

# **BEST PRACTICES OF THE INSTITUTION**



**ST. JOSEPH'S COLLEGE**

**DARJEELING**

**2022-23**

## **BEST PRACTICE I**

### **1. Title of the Practice:**

Rain Water Harvesting in the Institution

### **2. Objectives of the Practice:**

Considering the water problem in the region, the institution has undertaken Rainwater Harvesting with the following objectives:

- i) To collect and store rainwater as much as possible and thus utilize it.
- ii) Provide hands-on investigation and analysis of water collected in the tanks and the reservoirs.
- iii) To create awareness among the students about rainwater harvesting for them to practice it even outside the campus and thus help the society and the community.

### **3. The Context:**

Rainwater harvesting (RWH) is a technique of collecting and storing rainwater into reservoirs or tanks. RWH as an artificially designed system, is a simple, easy and cost effective technique of aggregating water and delivering it to water resources like bore wells. RWH has the potential to overcome water problems caused by drought and water scarcity. The practice of RWH can thus be helpful to the society in general and the people in the community in particular. It is for this reason, lot of discussions, conferences, seminars are held across the globe as a sustainable solution in achieving Sustainable Development Goals (SDGs). The Government of India has also been advocating and promoting RWH since many years. Among many one such scheme is “Jal Shakti Abhiyan: Catch the Rain”. Rainwater harvesting is an important alternative to conserve water for future usage. The NITI Aayog Report 2018 has said that India’s water demand will exceed water supply by a factor of two by 2030. Hence, under the rapidly depleting groundwater table, water harvesting is an ideal solution (Satis, 2023). Furthermore, according to World Bank, India is a home to 18 per cent of the world’s population, but only 4 per cent of its water resources, making it among the most water-stressed in the world. A large number of Indians face high to extreme water stress, according to a recent report by the government’s policy Think Tank, the NITI Aayog. In this context Darjeeling Hills is no exception to the water crisis. Hence, in order to combat the water crisis RWH becomes important not only in the present times but also for the future.

### **4. The Practice:**

The entire region of Darjeeling Hills faces acute shortage of water and the crisis gets more serious during dry season. Considering this water situation in the region, the

institution has adopted the practice of Rain Water Harvesting. The institution has taken the following steps in term of RWH:

- i) The Institution has built a concrete reservoir or tank of 30 x 20 x 10 ft.
- ii) The Institution has installed or placed 500 or 1000 liters tank at different locations within the institution.
- iii) The pipes from rooftops are installed and directed towards the tank and the reservoirs.
- iv) The institution has also a system of regularly monitoring it i.e. checking the water levels and its quality.

The institution has the capacity of approximately 66,000 gallons' rain water harvesting. This would at least release some burden to the water suppliers in the region. The institution has been utilizing this rain water whenever and wherever it is required such as washrooms, hostels, etc.

The importance of rain water is also communicated to the students with the objective that they could also practice it outside the institution. This would help the society in terms of water management.

### **5. Evidence of Success**

The setting up of rainwater harvesting has proved beneficial to the institution. It has been helpful in providing the daily needs of water within the campus. The daily needs are seen in terms of its usage in washrooms, hostels, cleaning drains, etc. It has thus catered to almost three thousand students within the campus. Some faculty members have also practiced it in their residence. This has released some burden to the water suppliers, especially during extreme times.

### **6. Problems encountered**

Though rainwater Harvesting method has proved to be beneficial one there are certain limitations which are:

- i) Cleaning of reservoirs, tanks or pipes at regular interval becomes difficult due to large volume of water.
- ii) Considering the hilly typography, disposing of such large volume of water when it needs to be cleaned becomes burdensome task.
- iii) Deployment of personnel to keep a regular check on rainwater harvesting.

## BEST PRACTICE II

### 1. Title of the Practice:

Soil and Water Analysis as an Impact-Oriented Learning Initiative

### 2. Objectives of the Practice (Goal):

The existing curriculum for the Science courses suffers from the limitations of not having lab-based experiments extendable for small scale projects and research on current topics like environmental pollution and more specifically water and soil pollution. Added to this, are the problems of skill deficiency among the students and the unavailability of proper resources in host institutions. The current practice addresses the following issues:

- Provide the infrastructure and develop skills among the students.
- Provide hands-on investigation and analysis of water and soil quality parameters.
- Serve as an extension of the School Outreach Programs and bridge the knowledge gap between high schools and institutes of higher learning.

### 3. The Context

As per government records of the last five years, water-borne diseases have caused 10,738 deaths in India. The Darjeeling Hill region is no exception and water-borne diseases have been on the rise. Major waterborne diseases plaguing the region are cholera, diarrhoea, dysentery, Enteric Fever, Typhoid and Viral Hepatitis (A & E). Less than 50% percent of the district has access to portable water and sanitation (GoI census data). In urban areas, public water supply which draws its source from the Senchel lakes is limited in terms of quantity and quality (no treatment). Alternatively the entire populace depends on water supplied by tankers which collect water from natural springs. In rural areas like the villages and the tea estates people mostly depend on streams and natural springs. These sources are exposed to contamination by domestic effluence and the run-off from tea gardens during the rainy season which have indiscriminately used pesticides and inorganic fertilizers. Adequate knowledge about the portability of water from this region is not only desirable but a must. In addition to this the farmers around Darjeeling Hills have been experiencing the impacts of soil and water degradation with a downslide in quality of farm produce like oranges and cardamom, among others, which warrant immediate attention. Keeping in mind these challenges, the institution took the initiative to set up a laboratory for Water and Soil Analysis.

### 4. The Practice

The College set up the Soil and Water Analysis Laboratory in 2014 with the initiative of the Department of Chemistry. It is an in-house water and soil quality testing facility, sponsored wholly by the institution. The aim is to create the next

generation of water and soil analysts with a practical outlook to help provide practical solutions to some of the real environmental problems viz., water pollution and soil pollution. The hands-on investigation and analysis of Water Quality Parameters is a part of Active Learning. The strategy entails active involvement of the students in performing the tests themselves while thinking about it. They actively communicate with other fellow students taking part in the activity about what they are learning. They are asked to write reflectively about it, relate their findings to previous studies and report their findings.

The Lab has been designed to address students training as well as research activities.

It is an

activity based learning initiative which provides training and hands on experience through:

- a workshop session for the students on the basic concepts of water and soil pollution
- and waterborne diseases.
- a detailed instruction of the various water quality parameters that needs to be checked.
- Hand-outs of standard operating procedures are distributed to the participants.
- hands on training of the various tests are conducted and specific guidelines for the
- handling of instruments given

## **5. Evidence of Success**

Immediately after the setting up of the lab, it was used for carrying out the physio-chemical studies of water related to various research projects, by the teachers. Their results have been well-documented and presented in a UGC sponsored National Seminar held in 2015 (B. Rai & U. Rai, Assessment of Physiochemical Characteristics of Major Sources of Drinking Water in Darjeeling) and also in the form of an edited chapter in a book published by the College: Climate Change, Impact and Adaptations, 2017 (K. Pradhan, Hydrocarbon pollution in Water: Schiff Base Metal Complex for Its Chemical Remediation). The facility has also helped students from different schools to do outstandingly well in science exhibitions and fairs. Recently in 2019, students from a school from a remote area, Rabindranath High School, Soureni Bazaar were adjudged second best in the State level science exhibition at Kolkata. The students had availed the use of the facility at St. Joseph's College for their project preparation and sample analysis. St. Robert's School and St. Michael's School in Darjeeling had been chosen to represent in the State-level competitions, in 2018 and the students along with their supervisor had been provided free access of the College resources.

## **6. Problems encountered and resources required:**

Since the school outreach program had to be done over and above the regular class duties, coordinating with the school supervisor and arranging to accommodate them in the regular College timings was a big hurdle. Since the analysis requires a series of tests that need to be performed, sometimes repeatedly, it is an expensive affair as the costs of chemicals have gone up. Instrument maintenance is yet another hurdle. Abrupt power failures are a big cause of concern, rendering the investigation useless at times. Frequent power cut has damaged the UV spectrophotometer.

The resources required are the following:

- 1.Apparatus set up for titration
- 2.Chemicals for various tests
- 3.Distilled water unit
- 4.pH Meter
- 5.Conductivity Meter
- 6.TDS Meter
- 7.BOD Incubator
- 8.Flame photometer
- 9.UV spectrophotometer

The Soil and Water Analysis as an Impact-Oriented Learning Initiative has been a fruitful endeavor as this is the only laboratory in Darjeeling Hills working in this direction; and is expected to contribute significantly to environmental awareness and regeneration in the region. Furthermore, the initiative is expected to contribute towards alternative livelihood planning for the farmers in the long run with the sustained awareness and planning towards soil and water testing and analysis through this initiative.