

SAAD M. ALAYYASH

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Keywords

Civil Engineer, Rain Water Harvesting, Geographic Information System (GIS), Hydrologic Modeling, Storm Water Best Management Practice (BMP), Environmental Planning, Arid Land Hydrology, Water quality control, Water Reuse, Research Plans, Technical Reports, PhD Degree in Civil and Environmental Engineering.

Education

- 2002 Ph.D. in Civil Engineering (Water Resources), University of Central Florida, Orlando, FL. Research Title: "Surface Water Management Tool for Arid Lands of Jordan Using GIS"
- 1993 M.Sc. in Civil Engineering (Water Resources), Jordan University of Science and Technology, Irbid, Jordan. Research Title: "Developing water harvesting systems at Safawi area in northern Jordan Badia"
- 1989 B.Sc. in Civil and Environmental Engineering, Jordan University of Science and Technology, Irbid, Jordan.

Training Courses

- 08/97 Environmental Management System Seminar (ISO 14000), By Quality Management Institute – QMI (Canada) and International Engineering Management Consultants - TEAM (Jordan), Amman, Jordan, 25 August.
- 12/95 Hydrological Measurements, By Inter-Islamic Network on Water Resources Development and Management – INWRDAM, Amman, Jordan, 2-7 December.
- 12/03 "Reclaimed Water and Biosolid Reuse Technical Study Tour", the University of Arizona, Tucson, Arizona.
- 05/04 "Numerical 3D Groundwater Flow and Solute Transport Modeling Using MODFLOW and MT3D", UNESCO's IHP Network on Groundwater Protection in the Arab Region, Muscat, Oman.
- 06/04 "International Seminar on Watershed Management", the University of Wisconsin-Stevens Point and the USDA Forest Services International Program, Wisconsin, USA
- 10/04 "Development of regional guidelines for wastewater treatment and reuse training course", Al al- Bayt University, Jordan,
- 03/06 "Implementation of Anaerobic Sewage Treatment in the Middle East with a focus on Jordan and Egypt: A low-cost, low-energy alternative", National Research Centre (NRC), Cairo, Egypt
- 06/06 "Artificial Recharge of Groundwater training course", Regional Center for Training and Water Studies (RCTWS), Egypt, UNESCO-IHP and Italian Ministry of Environment, Cairo, Egypt

Work Experience:

02/09– now, Al Al-Bayt University, Mafraq, Jordan,

- 1) **Associate professor**, Civil Engineering Depts., Faculty of Engineering, 02/2018
- 2) **Assistant professor**, Civil Engineering Depts., Faculty of Engineering, 05/2012 – 02/2018
- 3) **Lecturer**, Institute of Architecture and Islamic Arts, 02/2009– 09/2010
- 4) **Vice Dean**, Faculty of Engineering, 10/2015 – 09/2016
- 5) **Director**, Water, Environment and Arid Region Research Center 09/2013 – 09/2014
- 6) **Head**, Civil and Surveying Engineering Depts., Faculty of Engineering, 10/2010–10/2012
- 7) **Director**, Consultation, Technical Services and Community Development Center, 02/2010–10/2010
- 8) Prepared curricula for new Civil Engineering and Surveying Engineering programs 2010

03/08– 02/09, **Water Resources Expert**, the Hashemite Fund for the Development of Jordan Badia, Amman, Jordan. Duties cover working on strategic planning for the Hashemite Fund work in the Badia development, managing national project for fodder cultivation implemented by the Hashemite Fund.

06/03– 02/08, **Vice President, Head of Research and Development Division and Projects Coordinator**, Jordan Badia Research and Development Center, Safawi, Jordan. Working in projects cover the fields of watershed management, Reclaimed water reuse and Sustainable Development of Drylands. Duties include project management and coordination, writing periodical and progress reports, writing proposals and working on data collection and analysis in the area of hydrology for these projects.

10/05– 01/06, **Part-time Lecturer**, Jordan University of Science and Technology, Environmental Science Dept, Irbid, Jordan. Teaching undergraduate course in environmental education.

02/05– 06/05, **Part-time Lecturer**, University of Jordan, Applied and Environmental Geology Dept, Amman, Jordan. Developed and taught Graduate course in Remote Sensing and GIS.

12/02– 05/03, **Post-doctoral Fellow**, University of Central Florida, Civil and Environmental Engineering Dept, Orlando, FL. Writing proposal for fund in the area of stormwater management and water quality assessment and working with research in stormwater treatment option.

01/98– 12/02, **Research and Teaching Assistant**, University of Central Florida, Civil and Environmental Engineering Dept, Orlando, FL. Developed and taught graduate level course in Geographical Information System (CGN 5320). Developed water modeling and management tool with GIS for arid lands of Jordan. Worked in water quality project, such as BMP for storm water treatment, fate and transport of airports deicing fluids and Microscopic Particulate Analysis, work included water sampling, literature review and reports writing.

01/94–12/97, **Director Assistant**, Jordan Badia Research and Development Program, Safawi, Jordan. Duties included: running a technical unit of 12 technical staff with different backgrounds that arranges field work and data collection for more than 100 researcher from national and international institutes, working with researches in hydrology and water resources field, preparing progress reports for the technical and research activities, reviewing proposals and reports presented to the program in the water resources field, working in preparation of the program research plan for the years 1996-2000, representing the Program in national activities.

06/95–06/96, **Owner and Senior Engineer**, Quasr Al-Fdayn for Engineering and Architecture, Mafraq, Jordan. Running engineering firm that designs small concrete houses and

prepare the permit plans and document. Duties were reviewing the building plans and designs and approve them.

01/90–07/93, **Research and Teaching Assistant**, Jordan university of Science and Technology, Irbid, Jordan. Modeling the surface runoff for arid lands catchments, teaching undergraduate hydraulic and water quality labs and helping in water resources and environmental courses.

Publications

Refereed Journals:

- Al-Shabeeb, A.A.R., Al-Adamat, R., Al-Amoush, H., & AlAyyash, S. (2018). Delineating groundwater potential zones within the Azraq Basin of Central Jordan using multi-criteria GIS analysis. *Groundwater for Sustainable Development*. Volume 7, pp. 82-90. doi: 10.1016/j.gsd.2018.03.011
- Hani Al-Amoush, Saad AlAyyash, and Akram Shudeifat, (2018) "Harvested Rain Water Quality of Different Roofing material types in Water Harvesting System at Al al-Bayt University/Jordan", *Jordan Journal of Civil Engineering* Vol. 12, No. 2, pp. 228-244
- Hani Al-Amoush, Abdel Rahman Al-Shabeeb, Rida Al-Adamat, A'kif Al-Fugara, Saad AlAyyash, Akram Shdeifat, Eid Al-Tarazi and Jafar Abu Rajab, (2018), "The Use of GIS Techniques and Geophysical Investigation for Flood Management at Wadi Al-Mafraq Catchment Area", *Jordan Journal of Earth and Environmental Sciences*, Vol. 8 No. 2, pp. 97-103.
- Saad AlAyyash, Odah Al-Meshan and Rania Shatnawi, (2017) "Application of Bio-solids as Soil Amendment in arid Rangeland of Jordan" *Journal of Environmental Protection*, Vol. 8 No. 3, pp. 344-357. doi: 10.4236/jep.2017.83026
- Saad AlAyyash, (2017) "Rainfall Floods as a Result of Land Use Alteration in a Syrian Refugee Camp in Jordan" *Civil and Environmental Research*, Vol. 9 No. 2, pp. 65-71.
- Hani Al-Amoush, Abdel Rahman Al-Shabeeb, Saad AlAyyash, Rida Al-Adamat, Majed Ibrahim, A'kif Al-Fugara, Jaafar Abu Rajab, (2016) "Geophysical and Hydrological Investigations of the Northern Wadis Area of Azraq Basin for Groundwater Artificial Recharge Purposes" *International Journal of Geosciences*, Vol. 7 No. 5, pp. 744-760. doi: 10.4236/ijg.2016.75057
- R.S. Shatnawi, S.M. AlAyyash and A. Abdellhadi, (2014) "Rainy Season Assessment of Azraq Basin in Eastern Jordan" *Research Journal of Applied Sciences, Engineering and Technology*, volume 8, number 1, Maxwell Science Publications, UK.
- S.M. AlAyyash, Rida Al-Adamat and Odeh Al-Meshan, (2012) "Application of Geo-informatics in Mapping Sites Appropriate for the Cultivation of Forage in Jordan's Badia (Desert) Region" *Journal of Surveying and Land Information Science (SaLIS)*, Vol. 72 No. 2, pp. 79-85
- S.M. AlAyyash, R. Al-Adamat, H. Al-Amoush, O. Al-Meshan, Z. Rawajfih, A. Shdeifat, A. Al-Harabsheh and M. Al-Farajat, (2012) "Runoff Estimation for Suggested Water Harvesting Sites in the Northern Jordanian Badia" *Journal of Water Resource and Protection*, Vol. 4 No. 3, pp. 127-132. doi: 10.4236/jwarp.2012.43015
- S.M. AlAyyash, R. Al-Adamat, H. Al-Amoush, O. Al-Meshan, Z. Rawajfih, A. Shdeifat, A. Al-Harabsheh and M. Al-Farajat, (2012), "Water Resources Management at Marab Hassan-NE Badia/Jordan", *Asian Journal of Agricultural Sciences*, volume 4, number 1, Maxwell Science Publications, UK.
- R. Al-Adamat, S.M. AlAyyash, H. Al-Amoush, O. Al-Meshan, Z. Rawajfih, A. Shdeifat, A. Al-Harabsheh and M. Al-Farajat, (2012) "The Combination of Indigenous Knowledge and Geo-Informatics for Water Harvesting Sitting in the Jordanian Badia" *Journal of Geographic Information System*, Vol. 4 No. 4, pp. 366-376. doi: 10.4236/jgis.2012.44042.

Hani Al-Amoush, Rida Al-Adamat, S.M. AlAyyash, Odeh Al-Meshan, Zahir Rawjefih, Akram Shdeifat, Adnan Al-Harashsheh and Mohammed Al-Farajat, (2012). "Preliminary Geophysical Investigation for Suggested Water Harvesting Sites in the Northern Jordanian Badia" Research Journal of Environmental and Earth Sciences, 4(5): 560-569.

Akram Shdeifat, Rida Al-Adamat, S.M. AlAyyash, Adnan Al-Salihi, and Adnan Al-Harashsheh (2011), "The Use of GIS to Select the Optimum Route for Jordan National Water Carrier", International Journal of Information Technology and Network Application (IJITNA), volume 1, number 2.

Taqieddin S., A. Al-Homoud, A. Awad and S. Ayyash, (1995) "Geological and hydrological investigation of a water collection system in arid Jordanian lands", Environmental Geology, volume 26, number 4, Springer-Verlag GmbH, Berlin, Germany.

Chapter in a book

S.M. AlAyyash, F.N. Nnadi and R.S. Shatnawi (2008), "A surface water management tool for arid lands using GIS - a Jordan Badia case study", In "Jordan's arid Badia: deepening our understanding" editors: R.W. Dutton and M.I. Shahbaz, Smith-Gordon and Company, U. K.

R.S. Shatnawi, S.M. AlAyyash, C.R. Cratchley and J.A. Kay (2008), "Water resources management for rain-fed agriculture in north-east Badia Jordan", In "Jordan's arid Badia: deepening our understanding" editors: R.W. Dutton and M.I. Shahbaz, Smith-Gordon and Company, U. K.

S.M. AlAyyash, and R. A. Al-Adamat (2001), "Water Harvesting in the North Badia of Jordan", In "Living with Water Scarcity -Water Resources in the Jordan Badia Region, The Way Forward" editors: Sarwan M.J. Baban and Nadhir A. Al-Ansari, Al al-Bayt University Publication, Mafraq, Jordan.

Refereed conference proceeding:

S. M. AlAyyash, R. S. Shatnawi, A. N. Hamaideh and H. M. Saoub (2012), "Simple, Low Cost, and Scientifically Based Community Rainwater Harvesting Systems - Jordan", Proceeding of "The 2nd International Conference on Water Resources (ICWR2012)", Langkawi, Malaysia, 5-7 November,

R. S. Shatnawi and S. M. AlAyyash (2012), "PREDICTING RAINFALL SEASON IN JORDAN USING EL NINO AND LA NINA CLIMATIC PHENOMENA INDICES", Proceeding of "The 2nd International Conference on Water Resources (ICWR2012)", Langkawi, Malaysia, 5-7 November,

S.M. AlAyyash, R. Shatnawi, and R. Al-Tabini (2005), "Reclaimed Water Reuse in Jordan - The Bedouin Experience in Wadi Mousa", Proceedings of "Promoting Community-driven Conservation and Sustainable Use of Dryland Agrobiodiversity Conference", ICARDA, Aleppo, Syria, April 18-21.

S.M. AlAyyash, and F.N. Nnadi (2001), "Surface Water Management in Arid Lands of Jordan With GIS Application", Proceedings of American Water Resources Association Summer Specialty Conference, Decision Support Systems for Water Resources Management, Snowbird, Utah, Jun 27-30.

F.N. Nnadi and S.M. AlAyyash, (1999), "Evaluating Water Resources in Badia Region - Jordan Desert", Proceedings of Universities Council on Water Resources annual meeting, Water: World Lessons, and International Water and Resources Economics Consortium 6th Biennial meeting, Kamuela, Hawaii, June 29-July 2.

Taqieddin S. and S. AlAyyash, (1993) "Hydrological and Geological Investigation on Surface Water Collection System on Arid-Jordanian Lands", Proceedings of 33rd Science Week, Aleppo University, Aleppo, Syria, 6-11 November.

Conference proceeding:

S.M. AlAyyash, R. Shatnawi, and A. Al-Kharabsheh (2004), "Rainwater Harvesting in the Northern Badia of Jordan", Proceedings of "Water Crises Management in Arid Regions Workshop", Balqa' Applied University, Salt, Jordan, Dec 15-16

A. Al-Kharabsheh and S.M. AlAyyash (2004), "Impact of Water Harvesting on Water Quantity and Quality at the Central Part of Jordan Valley", Proceedings of "Water Crises Management in Arid Regions Workshop", Balqa' Applied University, Salt, Jordan, Dec 15-16

S.M. AlAyyash, and O. Al-Meshan (2003), "Geo-Database for Arid Lands Surface Water Simulation", Proceedings of "The Second International Conference on Wadi Hydrology", Amman, Jordan, July 1-4

Thesis and Report:

AlAyyash S.M., (2002) "Surface Water Management Tool for Arid Lands of Jordan Using GIS", Ph.D. thesis, Civil Engineering Department, University of Central Florida, Orlando, Florida, USA.

AlAyyash S.M., (1993) "Development of water harvesting system at Safawi area in northern Jordan Badia", M.Sc. thesis, Civil Engineering Department, University of Science and Technology, Irbid, Jordan.

Conferences and Workshops Presentations

(2007), "Badia Center Activities in Water Harvesting in the Badia" presented at the Science Day of Environment and Geology Institute – Al al-Bayt University, Mafraq, Jordan, May 8.

(1997), Scientific Research and its Role in Saving Arabic Water Resources from Pollution Workshop, Higher Council for Science and Technology – HCST, Royal Scientific Society – RSS and The Union of Arabic Scientific Research Councils, Amman, Jordan, July 28-30.

(1996), "Jordan Badia Research and Development Program – Towards Sustainable Development for Jordanian Badia", Presented in Towards Planning for Jordan 2020 Workshop, Great Amman Municipality, Amman, Jordan, May 19-21.

(1996), "Jordan Badia Research and Development Program and Water Harvesting", Presented in Effect of Water Harvesting on the Range Lands in the Badia Workshop, Jordan Society for Combating Desertification and Badia Development and University of Jordan / Water Research and Study Center, Amman, Jordan, May 6.

(1996), Past, Present and Future for Desert in the Middle East Conference, Yarmouk University / UNISCO Chair for Desert Studies and Combating Desertification, Irbid, Jordan, July 30,31 and August 1.

(1995), "Rain Water Harvesting", Presented in Environmental Problems in the Northern Badia and Suggested Solution Workshop, Fredrich Naoman Organization and Jordan Environment Society, Safawi, Jordan December 3.

Funded Research Projects

Co-PI, "Flood wave Propagation and Infiltration in Desert Regions: The Azraq Basin, Jordan", 2012 - 2015, funded by PEER – USAID.

PI, "Community Water Harvesting System", a 1-year community based project in 2010, funded by the USDA Jordan Economic Development Program (SABEQ) to evaluate simple technique for water harvesting.

Co-PI and Project Manager, "Middle East Watershed Monitoring and Evaluating Project", 5 years multi- national project (2001 – 2005) to study the various watershed management practices and monitoring techniques, funded by the USDA and US State Department.

Project Manager, “Sustainable Development of Drylands Project in Asia and the Middle East”, a 5 years multi-national project, (2003 – 2007), funded by USAID through the International Arid Lands Consortium (IALC), University of Arizona, The project is to study and evaluate the various methods of reclaimed water and bio-solid reuse and other sustainable activities in the field of water and droughts in the arid lands.

Co-PI, “Sitting Criteria for Water Harvesting in the Jordan Badia”, 3 years research project, (2010 – 2012) funded by the Jordanian Scientific Research Support Fund to investigate the sitting criteria for water harvesting and develop a water harvesting potential areas in The Jordan Badia.

Co-PI, “Desert of the World Documentation”, a 1 year multinational project (2004) funded by the International Arid Lands Consortium (IALC), the project documented the resources of the arid lands for the involved countries using GIS environment.

Co-PI, “Agro-business and water economic in agriculture”, a 2 years project (2004-2005) with New Mexico State University (NMSU) funded by USAID through the International Arid Lands Consortium (IALC), the project aims into developing business plans for small enterprises in the Badia and study the economic feasibility of ground water input into the farming business in the Badia region.

PI, “Development of demonstration plan to monitor and evaluate the use of bio-solid in the range land watersheds”, part of the sustainable Dryland Development project to develop a field scale demonstration experiment to monitor and evaluate the use of bio-solid in the arid lands watershed.

Professional Committees

Member in the national committee for **rain water harvesting** at the Hashemite Fund for the Badia Development,

Member in the ad hoc committee for bio-solid reuse at the Royal Scientific Society (RSS),

Member in the Technical Advisory Committee for the “Outreach and Technology Transfer for the Reclaimed Water and Bio-solid Reuse Project” with the Jordan University of Science and Technology (JUST),

Member in the international Technical Advisory Committee for the Sustainable Dryland Development Project with the International Arid Land Consortium (IALC),

Member in the Advisory committee for Grey water reuse project at the Royal Scientific Society (RSS),

Other Professional Activities

Team member of special task force that reviewed and updated the first draft of the **Jordan National Strategy and Action Plan to Combat Desertification 2006** and put it in its final published version.

Lead Author for the **Central and West Asia and North Africa (CWANA) sub-global assessment report** for the Bureau of International Assessment of Agricultural Science and Technology for Development (IAASTD). The IAASTD is comprised of a global assessment and five sub-global assessments. The role of the IAASTD-CWANA sub-global assessment is to assess the scientific, technical and socio-economic literature, experience and knowledge on the CWANA region with the aim of understanding the ways in which agriculture science and technology (AST) can reduce hunger and poverty, improve rural livelihoods and facilitate equitable, environmentally, socially and economically sustainable development.

Consultant for **JCP Srl Consultant**, Italy, an international consultant developed **A Strategic Master Plan for Petra Region 2011**.

Teaching Experience

Graduate Thesis'

External Examiner for MSc Thesis, "Surface Water Modeling for Humret Es-Sahin Area", by Maha Al-Hoot, Jordan University, 2005.

External Examiner for MSc Thesis, "Introducing the Blue Flag Eco-Label in the Gulf of Aqaba", by Hotaf Yassien, Jordan University, 2010.

External Examiner for MSc Thesis, "Integrated Watershed Management of Al-Qantara Spring in Ajlun", by Rana Ali Alsabah, Jordan University of Science and Technology, 2011.

External Examiner for MSc Thesis, "Alternative Financing Mechanisms of Development Projects in The Water Sector - Potentials of Crowdfunding in the Occupied Palestinian Territories and Morocco", by Liesa Sauerhammer, Jordan University, 2011.

Co-advisor for MSc Thesis: "Hydrological study of burqu' dam project", by Ay'yat Musa Rabi', Al al-Bayt University, 2008.

Co-advisor for MSc Thesis: "Evaluating Water Demand Management in Al-Mafraq Governorate: Options to Meet Growing Demand" by Fatima Ali Bany Khaled, Jordan University of Science and Technology, 2012.

Course Taught

Al al-Bayt University, Sep2009 – now:

Civil241, Statics, Civil371, Hydrology; Civil362, Hydraulic; Civil231, Engineering Geology; Civil372, Water Resources Engineering; Arch483, Specifications, Costs and Quantities; Arch281, Fundamentals of Surveying; Arch336, Construction Mechanics; Arch336, Introduction to Structural Design; Arch232, Building construction 2.

Jordan University of Science and Technology, 1990 - 1993

Teaching Assistant for: Sanitary Engineering; Materials of Construction

Lab instructor for: Sanitary Engineering Lab; Fluid Mechanics and Hydraulics Lab.

University of Central Florida, 1998 - 2002

Developed and taught Geographic Information System (GIS) graduate course

University of Jordan, 2005

Developed and taught Graduate level course in Remote Sensing (RS) and Geographic Information System (GIS) for Geology Department.

Jordan University of Science and Technology, 2005

Environmental Education

Professional Organizations

American Society for Civil Engineering (ASCE)

American Water Resources Association (AWRA)

Water Environment Federation (WEF)

International Water Association (IWA)

Jordanian Engineering Association, JORDAN

Jordanian Society for Combating Desert and Badia Development, JORDAN

Computer Skills

Water Models (HEC-HMS, HEC-RAS, SMADA, WMS),
GIS Software (ArcGIS, Idrisi, ERDAS),
Computer Programming (Visual Basic, Fortran, HTML, ArcView GIS Avenue),
Microsoft Office (Excel, Word, Power Point, Access),
AutoCAD.

Honors and Scholarships

College of Engineering Honor list (1985, 1986),
Royal scholarship (1985 - 1989),
Civil Engineering Dept Fellowship (1990 - 1993),
Frank Hubbard Engineering Scholarship (1999),
UCF Assistantship Enhancement for Academic Outstanding (2000),
FES Waldron M. McLellon Scholarship (2001).

REFERENCES:

Available upon request