



Mustafa Youssif Mustafa ELFAHL

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ABOUT ME

I am interested in using remote sensing data, geospatial tools, machine learning, and cloud computing in vegetation monitoring in addition to analyzing land and water resources to support agricultural policies for sustainable agricultural expansion.

WORK EXPERIENCE

[13/02/2023 – Current]

Researcher

National Research Council, Institute of Bioeconomy (CNR-IBE)

Address: Via F. Biasi 75, San Michele all'Adige , 38010 , Trento, Italy

- Processing and analysis of remotely sensed and proximal data for the study of ecophysiological processes of plants (i.e.: photosynthesis, transpiration, stomatal conductance,...etc) and forest management.
- Furthermore, I am responsible for the calibration and validation of the data acquired from the Italian hyperspectral satellite of Prisma, especially in the agriculture site.

[14/11/2012 – 31/12/2018]

researcher assistant

National Research Centre www.nrc.sci.eg

Address: 33 El-behooth St, 12622, Cairo, Egypt

- Planning of the irrigation field experiments from thoughts to results.
- Irrigation water management, and determining the plant requirements of irrigation water under different conditions.
- Using simulation models in irrigation water management.
- Using remote sensing techniques in irrigation water management.

[01/10/2011 – 10/11/2012]

executive engineer

Green Hills company

City: Cairo

Country: Egypt

Implementation of irrigation systems for Golf and landscape.

EDUCATION AND TRAINING

[01/10/2007 – 19/07/2011]

Bachelor's degree in Agricultural Engineering

Ain Shams University agr.asu.edu.eg

City: Cairo

Country: Egypt

- Hydraulics, Irrigation and Drainage Engineering, Fluid mechanics, Statistics, Mathematics, Physics and Meteorology, Engineering Drawing, Mechanics (Statistics and Dynamics), Thermodynamics, Hydraulics machines, Land reclamation

machines, Environmental Engineering, Farm economics, Surveying and its application (Total station, Auto level and Pythagoras Program), Measurements and control equipment.

Final Grade : very good with honors (82.638%).

[06/10/2015 – 31/05/2016]

Diploma (master level 1) in Land and Water Resources Management

Mediterranean Agronomic Institute of Bari & University of LUM www.iamb.it

City: Valenzano - Bari

Country: Italy

- Hydrology, Ground water hydraulics, Crop response to water, crop water requirement, Irrigation scheduling, Wastewater treatment, GIS, Open channel, Salinity, Crop growth modeling, Agrometeorology, Soil physics, Soil erosion and land degradation, Pedology, Farm economics and cost benefits analysis.
- Design, Operation, Maintenance and Performance evaluation of Pressurized systems.

Final Grade : Cum Maxima Laude (89.15%).

[06/10/2015 – 13/10/2017]

Master of Science in Land and Water Resources Management: Irrigated Agriculture

Mediterranean Agronomic Institute of Bari www.iamb.it

Address: Via Ceglie, 9, 70010, Valenzano - Bari, Italy

- Using bio-technologies such as Plant growth promoting bacteria as a sustainable tool to minimize water footprint and enhancing water productivity in agriculture in arid and semi-arid zones.

Final Grade : Cum Maxima Laude (90.65%).

[18/01/2019 – 15/04/2022]

PhD in Agricultural Hydraulics and Hydraulic-Forestry Arrangements

University of Palermo www.unipa.it

Address: Piazza Marina, 61, 90133, Palermo, Italy

Field(s) of study: Agricultural engineering

Thesis: Validating IRRILAB and IRRIPRO software applications to design microirrigation systems in an apple farm in Sicily
Optimal design of irrigation systems laid on sloped fields that are corresponding to maximum energy saving.

LANGUAGE SKILLS

Mother tongue(s): Arabic

Other language(s):

English

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

Italian

LISTENING B1 READING B1 WRITING B1

SPOKEN PRODUCTION B1 SPOKEN INTERACTION B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

JOB-RELATED SKILLS

Agriculture hydrology and water resources management for sustainable irrigated agriculture

- Design an experiment, plan, or model that defines a problem, tests potential resolutions, and implements a solution.
- Aware of most Microsoft Office Programs, Aware of certain issues in hardware and software, FAO software (Aqua Crop, Cropwat, Climatwat, COPAM,..etc), GIS software (ArcGIS, QGIS, ENVI, AutoCAD), and some programming language (MATLAB, Python, R).

Remote sensing for agriculture management

- Processing and analysis of hyperspectral data, multispectral satellite images, and LiDAR data in addition to proximal data for the study of ecophysiological processes of plants (i.e. photosynthesis, transpiration, stomatal conductance, actual evapotranspiration, sun-induced chlorophyll fluorescence (SIF)... etc.), plant phenological stages (i.e. accurate estimation of crop coefficient), and forest management.
- The software and tools used to process the hyperspectral data are ENVI, QGIS, ARTMO, R.
- The software and tools used to process the LiDAR data are QGIS, FugroViewer, LASTools, CloudCompare, R.
- Using MicroTops-II for retrieving the atmospheric parameters (i.e. Aerosol optical thickness and water vapor column).

PUBLICATIONS

International Published Papers

- Baiamonte, G., Provenzano, G., Iovino, M., **Elfahl, M.** (2021). Hydraulic Design of the Center-Pivot Irrigation System for Gradually Decreasing Sprinkler Spacing. *Journal of Irrigation and Drainage Engineering*, 147(7), 04021027.
- Baiamonte, G., Dio, P. D., **Elfahl, M.** (2021). Verification of IRRILAB Software Application for the Hydraulic Design of a Micro-Irrigation System by Using IRRIPRO for an Apple Farm in Sicily. *Water*, 13(5), 694.
- Riva, V., Mapelli, F., Dragonetti, G., **Elfahl, M.**, Vergani, L., Crepaldi, P., ... & Borin, S. (2021). Bacterial Inoculants Mitigating Water Scarcity in Tomato: The Importance of Long-Term in vivo Experiments. *Frontiers in Microbiology*, 12, 1328.
- Baiamonte, G., Provenzano, G., Palermo, S. S., **Elfahl, M.** (2022). Designing Trickle Irrigation Systems in Sloping Fields without Pressure-Compensating Emitters: Application of the IRRILAB Software. *Journal of Irrigation and Drainage Engineering*, 148(12), 04022044. Doi:10.1061/(ASCE)IR.1943-4774.0001709
- **Elfahl, M.**, Provenzano G., Di Dio, P., Palermo, S.S., Baiamonte, G. (2022). Assessing the performance of IRRIPRO software to estimate emitter flow rates in sloping fields under different operating pressures". Submitted to *Journal of Irrigation and Drainage Engineering* – ASCE on November 2, 2023, under review.

INTERNATIONAL CONFERENCES

International Conferences

- Valentina Riva, Sara Borin, Francesca Mapelli, Matteo Brochetti, Elena Crotti, Ameur Cherif, Hanen Cherif, Bilel Bejaoui, Redouane Choukr-Allah, Ahmed Rashed, **Mustafa Elfahl**, and Nicola La Maddalena "Plant growth-promoting bacteria: a

sustainable tool to minimize water footprint in agriculture in arid and semi-arid zones". Oral presentation within 4TH INTERNATIONAL CONFERENCE ON MICROBIAL DIVERSITY 2017, Bari University, Italy, from October 24-26, 2017.

- Baiamonte, G., **Elfahl M.** Provenzano, G., (2020). "Designing Centre-pivot irrigation system for constant water application rate" EGU General Assembly, 2020. Vienna, Austria, May, 3 – 8. <https://doi.org/10.5194/egusphere-egu2020-2711>
- Baiamonte G, **Elfahl, M.**, Palermo S.S. (2022). Experimental tests to validate a simple procedure to design dual-diameter drip laterals on flat fields. "Biosystems Engineering towards the Green Deal" Improving the resilience of agriculture, forestry, and food systems in the post-Covid era. 12th International AIIA Conference: September 19-22, 2022 Palermo – Italy.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS

Membership of Professional Associations

Member in the **Egyptian Association for Land Science**.

INTERNATIONAL COURSES

International Courses

- International training courses in **water-saving irrigation technologies** in China from 22 June 2015 to 16 July 2015.
- International training courses in **Climate change and food security nexus** in Netherland (Wageningen University and Research, Wageningen Centre for Development Innovation) from 10 - 21 September 2018.
- International Advanced courses in **Agricultural Meteorology for Supporting Crop Production** in Slovakia (Slovak Academy of Science) from 11 – 15 December 2023.

DOMESTIC COURSES

Domestic Courses (Egypt)

- Training courses at the National Research Centre for **Upgrading research and personal competency** from 24 March until 27 Jun 2013.
- Training course on using **Geographic Information System in Agriculture** from Ain Shams University.
- Training course on using **AutoCAD** from Armed Forces Institute.

WORKSHOPS

workshops

- Participate in the workshop on **Climate Change Adaptation for Water. Food and Environment Security**, which was executed by CIHEAM – IAM Bari in Egypt from 13–15 June 2015.
 - Participate in the workshop on **Agricultural Engineering in Egypt and China**, which was organized at National Research Center (Egypt) on 7th August 2016.
 - participate in the workshop of **GIS for Agriculture and Environment**, which was organized at the National Research Center (Egypt) on 15th August 2016.
 - participate in the workshop on **Agricultural Expert Systems**, which was organized at National Research Center (Egypt) on 3 January 2017.
 - participate in the workshop on **Experiences on Soil Erosion**, which was organized at Palermo University (Italy) on 20 May 2019
 - participate in the workshop on **Startup and Pitching**, which was organized at Palermo University (Italy) on 3 October 2019.
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