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National Water Sustainability & Desalination Hackathon 2026

Editorial Team

- Prof. Pradip K. Tewari
- Dr. Manoj K. Jindal
- Mr. Vairagaya Joshi

Content

The IITJ-JJM Center for Sustainable Drinking Water at the Indian Institute of Technology Jodhpur successfully conducted the National Water Sustainability & Desalination Hackathon, a flagship innovation challenge that was organized under the Jal Jeevan Mission, Ministry of Jal Shakti, Government of India. The hackathon, designed as a national innovation platform, brought together students, researchers, professionals, and Innovators from across India to develop sustainable solutions for water challenges in arid and semi-arid regions. This event was conducted virtually and attracted participation across diverse disciplines, encouraging interdisciplinary problem-solving. Participants focused on critical themes such as Sustainable water sourcing and aquifer recharge, Advanced water treatment and quality monitoring, Energy-efficient desalination technologies, Brine management and resource recovery, AI-driven smart water systems and IoT monitoring, and Nature-Based and community-driven solutions. A total of 29 innovators and teams were selected for the final presentation round, representing institutions and organizations from over ten (10) states, including Rajasthan, Uttar Pradesh, Delhi, Maharashtra, Gujarat, Haryana, Kerala, Tamil Nadu, Punjab, Telangana, and Chhattisgarh. Out of these, 24 teams presented their innovations before the expert panel. Participating institutions included start-ups, students, NGOs and organisations. The presentations were organized into two sessions, with Day 1 (18th March) hosting 15 participants and Day 2 (20th March) hosting 14. Each participant was allotted a structured slot of approximately 9–10 minutes comprising a 5-minute innovation pitch, 3–4 minutes of queries by the expert panel, and a 1-minute transition interval. Participants addressed a rich diversity of critical water challenges spanning water quality monitoring and contaminant detection, advanced desalination and treatment technologies, groundwater recharge and source sustainability, AI-driven and IoT-enabled smart water systems, and nature-based and community-driven solutions; all directly aligned with the Jal Jeevan Mission's goal of ensuring safe drinking water in rural areas. All submissions were rigorously evaluated by a distinguished Expert Panel comprising Dr. Dinesh Kumar Periwal (National WASH Expert), Prof. Pradip K. Tewari (JJM Professor Chair, IIT Jodhpur), and Dr. Vikky Anand (Assistant Professor, Department of Chemical Engineering, IIT Jodhpur), using a comprehensive 100-point standardized scoring framework. Entries were assessed across seven dimensions: Innovation & Originality, Technical Feasibility, Relevance to Theme and JJM alignment, Scalability & Impact, Cost Effectiveness, Presentation Quality, and Prototype or Proof of Concept maturity. Special emphasis was placed on the practical

deployability of solutions in arid, semi-arid, and rural geographies; particularly the most critical target areas for India's water security agenda. The results were formally declared on 22nd March 2026 on the occasion of World Water Day by Prof. Pradip K. Tewari during the Online Capacity-Building Programme organized by the Center on the same day. Dr. Karan Gupta from STVENANT LLP, Uttar Pradesh, was awarded the First Prize for his project *SiltWatch* — a low-cost pond siltation assessment. The Second Prize was awarded to Ms. Aatika Kamal and Dr. Saif Ali from Jamia Hamdard, Delhi, for the NLP-based LLM-assisted information retrieval system for groundwater governance in India. The Third Prize was awarded to Mr. Lalit Mohan Sharma from Haryana, for his innovative solution on creating a freshwater source within saline groundwater aquifers. The winners were felicitated with a total prize pool of ₹50,000 along with mentorship opportunities to further develop and refine their solutions towards real-world deployment. The hackathon emphasized low-cost, scalable, and sustainable innovations aligned with national priorities for water security.

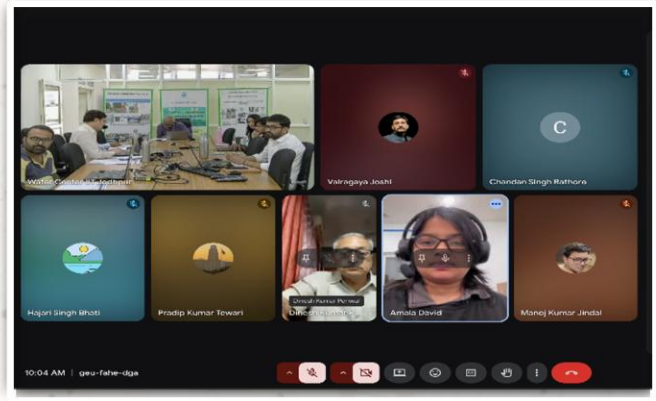
The winners:

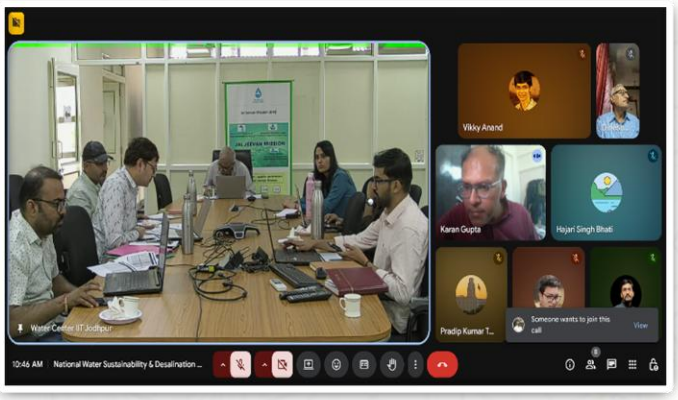
🥇 1st Prize: Dr. Karan Gupta

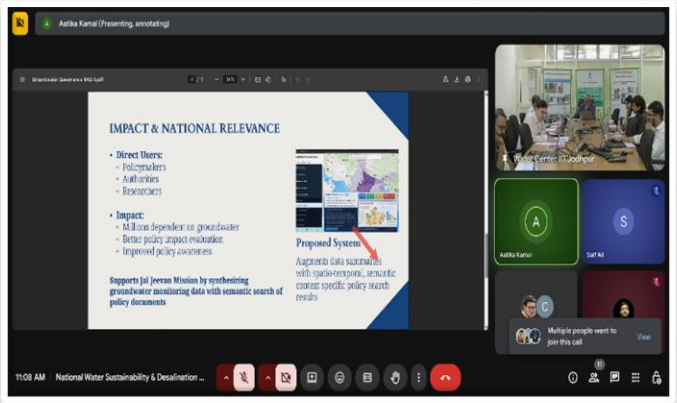
🥈 2nd Prize: Ms. Atika Kamal & Dr. Saif Ali H

🥉 3rd Prize: Mr. Lalit Mohan Sharma

The winners were recognized for their innovative, impactful, and scalable solutions addressing real-world water sustainability challenges. The hackathon was conceptualized, organized, and executed by the IITJ-JJM Center for Sustainable Drinking Water under the leadership of Prof. Pradip K. Tewari, JJM Professor Chair. The organizing team included Dr. Vikky Anand as Expert Evaluation Panel Member, Dr. Manoj Kumar Jindal who coordinated the event and hosted the results declaration session, and Dr. Hajari Singh Bhati, Mr. Uthukota Sriram Abhishek, Mr. Vairagaya Joshi, Mr. Devendra Singh, Mrs. Priyanka, Mr. Chandan Singh Rathore who provided support throughout the Hackathon. By bringing together 24 presenting teams spanning the full spectrum from students and early-career researchers to established professionals and doctoral scientists, the hackathon catalysed innovation and interdisciplinary collaboration between academia, industry, and government. The initiative reinforced the importance of technology-driven and community-oriented solutions to ensure long-term water sustainability in India.

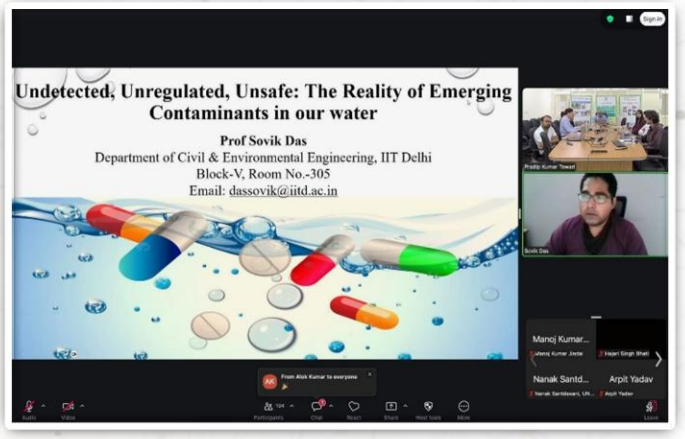


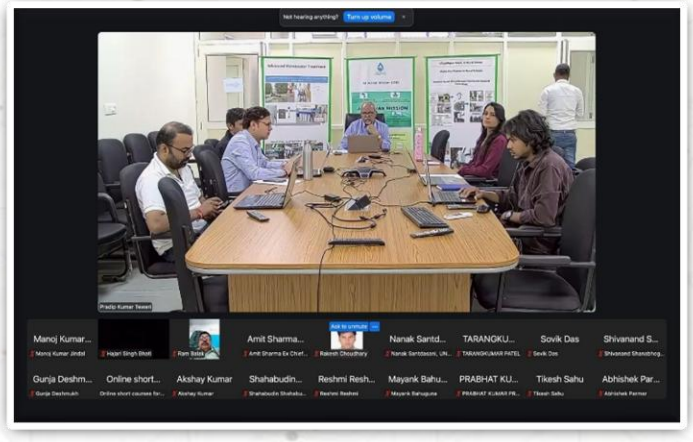


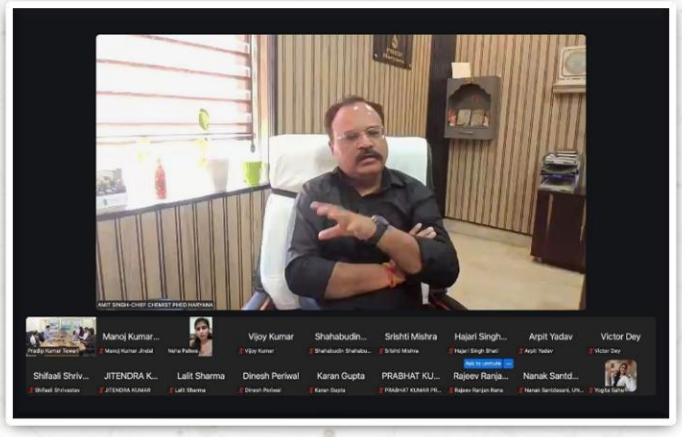


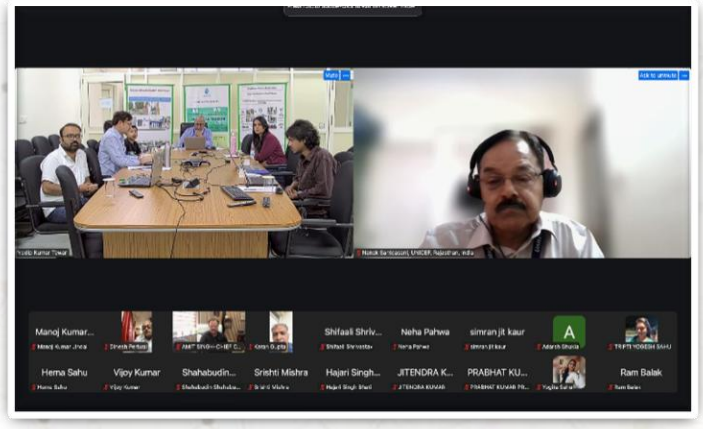
World Water Day 2026 Capacity-Building Programme

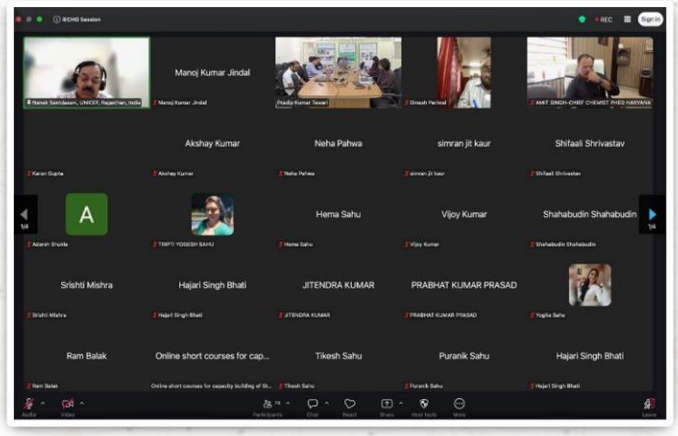
Marking World Water Day 2026, the IITJ-JJM Center for Sustainable Drinking Water at Indian Institute of Technology Jodhpur, in collaboration with SPM-NIWAS under the Jal Jeevan Mission, successfully conducted an Online Capacity-Building Programme on: “Ensuring Sustainability of Water Sources for Improving WASH in Rural Areas” The programme witnessed an overwhelming response with 253 registrations and 100+ participation from professionals, government officials, researchers, and stakeholders across the country. The session began with a welcome address by Prof. Pradip K. Tewari, who emphasized the importance of sustainable water management for public health and rural development. An insightful address was delivered by Mr. Nanakkumar Santdasani, WASH Officer at UNICEF Rajasthan, who shared his extensive experience in the development sector and highlighted challenges in rural WASH implementation. The technical sessions included the invited talk by Dr. Sovik Das, IIT Delhi, on “Undetected, Unregulated, Unsafe: The Reality of Emerging Contaminants in our water”, covering: Microplastics and household contaminants, Detection challenges, Treatment and removal strategies. Another invited talk by Mr. Amit Singh, Chief Chemist, PHED Haryana, discussed “Water Quality Testing, Monitoring, Accreditation & Conservation,” and Groundwater contamination issues, such as uranium. During the programme, the results of the National Water Sustainability & Desalination Hackathon 2026 were also announced, recognizing outstanding innovations in water sustainability. The event was hosted by Dr. Manoj Kumar Jindal, ensuring smooth coordination and engagement throughout the sessions. Along with technical session, open forum was also organized to enhance the effectiveness of the program. During this session, participants were encouraged to actively share their ideas, real life challenges and discuss practical solution.

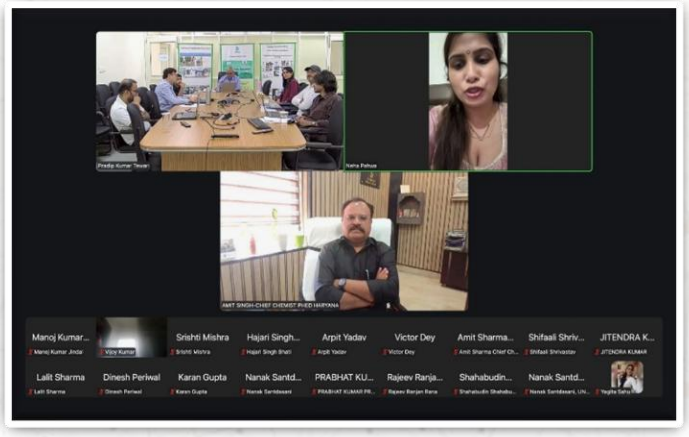






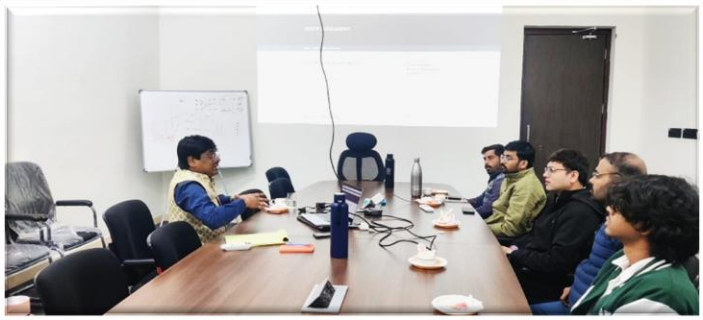






Visit of Prof. Saugata Datta, the University of Texas at San Antonio

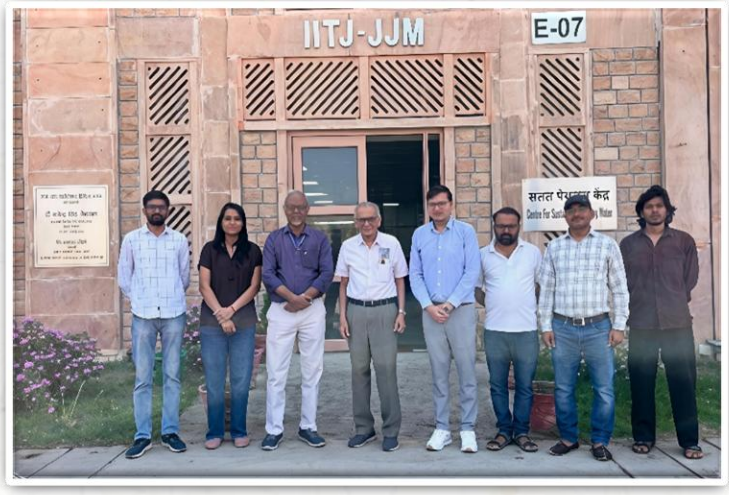
Water Center had the privilege of hosting Prof. Saugata Datta, Weldon W. Hammond, Jr. Endowed Distinguished Professor and Director of the Institute of Water Research Sustainability and Policy at the University of Texas at San Antonio, during his recent academic visit. The visit was jointly hosted by the Department of Chemical Engineering, IIT Jodhpur, and the IITJ-JJM Center for Sustainable Drinking Water. It marked a significant step towards fostering international collaboration in the field of water sustainability and policy research. During his visit, Prof. Datta delivered an expert seminar and engaged in detailed technical discussions with students, faculty members, and researchers. The sessions provided valuable insights into global water challenges, sustainable resource management, and policy-driven scientific research. Extensive interactions were held with distinguished faculty members, including Prof. Pradip K. Tewari, JJM Professor Chair; Prof. P. A. Deshpande, Head, Department of Chemical Engineering; & Dr. Vikky Anand, Department of Chemical Engineering and staff of IITJ-JJM Water Center: Dr. Manoj Kumar Jindal, Dr. Hajari Singh Bhati, Mr. Uthukota Sriram Abhishek, Mr. Vairagaya Joshi, Mr. Devendra Singh, Mrs. Priyanka, Mr. Chandan Singh Rathore and students.



Visit of Prof. Deepak Kunzru, Distinguished Academician

Water Center hosted Prof. Deepak Kunzru, a distinguished academician in the field of chemical engineering, during his recent visit at the institute. The visit was organized by the Department of Chemical Engineering, IIT Jodhpur. Prof Kunzru was invited to the IITJ-JJM Center for Sustainable Drinking Water. The visit provided an excellent platform for academic exchange and research discussions. During his visit, Prof. Kunzru had meaningful discussions with researchers and students. His interaction focused on strengthening fundamental understanding and advancing research in chemical engineering and allied domains.

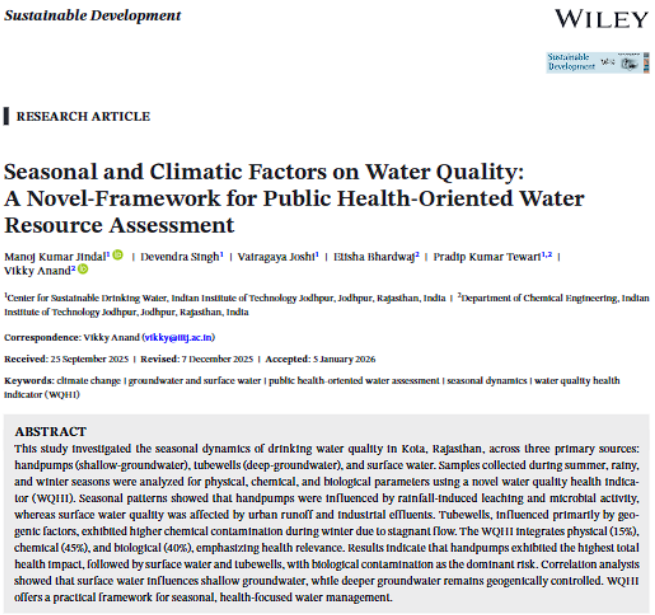



Publications

Seasonal and Climatic Factors on Water Quality

The work titled *"Seasonal and Climatic Factors on Water Quality: A Novel Framework for Public Health-Oriented Water Resource Assessment"* has been published in the reputed journal Sustainable Development. This study proposes a novel framework linking seasonal and climatic variations with water quality to support public health-oriented water resource assessment and management. The research highlights the importance of integrating environmental variability into planning for safe and sustainable drinking water systems.

DOI: https://doi.org/10.1002/sd.70664



Sustainable Development WILEY

RESEARCH ARTICLE

Seasonal and Climatic Factors on Water Quality: A Novel-Framework for Public Health-Oriented Water Resource Assessment

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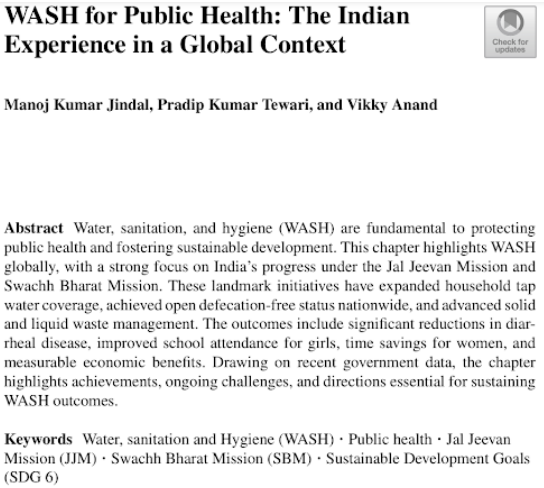
Keywords: climate change | groundwater and surface water | public health-oriented water assessment | seasonal dynamics | water quality health indicator (WQHI)

ABSTRACT

This study investigated the seasonal dynamics of drinking water quality in Kota, Rajasthan, across three primary sources: handpumps (shallow-groundwater), tubewells (deep-groundwater), and surface water. Samples collected during summer, rainy, and winter seasons were analyzed for physical, chemical, and biological parameters using a novel water quality health indicator (WQHI). Seasonal patterns showed that handpumps were influenced by rainfall-induced leaching and microbial activity, whereas surface water quality was affected by urban runoff and industrial effluents. Tubewells, influenced primarily by geogenic factors, exhibited higher chemical contamination during winter due to stagnant flow. The WQHI integrates physical (15%), chemical (45%), and biological (40%), emphasizing health relevance. Results indicate that handpumps exhibited the highest total health impact, followed by surface water and tubewells, with biological contamination as the dominant risk. Correlation analysis showed that surface water influences shallow groundwater, while deeper groundwater remains geogenically controlled. WQHI offers a practical framework for seasonal, health-focused water management.

WASH for Public Health: The Indian Experience in a Global Context

The work titled *"WASH for Public Health: The Indian Experience in a Global Context"* has been published as a book chapter in Water Health and Sustainability by Springer. The chapter presents India's experience in implementing Water, Sanitation, and Hygiene (WASH) initiatives, placing it within a global perspective. It discusses policy frameworks, challenges, and best practices contributing to improved public health outcomes and sustainable water management. **DOI:** https://doi.org/10.1007/978-3-032-16958-7_3



WASH for Public Health: The Indian Experience in a Global Context

Manoj Kumar Jindal, Pradip Kumar Tewari, and Vikky Anand

Abstract Water, sanitation, and hygiene (WASH) are fundamental to protecting public health and fostering sustainable development. This chapter highlights WASH globally, with a strong focus on India's progress under the Jal Jeevan Mission and Swachh Bharat Mission. These landmark initiatives have expanded household tap water coverage, achieved open defecation-free status nationwide, and advanced solid and liquid waste management. The outcomes include significant reductions in diarrheal disease, improved school attendance for girls, time savings for women, and measurable economic benefits. Drawing on recent government data, the chapter highlights achievements, ongoing challenges, and directions essential for sustaining WASH outcomes.

Keywords Water, sanitation and Hygiene (WASH) · Public health · Jal Jeevan Mission (JJM) · Swachh Bharat Mission (SBM) · Sustainable Development Goals (SDG 6)

Miscellaneous Ongoing Activities

- It is proposed to organize the next training and capacity-building program in September 2026 for officials working in rural drinking water supply and stakeholders.
- IIT Jodhpur offers courses related to water and wastewater at the UG and PG levels, as well as conducting a Ph.D. program in the water-related area.
- JJM Professor Chair at IIT Jodhpur continues to provide technical support to different States and Union Territories as per their demand and requirements.

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