

Curriculum Vita

Prof. Muhammad Rashid Shatanawi

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Key Qualifications

Muhammad R. Shatanawi is Professor of Water Resources and Irrigation, UNESCO Chair in Hydrology and Ex-Minister of Water and Irrigation in the Hashemite Kingdom of Jordan. Dr. Shatanawi has had a distinguished career as a minister, professor, scientist, researcher, decision maker and policy advisor in the area of water resources and environment. He has more than thirty years of diverse and wide experience domestically and internationally in hydraulic engineering, water resources management, water and agriculture policy, irrigation systems design, hydrology of arid areas and water desalination. The results of his research and other work experience have had a measurable impact on policy development, improving water use efficiency, water quality and environmental quality in Jordan.

In September of 2007, he was appointed as the Minister of Water and Irrigation in Jordan. Between 1999-2003, he was the Dean of the Faculty of Agriculture at the University of Jordan. He was the Director of the Water and Environment Research Center for eight years. His duties in the center included coordination of research projects, and had succeeded in raising funds for more than 20 projects. He worked for FAO as an expert in water and irrigation in Egypt (1989-1991). Dr. Shatanawi was the head of the Department of Soils and Irrigation at the University of Jordan and was involved with many applied research topics related to water and environment. In this capacity as Professor and UNESCO Chair, he has been coordinating nine research projects funded by the EU, UNESCO and others (SMART, WASAMED, MEDCOASTLAND, IRRIMED, OPTIMA, DIMAS, GEWAMED, MELIA, SOWAMED). He has more than 60 publications and books in irrigation modeling and management, water resources planning and policy; and he has often been consulted by many international organizations in project formulation and evaluation. He held an Adjunct Professor appointment for three years at Washington State University (1995-1997). He is also a visiting professor at the Mediterranean Agronomic Institute in Bari, Italy. Dr. Shatanawi was a member of the Working Group on Water Resources of the Middle East Peace Process Multilateral Negotiations, and was also a member of the Jordanian delegation to the Earth Summit held in Rio De Janeiro 1992, which had resulted in the adoption of the Agenda 21.

Professor Shatanawi is the holder of the UNESCO Chair in Wadi Hydrology, where he has organized the 2nd International Conference on Wadi Hydrology in 2003 and established the Virtual Lab on drying lakes specifically on the "Dead Sea." He is also a member in several national and international professional associations, and societies in the fields of Civil and Agriculture Engineering, water, environment, irrigation and desertification and is a member of the theme advisory board of the 6th International Hydrological Program (IHP-VI), UNESCO. He acted as a member of the Scientific Committee of the Standing Committee for RAMSAR Convention for six years, a member of RADAC Committee of the International Arid Land Consortium and was a member of different national and steering committees in water and agriculture. He participated in many international and regional conferences and workshops in water management, water policies, water disputes and cooperation.

Professor Shatanawi holds a Ph.D. in Civil Engineering (hydraulics) from the University of California, Davis.

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Education

Ph.D.: (Civil Engineering) 1980, University of California, Davis, USA; Major: Hydraulics; Minors: Irrigation and Engineering Analysis.

M.Sc.: (Irrigation and Drainage) 1975, American University of Beirut, Lebanon.

B.Sc.: (Agricultural Engineering) 1968, University of Alexandria, Egypt.

Specialization

Water resources management, Water and agricultural policy formulation, Hydrology of arid land, Irrigation management, Design of irrigation and water projects, Hydraulic Engineering, and Water Desalination.

Professional Qualification

Member in: Jordan Engineers Association, Agricultural Engineers Association of Jordan, American Society of Agricultural Engineers, American Society of Civil Engineers, Jordan Environment Society, Jordan Water Society, Jordan Society for Combating Desertification, International Water Resources Association, Water Environment Federation, the International Water Quality Association, the World Water Council and the Arab Water Council.

Advisory Committees and Honorary Membership

Dr. Shatanawi has acted or is acting as a member in the following:

- Vice Chairman of the National IHP committee in Jordan
- Member of the theme Advisory Board of the sixth phase of International Hydrological Program (IHP), UNESCO.
- Member of the Projects Steering Committee of the Ministry of Agriculture.
- Chairman of the Executive Committee of Badia Research Program.
- The holder of the UNESCO chair in Wadi Hydrology since 1999.
- Member of the Board of Directors of the National Center of Agriculture Research and Technology Transfer (NCARTT).
- Member of the Water Policy Committee and the Wastewater Treatment and Reuse Committee of the Ministry of Water and Irrigation.
- Editor-in-chief of the Arab Water Council Journal, Member of the editorial board of the Jordanian Agricultural Science Journal, member of editorial board of WATER International and member of the advisory committee of JRBM.
- Consultant to UNDP for several Projects Evaluation and projects Formulation.
- Adjunct professor in Water Resource and Environment at Washington State University, Pullman, WA, USA. (Jan. 1, 95- Dec. 31, 97)

- Member of the Scientific Committee of the Standing Committee of RAMSAR Convention for wetland protection for two terms (93-95 and 99-2001)
- Visiting Professor at the Mediterranean Agronomic Institute in Bari, Italy.
- Member in RADAC Committee of the International Arid Land consortium.
- Peer reviewer of many scientific Journals and Award committees.

Experiences

- 8/2003-present: Professor of water resources and irrigation, UNESCO Chair Holder in Wadi Hydrology, and research projects coordinator, Editor in Chief for the Arab Water Council Journal.
- 2/1991-present: Part time consultant with many national and international organization like: the World Bank, UNDP, EU, UNESCO.
- 9/2007-11/2007: Minister of Water and Irrigation in Jordan
- 9/99-8/2003: Dean of the Faculty of Agriculture, University of Jordan. and Professor of Water Resources and Irrigation.
- 2/92-9/99: Director of Water and Environment Research and Study Center, University of Jordan,
- 9/91-2/92: Head of the Department of Soils and Irrigation, University of Jordan.
- 7/89-1/91: Expert with FAO in Egypt as Senior Irrigation Advisor to Project EGY/87/010 (Agricultural Development in the North Western Coastal Zone).
- 9/80-7/89: Assistant and then Associate Professor of Hydraulic and Irrigation Engineering, University of Jordan.
- 8/78-Present: Consultant (part-time) in Irrigation and Water Resources.
- 9/77-8/80: Research Assistant at LAWR, University of California, Davis.
- 9/76-8/80: Ph.D. Student at the Civil Engineering Department, University of California, Davis.
- 10/75-9/76: Lecturer in Irrigation, University of Jordan.
- 9/74-9/75: Research Officer in Irrigation, Ministry of Agriculture, Amman, Jordan.
- 7/72-8/74: M. Sc. Student at the American University of Beirut, Lebanon.
- 10/68-7/72: Design Engineer, Ministry of Agriculture, Amman, Jordan.

SCOPE OF WORK

As University Professor

- 1- As a Dean of the Faculty of Agriculture, he was carrying day-to-day responsibilities of managing the Faculty in teaching and research.
- 2- Teaches courses in: Hydraulics, Hydrology, Irrigation principles, Water Resources, Drainage, Irrigation systems Design, Irrigation Planning and Management, Irrigation Theory, Fluid Mechanics and water desalination.
- 3- Carry out research in: Evaluation of Irrigation Projects, Water Management, Water Planning and Management, Water Harvesting, and Arid Land Hydrology.
- 4- Has supervised 35 M. Sc. students and 15 Ph. D. students.
- 5- Coordinate research and studies in the areas of water and environment.

- 6- Has been directing research projects in Arid Land Hydrology, Water Harvesting, Artificial Recharge of Groundwater, Irrigation Management, Water Quality and Water Conservation in Arid Areas.
- 7- Organizes workshops and conferences in water and conduct training courses in Water and Environment.
- 8- He is the organizer of an annual international workshop on Wadi Hydrology.
- 9- He organizes training courses and study tours for participants from Jordan and the Arab Countries.
- 10- Has participated in more than 50 international, regional and national conferences and workshops.

As FAO Expert

- 1- Coordinated the production, research, and training activities for the development of Water Resources in the NWCZ (Egypt).
- 2- Designed the most suitable irrigation systems and carrier pipes for the irrigation projects in the NWCZ and Siwa (Egypt).
- 3- Advised on water harvesting and irrigation management activities.
- 4- Advised on management strategies of the conjunctive use of drainage and fresh waters and provided alternatives for blending or alternate irrigation.
- 5- Participated in sites selection, structural design and the installation of devices for flood measurements in four selected wadies in the NWCZ.
- 6- Supervised the drilling of deep wells penetrating the Nubian Sand Stone Aquifer in Siwa, Egypt.

As Project Coordinator

In his capacity as a Professor and UNESCO Chair, he has coordinated or participated in the following projects:

- 1- Decision Support System for Mitigation of Drought Impacts in the Mediterranean Regions funded by EU/DG XII B through INCO-DC initiative with participating institutes from Jordan (WERSC), Tunisia, Portugal and Italy.
- 2- A System Approach to Wastewater Bio-treatment for the Protection of Mediterranean Coastal Areas (BIOWATSYS); funded by EU/DGXII through INCO-DC initiative with participating institutes from Jordan (WERSC), Italy, Greece, Morocco, and Egypt.
- 3- Integrated Management Study for Swayed Sub-Basin in Safawi area; funded by the Badia Research and Development Center of the Higher Council for Science and Technology from 1/1/96 for three years.
- 4- A Collaboration project with Washington State University for improving and management of natural resources in Jordan and the State of Washington; funded from USAID/University Development Linkages Program (UDLP).
- 5- Long-term Studies on Water Conservation and Management in Arid and Semi-Arid Regions: Al-Azraq Oasis Project (1994-1998); funded by UNDP and WB.
- 6- Rainfall Forecasting and Irrigation Management; funded by the European

- Commission (EC) for three years.
- 7- Water Harvesting Project, with participation of Concordia University, Canada and ICARDA; funded by the International Development and Research Center (IDRC), Canada.
 - 8- Purification and Reuse of Domestic Wastewater Using Low Cost Eco-Bio Technological Methods; funded by the EU.
 - 9- Capacity Building on Wastewater Valorization for Agriculture Production in the Middle East Area”; funded by the Netherlands Government with the participation of Wageningen University.
 - 10- Integrated Water and Soil Management of the Upper Yarmouk Basin; funded by the General Corporation of Environment Protection (GCEP), Jordan.
 - 11- The effect of Tafilah Treatment plant on the water resources of wadi Fifa basin; funded by the GCEP, Jordan.
 - 12- The effect of al Ramtha wastewater treatment plant on the water resources of wadi al Shoumer; funded by GCEP, Jordan.
 - 13- The effect of recycled irrigation water on the soil salinity in wadi Wala; funded by GCEP, Jordan.
 - 14- Development of cost effective reclamation technologies for domestic wastewater and the appropriate agricultural use of treated effluent under semi–arid climate conditions; funded by the EC.
 - 15- Water Resources Management under Drought Conditions: Criteria and tools for conjunctive use of conventional and marginal waters in the Mediterranean Region; funded by EC.
 - 16- Sustainable Management of Scarce Resources in the Coastal Zone (SMART); funded by EC.
 - 17- Improved Management Tools for Water-Limited Irrigation: Combining ground and satellite information through models (IRRIMED); funded by the EC
 - 18- Water Saving in Mediterranean Agriculture (WASAMED); funded by the EC.
 - 19- Mediterranean coordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean coastal zones (MEDCOATLAND) ; funded by the EC.
 - 20- Optimization of Water Resources in Coastal Areas (OPTIMA); funded by EC.
 - 21- Deficit Irrigation in The Mediterranean Countries (DIMAS); funded by the EC.
 - 22- Mainstreaming Gender Dimension into Water Resources Development and Management in the Mediterranean Region (GEWAMED); funded by the EC.
 - 23- Mediterranean Dialogue on Integrated Water Management (MELIA); funded by the EC.
 - 24- Network for exchange of methodologies and expertise on sustainable water and land management in the Mediterranean (SOWAMED); funded by the EC.
 - 25- Virtual Lab on Dry Lakes, namely; Oral Sea, Lake Chad and the Dead Sea; funded by UNESCO.

List of Publications of Muhammad R. Shatanawi

1. Shatanawi, M. R. and T. Strelkoff (1984) "Management Contours for Border-Irrigation," *Journal of Irrigation and Drainage Engineering, ASCE*, Vol. 110, No. 4, pp: 393-399.
2. Strelkoff, T., and M. R. Shatanawi (1984) "Normalized Graphs for Border-Irrigation Performance," *Journal of Irrigation and Drainage Engineering, ASCE*, Vol. 110, No. 4, pp: 359-374.
3. Shatanawi, M. R. (1986) "Efficiency of the Jordan Valley Irrigation System," *Dirasat (Agricultural Sciences)*, Vol. 13, No. 5, pp: 121-142.
4. Ghawi, I., M. R. Shatanawi and R. Sharaiha (1986) "Water Consumption of Okra in the Jordan Valley," *Dirasat (Agricultural Sciences)*, Vol. 13, No. 8, pp: 19-25.
5. Shatanawi, M. R. (1987) "Trickle Irrigation and its Effect on Squash Yield, Root Development and Soil Salinity," *Dirasat (Agricultural Science)*, Vol. 14, No. 5, pp: 107-117.
6. Shatanawi, M. R., I. Ghawi, R. Sharaihah and M. Duwayri (1987) "Water Consumption of Wheat and Barley in the Jordan Valley," *Dirasat (Agricultural Sciences)*, Vol. 14, No. 5, pp: 49-67. (in Arabic).
7. Shatanawi, M. R., Th. Oweis and I. Ghawi (1987) "Irrigation and its Effect on Evapotranspiration and Yield of Wheat in the Jordan Valley," *Dirasat (Agricultural Sciences)*, Vol. 14, No. 11, pp: 169-177. (in Arabic)
8. Ghawi, I., and M. R. Shatanawi (1987) "Water Consumption of Beans and Broad Beans in the Central Jordan Valley," *Journal of Damascus University*, Vol. 3, pp: 11-31.
9. Shatanawi, M. R. (1987) "Supplemental Irrigation: Needs and Expectations," Presented at the Regional Consultation on Supplementary Irrigation, FAO, Rabat, Morocco, 7-9 Dec., 1987, Paper No. 6.
10. Assad, A. and M. R. Shatanawi (1988) "Erosion Control of Highway Embankment," *Dirasat (Engineering and Technology)*, Vol. 15, No. 6, pp: 67-77.
11. Oweis, Th., I. Ghawi and M. R. Shatanawi (1988) "Irrigation Production Function and Crop Coefficient of Potatoes in the Jordan Valley," *Dirasat (Agricultural Sciences)*, Vol. 15, No. 10, pp: 43-51.
12. Oweis, Th., M. R. Shatanawi and I. Ghawi (1988) "Optimal Irrigation for Protected Tomato in the Jordan Valley," *Dirasat (Agricultural Sciences)*, Vol. 15, No. 11, pp: 104-112.
13. Ghawi, I., M. R. Shatanawi and R. Sharaiha (1989) "Water Consumption of Cauliflower and Water melon in the Jordan Valley," *Dirasat (Agricultural Sciences)*, Vol. 16, No. 7, pp: 7-19.

14. Oweis, Th., I. Ghawi, M. Omari, A. Tell and M. R. Shatanawi (1989) "Crop Production Function under Irrigation and Fertilization of Sugar beets in Jordan," *Dirasat (Agricultural Sciences)*, Vol. 16, No. 9, pp: 7-25. (in Arabic).
15. Oweis, Th., I. Ghawi and M. R. Shatanawi (1990) "Irrigation Scheduling of Snap Beans Grown in Plastic Houses in Jordan," *Dirasat*, Vol. 17, No. 3, pp: 97-110.
16. Haddad, N. I., R.. Sharaiha, B. Hattar, and M. R. Shatanawi (1990) "The Performance of Potato and Fababean when Grown in Association or as Sole Crops under Two Irrigation Methods with and without P & K Addition," *Emirates Journal of Agricultural Sciences*, Vol. 2, pp: 99-120.
17. Al-Salem, S., and M. R Shatanawi (1998) "Potential of Wastewater Reuse in Jordan," a paper presented at the Regional Seminar on Wastewater Reclamation and Reuse held during 11-16 December, 1988, Cairo, Egypt; Organized by FAO.
18. Shatanawi, M. R. (1989) "Irrigation in Jordan" in the "State of Environment in Jordan" edited by Sufian Tell and Yassir Sarah, Ministry of Municipal and Rural Affairs and Environment, pp: 91-102, (in Arabic).
19. Shatanawi, M. R. et al. (1989) "Treated Wastewater Reuse in Agriculture, Part I", *Bulletin of the Water Research and Study Center, University of Jordan*, Vol. 12.
20. Shatanawi, M. R. et al. (1989) "Treated Wastewater Reuse in Agriculture, Part II." *Bulletin of the Water Research and Study Center, University of Jordan*, Vol. 13.
21. Shatanawi, M. R., M. Bani Hani, and Th. Oweis (1992) "Principles of Irrigation and Drainage", Al-Quds Open University, Amman, Jordan.
22. Qasem, S., A. Wir and M. Shatanawi (1993) "Jordan Agricultural Sector Review: Irrigated Agriculture." Technical Report No. 132, Vol. IV, prepared for APAP II and USAID, Amman.
23. Shatanawi, M. R. (1993) "Toward a Water Policy in Jordan; a Prospective", *Proceedings of the Jordan Economic Conference: Problems and Prospective*, University of Jordan, June 13-15, 1993.
24. Shatanawi, M. R. (1993) "The Water Problem in Jordan", a paper presented at the International Symposium on Water Resources in the Middle East: Policy and Institutional Aspects, University of Illinois, Urbana, IL, U.S.A, October 24-27, 1993.
25. Shatanawi, M. R. et al. (Editors) (1993) "Proceedings of the Regional Seminar on the Potential of Artificial Recharge of Groundwater", organized by Water and Environment Research and Study Center, University of Jordan, Amman, Jordan, December 13-15, 1993.
26. Shatanawi, M. R. et al. (1994) "Irrigation Water Quality Guideline," Water and Environment Research and Study Center, University of Jordan, Amman, Jordan, Technical Bulletin No. 17.

27. Shatanawi, M. R. and A. Abu-Awwad (1994) "Potential for Water Harvesting in Jordan: Present Situation and Future Needs", a paper presented at the International Conference on Land and Water: Resources Management in the Mediterranean Region, Vol. III, Valenzano, Bari, Italy, September 4-8, 1994.
28. Shatanawi, M. R. (1994) "Water harvesting in Jordan and the region, present situation and future needs", in Water Harvesting for Improved Agricultural Production, Water Report No. 3, FAO, Rome, Italy, pp: 391-400.
29. Shatanawi, M. R. et al. (1994) "Irrigation Management and Water Quality in the Central Jordan Valley", A Baseline Report Prepared for the USAID Mission to Jordan, by the Irrigation Support Project for Asia and the Near East (ISPAN) and the Water and Environment Research and Study Center, University of Jordan, Amman, Jordan, November, 1994.
30. Shatanawi, M. R. and O. Al-Jayyousi (1995) "Evaluating Market Oriented Water Policies in Jordan: A Comparative Study". Water International, Vol. 20, No. 2, June, pp: 88-96.
31. Al-Jayyousi, O. and M. R. Shatanawi (1995) "Analysis of Future Water Policies in Jordan" Water Resources Development, Vol. 11, No. 3, pp. 315-330.
32. Shatanawi, M. R. and others (1996) "Experimental Field Studies on the use of as-Samra Treated Wastewater for Irrigation in Jordan -Phase I" Abhath al-Yarmouk (Pure Science and Engineering Series), Vol. 5, No. 2, pp: 197-221.
33. Shatanawi, M. R. and M. Fayyad (1996) "Effect of Khirbet Es-Samra on the Quality of Irrigation Water in the Central Jordan Valley", Water Research, Vol. 30, No. 12, pp: 2915-2920.
34. Shatanawi, M. R. and M. Jitan (1994) "The Concept of Irrigation Evaluation Unit as a Mean for Water Conservation", Proceedings of the Regional Seminar on the Optimization of Irrigation in Agriculture, Organized by the French Embassy and the University of Jordan. Amman, Nov. 21-24, 1994, pp: 219-230.
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39. Shatanawi, M. R (1998) "Enforcement of Water Legislation through Compliance and Participation", Policy Dialogue on Water Legislation Enforcement in

- Mediterranean Countries. International Academy of the Environment, Geneva, Switzerland 15-17 February 1998.
40. Shatanawi, M. R. et al. (1989). "Water Consumption of Major Crops in Jordan", Water and Environment Research and Study Center, University of Jordan, Amman, Jordan, Technical Bulletin No. 21.
 41. Shatanawi, M. R. et al. (1998) "Jordan Experience in Treated Wastewater Reuse in Irrigation", Water and Environment Research and Study Center, the University of Jordan, Amman, Jordan, Technical Bulletin No. 22.
 42. Shatanawi, M. R (1988) "Formulation of a National Water Policy: Case Study From Jordan", International Conference on Policies and Regional Instruments for the Sustainable Management of Water Resources in the Mediterranean Region, Milan, Italy 27-28 March 1988.
 43. Shatanawi, M. R (1997) "Capacity building in water resources in the Arab Countries", a paper presented at 7th regional meeting of the Arab National Committees of the International Hydrological Program of UNESCO, Rabat, Morocco, 8-12 September 1997.
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 46. Al-Zu'bi, M. R. Shatanawi, O. al-Jayoussi and A. al-Kharabsheh (2002), "Application of Decision Support System for Sustainable Management of Water Resources in Azraq Basin in Jordan", *Water International*, Vol. 27, No. 4. pp: 532-541
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 50. Shatanawi, M. R. (2002). Policy Analysis of Water, Food Security and Agriculture Policies In Jordan, Review paper submitted to the World Bank.
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