1. Record Nr. UNINA9911049198003321

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Titolo	Groundwater Depletion and Sustainability : A Methodology Utilizing Artificial Intelligence and Earth Observation Systems / / edited by Anindita Nath, Arkoprovo Biswas, Bappaditya Koley, Tanupriya Choudhury, Jung-Sup Um
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	3-032-09921-8
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (470 pages)
Collana	Advances in Geographic Information Science, , 1867-2442
Disciplina	006.3
Soggetti	Artificial intelligence Water Hydrology Geographic information systems Environmental protection Civil engineering Artificial Intelligence Geographical Information System Soil and Water Protection
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Advanced application of Artificial Intelligence (AI) and earth Observation systems on groundwater management -- Leveraging AI and Machine Learning for Groundwater Pollution Control and Management -- Innovative AI and ML Solutions for Groundwater Contamination and Sustainable Management -- Artificial Intelligence and Machine Learning Applications in Groundwater Pollution Control and Resource Management -- AI and ML-Driven Approaches for Groundwater Pollution Mitigation and Sustainable Management Integrating Explainable AI with Advanced Learning Models for Groundwater Management in Semi-Arid Areas -- Spatio-temporal Dynamics of Groundwater Quality in B10:B24Statistical modeling -- Assessing Groundwater Potential in the Upper Blue Nile River Basin, Ethiopia: A Comprehensive Integration of Remote Sensing, GIS and

MCDA -- Mapping of groundwater potential zones of buniadpur sub-division of dakshin dinajpur district, west bengal, india using ahp and gis techniques -- Hydrogeological assessment of Mawar Basin, Kupwara: Groundwater Fluctuation Analysis -- An Appraisal of Groundwater Potentiality in Balason River Basin of Darjeeling district using Geospatial Technology -- Groundwater Potential Zone Mapping in Murshidabad District using Geospatial and AHP Techniques -- Applications of GIS Technology for Restoration of Ground water Resource -- A Geospatial Analysis of Surface runoff Potential Using the SCS-CN Method in Chikwawa District, Malawi -- Geospatial Approaches to Groundwater Restoration and Management -- Multispectral remote sensing and Geographic Information System analysis of morphometric features -- Delineating groundwater potential zones in Dhasan basin of Central India using MCDM Approaches -- Vulnerability of Groundwater in Jenin Governorate, West Bank Occupied West Bank/Palestine -- Regional Inequalities in Water Supply Provisions of Rural and Urban Areas of West Bengal: A District Level Analysis -- Influence of rainfall in the hydro-geochemistry variations using GIS and Remote sensing techniques in hard rock terrain, Tamil Nadu, India -- Spatio-temporal analysis of water anomalies and their impact on paddy yields along the Huruluwewa Right Bank Irrigation Canal (HWRBIC) in Sri Lanka -- Modelling of groundwater condition for developing the aquifer system -- Groundwater Resilience in the Era of Climate Change: The Promise and Perils of Advanced Technologies -- Climate Change, Rising Groundwater Table and Flooding in Cape Town Informal Settlements: Impacts and Solutions through Cutting-edge Technologies -- Climate Change Impact of Cutting-Edge Technology and Groundwater Sustainability.-Assessment of Environmental Impacts of Arsenic and Fluoride Contamination and Remediation.-Precipitation and Altitude Impact on Groundwater Arsenic and Fluoride Distribution in Chandrapur District, Central India -- Environmental Impact Evaluation of Arsenic and Fluoride Contamination and Remediation Strategies -- Assessment of Aquifers Recharge Potential Zones Using an Integrated Approach for Sustainable Water Supply Management” -- Comprehensive Groundwater Recharge Assessment using Integrated Approaches -- Modelling of Groundwater Condition for Developing the Aquifer System -- Groundwater Depletion and Rejuvenation Strategies Augmented by Digital Technology -- Anammox Technology: Low-Carbon and Energy-Saving Solutions for Enhanced Water Pollution Control -- Assessing Groundwater Depletion in Marrakech, Morocco: A Remote Sensing Approach to Sustainable Water Management in Luxury Complexes -- Groundwater Recharge Assessment with Integrated Approaches.

Sommario/riassunto

This contributed volume details how Artificial Intelligence (AI) and Earth observation systems can effectively improve the prediction of groundwater quality and support decision-making in arid and semi-arid regions. Earth observation systems, including remote sensing and geographic information systems (GIS), play a crucial role in assessing and monitoring groundwater quality. Remote sensing data, such as satellite imagery, can provide valuable information on land cover, vegetation indices, and water quality parameters. GIS tools enable the spatial analysis and visualization of groundwater quality data. AI and Earth observation-based methods support effective water resource management by identifying suitable areas for artificial groundwater recharge (AGR) and assessing the impact of pollution on water resources. These techniques help formulate conservation policies and sustainable water management strategies. Various AI techniques, including ANN, SVM, KNN, and decision trees, have been applied to

model groundwater quality and predict water quality indices. These models capture complex relationships between hydro chemical parameters and groundwater quality, enabling accurate predictions and informed decision-making. The application of AI and Earth observation systems in groundwater quality prediction contributes to the sustainability of water resources. Identifying pollution sources, assessing water quality, and guiding decision-making processes support preserving and managing water resources in arid and semi-arid regions.