

TECH SCAN

RAIN WATER HARVESTING SYSTEM





Rainwater harvesting is a sustainable water - management approach that captures, collects, filters, stores, and reuses rainwater from rooftops, paved surfaces, landscapes, and other catchment areas. It helps reduce dependence on municipal water supplies and groundwater while supporting water conservation, flood mitigation, and drought resilience. These systems can be implemented across residential buildings, commercial facilities, industrial sites, agricultural areas, institutional campuses, and urban infrastructure.

Modern rainwater-harvesting technologies combine catchment structures, first-flush diversion systems, filtration units, storage tanks, groundwater-recharge systems, sensors, pumps, and automated controllers. Current innovation is focused on improving water quality, increasing collection efficiency, reducing contamination, optimizing storage capacity, and enabling real-time monitoring of rainfall, water levels, and usage. Smart rainwater-harvesting systems may also integrate Internet of Things sensors, weather forecasting, automated valve control, and data analytics to improve system performance and reduce water wastage.

From an intellectual property (IP) perspective, rainwater harvesting presents patent opportunities across filtration systems, modular storage structures, first-flush mechanisms, recharge-well designs, sensor-based monitoring, automated water-diversion systems, treatment processes, and integrated water-management platforms.

INNOVATION TIMELINE



PATENTABLE COMPONENTS

Deployment / Assembly Mechanisms

- Modular rooftop rainwater-collection and gutter assembly
- Automated first-flush diversion mechanism
- Integrated filtration and storage installation system
- Collapsible or underground water-storage tank assembly
- Modular groundwater-recharge pit and well system
- Automated overflow and backflow-control mechanism
- Quick-connect pipe, valve, and filter assembly
- Retrofit rainwater-harvesting system for existing buildings



Novel Materials

- Antimicrobial and contamination-resistant storage-tank materials
- UV-resistant and corrosion-resistant polymer coatings
- Recycled composite materials for modular storage tanks
- Self-cleaning and anti-fouling filter surfaces
- Permeable materials for groundwater-recharge structures
- Bio-based or biodegradable filtration media
- Low-carbon concrete for recharge wells and storage chambers
- Smart membrane materials for selective water purification



Methods of Production

- Rotational moulding methods for seamless modular storage tanks
- Extrusion and thermoforming processes for lightweight collection channels
- Additive manufacturing of customized filters and flow-control components
- Continuous fabrication of multilayer filtration cartridges
- Surface-treatment methods for anti-fouling gutters and tanks
- Automated assembly of sensor-integrated rainwater systems
- refabrication methods for modular recharge chambers
- Low-cost manufacturing processes using recycled or locally available materials



Smart Monitoring and Control Technologies

- IoT-enabled water-level and quality monitoring systems
- Sensor-controlled first-flush diversion methods
- Weather-forecast-based storage optimization systems
- Automated pump and valve-control mechanisms
- Predictive filter-cleaning and maintenance systems
- Real-time leakage and overflow detection systems
- AI-based rainwater demand and supply management
- Integrated control systems for rainwater, greywater, and municipal water supplies



PATENT STATISTICS



PATENT LANDSCAPE



TOP APPLICANTS



112

NANJING FORESTRY UNIVERSITY

MCC

50

48

SECOND CONSTRUCTION ENGINEERING

WATER RESOURCES RESEARCH INSTITUTE OF SHANDONG PROVINCE

39

37

CHINA MCC17 GROUP

36

POWERCHINA HUADONG ENGINEERING

POWERCHINA KUNMING ENGINEERING

32

31

KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY

NORTHWEST INSTITUTE OF ECO ENVIRONMENT & RESOURCES CHINESE ACADEMY OF SCIENCES

29

29

POWERCHINA NORTHWEST ENGINEERING

Database: Questel Orbit

Data Range: 01/01/2021 - 23/06/2026

NOTABLE INNOVATIONS

Patent Application	Priority date	Title	Assignee
GB436788	20.12.1934	A rainwater trap	Herbert Plaistow Pearce; William Herbert King
US2547381	06-06-1945	Automatic rain-water control for cisterns	Bishoff Edward E; Susan Fowler Mary
US3730120	01.03.1971	Method and apparatus of collecting rainwater	Aquavoir Holding
DE7508397	17.03.1975	Valve device for collecting rainwater	Beckmann
EP0151921	10.02.1984	Rain water collector for a down pipe	Marley Deutschland 31515 Wunstorf; Marley Werke
SG42842A1	29.04.1993	Potable rainwater collecting apparatus	Rainsystems
US20160200551A1	29.05.2007	Facade rainwater harvesting system	Donald Canavan; Canavan Donald H; Hurdrolland Partnership
CN205579370	24.02.2016	Collect street lamp of function from taking rainwater	Zhengzhou Tianrui Energy Saving Technology
CN116103974	28.02.2023	Road snow water rainwater collecting and utilizing device and collecting and utilizing system	Chengdu Datong Road & Bridge Components
CN224063558	17.02.2025	Rainwater collection module rapid installation structure	Suzhou Fenghongli Ecological Technology



WHITESPACES

Automated Leak
and Overflow
Detection

Smart First-Flush
Diversion Systems

Anti-Clogging
Groundwater-
Recharge
Structures

Compact Modular
Storage Systems

Decentralized
Community Water -
Harvesting Systems

Low-Energy
Pumping and
Distribution
Systems

Cybersecure IoT
Water-Management
Platforms

Real-Time Water-
Quality Monitoring

Self-Cleaning
Rainwater
Filters

Low-Cost Potable-
Water Treatment
Systems

AI-Based Rainfall
and Storage
Optimization

If you would like to learn more about any of these areas or have specific questions, we're here to provide further information and insights. Our team is dedicated to driving progress and staying at the forefront of Rain Water Harvesting System.

About IP Bazaar

IP Bazaar is an initiative towards successful commercialization of Intellectual Property Rights. IP Bazaar is a private limited company, acts for both innovators/creators and investors; and manages the commercialisation of Intellectual Property. It operates through a wide network of association with companies, industries, industry-associations, entrepreneurs, government organization, NGOs, Universities, Venture Capitalists, overseas law firms, overseas technology transfer companies and through Patentwire.

Disclaimer

IP Bazaar has used reasonable endeavours to ensure that contents of this report were correct at the time the relevant pages were created, modified and published. IP Bazaar does not make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the firms. The views and opinions of authors expressed herein do not necessarily state or reflect those of the firm.



© IP Bazaar 2026. All Rights Reserved.

This report is for informational purposes and is not intended to constitute legal advice.

Contact us:



Lalit Ambastha
Co-Founder, IP Bazaar
Mob: +91-9811367838
E-mail: lalit@ipbazaar.com



Medha Kaushik
Director | Special Projects & Tech Transfer
Mob: +91-6359777555
E-mail: medha@ipbazaar.com



IP BAZZAAR TECHNOLOGY CONSULTANTS PVT. LTD.

716, Seventh Floor, DLF Prime Towers,
Okhla Phase I, New Delhi-110020, India

www.ipbazaar.com