



The New Miraj Education Society's
Kanya Mahavidyalaya, Miraj
Environment Audit Report



Prepared by
Department of Environmental Science,
Shivaji University, Kolhapur- 416004

2021-22



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Certificate

This is to certify that the Department of Environmental Science, Shivaji University, Kolhapur has conducted detailed "Environmental Audit" of "The New Miraj Education Society's Kanya Mahavidyalaya, Miraj" during the academic year 2021-2022. The Environmental audit was conducted in accordance with the applicable standards prescribed by Central Pollution Control Board, New Delhi and Ministry of Environment, Forest and Climate Change, New Delhi. The audit involves water, wastewater, energy, air, green inventory, solid waste etc and gives an 'Environmental Management Plan', which the institute can follow to minimize impact on the institutional working framework. The performance of college was found to have good quality. Even though there is more improvement needed with respect to sustainable Green practices in case of water resource management and Solid waste management. In an opinion and to the best of our information and according to the information given to us, said Environmental audit gives a true and fair view in conformity with environmental auditing principles accepted in India.

Head

Department of Environmental Science,
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Principal's Message



The Institute realizing the need of Green, Energy and Environment Audit for Environment friendly campus is serious for the assessment of the campus for such audits. In the Globalized world, many environmental issues have to face and it has become our prime duty to protect the earth from all types pollutions.

Our institute has framed the 'Eco-Friendly Campus Cell' which takes initiatives to keep the environment of the campus clean and green. Under the guidance of this cell our departments of N.S.S. and N.C.C. organize cleanliness drive regularly. Similarly, various programmes are organized for our students to increase awareness about environment protection and sustainability. The institute has set up Rain-Harvesting and Compost Fertilizer project for waste management.

The roll of HEI institutes in Environment Sustainability is crucial today. Hence our institute not only takes efforts inside the campus but also outside the campus for eco-friendly activities. The collection of e-waste is also done to increase the awareness of society about the dangers of e-waste and plastic.


Along with this programmes, the record is maintained to assess the environmental performance of our institution and to find out solutions for eco-friendly campus. All the programmes are in relation to the objectives to improve the environmental conditions in and around the institute.

So, I am happy that our institution is conducting these audits very keenly under the guidance of a team from the Shivaji University, Kolhapur. It certainly helps us to act in response to the environmental issues in future.

Thank you,

Place: Miraj
Date:11/05/2022




Acting Principal
Kanya Mahavidyalaya, Miraj.
Dr. Sharwari Sharad Kulkarni

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Chapter - I

Introduction

1.1 Environment Audit, a Tool for Environmental Protection:

The modernization and industrialization are the two important outputs of twentieth century, which have made human life more luxurious and comfortable. On the other hand, they are responsible for voracious use of natural resources, exploitation of forests and wildlife, producing massive solid waste, polluting the scarce and sacred water resources and finally making our mother Earth ugly and inhospitable. Today, people are getting more familiar to the global issues like global warming, greenhouse effect, ozone depletion and climate change and so on. Now, it is considered that this is the final call by mother Earth. The time has come to wake up, unite and combat together for sustainable environment.

Environment Audit is the most efficient ecological tool to solve such environmental problems. Such audit was invented in late 1970s with the motive for inspecting the work conducted within the organization. It is systematic identification, quantification, recording, reporting and analysis of components of ecological diversity and expressing the same in financial or social terms. Through Environment Audit one gets a direction as how to improve the condition of environment.

1.2 Benefits of Environment Audit:

There are many advantages of Environment Audit if is implemented properly:

- It would help to protect the environment in and around the campus.
- Recognize the cost saving methods through waste minimization and energy conservation.
- Find out the prevailing and forthcoming complications.
- Empower the organization to frame a better environmental performance.
- It portrays good image of institution through its clean and green campus.

Finally, it will help to build positive impression for the upcoming NAAC visit.

1.3 NAAC Criteria VII Environmental Consciousness:

Environment Audit is assigned to Eco-club. The criterion VII of NAAC. National Assessment and Accreditation Council that is a self-governing organization that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of

accreditation of the institution. The intention of Environment Audit is to upgrade the environmental condition in and around the institution. It is performed by considering some environmental parameters like water and wastewater management, energy conservation, waste management, air monitoring, etc. for making the institution eco-friendlier.

Students are the major strength of any academic institution. Practicing green actions in any educational institution will inculcate the good habit of caring nature in students. Many environmental activities like plantation and nurturing saplings and trees, cleanliness drives, bird watching camp, no vehicle day, rain water harvesting visits to ecologically important places through Eco clubs will make the student a good citizen of country.

Chapter II

Methodology

The College has conducted Environment Audit in the year 2021-22, on a yearly basis. The audit was carried out in three phases.

2.1 Questionnaire survey:

It includes administrative issues associated with the planning of audit, selecting the personnel for the audit team, preparing the audit protocol used by organization, obtaining background information, etc. The scope of the audit was defined at this step. It was decided that the information related to Water and Wastewater management, Energy conservation, Green belt, Carbon inventory, Solid waste management, Hazardous waste management, Air and noise quality status, activities of nature club, etc. should be gathered for the audit purpose. For collecting data related to these different areas, specific questionnaires were prepared.

2. 2 Onsite visit and observations:

The data related to above mentioned areas was collected by visiting each and every facility of College campus. The questionnaires were filled up according to the present situation. Photographic documentation was also done with the help of sophisticated camera.

2.3 Data analysis:

After collection of secondary data, the reviews related to each environmental factor were taken by the Environment Audit team. The data was tabulated, analyzed and graphs were prepared using computer. Depending upon the observations and data collected, interpretations were made. The lacunas and good practices were documented. The Environmental Management Plan (EMP) was prepared for the next academic year in order to have better environmental sensitization. Finally, all the information was compiled in the form of Environment Audit Report.

Environmental Auditing Process

Planning



Choosing audit
team



Inspecting site/
Collection of data



Analysing results
of audit



Evaluating audit

Chapter III

Overview of Environment Audit

3.1 Kanya Mahavidyalaya, Miraj a glance:

Kanya Mahavidyalaya, Miraj college is one of the leading college to provide the opportunity of higher education to economically and socially disadvantaged students. Kolhapur Municipal Corporation established Kanya Mahavidyalaya, Miraj College to dispel this deficiency to develop college education. The College has huge campus with many classrooms, Arts and Commerce section, canteens, library facility, Auditorium, Gymkhana etc. Enormous manpower including students, administrative faculty, teaching and nonteaching faculty, workers use this huge premises for various purposes.

Kanya Mahavidyalaya, Miraj is situated in Maharashtra at $74^{\circ}38'36.56''E$ and $16^{\circ}49'27.65''N$, in the Kolhapur District. It covers an area of about 1.27 acre.

Satellite image of Campus Kanya Mahavidyalaya, Miraj.



Source: Google Earth

COLLEGE PROFILE IN BRIEF

NAME OF THE COLLEGE: The New Miraj Education Society's Kanya Mahavidyalaya, Miraj.

ESTABLISHMENT: 1983

PIONEERS: Hon.Arvindrao Govindrao Marathe

No. OF STUDENTS: 975

FACULTY: 13

NON-TEACHING STAFF: 17

FACILITIES: A spacious, green campus with a strong well ventilated building with good infrastructure, 15 classrooms, Library, Gymkhana, Canteen , Computer lab etc.. The institute provides basic facilities of washrooms, common room, water purifying system, vending machine. The campus is surrounded by various trees.

RESEARCH AND EXTENSION

ACTIVITY: College conducts different courses for the excellence of U.G.& P.G Degree and Certificate courses. The college has a good number of extension activities like plantation of trees, cleanliness drive, cleaning of public places and village, seminars, workshops, environmental awareness campaigns, etc. The college has compost fertilizer project which helps for waste management. In addition to it the college has rain harvesting system.

AREA OF COLLEGE: 1.27 acres.

3.2 Water and Wastewater Audit:

Water which is precious natural national resource available with fixed quantum. The availability of water is decreasing due to increasing population of nation, as per capita availability of utilizable water is going down. Due to ever rising standard of living of people, industrialization, urbanization, demand of fresh water is increasing day by day. The unabated discharge of industrial effluent in the available water bodies is reducing the quality of these ample sources of water continuously. Hence, the National Mission on Water Conservation was declared by the then Prime Minister Hon. Dr. Manmohan Singh in 2003 and appealed to all citizens to collectively address the problem of water shortage, by conserving every drop of water and suggested for conducting water audit for all sectors of water use.

Water audit can be defined as a qualitative and quantitative analysis of water consumption to identify means of reducing, reusing and recycling of water. Water Audit is nothing but an effective measure for minimizing losses, optimizing various uses and thus enabling considerable conservation of water in irrigation sector, domestic, power and industrial as well. A water audit is a technique or method, which makes possible to identify ways of conserving water by determining any inefficiency in the system of water distribution. The measurement of water losses due to different uses in the system or any utility is essential to implement water conservation measures in such an establishment.

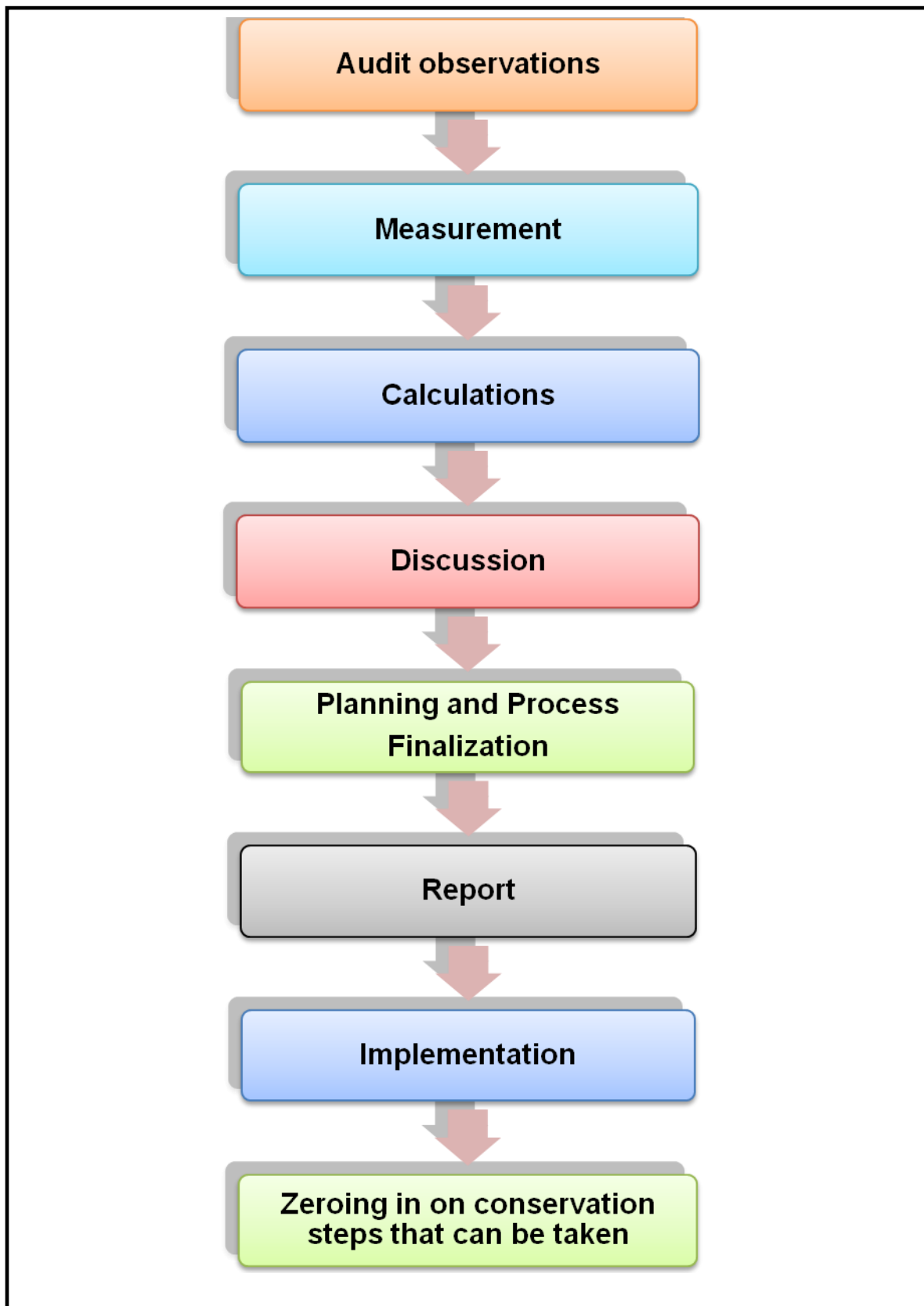
Importance of Water Audit:

It is observed that a number of factors like climate, culture, food habits, work and working conditions, level and type of development, and physiology determine the requirement of water. The community, which has a population between 20,000 to 100,000, requires 100 to 150 liters per person (capita) per day. As per the standards provided by WHO Regional office for South East Asia Schools require 2 liters per student for drinking; 10-15 liters per student if water-flushed toilets, Administration requires (Staff accommodation not included) 50 liters per person per day, Staff accommodation requires 30 liters per person per day and for sanitation purposes it depends on technology.

3.2.1 Water Audit:

Water usage can be defined as water used for all activities which are carried out on campus from different water sources. This includes usage in all residential halls, academic buildings, on campus and on grounds. Wastewater is referred as the water which is transported off the campus. The wastewater includes sewerage, residence, hall waters used in cooking, showering, clothes washing as well as wastewater from chemical and biological laboratories which ultimately going down in sink or drainage system

Water Audit Process



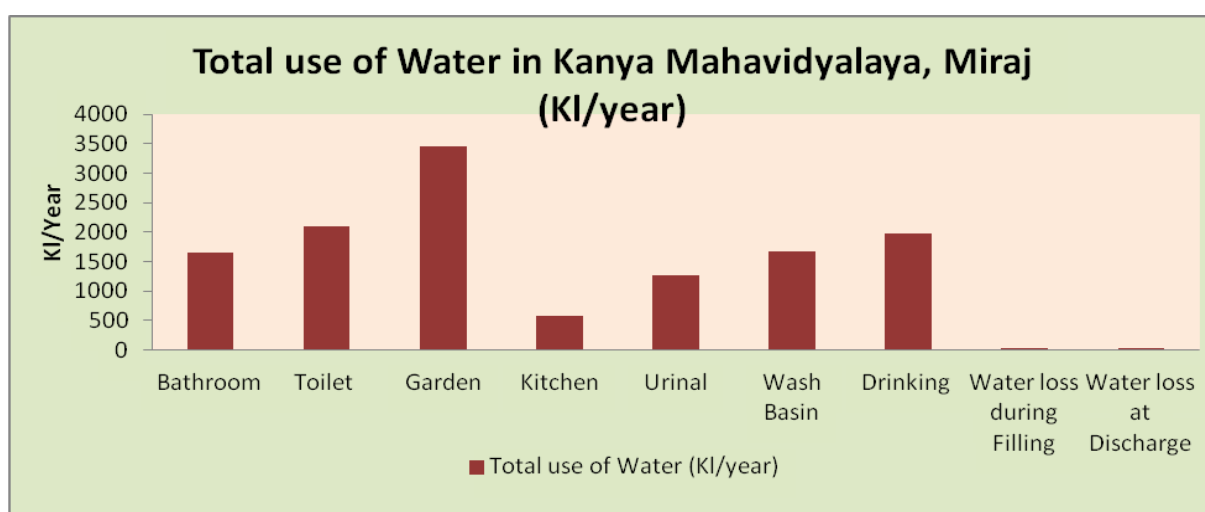
3.2.2 Water consumption in College:

From the data collected for water audit of Kanya Mahavidyalaya, Miraj the water distribution and water consumption pattern is noticed. The College includes Main Building with Staff room and Principal room, Exam section and Ladies room. Also, all Departments of Arts and Commerce including language. College has support services like Gymkhana, Auditorium, Garden, library, ICT room and NCC section etc.

3.2.2. a The water consumption at Kanya Mahavidyalaya, Miraj:

Table No. 3.2.1: Sector wise calculated use of water in Kanya Mahavidyalaya, Miraj

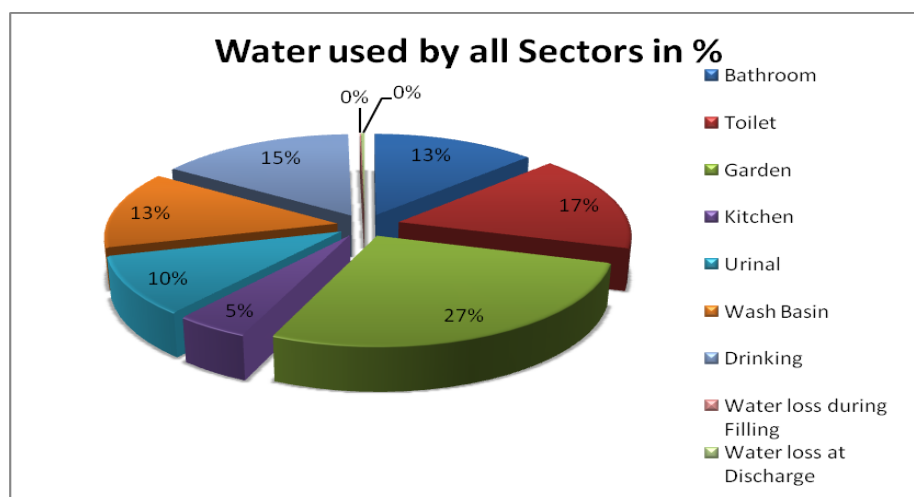
Sr. No.	Sector	Total daily use (Kl/day)	Total yearly use (Kl/year)	Percentage %
1	Bathroom	13.2	1650	12.94
2	Toilet	16.8	2100	16.8
3	Garden	21.6	3456	27.11
4	Kitchen	3.6	575	4.52
5	Urinal	10.15	1268.75	9.95
6	Wash Basin	13.44	1680	13.18
7	Drinking	15.75	1968.75	15.44
8	Water loss during Filling	0.096	12	0.09
9	Water loss at Discharge	0.28	36	0.28
Total		94.924	12747.5	100



Graph No. 3.2.1 Total water consumption yearly by Kanya Mahavidyalaya, Miraj.

It is revealed from the data given in Table No. 3.2.1 and Graph No. 3.2.1 that total **94.924** Kiloliter daily and yearly 12747.5 Kiloliter water is used. College includes Main Building, having Staff room and Principal room, Exam section and Ladies room. Also all Departments of Arts and Commerce including languages. College has support services like Gymkhana, Auditorium, Garden, library, ICT and NCC section using water is seen for bathrooms, toilet, drinking, wash basin, kitchen, and urinal purpose for daily and also calculated yearly. From above data, it is observed that the maximum water consumption was for Garden which is 21.6 Kilolitre/day i.e. 3456 Kilolitre/year and for Toilet purpose 16.8 Kilolitre/day and yearly 2100 Kilolitre/year. Water loss during filling of water in tank was noted as 0.096 Kilolitre/day i.e. 12 Kilolitre/year and water losses at discharge were found to be 0.288 Kilolitre/day i.e. 36 Kilolitre/year.

3.2.2. Average daily water consumption by Kanya Mahavidyalaya, Miraj.



Graph No. 3.2.2 Average Daily Water consumption by Kanya Mahavidyalaya, Miraj.

Graph No. 3.2.2 shows the total percent of water consumed by Kanya Mahavidyalaya, Miraj in the 2021-22. As per the graph Garden, Toilets, Bathroom, Drinking, and Wash Basin are the major sources of utilization comprising 27%, 17 %, 15%, 13% and 13% respectively. The other uses namely Urinal and Kitchen consume relatively less water with daily water requirement of 10 % and 5 % respectively in the year 2021-22.

3.2.3 Sustainable Water Practices (SWP):

3.2.3.a. Collection tank for water storage.

College has a water collection tank having 2000 lit capacity on terrace in front side of building. These tanks are useful to supply water for building.



Collection tank for water storage

3.2.3. b. Water filter Unit and drinking water facility:

Kanya Mahavidyalaya, Miraj has water filter unit in the campus from last four year. The plant has 1000 liter capacity, which helps to get pure water for drinking to all members of college. It will help to minimize the water born disease occurrence. College has drinking water facility in outside area of building. Water is purified in water filter unit and used for drinking and other cleaning activity.



Advanced water filter unit



Drinking water facility

3.2.3.c Drip Irrigation in Kanya Mahavidyalaya college Garden

College has green campus. Drip irrigation system has been installed at gardens, which help to save water, and nutrients by allowing water to drip slowly to the roots of plants. The goal is to place water directly into the root zone and minimize evaporation to save water.



Drip irrigation in Kanya Mahavidyalaya garden

3.2.3.d Rainwater collection pipe for Ground water recharging:

College is having rainwater collection pipe, which collect the water in tank helps to collect rain water from roof top area of college which helps for ground water recharging.



Rainwater collection pipe for Ground water recharging:

Key Observations:

- The calculation revealed that highest water use sectors are Garden, which consumes average 27 % water, and remaining 73 % water consumption further divided into other sectors in such garden, urinals, bathroom and kitchen etc.
- College has some water conservation practices such as Water collection tank, round water recharging pipe and tank, advanced water filter, Drinking water facility and Drip irrigation.
- There is safe drinking water facility in the college like water filters or water purification unit.
- To enhance the operating efficiency and reduce the water wastage, College should include more sustainable water practices (SWP) such as establish practices to monitor and maintain proper water usage, Install wastewater treatment plant and Water sub metering etc.

Chapter IV

CONCLUSION AND MANAGEMENT PLAN

The Department of Environmental Science, Shivaji University, Kolhapur has conducted a Environment Audit of Kanya Mahavidyalaya, Miraj in the academic year 2021-22. Environment Auditing is the process of identifying and determining whether college practices are eco-friendly and sustainable. The main objective of College to carry out Environment Audit is to check green practices followed by college and to conduct a well formulated audit to understand where we stand on a scale of environmental soundness.

Conclusions:

From the Environment Audit conducted by team following are some of the conclusions, which can be taken for improvement of the college campus to become environment friendly campus:

1. Availability of water is not the actual problem but efficient management of water is major issue that need to work on.
2. Water Audit helps to quantify all forms of losses and helps in reducing the non-revenue water.
3. Water consumption is more in Garden area.
4. Roof top rainwater harvesting project is present in college which is useful for filling up of tanks on campus.
5. College can conduct more seminars, group discussions and eco-friendly activities on environmental education and awareness
6. College should maintain hygienic conditions and cleanliness in their premises

Recommendations:

Following are some of the key recommendation for improving campus environment.

1. College should develop its own Environmental Policy by using guidelines given in Environment Audit document.
2. The data related to all measured environmental parameters should be monitored and recorded regularly and information be made available to administration.
3. The College should develop internal procedures to ensure its compliances with environmental legislation and responsibility be fixed to carry out it in practice.
4. Rainwater harvesting facility must be expanded and should be improvising through sand filtration system for better quality.

5. To meet EPA standards for safe drinking, water samples should be tested by a certified laboratory.

ENVIRONMENT MANAGEMENT PLAN:

By understanding the dynamics of present situation of resource utilization and current practices of waste disposal, we have prepared an Environment Management Plan (EMP) for the Kanya Mahavidyalaya, Miraj. This plan not only will provide the strengths, weaknesses and remedies for the green and clean campus but also give priority of the sector where the College has to give more efforts to improve its environment.

Environment Management Plan 2021-22

Sector	Strengths	Weakness	Suggestions	Priority
Water				
Water utilization	<ul style="list-style-type: none"> • College has Rain water harvesting project. 	<ul style="list-style-type: none"> • Overflowing of tanks at some places • Overuse of water at in toilets and Gardening perpose. 	<ul style="list-style-type: none"> • Installation of automatic water pumps to avoid overflowing losses • Proper and timely maintenance of plumbing at all departments • Installation of sand filter to rain water harvesting assembly. 	Medium