

MOJTABA SHAFIEI

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Professional Summary

- Experienced researcher with over a decade of expertise in hydrology and water resources management.
- Broad experience in hydrological modelling, climate adaptation, water accounting, socio-hydrology, indicator development, and strategic planning; applied across interdisciplinary research and consultancy projects.
- Actively engaged in and leading international research and capacity-building initiatives through collaborations with International Association of Hydrological Sciences (IAHS), UNESCO-IHP, and other international institutions.
- Passionate about bridging science, policy, and practice; translating research into actionable knowledge, including the use of AI, to support evidence-based decision-making in environmental governance.

Education

Doctor of Philosophy (Ph.D.): Hydrology 03/2015

Ferdowsi University of Mashhad – Mashhad, Iran

Dissertation: Uncertainty assessment of agro-hydrological model applications at field scale

Master of Science (M.Sc.): Hydrology 09/2009

Ferdowsi University of Mashhad – Mashhad, Iran

Thesis: Assessing the hydrological water balance at watershed scale by using GIS and SWAT model: Case study in Nishabour watershed, Iran

Bachelor of Science (B.Sc.): Water Engineering 09/2006

The University of Guilan – Rasht, Iran

Areas of Experience and Interest

- Hydrological modelling and catchment-scale analysis
- Data-driven and process-based modelling (including AI/XAI approaches)
- Water accounting and nexus studies
- Climate change adaptation and nature-based solutions
- Integrated Water Resources Management (IWRM) and decision-support systems

Work History

Postdoctoral Researcher (full time) 03/2023 to present

Norwegian Institute of Bioeconomy Research (NIBIO) – Ås, Norway

- Applied and developed SWAT+ hydrological models for Norwegian catchments.
- Secured and Led two projects on hydrological assessment and explainable AI (XAI) in modelling
- Designed process-based calibration approaches for data-limited catchments.
- Collaborated in multidisciplinary national and international research on climate adaptation and nature-based solutions

Senior Researcher and Research Director (full time) 01/2016 to 12/2022

East Water & Environmental Research Institute – Mashhad, Iran

- Conducted research on hydrology, climate–water interactions and management
- Implemented integrated hydrological modelling for water resources planning
- Developed proposals and secured national and international research funding
- Led multidisciplinary teams and coordinated research projects
- Delivered technical reports, guidelines and stakeholder workshops

Training Facilitator (contract) 04/2020 to 08/2021

The Hague Academy for Local Governance – the Hague, the Netherlands

- Co-facilitator and local expert in an international tailor-made training course in water management and food security nexus
- Lecturer in the field of sustainable water management

Project Partner Representative in Iran (contract) 10/2017 to 10/2019

IHE Delft Institute for Water Education – Delft, the Netherlands

- Contributing in getting two research funds from Netherland Enterprise Agency
- Developing a water accounting framework for one of complex Iranian watersheds
- Conducting a feasibility study of applying drone technologies and RS in agricultural water management in Iran (SMART WADI project)

Research and Development Director (full time) 02/2015 to 08/2017

Hydrotech Toos Consulting Engineers Company – Mashhad, Iran

- Developing proposals and concept notes in a broad range of water projects
- Maintaining the company's competitive position by working on different functional strategies and capacity building programs

Visiting Research Scholar (full time) 02/2013 to 11/2013
Water Resources Department, Technical University of Delft – Delft, the Netherlands

- Developing tools for constraining and calibrating hydrological models
- Application of MCMC methods for uncertainty assessment of hydrological models

Volunteer Professional Activities

Leading IAHS-Strategic UN Synergy (SUN) Working Group 10/2024 to Present
International Association of Hydrological Sciences – Worldwide

- The Strategic UN Synergy (SUN) Working Group, is supporting the implementation of the IAHS-HELPING initiative ([+](#)).

Co-Founder 03/2020 - Present
Unsolved Problems in Water Balance (UPWB) - A National Initiative in Iran

- More information on [+](#) and [+](#).

Director of International Office 9/2020 to 12/2023
Iranian Water and Wastewater Association – Tehran, Iran

Strategic Planning Consultant 12/2016 to 12/2018
Mashhad Wise Water Forum – Mashahd, Iran

- I was a member of scientific committee and strategic planning consultant in Mashhad Wise Water Forum (MWWF) ([+](#)).

Honors and Awards

Steering Committee – UNESCO-IHP Conference 19/04/2023 to 21/04/2023
International Conference on Climate Risk, Vulnerability and Resilience Building– Paris, France

- Member of Steering Committee and Panelist ([+](#)).

IAHS SYSTA award 29/05/2022 to 04/06/2022
International Association of Hydrological Science (IAHS) – Wallingford, UK

- I was awarded as a young researcher to attend the 2022 the IAHS 2022 Scientific Assembly, in Montpellier, France, from 29 May to 3 June 2022 ([+](#)).

Invited panelist 26/10/2021 to 10/28/2021
UNESCO global conference on Climate-resilient Water Management – Paris, France

- I was invited by UNESCO Intergovernmental Hydrological Program (IHP) in their global conference form October 26-28, online from Paris, Paris, France ([+](#)).

UNESCO Intergovernmental Hydrological Program (IHP) – Paris, France

- Webinar series entitled as “Adaptation in an age of uncertainty: tools for climate-resilient water management approaches” June 17, online, Paris, France ([+](#)).

Publications

Peer-Reviewed Journal Articles**Under Preparation**

1. Water Framework Directive (WFD) implementation in Norway: Challenges and opportunities in the era of data-driven approaches
2. Norwegian agricultural catchments: a review of processes, losses, and climate adaptation measures

Published (International Journals)

1. Shafiei, M., Farkas, C., Skarbøvic, E., Barneveld, R., Bieger, K. (2026). **Representing Hydrological Processes in a Norwegian Catchment Using SWAT+: Leveraging Soft Data as Process-Based Constraints in Calibration**. Hydrology Research. Accepted [Q2, IF=2.8].
2. Rahimzade, S., Moghaddam, M. R. A., Shafiei, M., & Namavar, M. (2025). **Sustainability assessment of urban wastewater management: Developing a multi-dimensional indicator-based framework**. Sustainable Cities and Society, 106646.[Q1, IF=12].
3. Kreibich, H., Sivapalan, M., AghaKouchak, A., Addor, N., Aksoy, H., Arheimer, B., ... Shafiei, M.,... & Blöschl, G. (2025). **Panta Rhei: a decade of progress in research on change in hydrology and society**. Hydrological sciences journal, 70(7), 1210-1236. [Q2, IF=2.8].
4. Arheimer, B., Cudennec, C., Castellarin, A., Grimaldi, S., Heal, K.V., Lupton, C., Sarkar, A., Tian, F., Kileshye Onema, J.M., Archfield, Shafiei, M. and other co-authors (2024). **The IAHS Science for Solutions decade, with Hydrology Engaging Local People IN one Global world (HELPING)**. Hydrological sciences journal, 69(11), 1417-1435. [Q2, IF=2.8].
5. Namavar, M., Moghaddam, M.R.A. and Shafiei, M., 2023. **Developing an indicator-based assessment framework for assessing the sustainability of urban water management**. Sustainable Production and Consumption, 40, 1-12. [Q1, IF=10.9].
6. Shafiei, M., Rahmani, M., Gharari, S., Davary, K., Abolhasani, L., Gharesifard, M. (2022). **Sustainability assessment of water management at river basin Level: Concept, methodology and application**. Journal of Environmental management, 316, 115-201. [Q1, IF=8.9].
7. Izady, A., Joodavi, A., Ansarian, M., Shafiei, M., Majidi, M., Davary, K., Ziaei A.N. (2022). **A scenario-based coupled SWAT-MODFLOW decision support system for advanced water resource management**. Journal of Hydroinformatics, 24 (1), 56-77. [Q2, IF=2.37].

8. Gholizadeh Sarabi, **A perceptual socio-hydrological model of co-evolutionary coupled human–water system based on historical analysis, Mashhad basin, Iran.** Hydrological Sciences Journal, 66(3), 355-372. [Q1, IF=3.78].
9. Blöschl, G., Bierkens, M.F., Chambel, A., Cudennec, C., Destouni, G., Fiori, A., Kirchner, J.W., McDonnell, J.J., Savenije, H.H., Sivapalan, M., ... Shafiei, M., and 220 others (2019). **Twenty-three Unsolved Problems in Hydrology (UPH)–a community perspective.** Hydrological Sciences Journal, 64(10), 1141-1158. (One of the IAHS initiatives). [Q1, IF=3.78].
10. Pareeth, S., Karimi, P., Shafiei, M., & De Fraiture, C. (2019). **Mapping agricultural landuse patterns from time series of Landsat 8 using random forest based hierarchial approach.** Remote Sensing, 11(5), 601. [Q2, IF=4.5].
11. Shafiei, M., Ghahraman, B., Saghaian, B., Davary, K., Pande, S., and Vazifiedoust, M. (2014). **Uncertainty assessment of the agro-hydrological SWAP model application at field scale: A case study in a dry region.** Agricultural Water Management. 146, 324-334. [Q1, IF=6.6].
12. Gharari, S., Shafiei, M., . **A constraint-based search algorithm for parameter identification of environmental models.** Hydrology and Earth System Sciences. 18 (12), 4861–4870. [Q1, IF=5.18].
13. Shafiei, M., Ghahraman, B., Saghaian, B., Pande, S., Gharari, S., and K. Davary. (2014). **Assessment of rain-gauge networks using a probabilistic GIS based approach.** Hydrology Research. 45 (4-5). 551–562. [Q2, IF=2.71].

Published (selected Journal papers in Persian)

1. Khazaei, S., Raeini, M., Davary, K., & Shafiei, M. (2020). **Assessing the Status of Water Resources and Consumptions Using Water Accounting Approach in the Rokh-nishaboor Basin by WA+ Framework in Data Scarcity Condition.** Iranian Journal of Irrigation & Drainage, 14(2), 379-392.
2. Shafiei, M., Ghahraman, B., & Saghaian, B. (2019). **A Review on Hydrological Modelling Concepts, Part2: Uncertainty Assessment Concepts.** Journal of Water and Sustainable Development, 6(1), 35-40.
3. Shafiei, M., & Gharari, S. (2017). **A Review on Hydrological Modelling Concepts: Part 1- Introduction of Modelling Process.** Journal of Water and Sustainable Development, 4(2), 95-102.
4. Shafiei, M., Ghahraman, B., Saghaian, B., Davary, K., & Vazifiedust, M. (2014). **Uncertainty Analysis in Prediction of Soil Water Balance Components in two Irrigated Field in Arid Region.** Iranian Journal of Water and Soil. 5, 909-917.

Selected Conference Papers

1. Farkas, C., Shore, M., Fennell, J., & Shafiei, M. (2025). **MET Nordic Reanalysis data improves the performance of catchment-level hydrological models.** In EGU General Assembly Conference Abstracts (pp. EGU25-13869).

2. Shafiei, M., Farkas, C., Skarbøvik, E., & Bieger, K. (2026). **Catchment-scale assessment of small retention ponds as nature-based solutions in a Norwegian agricultural catchment using SWAT+** (No. EGU26-19278).
3. Shafiei, M., Zahraie, B., Soleimaniha, S., Dehbandi, N., Naseri, N., Golkar, E., and Ghasemzadeh, F. (2022). **Water balance assessment in Iran: from unsolved problems to practical solutions**. IAHS-AISH Scientific Assembly 2022, Montpellier, France.
4. Shafiei, M., Gharari, S., Gharesifard, M., Ghoreishi, M., and V. Castro, C. (2022). **Sustainability assessment: the role of indicator-based frameworks in sustainable water management**. IAHS-AISH Scientific Assembly 2022, Montpellier, France.
5. Shafiei, M., Gharari, S., Pande, S., Bhulai, S. (2014). **Kernel Density Independence Sampling based Monte Carlo Scheme (KISMCS) to infer posterior hydrologic parameter distributions**. 7th Intl. Congress on Env. Modelling and Software, San Diego, CA, USA.
6. Shafiei, M., Ghahraman, B., Saghafian, B., Davary, K., Vazifiedust, M., and Pande, S. (2013). **Calibration and uncertainty assessment of soil hydraulic parameters for SWAP model application**. EGU general assembly 2013, Vienna, Austria.

Research Projects

Ongoing Projects

1. **2025 – 2027**; [HYDFANG](#). Hydrologiske strategier for optimalisering av funksjonen til fangdammer i et endret klima. Landbruksdirektoratet and Norwegian Institute of Bioeconomy Research (NIBIO). Principal Investigator.
2. **2026 – 2027**; WFD-XAI. Explainable AI (XAI) for transparent and trustworthy freshwater management: A WFD pilot. Internal project, FS-Pilot, Norwegian Institute of Bioeconomy Research (NIBIO). Principal Investigator
3. **2023 – 2026**; [SABICAS](#). Safeguard Biodiversity and improve Climate Adaptation in catchment areas under pressure: tools and Solutions. Research Council of Norway and Norwegian Institute of Bioeconomy Research (NIBIO). Co-Investigator.

Completed Projects

4. **2020 – 2022**; Developing a roadmap for implementation of water resources Atlas in Iran. Iranian Ministry of Energy (and water). Principal Investigator.
5. **2019 – 2021**; Sustainability assessment of Mashhad Basin by developing an Indicator-based assessment framework. Internal Grant, Ferdowsi University of Mashhad. Co-Principal Investigator.
6. **2019 – 2021**; Developing a water accounting plus (WA+) system for Integrated Water Resources Management at Nishabour Basin in Iran. Funded by Razavi-Khorasan Regional Water Authority, Mashhad, Iran. Co- Investigator.
7. **2018 - 2019**; SMART Water Decision for Iran (applying RS and drone technologies for agriculture water management). Funded by Netherlands Enterprise Agency. Collaboration with IHE Delft Water Education Institute. Co- Investigator.

8. **2017 - 2018**; Comprehensive Assessment of Water and Food Security in Mashhad Basin, Iran. Funded by Netherlands Ministry of Infrastructure and Environment (IenM). Collaboration with IHE Delft Water Education Institute. Co-Principal Investigator.
9. **2017 - 2019**; Capacity Development for Improving Innovational and Technological Strategies by Approaching International Experience in R&D section of Mashhad Water and Wastewater Company. Funded by Mashhad Water and Wastewater Company, Iran. Principal Investigator.
10. **2015 - 2017**; Evaluation and augmentation of rain-gage networks in South-Khorasan, Iran. Funded by South-Khorasan Water Authority, Birjand, Iran. Principal Investigator.
11. **2015 - 2017**; Rainfall-runoff modelling in semi-arid regions in data scarce condition. Funded by South-Khorasan Water Authority, Birjand, Iran. Principal Investigator.
12. **2014 - 2016**; Developing a decision support system (DSS) for evaluating distributed water balance at Iranian watersheds. Internal Grant, Ferdowsi University of Mashhad. Co-Investigator.

Training Workshops (Attended – Professional Development)

- Strategic planning for river basins and deltas. IHE Delft, the Netherlands, 29 July-August 17. (2020).
- Shiraka Water Management Course. The Hague Academy for Local governance, the Netherlands, September 2- 8. (2019).
- Improving the theoretical underpinnings of hydrologic models. Center Ligneum in Sopron, Hungary. 15-18 April 2018.
- International training workshop on “water accounting: concepts and tools”. Tehran, Iran. 23-26 February, (2019).
- “Hydrocourse, Model building, inference and hypothesis testing in hydrology”. Centre de Recherche Public - Gabriel Lippmann, Belvaux, Luxembourg. April 15-22, (2013).

Computer Skills

- Modelling tools: SWAT, SWAT +, HBV, FELEX, WEAP, ICECREAM
- GIS: ArcGIS, QGIS
- Programming: R, Python and Fortran
- Multi-criteria decision making softwares: SuperDecision