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(Data Generated for JAAI West Zone Conference 14-16 Nov 2025)

Rainwater Harvesting, Terrain-Based Recharge Assessment Solar Installation, Carbon Sequestration Study

1 RAINWATER HARVESTING ANALYSIS

RWH Formula:

RWH = P × A × C

Where:

- **P** = Mean annual rainfall (in meters)

- **A** = Surface area (m²)

- **C** = Runoff coefficient

  - Rooftop: 0.875

  - Paved: 0.7

  - Unpaved: 0.6

o   Green: Excluded from RWH (used for carbon sequestration only)

Data Considered:

- **Rainfall Data (CHIRPS – Last Three Years)**

Year	Rainfall (mm)	Rainfall (m)
2024	3,869.31	3.869
2023	2,798.47	2.798
2022	3,529.47	3.529

- **Mean Annual Rainfall (P)** = (3.869 + 2.798 + 3.529) / 3 = **3.3987 m/year**

- **Surface Area Data**

Surface Type	Area (m²)	Runoff Coefficient
Roof	2,754.37	0.875
Paved	984.66	0.7
Unpaved	6,430.26	0.6
Green	1,746.32	— (excluded)

RWH Calculations

- **RWH (Roof)** = 3.3987 × 2,754.37 × 0.875 = **8,201.90 m³**

- **RWH (Paved)** = 3.3987 × 984.66 × 0.7 = **2,338.49 m³**

- **RWH (Unpaved)** = 3.3987 × 6,430.26 × 0.6 = **13,112.15 m³**

Total Annual Harvestable Rainwater

- Total RWH = 8,201.90 + 2,338.49 + 13,112.15 = 23,652.54 m³ = 23,652,540 liters/year

TERRAIN PROFILE ANALYSIS

Profile 1: North–South

- **Elevation Range**: 31.29 m to 38.71 m → **Relief: ~7.42 m**

- **Slope Pattern**:

  - Central ridge; slopes gradually toward both north and south

- **Drainage Implication**:

  - Runoff likely diverges from central high point

  - Low zones on both ends can support **recharge or retention zones**
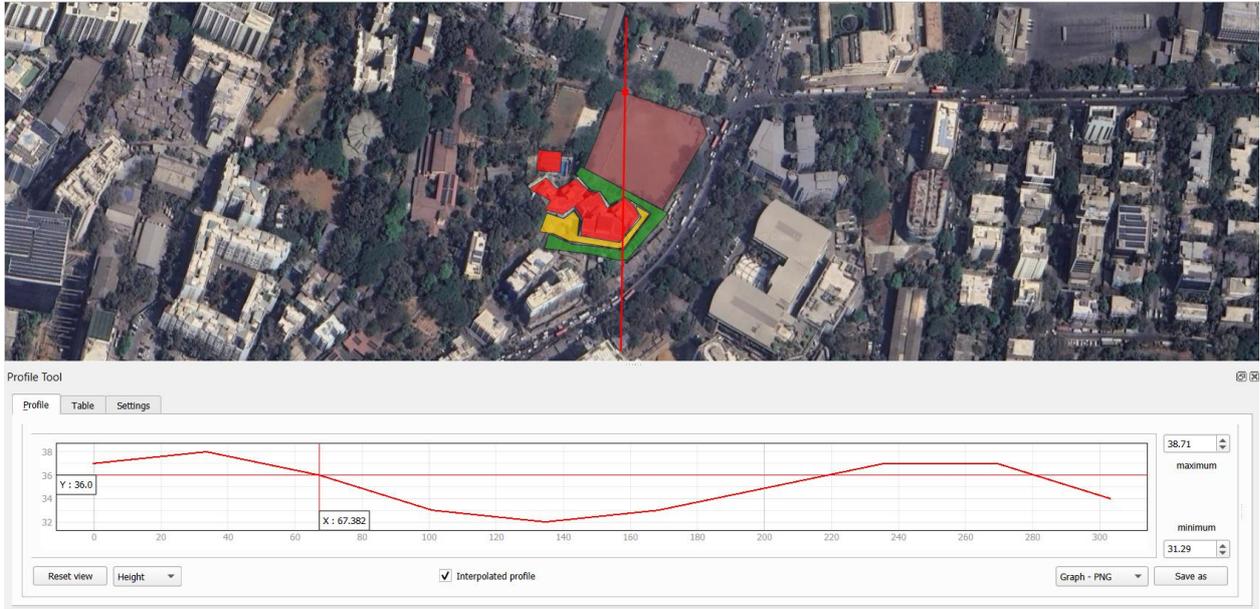
Profile 2: East–West

- **Elevation Range**: 28.11 m to 47.89 m → **Relief: ~19.78 m**

- **Slope Pattern**:

  - Pronounced slope from western edge upward to a high ridge, followed by flattening toward east

- **Drainage Implication**:

  - Runoff flows dominantly **east-to-west**

  - **Western low edge** ideal for **storage tanks or infiltration systems**
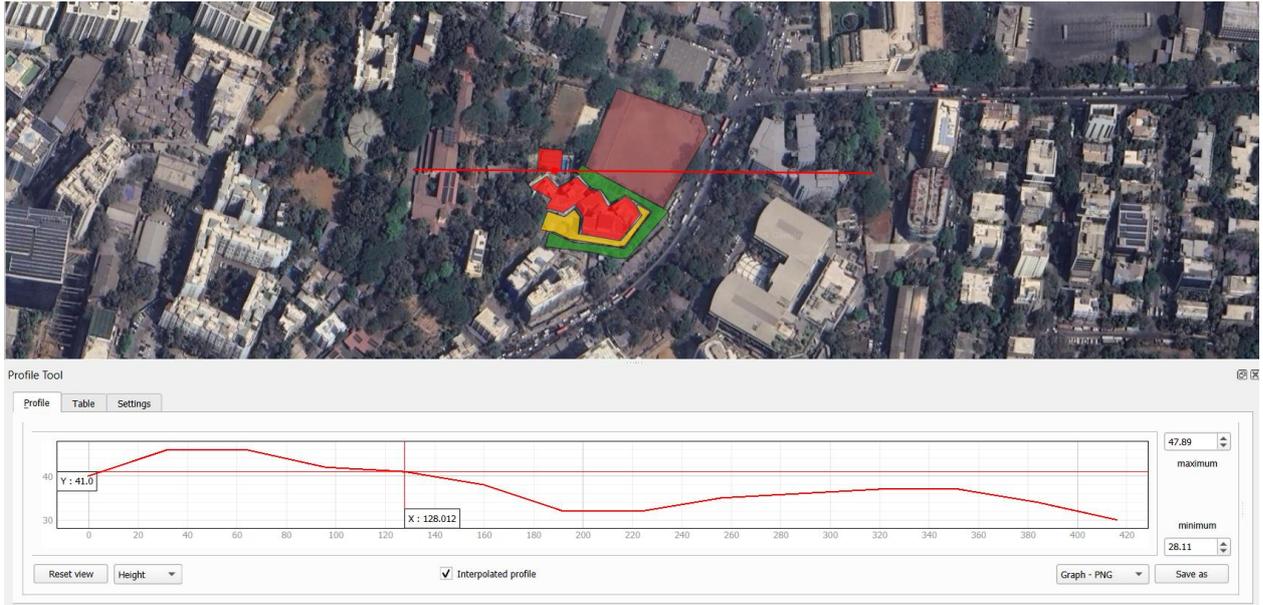
Recommendations: Storage & Recharge Zones

- **Western and southern edges** provide most suitable elevations for collection

- Use slope to your advantage for **gravity-fed recharge pits**

- Explore placement of **signage and education spots** near recharge zones or green areas for awareness

2 POTENTIAL OF RWH WATER THAT CAN BE USED FOR TOILET FLUSHING, GARDENING, TREES

- Rain Water Harvesting Potential: 23,652.54 m^3/year
- If RWH water is used *for toilet flushing* then the number of students whose flushing needs can be met in a year is: 8,959
- If RWH water is used *for Gardening* then the garden area that can be supported annually is : 12,960 m^2
- If RWH water is used for watering of trees, then the number of trees that can be irrigated annually is: 3,942

3 CARBON SEQUESTRATION POTENTIAL

- **Total Green Area** = **1,746.32 m²**
- Using IPCC standard sequestration rate: **0.9 kg CO_2/m²/year**
- **Estimated Annual CO_2 Sequestration** = 1,746.32 × 0.9 = **1,571.69 kg/year** = **1.57 metric tons CO_2/year**

4 SOLAR INSTALLATION

- Refer to : https://ecosjwestzone.org/solar-dashboard/ for Province/School information.
- Installed On Grid kW Capacity : 80 kW
- Installed Off Grid kW Capacity : 0
- Zero Bill Status: Not clear

5 Legend

- RWH: Rain Water Harvesting
- CHIRPS: Climate Hazards Group InfraRed Precipitation with Station data (It is a quasi-global dataset that blends satellite infrared imagery with ground-based rain gauge observations.)
- IPCC: Intergovernmental Panel on Climate Change (a United Nations body that assesses the science related to climate change, its causes, impacts, and possible solutions.)
- Carbon Sequestration: the process of capturing carbon dioxide (CO_2) from the atmosphere and storing it long-term in reservoirs like oceans, soil, trees. For the report the Trees/Greenery area in the school is considered.