



Confederation of Indian Industry
125 Years: 1895-2020



IGBC Net Zero Water Rating System

Pilot Version

Abridged Reference Guide

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Foreword

India is witnessing tremendous growth in construction industry and infrastructure development and responsible for more than 10% of total water consumption. The raw water is primary sourced from ground water and due to over-exploitation of water many areas are facing issues of water quality and quantity.

The green buildings have demonstrated 20-30% reduction in water consumption with respect to the national baselines. Adoption of green building principles have promoted the concepts of rainwater harvesting, water efficiency, waste water treatment and reuse of treated water in process and non-process applications.

The Indian Green Building Council (IGBC) is spearheading the initiative on 'Advancing Net Zero' by the World Green Building Council (WGBC). IGBC's vision is to 'Facilitate India to be the foremost country in implementation and demonstration of world class 'Net Zero Energy, Water, Waste and Carbon' buildings by 2030'.

Against this background, the Indian Green Building Council (IGBC) has launched Net Zero Energy rating and it has received overwhelmed response from the building industry. In continuation towards 'Advancing Net Zero', IGBC has now developed rating for Net Zero Water Buildings and Built Environment.

IGBC would also focus on activities that would enable a market transformation of technologies and services related to Net Zero Buildings. As we progress, IGBC would also work towards developing tools that facilitate adoption of Net Zero concepts in terms of Carbon, and Waste in future.

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Introduction

With 18% of world's population and only 4% of the world's water resources, India is already a water stressed country and per-capita water availability is declining rapidly. Indian building sector alone contributes more than 10% of total water consumption. The building sector is rapidly growing which has further increased the demand of raw water consumption. Due to over-exploitation of water, there has been a huge gap in demand and supply of raw water across the country. It is also evident that 80% of domestic water come from ground water reserve which is only replenished every year mostly by monsoon precipitation, hence it is essential to use the water judiciously and conserve it through rainwater harvesting and use recycled water for irrigation (landscaping), flushing, HVAC equipment and also in process and non-process applications.

The green buildings have demonstrated 20 to 30% reduction in water consumption with respect to the national baselines. Adoption of green building principles have promoted the concepts of rainwater harvesting, water efficiency, waste water treatment and reuse of treated water. However, to address the gap between supply and demand, there is a need to focus on water neutrality in buildings and built environment.

Against this background, the Indian Green Building Council (IGBC) has launched 'IGBC Net Zero Water Rating'. This rating is a tool which enables the designer to apply water efficiency concepts and adopt appropriate measures for harnessing alternate water to achieve Net Zero Water performance. In case of an existing building, the tool enables implementation of water efficient measures to reduce overall water consumption and encourages projects to meet rest of the water requirements through alternate water.

IGBC has set up the Net Zero Technical Committee under the leadership of Mr Ashish Rakheja to develop the rating system. This committee comprised of key stakeholders, including govt representatives, architects, builders, consultants, developers, owners, institutions, product manufacturers and industry representatives. The committee, with a diverse background and knowledge has added immense value through their input and contribution, enriching the rating system, both in its content and process.

Benefits

IGBC Net Zero Water rating system enables reduction in water consumption and use of alternate water sources to meet the balance requirement. The benefits of adopting Net Zero Water concepts in a building/ project are as below:

- Improvement in water efficiency and hence reduction in annual water consumption to the tune of about 30-50% with respect to National baseline.
- Overall reduction in water cost by 30%.
- Reduce dependency on raw water.

The intangible benefits of Net Zero Water include compliance to local regulation and promote water conservation.

National Priorities Addressed

The IGBC Net Zero Water Rating addresses the following national priorities such as:

- Reducing the National water demand by enhancing water efficiency.
- Harnessing alternate water to reduce water demand.
- Reducing dependency on raw water consumption.
- Promote water conservation at National level, to ensure water security.

The rating system compliments the National mission on Water Conservation and supports the Govt. of India to achieve the set targets.

➤ **National Water Mission:**

The National Action Plan on Climate Change (NAPCC) describes the features of National Water Mission as under: “A National Water Mission will be mounted to ensure integrated water resource management helping to conserve water, minimize wastage and ensure more equitable distribution both across and within states. The Mission will take into account the provisions of the National Water Policy and develop a framework to optimize water use by increasing water use efficiency by 20% through regulatory mechanisms with differential entitlements and pricing. It will seek to ensure that a considerable share of the water needs of urban areas are met through recycling of waste water, and ensuring that the water requirements of coastal cities with inadequate alternative sources of water are met through adoption of new and appropriate technologies such as low temperature desalination technologies that allow for the use of ocean water.

The National Water Policy would be revisited in consultation with States to ensure basin level management strategies to deal with variability in rainfall and river flows due to climate change. NAPCC has identified key areas related to

- Studies on management of surface water resources,
- Management and regulation of ground water resources,
- Upgrading storage structures for fresh and drainage system for wastewater
- Conservation of wetland, and
- Development of desalination technologies etc. required to be considered while preparing the comprehensive document for the National Water Mission.

IGBC Net Zero Water Rating

IGBC has set up the Net Zero Water Building Technical Committee to develop the rating programme. This committee comprised of key stakeholders, including architects, builders, consultants, developers, owners, institutions, manufacturers and industry representatives. The committee, with a diverse background and knowledge has enriched the rating system, both in its content and process.

A. Features

IGBC Net Zero Water Rating is a voluntary and consensus-based programme. The objective of IGBC Net Zero Water Rating is to facilitate a holistic approach to make water efficient buildings and harness alternate water to meet the water requirement.

The rating system evaluates buildings / projects on a performance-based approach. The rating system is evolved to be comprehensive and at the same time user-friendly. The programme is fundamentally designed to reduce the water requirement of a building and national priorities.

B. Scope

IGBC Net Zero Water Rating is designed for both new and existing building and built environment projects. These buildings include (but are not limited to) Offices, IT parks, Banks, Shopping malls, Hotels, Hospitals, Transit facilities (Airports Metro and Railway Stations), Convention centres, Educational institutions (Schools, Colleges, University campuses etc.) and industrial buildings (factory buildings and Warehouse).

Overview and Process

IGBC Net Zero Water System addresses water efficiency and encourages for harnessing alternate water. The guidelines detailed mandatory requirement & credit enables the design and construction of buildings /projects of all sizes and types (as defined in the scope).

Levels of Net Zero Water Certification:

Certification Level	Recognition
Near Net Zero Water	Best Practices
Net Zero Water	National Excellence
Net Positive Water (Platinum)	Global Leadership

A. When to use IGBC Net Zero Water Rating

IGBC Net Zero Water Rating System is designed for both New and Existing building and built environment. The project team can evaluate all the possible points to apply under the rating system using a checklist. The project can apply for IGBC Net Zero Water Rating System certification if the project can meet all mandatory requirements and is able to demonstrate that the Water Performance Ratio is at least 0.75.

B. Registration

Organisations interested in registering their projects under IGBC Net Zero Water Building Rating System Certification are advised to first register on IGBC website (www.igbc.in) under 'IGBC Net Zero Water Building Rating System' tab. The website includes information on registration fee for IGBC member companies as well as non-members.

Registration is the first step which helps establish initial contact with IGBC and provides access to the required documents, templates, important communications and along with other necessary information.

IGBC website provides all important details on IGBC Net Zero Water Building Rating System registration & certification - process, schedule and fee.

C. CERTIFICATION

To achieve the IGBC Net Zero Water certification, the project must satisfy all the mandatory requirements and shall demonstrate that the net raw water consumption is zero.

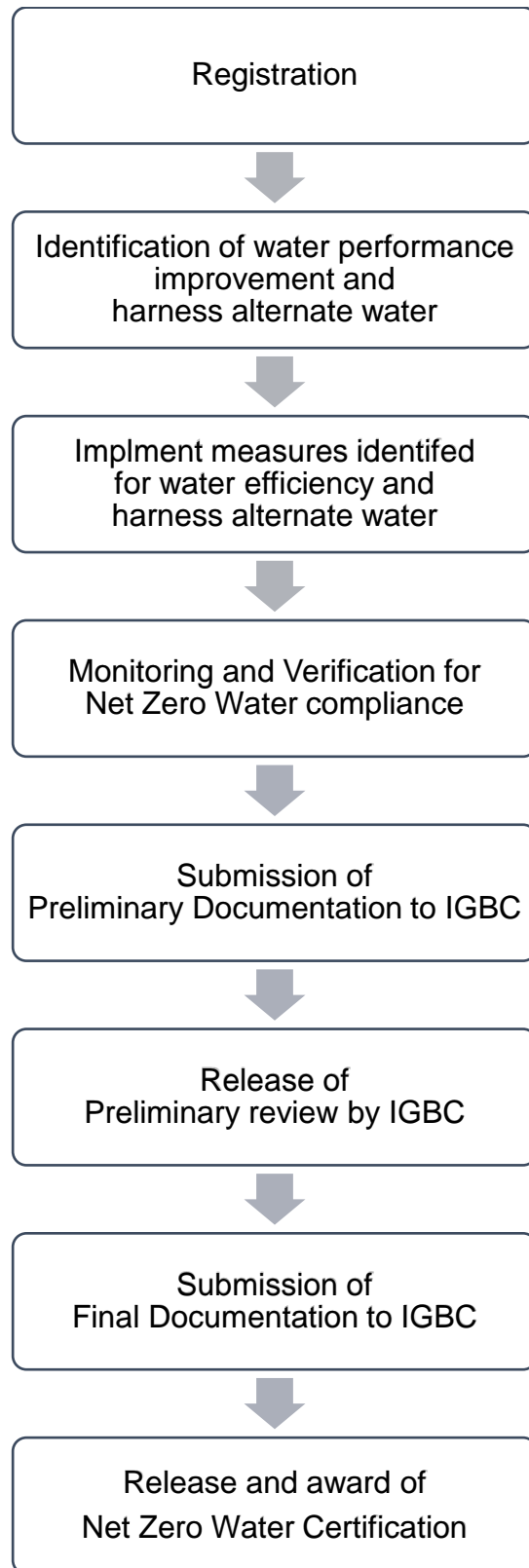
The project team is expected to provide supporting documents at preliminary and final stage of submission, for all the mandatory requirements and the credits attempted. The project documentation is submitted in two phases - Preliminary submittal and Final submittal:

- Preliminary phase involves submission of all documents, which shall include the mandatory requirements and credits. After the preliminary submission, review is done by third party assessors and review comments would be provided within 30 working days.
- The next phase involves submission of clarifications to preliminary review queries and final submittal. This review will also be provided within 30 working days, after which the rating is awarded.

It is important to note that the mandatory requirements and credits earned at the preliminary review are only considered as expected. These mandatory requirements and credits are not awarded until the final documents are submitted, along with additional documents showing implementation of design features. If there are changes in any 'expected credits' after preliminary review, these changes need to be documented and resubmitted during the final review

A building or built environment project to achieve Near Net Zero Water certification, Water Performance Ratio (% use of alternate water to total water consumption) shall be more than 0.75 (but less than 1); to obtain Net Zero Water certification, net raw water consumption shall be zero and further to achieve Water Positive (Platinum) Status, the water given back to source shall be more than 1.10. IGBC will recognise all buildings that achieve one of the rating levels with a formal letter of certification and a mountable plaque.

Certification Process



Summary of Credit Points

S. No.	Criteria	Credit Points
1	Reduce Water Demand	5 – 25
2	Harness Alternate Water	10 – 50
3	Water Back to Source	5 – 20
4	Community Initiatives and Innovation	5
	Total Credit Points	100

Methodology for Net Zero Water Building

Net Zero Water Building

'Net Zero Water Buildings are those that consume minimum raw water & produce alternate water to meet the balance requirement (and) give back such quantities to the original sources for use, so that the net annual water consumption is zero'

To obtain Net Zero Water Certification, project shall achieve net raw water consumption zero or project shall use alternate water more than 75% of the total raw water consumption to achieve Near Net Zero Water rating. For Net Zero Water performance, the project shall evaluate net raw water consumption through Equation 1.

$$\text{Net Raw water consumption} = \text{Total water consumption} - \text{Alternate water consumption} \quad \text{Equation (1)}$$

Further, to demonstrate compliance for Net Zero Water and Water Positive (Platinum), the project team shall estimate total water given back to source which include alternate water recharge and/ or return to source for useful purposes. While estimating the quantity of water given back to source with respect to net raw water consumption, the project team can achieve Net Zero Water/ Positive Water rating if water given back to source is higher than to net raw water consumption as per following Equation 2.

$$\text{Water given back to the source for use} \geq \text{Net Raw water consumption} \quad \text{Equation (2)}$$

Raw Water	Municipal water, borewell water (even if quality is not potable), tanker water purchased
Alternate Water	Rainwater (Recharge or Captive use), treated grey water, condensate water or any purchased grey water
Water given back to the source for use	<ul style="list-style-type: none"> ➤ Recharge the local aquifer by capturing rainwater from roof and non-roof ➤ Percolated water from landscape/ pervious areas would be considered as 'Return Back to Source'

	<ul style="list-style-type: none"> ➤ Return or sell treated alternate water for use ➤ If water table is high or regulations do not encourage recharging, project should donate /sell treated water for use
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Rating Levels for Net Zero Water Certification

Proposed Options	Criteria for Net Zero Water	Mandatory Requirement
Near Net Zero Water	Water Performance Ratio > 0.75 & < 1.0	Project should achieve at least 20 Credit Points a Mandatory Requirement
Net Zero Water	Ratio of Water Back to Source (WBS) for Use = 1.0	
Water Positive (Platinum)	Ratio of Water Back to Source (WBS) for Use > 1.10	

REDUCE WATER DEMAND

Reduce Water Demand

Intent:

Encourage best practices for reducing water demand, thereby demonstrating optimum raw water consumption.

Water Management System

Mandatory Requirement 1

Demonstrate water monitoring practices to capture water consumption at various sources especially raw water consumption, potable water requirement and alternate water use.

Compliance Options:

Provide water monitoring system to measure at least 80% of water consumption in the project. Water meters shall be provided to monitor water usage on daily or monthly basis for the following as applicable:

- ❖ Total raw water quantity sourced (Municipal / Borewell / tankers) on daily/ monthly basis.
- ❖ Total rainwater captured
- ❖ Treated waste water inlet and outlet
- ❖ Water usage in irrigation (landscaping)
- ❖ Water consumption in flushing (non-potable water)
- ❖ Water consumption in air-conditioning System (cooling tower make-up water)

Documentation Required:

- (i). Water balance of the project and water performance data
- (ii). Single line diagram (SLD) highlighting the location of the water meters installed
- (iii). Detailed description of water meters installed for various usage along with cut sheet/ specifications
- (iv). Purchase invoices / photographs of the installed meters

Water Efficient Fixtures

WUE Credit 1.0

Credit Points: 3-15

To minimise non-process water usage by installing efficient plumbing fixtures.

Compliance Options:

Install water efficient plumbing fixtures to improve water efficiency at least 30% from the baseline in aggregate.

Baseline Flow & Flush Rates for Water Fixtures

S No.	Fixture type	Maximum Flow Rate / Consumption	Duration	Estimated Daily Uses per FTE *
1	Water Closet (Full flush)	6 LPF	1 Flush	1 for male and female
2	Water Closets (Half flush)	3 LPF	1 Flush	2 for female
3	Urinals	3.0 LPF	1 Flush	2 for male
4	Faucets/ taps	6 LPM	15 seconds	4
5	Showers/ Handheld Spray	9.5 LPM	8 minutes	0.1
6	Metering Faucets	0.9 Litres per cycle		
7	Health Faucets	6.0 LPM	15 seconds	1
8	Kitchen	8 LPM	15 seconds	6

*Source: Uniform Illustrated Plumbing Code of India, 2017

*At a flowing water pressure of 3 bar

Credit Points are awarded as below:

Water Efficiency with respect to the Baseline	Credit Points
30%	3
35%	6
40%	9
45%	12
50%	15

Notes:

- Water fixtures do not include irrigation systems.
- Faucets / taps installed for hand wash in rest rooms and canteen shall be considered whereas, faucets / taps installed for dish washing and washing clothes need not be considered.
- Rain showers (if any) need to be considered in the calculations under Showerhead
- Default occupancy shall be considered as 50% for male and female.
- FTE occupancy shall be considered in calculation, including visitors.
- Plumbing fixtures that are certified by GreenPro Green Product Certification Programme, please provide certificate.

Documentation Required:

- (i). Water saving calculation clearly indicating the baseline and design / actual water consumption.
- (ii). Specification/ cut sheet of water fixtures including closet, faucet/ health faucet / tap, shower, urinals, faucet installed in kitchen etc. Flowrate shall be measured at 3 bar pressure
- (iii). Purchase order and photographs of water fixtures installed.

Water Efficient Landscape and Irrigation System

WUE Credit 2.0

Credit Points: 1-8

Ensure plantation of drought tolerant (native/ adaptive) species and design sustainable landscape to conserve water.

Compliance Options:

Option-1: Use of drought tolerant/ native/ adaptive species

1 Point

Plant drought tolerant/ native/ adaptive species for at least 40% of the landscape area to enhance biodiversity and conserve water.

And

Option-2: Limit Turf

1 Point

Limit use of turf on the site for less than 20% of the landscape area to reduce the water consumption.

And

Option-3: Water Efficient Irrigation System

6 Points

Provide or install highly water efficient irrigation systems incorporating features mentioned below: (One credit point for each measure)

- ❖ Central shutoff valve
- ❖ Pressure regulating device(s) to maintain optimal pressure to prevent losses
- ❖ Time based controller for the valves
- ❖ Drip irrigation for atleast 50% of landscape area
- ❖ Use of 100% alternate water for irrigation
- ❖ Automated irrigation system (time and based on soil moisture conditions)

Notes:

- This point is applicable only for projects which have minimum 10% of the site area landscaped.
- Landscape here refers to soft landscaping which includes only pervious vegetation.
- Landscape shall not be designed with monoculture plant species, since such species would not promote habitat and biodiversity.
- For this credit calculation, plotted plants should not be considered under landscaping.

Documentation Required:

- (i). Landscape plan highlighting the location and name of species.
- (ii). Calculations to demonstrate the percentage of landscape area provided with native/ drought tolerant/ adaptive species and percentage of landscape area provided with turf.
- (iii). Detailed description about the efficient irrigation measures implemented.
- (iv). Specification/ cut sheets (or copy of Purchase Order) and photographs of irrigation system installed.

Advanced Water Management System

WUE Credit 3.0

Credit Points: 2

Demonstrate online water performance system to reduce overall water demand and promote awareness on water monitoring.

Compliance Options:

Demonstrate online water performance to ensure continuous measurement on daily or monthly basis and share water performance data with IGBC's online platform.

Documentation Required:

- (i). Submit water balance of the project to show water usage for various end use such as total raw water intake, potable water use, non-potable water quantity and quality, total quantity of treated water, rainwater collected etc.
- (ii). Submit annual water performance (monitored on daily/ monthly basis).
- (iii). Snapshot of water performance system (water dashboard).

Harness Alternate Water

Harness Alternate Water

Intent:

Encourage use of alternate water, thereby demonstrating commitment to reduce dependency on raw water.

Waste Water Treatment

Mandatory Requirement 1

Demonstrate reduction in raw water consumption, by treating waste water and use recycled water generated on-site.

Compliance Option:

Provide an on-site wastewater treatment system to treat 100% of wastewater generated in the project, to the quality standards suitable for reuse as prescribed by Central (or) State Pollution Control Board, as applicable.

The CPCB requirements for recycled water are:

S No.	Parameter	Threshold Limits
1	BOD (mg/l)	10
2	COD (mg/l)	50
3	Ph	6.5 – 9
4	TSS (mg/l)	20
4	Odour	Nil
6	Colour	5
7	Turbidity	1

Notes:

- Waste water here refers to both grey and black water.
- The credit point(s) can be claimed only if the waste water is treated in-situ
- Mechanical and Natural waste water treatment systems can be used for treating waste water.

Documentation Required:

- (i). Detailed description (along with specifications) of the wastewater treatment.
- (ii). Purchase invoice and photographs of waste water treatment system.
- (iii). Test report of the treated water quality

Rainwater Harvesting Roof & Non - roof Mandatory Requirement 2

To increase the ground water table or to reduce water usage through effective and appropriate rainwater management.

Compliance Options:

Design rainwater harvesting system to capture at least 'one-day rainfall'* runoff volume from roof and non-roof areas.

Runoff coefficients for Typical Surface Types:

S No.	Surface Type	Runoff Coefficient
1	Cemented / Tiled Roof	0.95
2	Roof Garden (<100 mm thickness)	0.95
3	Roof Garden (100 – 200 mm thickness)	0.30
4	Roof Garden (201 – 500 mm thickness)	0.2
5	Roof Garden (\geq 500 mm thickness)	0.1
6	Turf, Flat (0 – 1% slope)	0.25
7	Turf, Average (1 – 3% slope)	0.35
8	Turf, Hilly (3 – 10% slope)	0.4
9	Turf, Steep (\geq 10% slope)	0.45
10	Vegetation, Flat (0 – 1% slope)	0.1
11	Vegetation, Average (1 – 3% slope)	0.2
12	Vegetation, Hilly (1 – 3% slope)	0.25
13	Concrete Pavement	0.95
14	Gravel Pavement	0.75
15	Open –grid Concrete Pavement	0.75
16	Open –grid Concrete Pavement	0.5

Notes:

- For rainfall information, refer Indian Meteorological Department (IMD) at <http://www.imd.gov.in>
- $\text{Runoff volume} = \text{Surface area} \times \text{Runoff Coefficient} \times \text{Peak-day Rainfall}^*$.
- *To arrive at the peak-day rainfall, divide peak month rainfall occurred in each year (for last 5 years) by number of rainy days in the respective month, and calculate average of 5 years peak-day rainfall. Abnormal rainy days like flash floods can be excluded from calculations.
- Consider Rainwater Harvesting Guidelines (as and when available) from the National Building Code (NBC) 2016 of India, Part 11 - Approach to Sustainability, Section 7.2 - Rainwater Harvesting- Surface Runoff.
- Projects which do not have data on the number of rainy days, a maximum of 15 rainy days can be considered to arrive at normal rainfall.
- In areas where the water percolation is limited, rainwater harvesting tank/pond (water body) shall be provided to meet the above requirement.
- Filtering of suspended solids shall be ensured by providing suitable filtering media before letting the water into the collection tanks, water bodies, municipal storm water drains

Documentation Required:

- (i). Site plan highlighting location of RWH system (tank / recharge pit / pond).
- (ii). Submit rainwater harvesting design which shall include roof catchment gutters, down pipes rainwater/ storm water drains, trenches, filter chamber, storage tanks/ pits/ sumps.
- (iii). Provide rainwater harvesting calculation and photographs of RWH system installed at the project.

Percentage Use of Alternate Water

Credit Points: 10-50

Use of alternate water for various water end use, to reduce raw water demand.

Compliance Options:

Demonstrate alternate water use at least 30% of the total water consumption in the project for various applications including flushing, irrigation, domestic use, cooling tower make-up water etc.

$$\begin{array}{l} \% \text{ Use of Alternate water} \\ (\text{Water Performance Ratio}) \end{array} = \frac{\text{Alternate Water Consumption}}{\text{Total Water Consumption}}$$

Points awarded are as follows:

Water Performance Ratio (% Alternate Water to the Total Water Consumption)	Credit Points
30	10
35	20
40	30
45	40
50	50

Notes:

- Use of alternate water includes the rainwater (captive use), treated waste water, condensate water or any purchased treated waste water.
- Treated waste water sourced from other sites / local authorities through permanent piped connections or other means can also be considered to show compliance for 'alternate water'.
- Captured rainwater can also be considered to show compliance.

- The water requirement and average number of watering days for landscaping shall be considered as 6 liters per sq.m. per day (i.e. 6 liters/sqm/ day) for a minimum of 300 days, (or) justify if the water requirement and the average number of watering days for landscaping is less than the above requirement.

Documentation Required:

- (i). Calculation indicating the percentage of alternative water used in the project to the total water consumption of the project.
- (ii). Submit total quantity of rainwater collected and waste water treated (recycled water).
- (iii). Capacity and type of waste water treatment plant installed.

Return Water Back to Source for Useful Purpose

Water Back to Source for Useful Purpose

WBS Credit 1.0

Credit Points:5-20

Intent:

Ensure water sustainability at community level, thereby addressing water security.

Compliance Option:

Provide rainwater harvesting recharge facility to give water back the source or sell or donate alternate water for useful purpose more than the total raw water consumption.

Credit Points are awarded based on

Percentage (%) of Water Back to Source (WBS) for useful purpose:

% of Water Back to Source (WBS) for Useful Purpose	Credit Points
1.05	5
1.10	10
1.15	15
1.20	20

$$\text{Ratio of Water Back to Source for Use} = \frac{\text{Water Recharged} + \text{Water Returned}^*}{\text{Total Raw Water Consumption}}$$

Notes:

- *Water Returned = Treated Water Sold or Donated for Useful purpose
- Recharge the local aquifer by capturing rainwater from roof and non-roof
- Water percolation from landscape/ pervious areas would be considered as 'Return Back to Source'
- If water table is high or regulations do not encourage recharging, project should donate /sell treated water for use

Document Required:

- (i). Submit calculation indicating percentage water given back to source for useful purpose (quantity of water recharge/ returned)
- (ii). Submit supporting document clearly highlighting quantify of water donated/ sold for useful purposes.

Community Initiatives and Innovation

Community Initiatives and Innovation

Intent:

Encourage communities to conserve water bodies and implement innovation design and operational measures.

Community Initiative Credit 1.0

Points: 1-2

Compliance Option:

Project shall support community initiatives to rejuvenate water bodies such as ponds, lakes, construction of check dams etc to preserve local water bodies.

Rejuvenation of Water Body	Credit Points
At least 2 to 5 times of total raw water consumption in the project	1
At least 5-10 times of total raw water consumption in the project	2

Documentation Required:

- (i). Submit execution report indicating rejuvenation work carried out the project
- (ii). Calculation highlighting catchment areas and water holding capacity.

Innovation in Design & Operation Credit 2.0

Points:1-3

Compliance Options:

The project team shall implement innovative measures which demonstrate tangible benefits to the project.

Credit 2.1: Innovation in Design & Operation

Identify the intent of the proposed innovation credit, the proposed requirement for compliance, and the proposed documentation to demonstrate compliance, and the design approach used to meet the required elements.

Credit 2.2: Innovation & Design Process

Same as credit 1.1

Credit 2.3: Innovation & Design Process

Same as credit 1.1