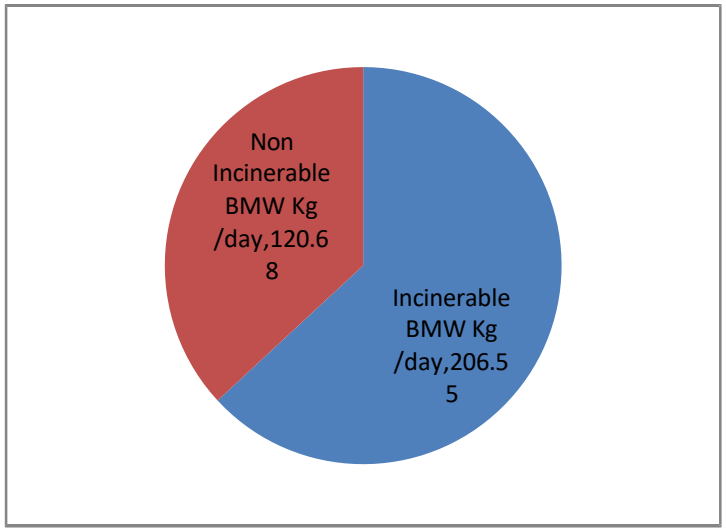
2507 24500 9.77



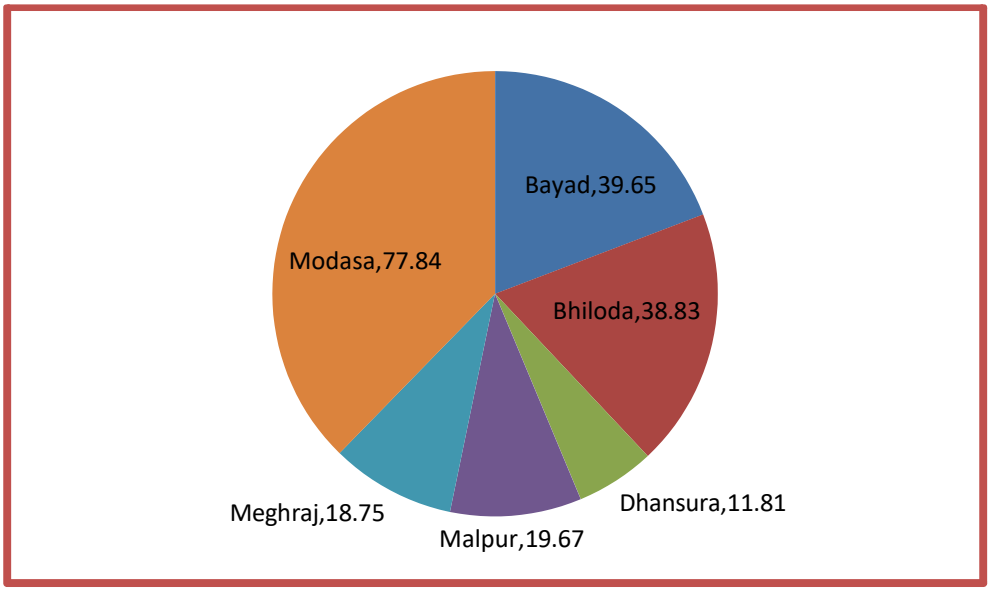


Table, Pi-chart/ Barchart Graphtec. Of sectionB

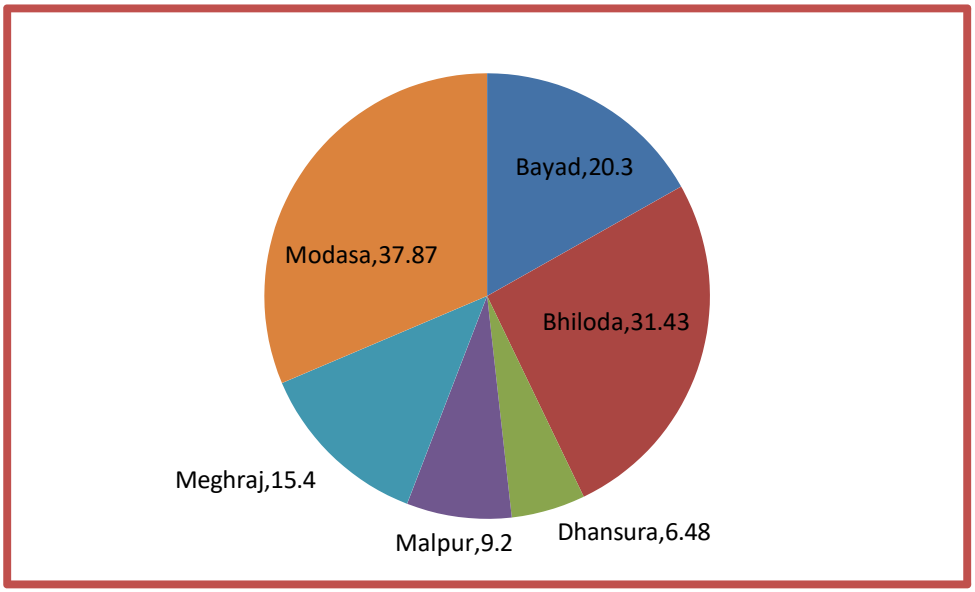
Incinerable BMW Kg/day	Non Incinerable BMW Kg/day	Total BMWKg/day
206.55	120.68	327.23



Taluka	Incinerable BMW kg/Day	No incinerable BMWkg/Day	Total
Bayad	39.65	20.3	59.9
Bhiloda	38.83	31.43	70.26
Dhansura	11.81	6.48	18.29
Malpur	19.67	9.2	28.87
Meghraj	18.75	15.4	34.15
Modasa	77.84	37.87	116.21
Total	206.55	120.68	327.23



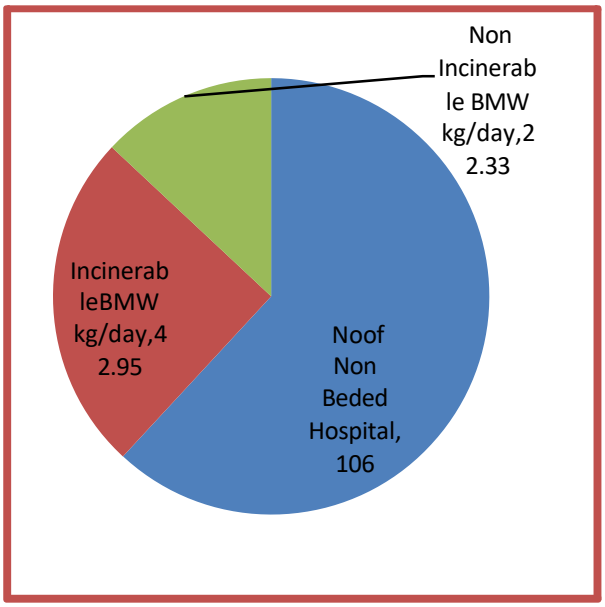
IncinerableBMWkg/Day



No in cinerable BMW kg/Day

No of Beded	Total Bed	Average Bed
210	2507	11.93
163.6	98.35	261.95

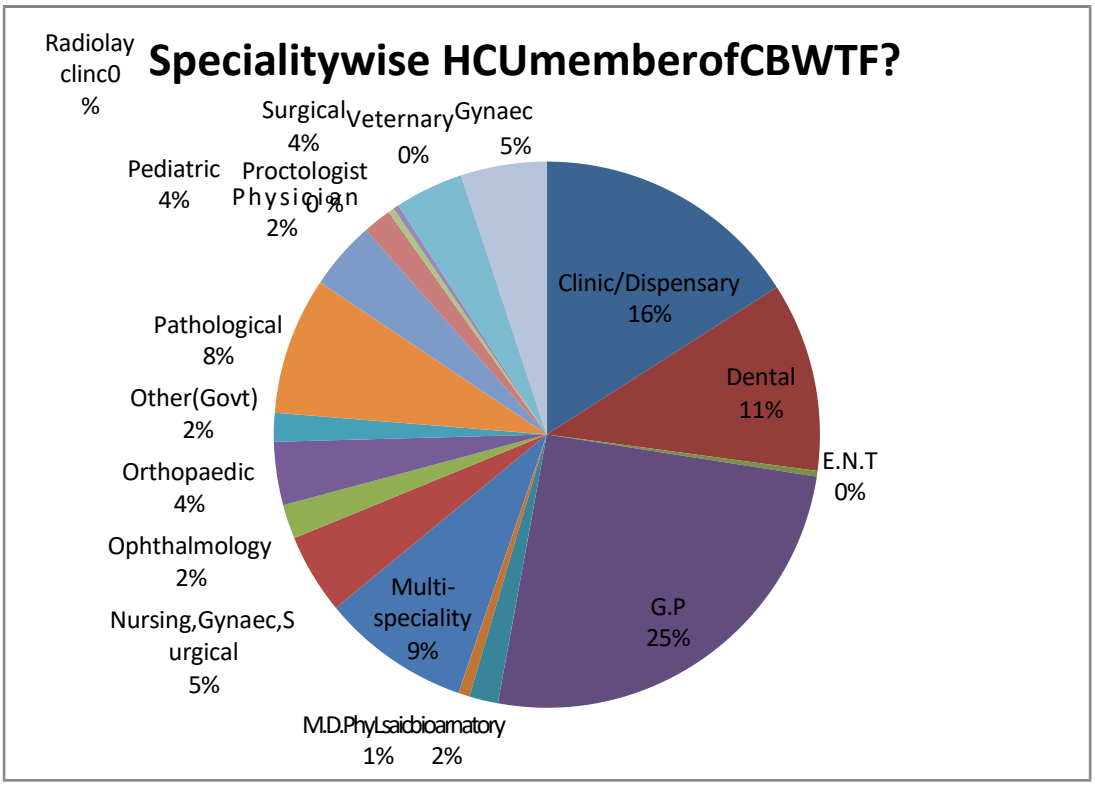
No of Non Beded Hospital	Incinerable BMW kg/day	Non Incinerable BMW kg/day	Total BMW kg/day
106	42.95	22.33	65.28



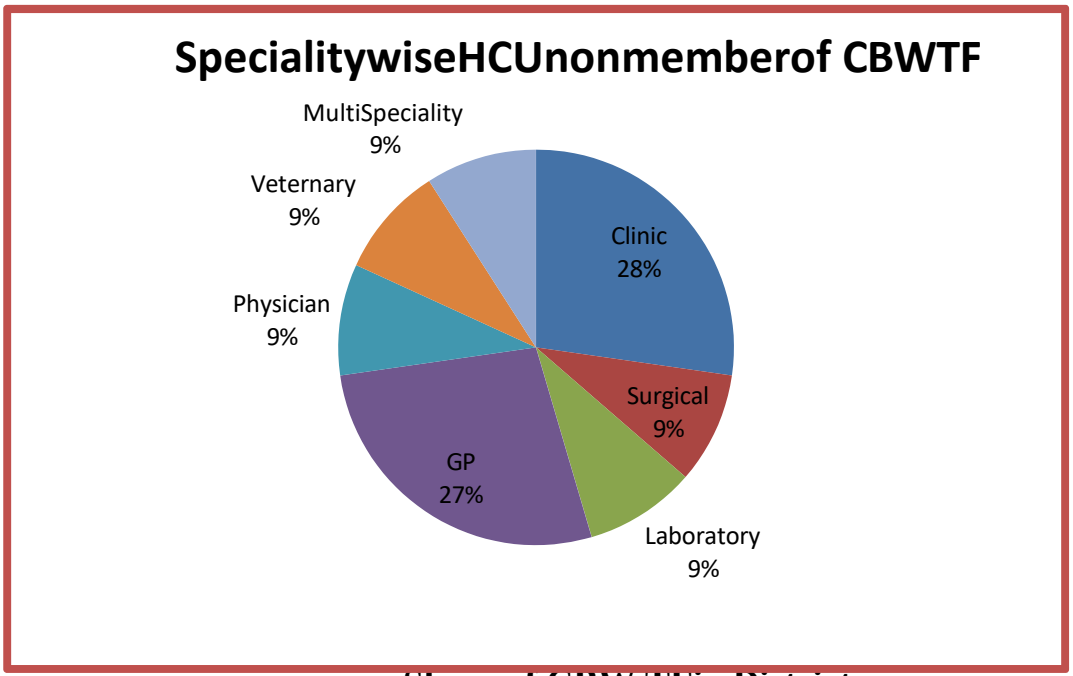
Graph and table section-C

The membership of CBWTF is 293. The rest of the 13 HCUs are not available with CBWTF.

Thespecialitywisetotal295HCUsmemberofCBWTFas follow



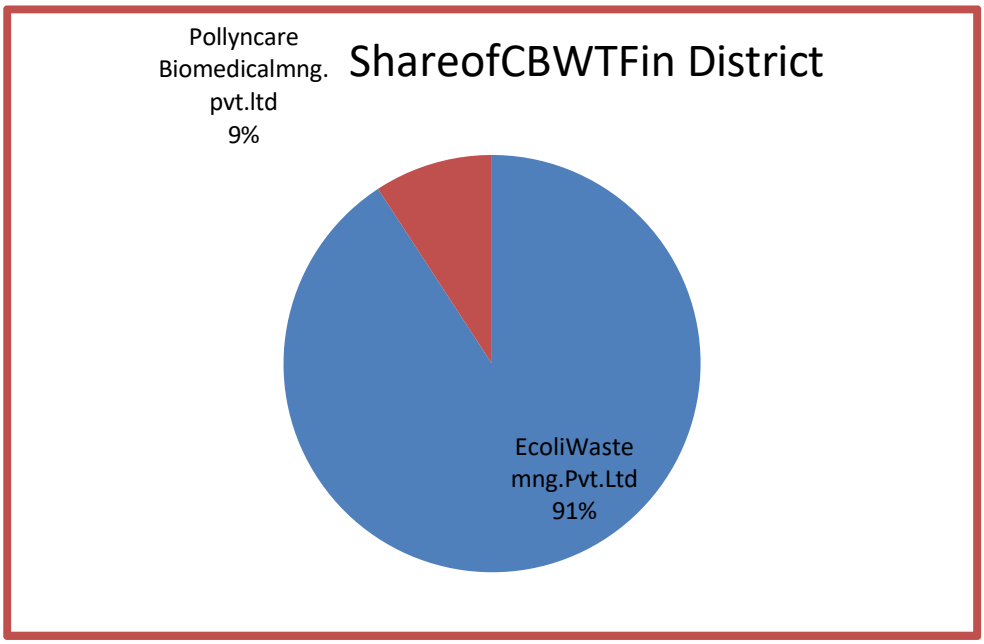
The specialitywisetotal11HCUsnonmember ofCBWTFas follow



Share of CBW TFin District

Share of CBWTF in District	
Ecoli Wastemng. Pvt. Ltd	266
Pollucare Biomedicalmng.pvt.ltd	27
Total	293

ThepercentagewiseshareofCBWTFin District



The Average Frequency of collection by CBWTF of all HCUs is observed as

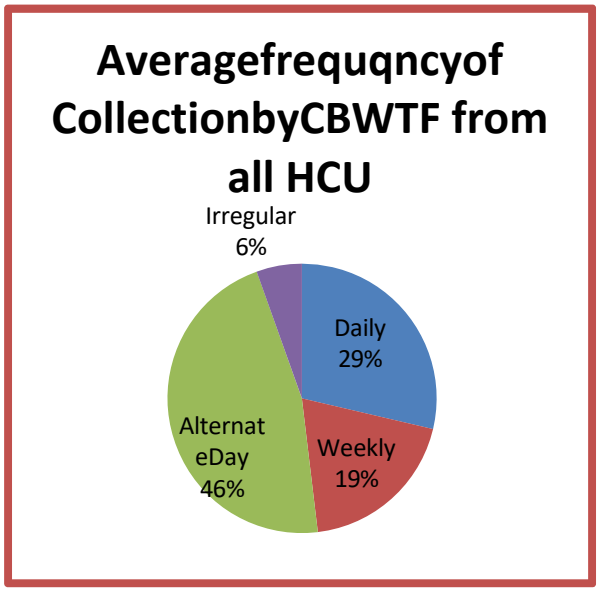
-Daily

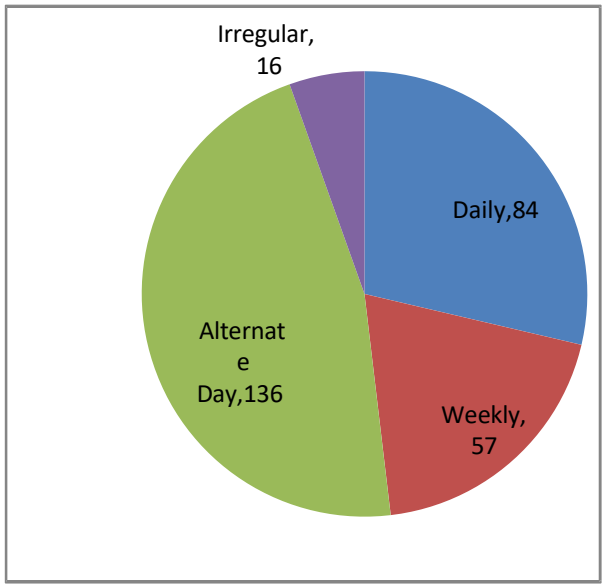
-Weekly

-Alternate day

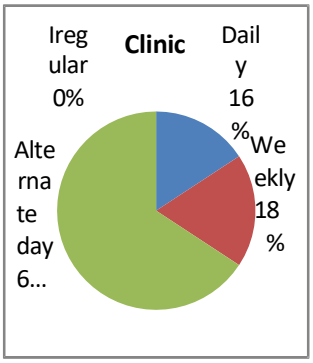
-Irregular

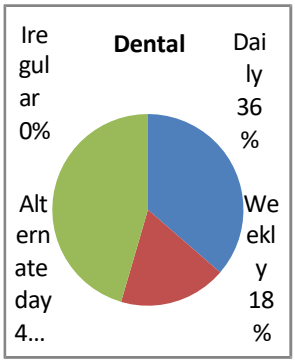
The Average Frequency of collection by CBWTF of all HCUs is observed as

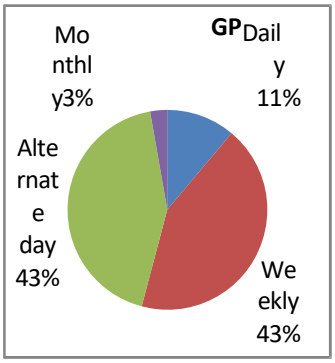


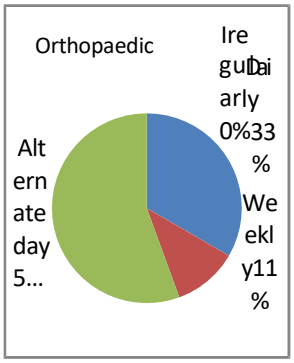


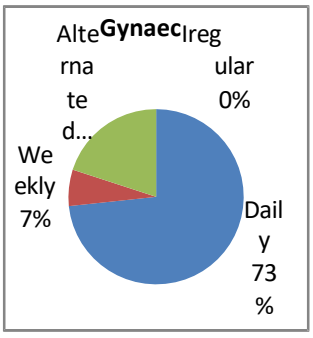
The Average Frequency of collection by CBWTF of all HCUs Speciality wise is observed as

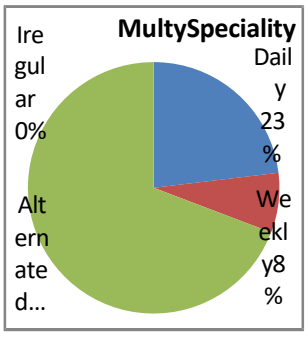


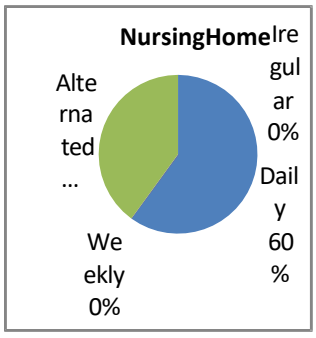


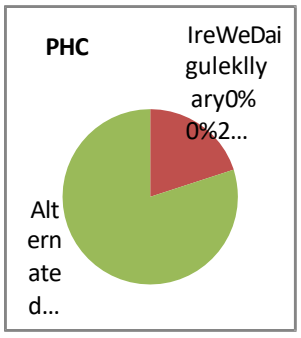


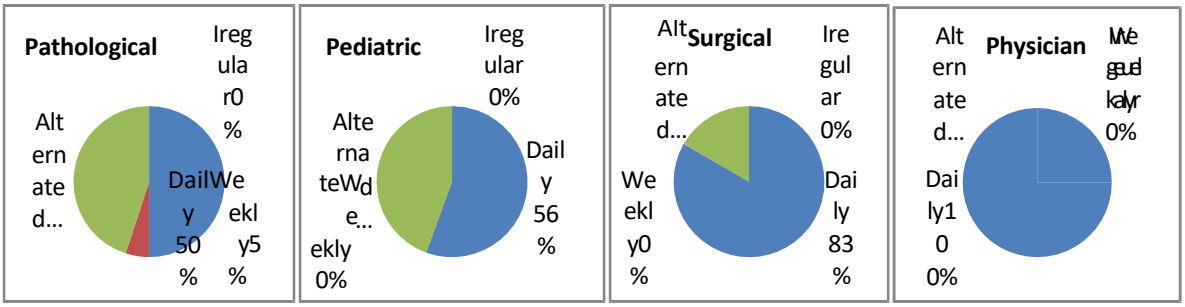




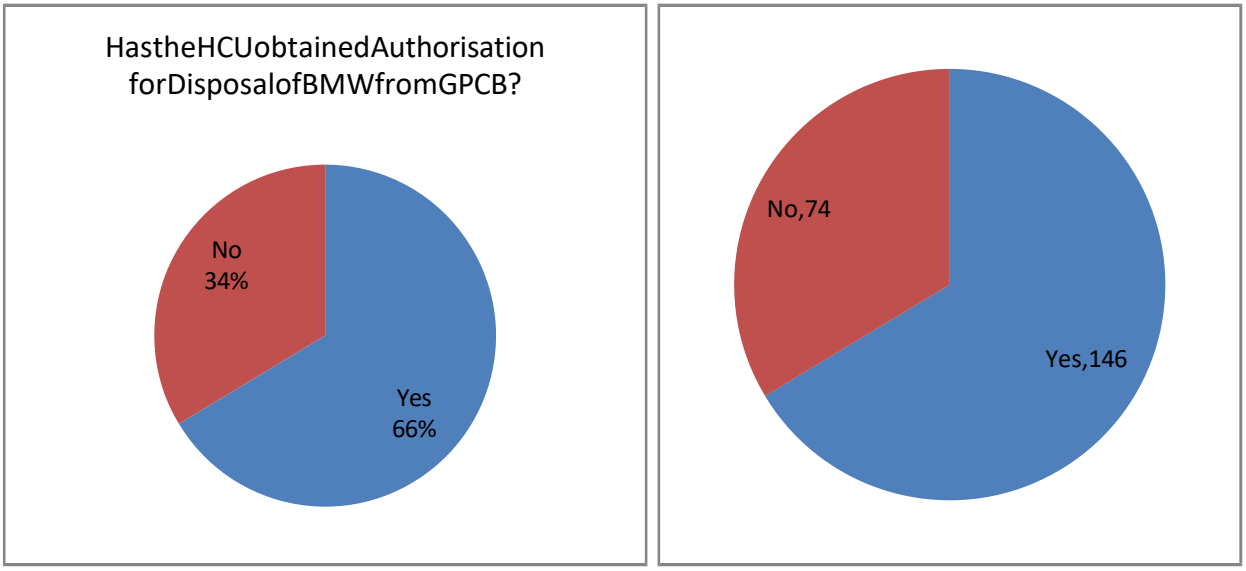




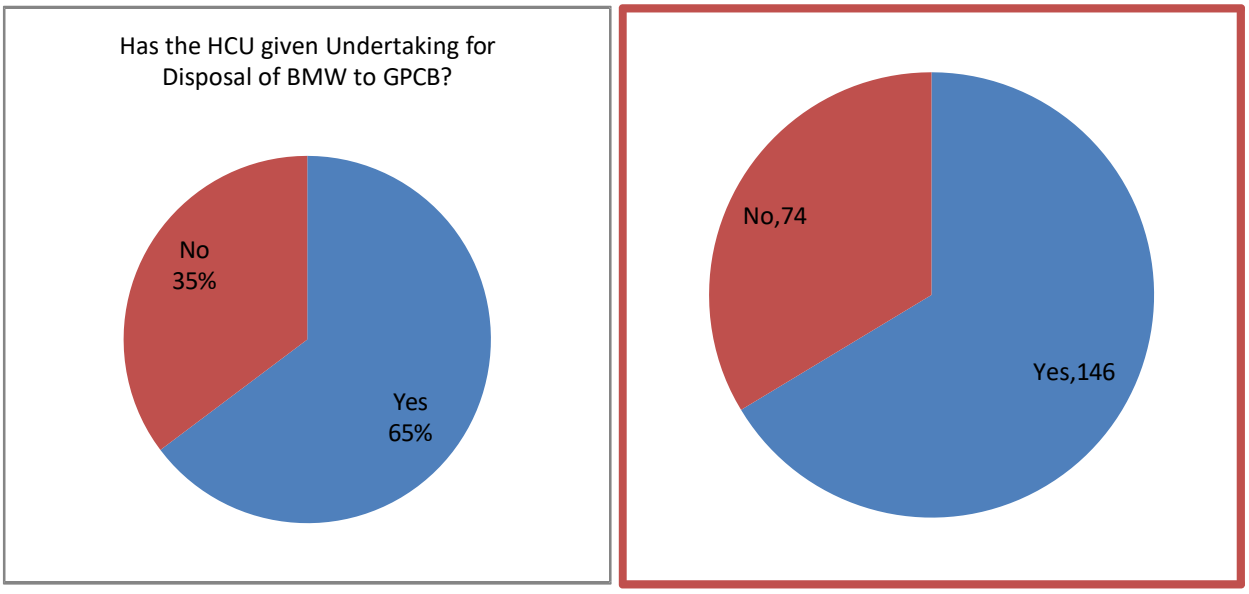


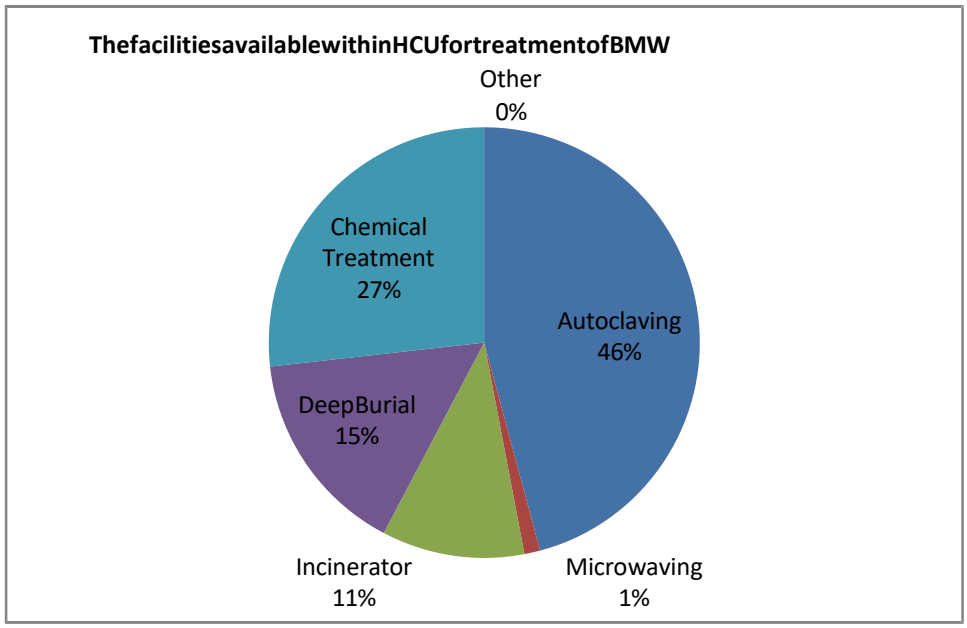


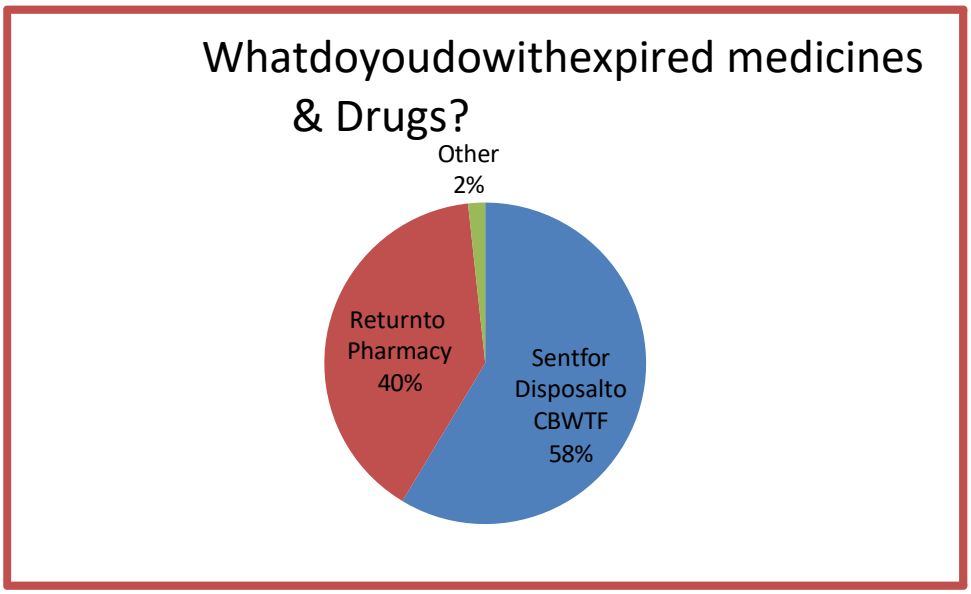
The HCU authorization obtained by from GPCB for Disposal of BMW in District



HCU giving undertaking for disposal of Bio-Medical Waste to GPCB

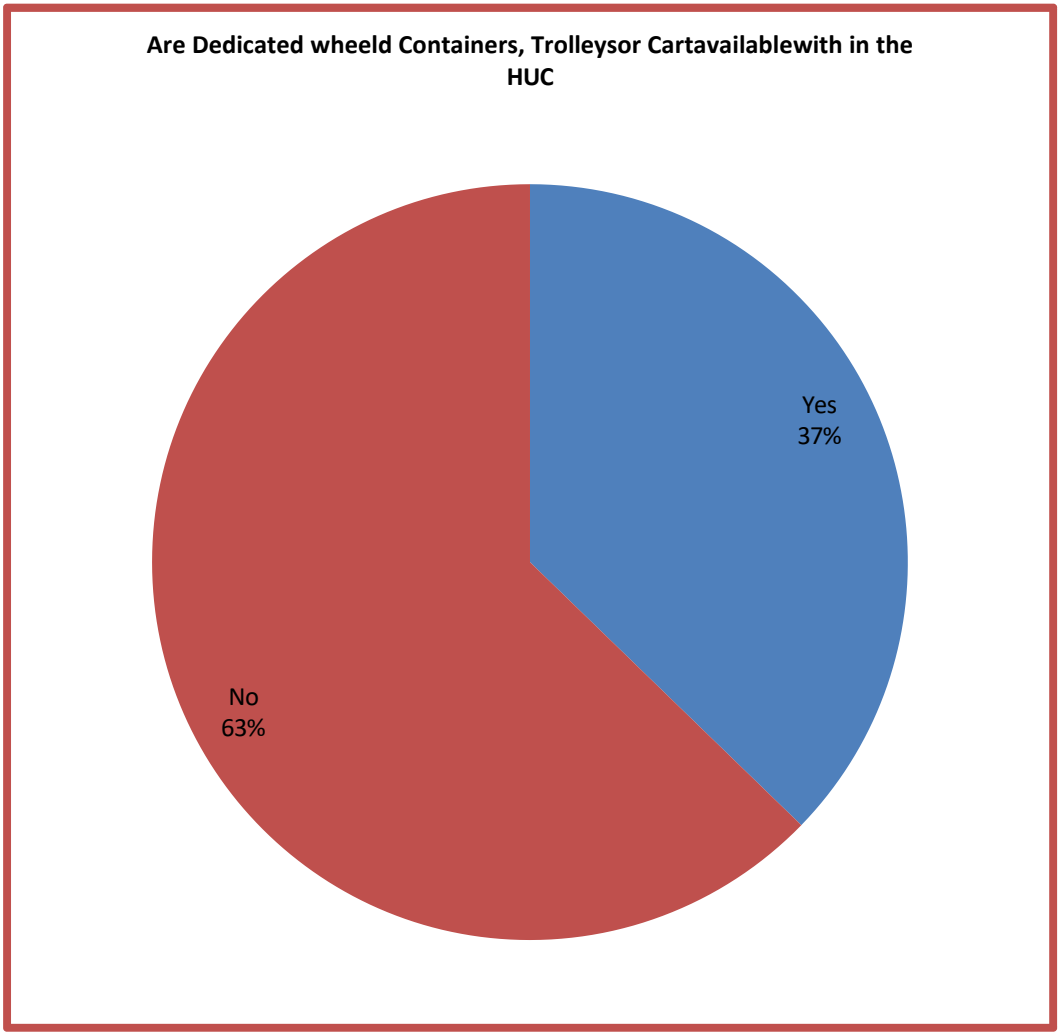


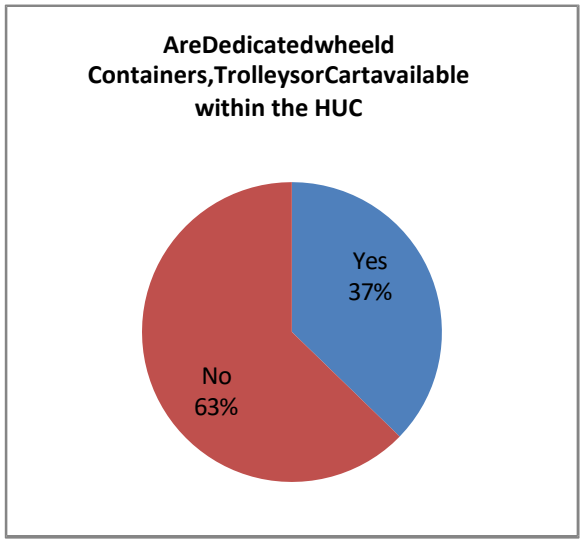

ThefacilitiesavailablewithinHCUfortreatmentofBMW
Other
0%
Chemical
Treatment
27%
Autoclaving
46%
DeepBurial
15%
Incinerator
11%
Microwaving
1%

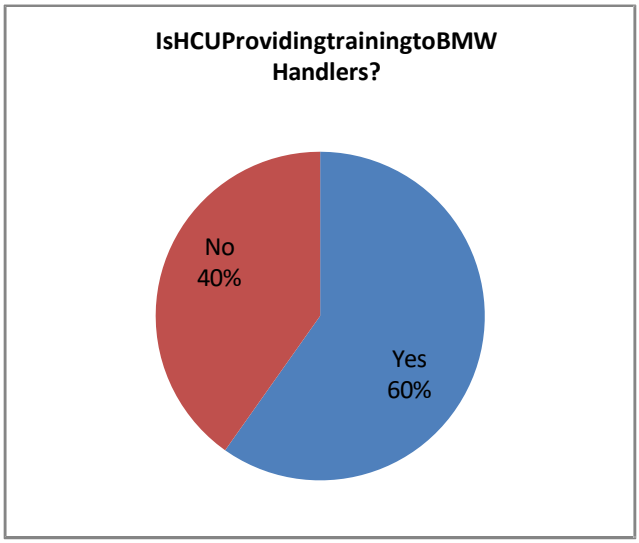

Whatdoyoudowithexpired medicines
& Drugs?
Other
2%
Returnto
Pharmacy
40%
Sentfor
Disposalto
CBWTF
58%

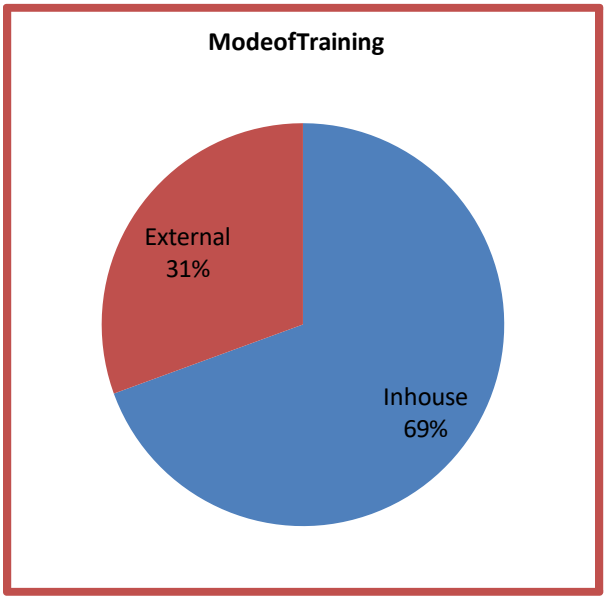
Section D Chart and Graph

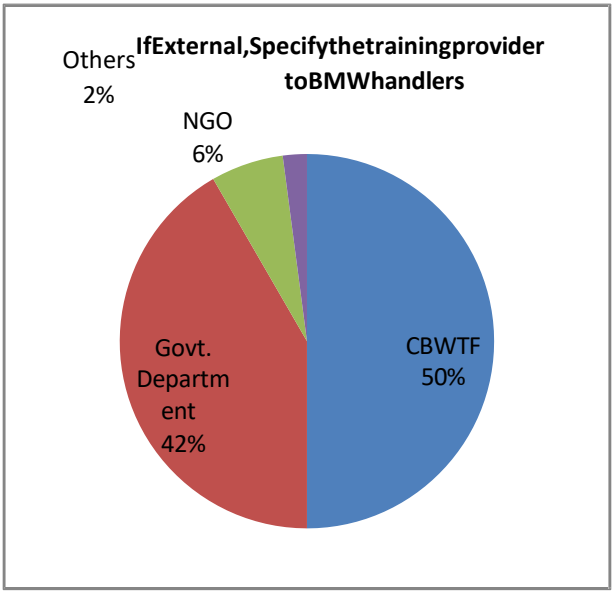
Personal Protective Equipment(PPE)in243HCU	
Hand Gloves	**233**
Head Cover	**82**
Facemask	**198**
Shoe Cover	**42**
Goggles	**42**
Gown/Apron	**101**
Cytoxic PPEs	**0**
Others	**0**




AreDedicatedwheeld Containers,TrolleysorCartavailable within the HUC
Yes 37%
No 63%


IsHCUProvidingtrainingtoBMW Handlers?
No 40%
Yes 60%


ModeofTraining
External 31%
Inhouse 69%


IfExternal,Specifythetrainingprovider toBMWhandlers
Others 2%
NGO 6%
Govt. Departm ent 42%
CBWTF 50%

Discussion and Conclusion

As per the observations and report of six Taluka of Aravalli District it is concluded that all the HCU generating bio-medical waste. It includes hazardous waste in the form of solid and liquid. Not a significant numbers of HCU from Aravalli has its own treatment and disposal mechanism. All most the HCU handed over their bio-medical waste to the CBWTF agency. The staffs of the Government HCU are trained to handle the waste but, in private hospitals the staffs are not adequately aware about the training. The transport and disposal facilities of solid waste are not up to them ark even in government hospitals. For liquid waste there is no proper record about the quantity of waste generated and their discharging measures. There is neither attempt to minimize the quantity of waste generation nor any mechanism to decrease the toxicity of the waste. There is no any provision by the management to have any innovations, equipments in the future to treat the waste generation at the source level.

Thus it is cleared that in Aravalli there is more requirement for efficient management of hospital waste is in existence. The rules and regulations regarding to the bio-medical waste is no adequately followed. The government as well as private hospitals are requiring in proper management and disposal of the irate in accordance to the environmental rules.