



SOHAIL RAI

MBA (Australia); PhD Engineering (Japan); MSc & BSc Engineering (Pakistan)
Director, Murray Darling Basin Authority, Australia

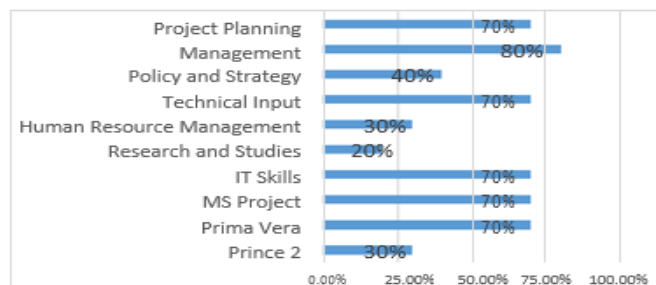
PROFILE

Sohail Rai has more than 25 years' work experience in planning, managing and delivering projects. From the past 13 years he has been working at different responsible positions in the Murray Darling Basin Authority, and presently heading a technical section of MDBA as Director. He is valued among the professional and academic circles of Australia and Pakistan for his sound and impartial advice and innovative approaches. He has extensive experience of planning, supervising and managing projects of development and technical nature. He is particularly good at providing policy advice and carrying out risk assessment studies. He has multinational work experience and worked in Australia, Japan and Pakistan. He is good at finding innovative solutions to development and technical problems and is experienced in stakeholder engagement strategies. He particularly excels in project designing & planning, and managing projects through creative economical and financial solutions. He holds a PhD in Civil & Environmental Engineering from Japan and an MBA from Australia. He is winner of many awards and scholarships such as winner of World Bank scholarship and Australian Day Achievement Awards. He has good relationships with universities and reviews studies of their PhD students and frequently publishes his research findings. He is also international reviewer of well renowned technical journals.

CONTACT

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Other details provided on demand

PRESENT USE OF KEY SKILLS



LANGUAGES

	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Urdu	Excellent	Excellent	Excellent
Punjabi	Excellent	Fair	Fair
Japanese	Basic	Basic	Basic

Excellent
 Fair
 Basic

PROFESSIONAL AFFILIATIONS

- Institute of Engineers, Australia
- Japan Society of Civil Engineers
- Pakistan Engineering Council
- Saitama University Alumni Association.
- Hydrological Society of Canberra
- Golden key international honour society
- University of Canberra Alumni Association

AWARDS

- Two times recipient of Australia Day Achievement Award for managing the technical work of the development of Basin Plan and Northern Basin Review of Murray Darling Basin.
- Member of Golden key international honour Society awarded for being in top 15% of academic achievements in MBA.
- Ph.D. Scholarship jointly funded by World Bank and the Ministry of Education, Japan
- MDBA financial support to undertake MBA
- PhD scholarship by Chinese Govt. for the promotion of higher studies (dropped).
- PhD Indigenous Merit Scholarship by Higher Education Commission of Pakistan (dropped).
- "Best Paper Presentation Award" by Japan Society of Civil Engineers in 9th international Conference held in Yokohama, Japan

- University position holder in MSc Engineering Faculty of civil and environmental engineering.
- University position holder in BSc Engineering Faculty of civil and environmental engineering.

EDUCATION

Degree	Dates	University/School
MBA	2015-2018	University of Canberra Australia
PhD Engineering	2003-2006	Saitama University, Japan.
MSc Engineering	1999-2001	University of Engg & Tech, Taxila Pakistan
BSc Engineering	1989-1993	University of Engg & Tech, Lahore Pakistan

(Appendix A for further details)

CAREER PROGRESSION

Position	Dates	Organisation
Director	July 2018 – to date	Murray Darling Basin Authority, Australia
Assistant Director	20-10-2008 - July, 2018	Murray Darling Basin Authority, Australia
Water Resources Engineer	Feb 2008 – 19-10-2008	Innovyze (XP-Solutions), Australia
Principal Engineer	Oct, 2006 – Jan, 2008	Saitama Package-D, Engineering Consultants, Japan
PhD Researcher	Oct, 2003 – Sep. 2006	Saitama University, Japan
Manager Planning	Jan, 1997 – Sep, 2003	National Construction Limited, Pakistan
Site Engineer	May, 1994 – Jan, 1997	Civil Works Organisation, Pakistan
Trainee Engineer	Nov, 1993 – May, 1994	National Highway Authority, Pakistan

(Appendix A for further details)

PROFESSIONAL COURSES AND TRAININGS

- Six-month course of “Leadership Development Programme for Executives” by the Tempo Strategies

(www.tempostrategies.com.au) and the Australian Public Service Commission.

- “Performance Management Training” arranged by the Australian Public Service Commission.
- “Project Management Course” arranged by the Australian Public Service Commission.
- “Influencing Skills for Executives” arranged by the Australian Public Service Commission.
- “Understanding ISO 9000” arranged by the Pakistan Institute of Management, Lahore.
- “Project identification, appraisal, preparation and planning” arranged by the Pakistan Institute of Development Economics, Quaid-e-Azam University, Islamabad.
- “Using various aspects of XP-RAFTS, Computer model”, arranged by the XP-Software, Canberra Australia.
- “Using various aspects of MODFLOW model to simulate groundwater”, by the IMMI, Lahore.
- On job training of using 1D and 2D features of XP-SWMM.
- Supervised PhD students of the Saitama University Japan, UET Lahore, Pakistan and UET Taxila, Pakistan.

EDUCATION AND CAREER PROGRESSION

PI see Appendix “A”

STRENGTHS, SKILLS AND IT SKILLS

PI see Appendix “B”

COMPETENCIES & CAPABILITIES

PI see Appendix “C”

PUBLICATIONS AND REVIEWER ACTIVITIES

PI see Appendix “D”

SYNOPSIS OF A FEW PROJECTS

PI see Appendix “E”

REFERENCES

PI see Appendix “F”

EDUCATION AND CAREER PROGRESSION**EDUCATION**

- **Master of Business Administration** **2015 – 2019**
University of Canberra, Australia
- **Doctor of Engineering** **2003 – 2006**
(Civil and Environmental Engineering)
Saitama University, Japan (Joint Japan World Bank Scholar)
- **MSc Engineering** **1999 – 2001**
(Water Resources Management and Irrigation Engineering)
University of Engineering and Technology, Taxila, Pakistan
- **BSc Engineering** **1989 – 1993**
(Civil Engineering)
University of Engineering and Technology, Lahore, Pakistan

CAREER PROGRESSION

Worked at various projects in Australia, Japan and Pakistan dealing with range of issues related with planning and management of big civil projects to research projects encompassing the core issues dealing with land, water and environment management.

Director**July, 2018 – till to-date****Murray Darling Basin Authority, Canberra, Australia**

MDBA is an Australian Government Department and is responsible to carry out equitable distribution of water among human, livestock, irrigation and environment use. MDBA worked on a landmark step in the water & environment history by developing a Basin Plan for Murray Darling Basin. Basin Plan is a legal document with all procedures and rules to identify and rectify environment issues for the RAMSAR listed wetlands in different seasons wet, average and dry.

I am leading a small team of highly qualified technical staff to inform and shape the policy decisions underpinning the rules of Basin Plan and finalising the Water Resource Plans for the river valleys in New South Wales (NSW) and Queensland States of Australia.

- Supervising the water resources planning work of River Basins of Queensland and New South Wales states of Australia through a daily computer model Source and IQQM (Integrated Quantity and Quality Model).
- Providing the critical hydrological input regarding flow regimes and frequency analysis of floods to shape the policy decisions of the basin plan.
- To manage projects, technically, financially, administratively and economically.
- To coordinate planning work with state hydrologists to solve the key hydrological problems.
- To analyse the hydrological results with various statistical, stochastic and graphical tools to get the key hydrological messages.
- To present results to the range of audience including different divisions within MDBA, CSIRO scientists, local communities, government departments and to the state governments and other stake holders.

- To carry out information sessions and training episodes of water resources planning methodologies and issues for the capacity enhancement of junior staff.

Assistant. Director**Oct, 2008 till July, 2018****Murray Darling Basin Authority, Canberra, Australia****Water Resources Software Engineer****Feb, 2008 till Sep, 2008****Innovyze (XP-Solutions), Canberra, Australia**

Worked as water resources software engineer in a leading American/Australian based water resources software company XP-Solutions, which deals with the preparation of commercial software's for modelling the hydrological, hydraulic and water quality systems. Its office was in Belconnen, ACT Australia, now moved to Brisbane.

- Maintained the numerical code for the analytical engine of the model XPSWMM (XP Storm Water Management Model). The engine code was written in Fortran language.
- Fixed bugs in the code of the engine reported by the users, by running the debug version of code in Compaq Visual Fortran compiler.
- Added new code for introducing new hydrological, hydraulic and water quality methods in the model.
- Provided online and telephone help to various water resources modelers using XP-software products i.e. XPSWMM, XPRAFTS, XPSTORM, XPCULVERT and XPRatHGL, to solve various hydrological and water quality issues.
- Tested engineering capabilities of soft-wares by developing hypothetical models, using the gauged data and hand calculations to check and verify the authenticity of the model results.
- Worked to improve the interface of the software by using the Microsoft Foundation Classes, MFC by coding and developing the projects in the Visual Studio 2003 and 2008 MFC build environment.

Principal Engineer, Tokyo, Japan**Oct, 2006 – Jan, 2008**

Saitama Package-D, Engineering Consultants. A leading engineering consulting organisation working in the engineering solutions of environmental and water related problems. Project leader of research project carried out in collaboration with the engineers of Japan Atomic Energy Agency (JAEA) and Faculty of Civil and Environmental Engineering, Saitama University.

- Project leader of research project carried out in Hokkaido, Northern Japan, to assess the effects of construction of deep underground shafts and research laboratory over the existing regional groundwater environment. Different computer models were used to simulate these effects. A combination of artificial neural network and genetic algorithm model gave the best results.
- Data handling, sorting, management and testing with range of statistical methods for validity purpose. Handled over one year data of 8 deep boreholes with four to five sensors in each borehole measuring several parameters like water temperature, pore pressure etc, at a frequency of 5 to 10 minutes.
- Project identified the existing groundwater flow directions and proposed changes in them after the construction of shafts. Project identified the presence of faults and high regions of groundwater movements to minimize the risk of water seepage in the shafts.
- Delivered lectures and presentations to discuss research results within Saitama University and JAEA staff.
- Guided PhD student of Saitama University, Mebrouk Mohammad, in a similar project in Mizunami, Nagayo, Japan of JAEA to predict changes in the groundwater levels during construction of vertical shafts. A grey numerical model was developed for this site.
- Submitted project reports and written papers to publish research results in international conferences and technical journals.

Doctoral Researcher, Saitama, Japan**Oct, 2003 – Sep, 2006**

Geosphere Research Institute, School of Civil and Environmental Engineering, Faculty of Engineering, Saitama University, Japan

- Developed a new numerical model by combining artificial neural networks and genetic algorithms techniques to perform runoff analysis in mountainous catchments. The model was tested in Tono area, an experimental watershed near Tokyo, maintained by JAEA. Hydrological and meteorological data was obtained from JAEA. The study achieved excellent results and helped to understand the runoff process of the mountainous watersheds.

Manager/Engineer Planning, Pakistan**Jan, 1997 – Sep, 2003**

National Construction Limited (NCL), a leading construction company of Pakistan doing construction work of bridges, roads, multi-storey commercial buildings and Housing colonies. Worked with Managing Director at head office to look after planning and monitoring of projects.

- Lead the planning and monitoring section of NCL, performing planning and day to day monitoring of the construction projects carried out throughout the country.
- Used planning soft-wares like MS Project, Prima Vera to allocate resources, man power, working days and material requirement. Preparation of construction schedules, Bar and Gantt charts, master planning documents, progress reports of projects, cash flow statements, profit loss statements etc.
- Preparation of tender documents, prequalification of contractors, preparation of contract documents according to FIDIC, pricing bill of quantities, preparing monthly bills for the smooth cash flow etc.
- Carrying out technical meetings with clients and consultants, preparation of technical drawings and shop drawings, reinforcement design, preparation of contractual claims and general supervision of the projects.

Site Engineer, Pakistan**May, 1994 – Jan, 1997**

I worked as Site/Field engineer in Civil Works Organisation. CWO is a semi government organization mostly engaged in the construction projects of the military use. I worked with this organization from May 1994 to January 1997.

- Supervising the physical progress of projects at site. Handling the sub engineers and construction supervisory staff. Assigning them daily and weekly tasks to meet the various project landmarks as per planned construction activities.
- Studying the engineering drawings and the project contractual documents, prequalification of subcontractors, estimating the various material and manpower resources, supervising the procurement of construction material, managing the construction material stores.
- Preparation of running bills to keep the smooth flow of cash at site. Discussion regarding various technical matters with consultants and clients, preparation of shop drawings for the construction staff at site, preparation of bar bending schedule.
- To check the quality of construction work as per engineering standards and to keep the pace of construction work as per construction schedule. To ensure the targets are met within the scheduled time.

Trainee Water Resources Engineer, Pakistan**Nov, 1993 – May, 1994**

Worked as trainee engineer in the water resources section of National Highway Authority, Pakistan.

- Involved in the hydrological and hydraulic analysis of the waterways and the rivers. Estimating design flood peaks to design the structural components of water structures like water ways, causeways and bridges and bridge spans.

- Remained busy in the collection of hydrological and meteorological data from various sources, handling, management, sorting and verification of the data.

STRENGTHS, SKILLS AND IT SKILLS**STRENGTHS**

- More than 24 years’ experience in planning, managing and delivering projects.
- Sound judgements and valued opinions underpinned by strong academic understanding of the principles of engineering plus physical and social sciences.
- Education from prestigious universities of Australia, Japan and Pakistan.
- Leadership qualities, leading sections and teams from diverse fields and diverse cultures.
- Mentoring and coaching the junior staff.
- Strong interpersonal skills in English, Urdu, Punjabi and Japanese.
- Project management skills right from appraisal, planning, monitoring till finalisation of projects.
- Analysis and shaping the policy issues of water and environmental sectors.
- Economic analysis and policies review of water and environmental issues.
- Financial management of projects, sections and teams.
- Administrative management of projects, sections and teams.
- Multinational work experience, Pakistan, Japan and Australia.
- Joint Japan World Bank Scholar to Japan for PhD Studies.
- Australia Day Achievement Award
- Reviewer of many international journals.
- Examiner of PhD studies.
- Contributor to international journals and conferences.
- Languages, English, Urdu, Punjabi, Saraiki, Japanese

SKILLS

- Managed sections and teams from diverse fields and different cultural backgrounds.
- Mentoring and coaching the junior staff.
- Leadership role to guide and control the projects economically, technically and financially.
- Providing critical technical, policy and statistical input to shape up the policy position of integrated basin plan of Murray Darling Basin Australia.
- Policy review, analysis and finalization of policy plans regarding risks to the environment and communities.
- Policy advocacy to the stake holders, state and local governments and local bodies.
- Vast experience in handling complex water and environmental issues and applying innovative techniques to solve them.
- Trained in solutions of hydrological and environmental issues through computer modelling techniques.
- Equitable distribution of water through finalization and implementation of Water Resource Plans.
- Vast experience of performing rainfall runoff analysis.
- Flood estimation studies, basin optimization techniques, water recharge techniques.
- Environmental impact assessment studies.
- Catchments scale forestation and deforestation effects.
- Experience in handling and supervising big civil engineering projects.
- Experience in planning and coordinating civil engineering projects.
- Managing and supervising technical and non-technical teams.
- Experience in handling large datasets.
- Experience in undertaking statistical analysis.
- Specialized in assessing regional scale groundwater movements.
- Impact assessment studies of construction of tunnels and deep underground research laboratories over the regional groundwater environment.
- Experience in land use and land cover mapping.
- Experience in salinity control techniques.
- Good knowledge of Fortran, C, C++ and Visual Sharp C languages.
- Good familiarity with MS Word, MS Excel, MS PowerPoint and other Statistical softwares including computer models.

- Performed water accounting, water use efficiency and productivity analysis from field to river basin scale
- Vast experience in
 - Preparing project summaries, progress reports.
 - Schedule charts, bar charts, progress charts.
 - Project meetings, quality control.
 - Timely completion of projects, liaison with clients and consultants.
 - Technical meetings and handling technical matters
- Experience in managing research projects, client interactions and communication of results at a range of levels

IT SKILLS

Operating Systems: Windows, DOS

General Packages: MS Office and other general use packages

Professional software/models:

Storm Water & Surface Hydrology Models:

1. Integrated Quantity and Quality Models (IQQM) applied in Australia (NSW state).
2. Resource Allocation Models (REALM) applied in Australia (Victoria state).
3. Monthly Simulation Model (MSM) applied in River Murray Australia.
4. BigMod Model daily model applied in River Murray Australia
5. MIKE Flood Models for the hydraulic modelling of Wetlands
6. Digital Elevation Models.
7. Storm Water Management Model (SWMM).
8. Artificial Neural Network Models (ANN) applied in Tono Basin Japan.
9. Genetic Algorithm Models (GA) applied in Tono Basin Japan.
10. Auto Regressive and Moving Average Models (ARMA) applied in Tono Basin Japan.
11. 2D and 3D Finite Element Models (FEM),
12. Finite Difference Models (FDM) applied in SCARP Project Pakistan.

Groundwater Hydrological/Statistical:

1. MODFLOW Model applied in SCARP Project Pakistan.
2. SURFER, SPSS

Programming languages:

- Advanced programmer in C, C ++ and Visual C Sharp with implementation of object oriented concepts using classes and developing window based programs with MFC.
- Good programming skills in C using structures.
- Competent in using PYTHON, FORTRAN and MATLAB languages
- Good concepts of SQL and other database languages.
- Worked in HTML, DHTML

COMPETENCIES & CAPABILITIES**Program management and leadership skills**

A program manager should demonstrate management skills and leadership qualities to deliver projects. I learned these skills by attending professional courses. I was nominated by the Chief Executive Murray Darling Basin Authority to attend a six-month course of “**Leadership Development Program**”. It was arranged by the Australian Public Service Commission, which helped me in understanding strategies about time management, setting personal/team goals, team management, identifying critical project paths and monitoring the progress of projects.

I am working as Acting Director in the Murray Darling Basin Authority and managing a section of highly competitive professionals. I work in both technical and policy spaces. Technically, carrying out impact assessment studies to predict effects of management decisions and river operations on river flows, as well as running model scenarios, extracting results, undertaking statistical analyses, identifying hydrological and environmental risks to river communities and categorizing risks – as low, medium or high. I also facilitate discussions with range of stakeholders including local communities, farmers, state authorities and town councils to finalise water policies. Within MDBA I work with the senior management in formulating water risk management strategies. I coordinate with state governments, local authorities and aboriginal communities and farmer organizations to chalk out comprehensive plans to implement water policies.

Planning, organizing, directing, controlling and reviewing programs and projects

I have planned, organised, managed and successfully delivered projects, including both individual and team projects. As a manager, I always tried to finish projects within allocated timeframes, meeting goals and objectives.

I have undertaken project management courses such as project identification, appraisal, monitoring and delivery. Such courses refined my project management capabilities, improved understanding of projects and enhanced capability to meet the project interim goals by identifying critical paths. It helped me to financially and administratively control projects and resolve timely supply of resources. I use different tools in managing projects, from simple excel and word sheets to more advanced commercial packages like MS Project, Primavera and Prince2.

Policy analysis – analyse and review of water and environment policies

Policy is defined as the system of principles and procedural steps implemented as protocols. When followed properly it helps to shape and guide decisions at the individual, group or at the organizational level to achieve certain rationale outcomes. A policy can be analysed quantitatively, qualitatively or by both approaches. Gather the factual data through surveys, take on board the views of stake holders by interacting with them likely to be affected by the policy, initiate discussion with the management of the organization, pass out all this data and views through different policy plans against the stated outcomes and see which policy plan is practical and acceptable.

In Murray Darling Basin Authority, I am involved in discussions with colleagues to analyse water and environment policies. The purpose is to achieve a balance between river communities and the economic wellbeing of communities by altering river flows. We have developed policies regarding water resource plans, risk management plans, environmental plans and are continuously analysing, revising and updating them in light of the new data and surveys.

Accreditation and compliance of State water policies

Murray Darling Basin includes water resources of four States and one Territory. MDBA a Commonwealth authority ensures States/territory adhere to the agreed water use. States put forward their water resource plans for accreditation by MDBA. Actual water use by States is audited each year for compliance with permitted water use. My section helps in reviewing hydrological models underpinning the water resource plans. A water resource plan is a legal document prepared for each river basin. It provides comprehensive information about the water use by irrigation, industry, critical human needs, recreational, cultural and stock use. It has provisions to allow water for the improvement of river health and preservation of wetland communities.

Analysing risk management strategies

We use standard approaches to carry out risk studies that include identifying, scoping, and defining risks, establishing baseline conditions, risks prediction and assessment, decision making and communication of results to various stakeholders. To identify and tackle water related environmental risks gathering information to design risk aversion and mitigation strategies is important. Simple methods such as preparation of checklist of environmental factors, formulation of more detail interaction matrices and most importantly and presently extensively used mathematical models are also used.

In the Murray Darling Basin Authority (MDBA), we do multitudes of investigatory and research works to provide information to the risk assessment and management studies in shaping the water and environmental management policies. From the hydrological perspective we run hydrological models for different scenarios to identify risks. Hydrological models are run for without development, baseline and basin plan scenarios. Without development scenario means running the model without any water related infrastructure like dams or irrigation diversions, it mimics the river natural environment. Baseline conditions signifies the current state of the river highlighting the poor environmental health of river communities and wetlands. Basin plan scenarios represent a set of options of different river management practices to improve the environmental health of river communities and wetlands without impacting the socio and economic indicators of local communities relying on river waters. To comparing different management scenarios key environmental indicators are developed for important hydrological sites such as flow frequency analysis, seasonal analysis and dry spell analysis. The hydrological indicators are ranked from highly uncertain to low uncertainty, the indicators falling below the high uncertainty level are in red zone i.e., danger zone and need immediate attention, indicators falling between high and low uncertainty levels are moderate risks to environment and indicators falling above low uncertainty level have no risk and are in healthy condition.

PUBLICATIONS AND REVIEWER ACTIVITIES

Numerous publications and reports have been written so far, out of them some leading ones are mentioned below:

International Journal Publications

- K. Aziz, S. Rai, A. Rahman (2015). *Design flood estimation in ungauged catchments using genetic algorithm based artificial neural network (GAANN) technique for Australia*. Natural Hazards, Springer, DOI 10.1007_s11069-015-1625-x.
- K. Aziz, A. Rehman, S. Rai (2014). *Application of Artificial Neural Network and Genetic Algorithm for Regional Flood Estimation in Australia*. Hydrology & Water Resources Symposium 2014, 24th-27th Feb, 2014 at Pan Pacific Hotel, Perth Australia.
- A.R. Ghumman, Y. M. Ghazaw, A. R. Sohail and K. Watanabe (2011). *Runoff forecasting by artificial neural network and conventional model*. Alexandria Engineering Journal, Science Direct. 50(4): pp 345-350.
- Sohail A., K. Watanabe, and S. Takeuchi (2008). *Runoff Analysis for a Small Watershed of Tono Area Japan by Back Propagation Artificial Neural Network with Seasonal Data*, International Journal of Water Resource Management, Springer. 22:pp1-22.
- Sohail A. R., and Ghumman A., R. (2007). Predicting monthly flows by ANN models for three rivers of Pakistan. In proceedings of the 9th International Summer Symposium, Japan Society of Civil Engineers, September 18, 2007, Yokohama, Japan: pp 95-98.
- Sohail A., K. Watanabe (2007). Groundwater management model of Horonobe project Japan. A report submitted to Japan Atomic Energy Agency (JAEA) through Kajima Construction Company.
- Sohail A., K. Watanabe, and S. Takeuchi (2006). *Stream flow forecasting by artificial neural network (ANN) model trained by real coded genetic algorithm (GA)*. Journal of Groundwater Hydrology Japan. 48(4), 606, pp 233-262.
- Sohail A., K. Watanabe, and S. Takeuchi (2006). Joint application of artificial neural network and genetic algorithm to stream flow forecasting in Tono area Japan. In Proceedings of the International Conference on Management of Water, Wastewater and Environment: Challenges for the developing countries, Kathmandu, Nepal. 13th – 15th September, 2006, 21.
- Sohail A. (2006). Applications of Artificial Neural Network and Genetic Algorithms to Runoff Analysis for Mountainous Watersheds. Doctorate of Engineering thesis submitted to Saitama University Japan.
- Ghumman A. R., and Sohail A. (2003). Simulation of groundwater levels by a numerical model. Technical Journal of University of Engineering and Technology Taxila, Pakistan. 2003(1), pp 11-18.
- Ghumman A. R., Sohail A., and Rajab M. (2003). Simulation of groundwater levels using a numerical model. In proceedings of Hydro Africa 2003 International Conference on Hydropower, Arusha Tanzania, November 17-19, 2003: pp 1-8.
- Sohail A. (2001). Simulation of groundwater levels using numerical model (ModFlow i.e. PMWin). Master of Engineering thesis submitted to University of Engineering and Technology Taxila Pakistan.

Professional Reports:

- Sohail, R. (2017a). Public management options to solve the Great Barrier Reef, a report submitted to the faculty of business, government & law, University of Canberra, March 10, 2017.
- Sohail, R. (2017b). Public management options to sharing the water resources of Murray Darling Basin, a report submitted to the faculty of business, government & law, University of Canberra, April 09, 2017.
- Sohail, R. (2017c). Restructuring of the Punjab Irrigation Department of Pakistan, a report submitted to the faculty of business, government & law, University of Canberra, May 12, 2017.
- Sohail, R. (2017d). Role of performance management in the success of an organisation, a report submitted to the faculty of business, government & law, University of Canberra, August 27, 2017.

- Sohail, R. (2017e). Role of reward management in the success of an organisation, a report submitted to the faculty of business, government & law, University of Canberra, September 17, 2017.
- Sohail, R. (2017f). Role of talent management in the success of an organisation, a report submitted to the faculty of business, government & law, University of Canberra, September 17, 2017.
- Sohail, R. (2018a). Environment as wicked problem in Australia – case study climate change policy, a report submitted to the faculty of business, government & law, University of Canberra, May 20, 2018.
- Sohail, R. (2018b). External and internal drivers of innovation and change management in organisations, a report submitted to the faculty of business, government & law, University of Canberra, September 9, 2018.
- Sohail, R. (2019). Impacts of hydrological models on water policy making: the case of Murray Darling Basin, Australia, a report submitted to the faculty of business, government & law, University of Canberra, May 19, 2019.

Nominated as Expert for following PhD Research Work

Reviewed the following PhD thesis work as the Foreign Expert:

- 2014, “Optimization of Multiple Reservoirs Operation with Consideration to Sediment Evacuation”, by Muhammad Usman Rashid, University of Engineering and Technology Lahore Pakistan.
- 2014, “An Investigation of Representative Discharge and Its Impact on Channel Plan-forms”, by Muhammad Mubashir Qureshi, University of Engineering and Technology Lahore Pakistan.
- 2013, “Numerical Simulation for Optimization of Canal Irrigation System”, by Mazhar Hussain, University of Engineering and Technology Lahore Pakistan.
- 2013, “Performance Evaluation of On-farm Water Management Interventions in Punjab”, by Abid Latif, University of Engineering and Technology Lahore Pakistan.
- 2011, “Performance Evaluation of Canal Irrigation System of Punjab Pakistan” by Riaz Akhtar Khan, University of Engineering and Technology Taxila Pakistan.
- 2011, “Flood Inundation Modeling for a Watershed in Pothowar Region” by Qazi Tallat Mahmood, University of Engineering and Technology Taxila Pakistan.
- 2010, “Performance Assessment of Surface and Subsurface Drip Irrigation Systems for Crops and Fruit Trees”, by Tallat Farid Ahmad, University of Engineering and Technology Taxila Pakistan.
- 2009, “Investigation of Various Sediment and Flow Parameters Upon 3D Flow Using Numerical Model”, by Usman Ghanni, University of Engineering and Technology Taxila Pakistan.
- 2009, “An Investigation of the Characteristics of Effluent Mixing in Streams”, by Naeem Ejaz, University of Engineering and Technology Taxila Pakistan.

Nominated as the Reviewer for Leading Journal Papers

Reviewed a number of research papers of some leading journals in Environment and Engineering Sciences. Some of them are as follows.

- 2013, July. *Stochastic Environmental Research and Risk Assessment, Springer*. “Simulation of Snowmelt Runoff in Ungauged Basins based on MODIS: A case study in the Lhasa River Basin.”
- 2013, April. *Stochastic Environmental Research and Risk Assessment, Springer*. “Risk model of sustainable regional sustainability based on ecological footprint”.
- 2013, March. *Journal of Engineering and Applied Sciences, University of Engrg and Tech, Peshawar Pakistan*. “Investigation of performance and sediment transport of an irrigational canal”
- 2012, December. *Environmental Monitoring and Assessment Journal, Springer*. “Assessing contamination from continuous combined sewer outfall (CSO) discharge on a tidal creek: bacteriological and heavy metals indicators”.

- 2012, November. *American Journal of Climate Change, Scientific Research Publishing*, "Impact of elevated CO₂ and temperature on methane consumption in different soil aggregate size fractions".
- 2012, September. *Stochastic Environmental Research and Risk Assessment, Springer*. "Application of Artificial Neural Networks in Regional Flood Frequency Analysis: A Case Study for Australia".
- 2012, May. *Environmental Monitoring and Assessment Journal, Springer*. "Investigation of Impact of Environmental Changes on Precipitation Pattern of Pakistan".
- 2012, January. *Pakistan Journal of Engineering and Applied Sciences, University of Engineering and Technology Lahore Pakistan*, "Flow variation in Astore River under assumed glacial extents due to climate change". Application of University of British Columbia watershed model in Astore Valley Pakistan.
- 2011, December. *Journal of Hydrological Engineering*, "Ranking sensitive calibration parameters of UBC (University of British Columbia) watershed model".
- 2011, September. *International Journal of Physical Sciences, Academic Journals*, "Determination of Kinetic Coefficients for the Biological Treatment of Textile Wastewater". A bench scale study carried out in Pakistan.
- 2011, May. *Water Resources Management Journal, Springer*, "Modelling Canals for Various Operating Strategies". A modelling study done in Faisalabad Pakistan.
- 2011, May. *Journal of Institute of Soil & Environmental Sciences, University of Agriculture Faisalabad Pakistan*, "Application of weather generator for environmental parameters estimation for upper Indus basin."
- 2011, April. *Journal of Chinese Institute of Engineers, Department of Civil Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan*, "Faecal Coliform Modelling- A Case Study of Ravi River". A modelling study done in Ravi River Lahore Pakistan.
- 2011, March. *Pakistan Journal of Engineering and Applied Sciences, University of Engineering and Technology Lahore Pakistan*, "Gradually Varied Flow Computation in Compound Channel Networks".
- 2011, February. *Pakistan Journal of Engineering and Applied Sciences, University of Engineering and Technology Lahore Pakistan*, "Hydraulic Transient Analysis of Surge Tanks: A case study of Satpara and Golen Hydropower Projects in Pakistan".
- 2010, September. *Environmental Monitoring and Assessment Journal, Springer*, "Assessment of water quality of Rawal Lake by long time monitoring."
- 2010, August. *Environmental Monitoring and Assessment Journal, Springer*, "Environment and Socio-Economic Impacts of Pipe Drainage in Pakistan."
- 2009, December. *Environmental Monitoring and Assessment Journal, Springer* "Impact Assessment of subsurface Drainage on Waterlogged And saline Lands". A research work carried out in water logged areas of Punjab Pakistan.
- 2009, May. *Environmental Monitoring and Assessment Journal, Springer* "Groundwater Modeling of Buraydah Al-Qasim for Better Water Management Strategies". A research work done in Buraydah Al Qasim Saudi Arabia.

SYNOPSIS OF A FEW PROJECTS**Suggestions to improve the hydraulic pressure prediction system of Mizunami underground research laboratory, Nagoya Japan****2007**

This study was related with predictions and forecasting of underground hydraulic pressures measured with the help of measuring probes installed at various locations in the deep boreholes. The purpose of the study was to develop a methodology to manage the deep ground pore pressure changes under different conditions. The study site is located near Nagoya Japan and is managed by JAEA (Japan Atomic Energy Agency). Eight measuring probes installed in deep boreholes measure the hydraulic pressures and groundwater temperatures continuously after fixed period of time. The construction of shafts for an underground research laboratory was already underway. Another aim of the study was to enhance the capability of JAEA to understand and get control of real time management of groundwater fluctuations. The JAEA was already using a comprehensive methodology based on the conceptual modeling techniques and require to enhance their capability to understand the natural pore pressure fluctuation system by the combined use of artificial neural network, genetic algorithm and finite element modeling techniques. The study was carried out in collaboration with JAEA engineers and a comprehensive report suggesting the various improvements in the present system were recommended.

Suggesting a reliable groundwater monitoring and management system in Horonobe, Hokkaido Japan**2006 - 2007**

This study was carried out in Horonobe area, Hokkaido Japan. JAEA was planning to construct an underground research facility to broaden the knowledge about different research fields related with underground environment like geology, hydrology, environment and hydrogeology studies etc. Two shafts were proposed to be constructed, i.e. main and ventilation shafts which would provide access to this underground laboratory approximately 1 km below ground surface. In order to study the affects of the construction of these shafts and the underground repository over the existing regional groundwater flow patterns, some deep study boreholes with measuring probes were installed around the proposed site. In each deep borehole 7-11 measuring probes or measuring sensors were installed which measure the hydraulic pressure and groundwater temperature continuously at regular intervals of time i.e. 10 minutes. The main aim of this study was to quantify the effects of various factors like earth tides, barometric pressures and human activities over the natural hydraulic pressures. Various numerical techniques and GIS based approaches were implemented for this purpose. The cross correlation analyses were carried out considering inter-borehole and intra-borehole scenarios to identify similar hydraulic pressure zones laterally and vertically in each borehole. In brief the methodology being followed was that models were simulated for the undisturbed conditions of natural hydraulic pressures and then used to predict the hydraulic pressures for the disturbed period. The difference in the measured and predicted hydraulic pressures helped to quantify the effects of construction over regional groundwater environment.

Suggesting a comprehensive catchment management system by using different modelling approaches in Tono area Japan**(2003 – 2006)**

This study was carried out in the Tono area basin near Tokyo, Japan. It was an experimental catchment and different types of hydrological, hydrogeological and geological data was collected by JAEA on regular basis. The aim of the research was to study and measure the difference in the hydrological processes of the basin during rains of dry (winter) and wet (summer/rainy) seasons and to judge the climatic effects over the performances of numerical models to predict and forecast runoff in space and time. The hydrological and hydrogeological study of the site was carried out in detail to measure and assess hydrogeological parameters of site like hydraulic conductivities in x-y directions, storage capacity, transmissivity and permeability of the soil. Different numerical modelling approaches including both linear and nonlinear approaches and GIS based

techniques were adopted for the analysis. The study achieved excellent results and proper modelling steps were identified for the application of GIS and numerical based models in the mountainous watersheds for the first time. The seasonal effects on the development of models were also identified and seasonal models were found to be better choice than yearly models.

Simulation of groundwater levels using a numerical model (Modflow i.e. PMWIN) in SCARP area Pakistan **(1999-2001)**

This study was carried out in the SCARP-1 region (SCARP: Salinity control and reclamation project), emphasizing over the “Khanqah Dogran Scheme” in Punjab Pakistan. The study was funded by WAPDA (Water and Power Development Authority of Pakistan). The major problem of the area was the water logging due to continuous recharge from Qadriabad-Balloki Link Canal. The tube wells were installed at various locations by WAPDA to lower the groundwater table, however due to improper planning and lack of thorough research, the desired results could not be achieved. The study was undertaken addressing the two major targets. Firstly, to calculate the optimum pumping capacities of installed tube-wells and to increase their efficiencies and to reduce the overheads and maintenance costs. Secondly, to categorize the whole area into different zones i.e. maximum, moderate and minimum according to the intensity of pumping required to lower the groundwater table and identifying areas requiring more pumping of groundwater. The study provided convincing results and a proper planning and management system was suggested after the analysis of results.

REFERENCES

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