



السيد الأستاذ الدكتور / هشام فوزى

عميد كلية الهندسة - جامعة الزقازيق

تحية طيبة .. وبعد ،

ايماً إلى التعاقد المبرم بين الأكاديمية وكلية الهندسة جامعة - الزقازيق و السيد  
الاستاذ الدكتور/ عبد العظيم محمد نجم على مشروع "استكشاف امكانية دراسة خصائص  
المسطحات المائية لنهر النيل باستخدام صور الاقمار الصناعية الجديدة" بتكلفة اجمالية قدرها  
٢٠٠٠٠٠ لمدة ٢٤ شهراً وتم صرف مبلغ ١٨٨٢٩٦ جنيهاً.

و نحيط سيادتكم علماً بأنه تم الموافقة على التقرير التام للمشروع بتاريخ ٢٠٢٢/٤/٤  
وبمراجعة البيان المالى المقدم من الباحث الرئيسى تبين وجود رصيد لديكم ٦٥٢٨٢,١٥ جنيهاً.

فالمرجو من سيادتكم رد المبلغ المتبقى لدى الجهة وقدره ٦٥٢٨٢,١٥ جنيهاً على رقم  
(حساب الاكاديمية ٩١٩٠٤٤٧٧٧٨ ) البنك المركزى المصرى كود منشأة رقم (١١١٠١٢٠١) وذلك  
طبقاً لتعليمات الجهاز المركزى للمحاسبات.

وتفضلوا سيادتكم بقبول وافر الاحترام والتقدير ...

رئيس الأكاديمية

أ.د. محمود محمد صقر  
٢٠٢٢/١١/١٤

١- مشروع لمدة عامين بدأ في شهر ١٢ عام ٢٠١٨ وانتهي في شهر ١٢ عام ٢٠٢١ (بمد عام نتيجة ظروف كورونا) بتمويل مشترك من أكاديمية البحث العلمي والتكنولوجيا و المركز القومي للبحوث الإيطالية (بقيمة ٢٠٠ الف جنيه لكل جهة) بهدف دراسة إمكانية استخدام صور الأقمار الصناعية الجديدة (الأقمار الاورونية Sentinel) لتقدير الرسوبيات في خزان السد العالي والذي هو بنك مصر المائي تحت عنوان:

استكشاف امكانية دراسة خصائص المسطحات المائية لنهر النيل باستخدام معلومات القمر الصناعي الجديد

Experimentation of the new Sentinel missions for the observation of inland water bodies on the course of the Nile River

. وبالطبع تم نشر عدة أبحاث وهي:

Publications	<p>1-Scazzari, A.; Vignudeli, S.; Negm, A. Lake Water Level Estimated by a Purely Radiometric Experiment With SLSTR Radiometric Onboard Sentinel 3 Satellites, IEEE International Instrumentation and Measurements Technology Proceedings, I2MTC 2020, Dubrovnik, Croatia, 25 May – 29 May.</p> <p>2-Hossen, H.; Khairy, M.; Ghaly, S.; Scozzari, A.; Negm, A.; Elsahabi, M. Bathymetric and Capacity Relationships Based on Sentinel-3 Mission Data for Aswan High Dam Lake, Egypt. Water 2022, 14, 711. <a href="https://doi.org/10.3390/w14050711">https://doi.org/10.3390/w14050711</a></p> <p>3- Hickmat Hossen<sup>1</sup>, Mona G. Ibrahim<sup>2</sup>, Wael Elham Mahmod<sup>3</sup>, Abdelazim Negm<sup>4</sup>, Takashi Nakamura, Assessing Water Quality Parameters in Burullus Lake Using Sentinel-2 Satellite Images, Water Resources, Accepted for publication in issue 2 (March-April) or issue 3 (May-June), 2022.</p> <p>4-Saeed, R., Abdelrahman, S.M., Negm, A. Satellite-Derived Bathymetry Using LandSat-8 Imagery for SAFAGA Coastal Zone, Egypt, Acta Marisiensis. Seria Technologica, Vol.18 (xxxv), no.1, 2021. <a href="https://doi.org/10.2478/amset-2021-0002">https://doi.org/10.2478/amset-2021-0002</a> (link: <a href="https://amset.umfst.ro/?pag=vols/2021-1">https://amset.umfst.ro/?pag=vols/2021-1</a>)</p> <p>-----</p> <p>1-Abdel-Sadek, E., Elbeih, S., Negm, A. Coastal and Landuse Changes of Burullus Lake, Egypt: A Comparison Using Landsat and Sentinel-2 Satellite Images, Volume 25, Issue 3, December 2022, Pages 815-829, <a href="https://doi.org/10.1016/j.ejrs.2022.07.006">https://doi.org/10.1016/j.ejrs.2022.07.006</a></p>
Dissemination and Stockholder Engagement	1-Attending the conference on Biological Diversity in Lake Nasser, Aswan University, 24-26 Feb. 2020 and presenting the project achievements while stackholders and experts in all topics of Nasser Lake were attending. See Appendix F.

Also, we attended EGU2020 and EGU2021 and presented our achievements as below:

2-Khairy, M., Hossen, H., Elshabi, M., Ghaly, S., Scozzari, A., and Negm, A.: Feasibility of Using Sentinel-3 in Estimating Lake Nasser Water Depths, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-11958, <https://doi.org/10.5194/egusphere-egu21-11958>, 2021.

3-Negm, A., Hossen, H., Elshabi, M., Makboul, O., and Scozzari, A.: Estimation of sediment capacity of Aswan High Dam Lake utilizing remotely sensed bathymetric data: Case Study Active Sedimentation portion of Lake Nubia, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-13628, <https://doi.org/10.5194/egusphere-egu21-13628>, 2021.

4- Saeed, R., Abdelrahman, S., Scozzari, A., and Negm, A.: Sentinel-2 mission Contribution for Supporting Bathymetric layers of SAFAGA coastal zone, Egypt, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-14327, <https://doi.org/10.5194/egusphere-egu21-14327>, 2021.

6-Scozzari, A., Vignudelli, A., Elshabi, M., Galal, N., Khairy, M., Negm, A. Synergy between optical imaging radiometry and radar altimetry for inland waters: an experincewith Sentinel-3 on the Nasser Lake, EGU2020 General Assembly, <https://doi.org/10.5194/egysphere-egu2020-18804>.

مشروع لمدة عامين ( ٢٠١٩/٠٢/١٤ حتى ١٣ / ٩ / ٢٠٢٢ ) تمويل مشترك من ال STDF والقنصلية البريطانية وتم تنفيذه بكلية الزراعة بالجامعة وهو عبارة عن منظومة زراعية مبتكرة بعنوان:

**منظومة زراعة محمية مبتكرة تعمل بالطاقة الشمسية والتحليلة: تنبت الطاقة ومياه الري**

## **A Novel Standalone Solar-Driven Agriculture Greenhouse - Desalination System: That Grows its Energy and Irrigation Water**

وقد صممت ونفذت لخدمة عدة اهداف من اهداف التنمية المستدامة وتعمل كمعمل طلابي وبحثي ومركز استشارات بحثية. وقد تم نشر العديد من الأبحاث الدولية وإعطاء محاضرات في المؤتمرات وعقد عدة وبيانات دولية و سلسلة ورش عمل و لقاءات بالتليفزيون.



**Publications resulted from the project [published manuscripts, conferences abstracts (talks and posters) ...etc**

### **Highly Ranked Journal Papers:**

1. Akrami, M.; Salah, A.H.; Javadi, A.A.; Fath, H.E.; Hassanein, M.J.; Farmani, R.; Dibaj, M.; Negm, A. Towards a Sustainable Greenhouse: Review of Trends and Emerging Practices in Analysing Greenhouse Ventilation Requirements to Sustain Maximum Agricultural Yield. Sustainability 2020, 12, 2794. (Published on 01 April 2020).
2. Akrami, M.; Salah, A.H.; Dibaj, M.; Porcheron, M.; Javadi, A.A.; Farmani, R.; Fath, H.E.S.; Negm, A. A Zero-Liquid Discharge Model for a Transient Solar-Powered Desalination System for Greenhouse. Water 2020, 12, 1440. (Published on 19 May 2020)
3. Akrami, M.; Gilbert, S.J.; Dibaj, M.; Javadi, A.A.; Farmani, R.; Salah, A.H.; Fath, H.E.S.; Negm, A. Decarbonisation Using Hybrid Energy Solution: Case Study of Zagazig, Egypt. Energies 2020, 13, 4680. (Published 08 Sept. 2020).
4. Awaad, H.A.; Mansour, E.; Akrami, M.; Fath, H.E.; Javadi, A.A.; Negm, A. Availability and Feasibility of Water Desalination as a Non-Conventional

Resource for Agricultural Irrigation in the MENA Region: A Review. *Sustainability* 2020, 12, 7592. (Published 15 Sept. 2020).

5. Akrami, M.; Alsari, H.; Javadi, A.A.; Dibaj, M.; Farmani, R.; Fath, H.E.; Salah, A.H.; Negm, A. Analysing the Material Suitability and Concentration Ratio of a Solar-Powered Parabolic trough Collector (PTC) Using Computational Fluid Dynamics. *Energies* 2020, 13, 5479 (Published 20 Oct. 2020).
6. Akrami M, Javadi A, Hassanein M, Farmani R, Dibaj M, Tabor G, Negm A. (2020) Study of the Effects of Vent Configuration on Mono-Span Greenhouse Ventilation Using Computational Fluid Dynamics, *Sustainability*, DOI:10.3390/su12030986
- 7.

### **Publications in Local Journal**

1. Hassan Awaad, Abdelazim Negm , Mohammed M Abd- El- Hamed Ali1, El-Sayed Mansour and Mohamed Abu-hashim, Greenhouse Productivity Using a Recirculating Desalination System Supported By Solar Energy: A Review, IWTC2019, Ismailia,10-13 Sept., 2019, <http://iwtc2019.website2.me/iwtc-2019> and published in IWTJ, Vol.10, No.1, March 2020 (currently the website is down but for confirmation, this is the email of the journal: [iwtj.journal@gmail.com](mailto:iwtj.journal@gmail.com)).
2. M. A. A. Abdrabbo, Abdelazim Negm, Hassan E. Fath and A.A. Javadi, Greenhouse Management and Best Practice in Egypt, IWTC2019, Ismailia,10-13 Sept., 2019, <http://iwtc2019.website2.me/iwtc-2019>, and published in IWTJ, Vol.9, No.4, Dec. 2019. (currently the website is down but for confirmation, this is the email of the journal: [iwtj.journal@gmail.com](mailto:iwtj.journal@gmail.com)).
3. Khalid Z. Kewan, Ahmed A. Elkhoully, Abdelazim M. Negm, and A.A. Javadi, "Feedstock Values of Some Common Fodder Halophytes in the Egyptian Desert", IWTC2019, Ismailia,10-13 Sept., 2019, <http://iwtc2019.website2.me/iwtc-2019> and published in IWTJ, Vol.9, No.4, Dec. 2019. (currently the website is down but for confirmation, this is the email of the journal: [iwtj.journal@gmail.com](mailto:iwtj.journal@gmail.com)).

### **Publications in International Conferences**

- 1- Abdrabbo, M.A.A, Javadi, A.A., Negm, A. (2021), Microclimate and irrigation requirement under greenhouses in Egypt, The virtual conference of AQUA≈360: Water for All - Emerging Issues and Innovations 31st August 2021 – 2nd September 2021, University of Exeter, United Kingdom
- 2- Fath, H.E.s., Salah, A.H, Akrami, M., Javadi, A.A., and Negm, A. (2021), Novel Standalone Solar Driven Agriculture Greenhouse Desalination System: Self Sufficient of Energy and Irrigating Water, The virtual conference of

AQUA≈360: Water for All - Emerging Issues and Innovations 31st August 2021 - 2nd September 2021, University of Exeter, United Kingdom

3- Abd-Elaty, I., Attwa, M., Abu-hashim, M., Javadi, A.A., Negm, A. (2021), Hydrogeophysical investigation of aquifer potentiality to sustain brackish water supplies for greenhouses in coastal aquifers, The virtual conference of AQUA≈360: Water for All - Emerging Issues and Innovations 31st August 2021 - 2nd September 2021, University of Exeter, United Kingdom

4- Fath, H., Javadi, A, Akrami, M, Farmani, R, Negm, A and Mallick, T (2019) A Novel stand-alone solar-powered agriculture greenhouse-desalination system; increasing sustainability and efficiency of greenhouses, IAPE '19, 14-15 March, Oxford, United Kingdom, ISBN: 978-1-912532-05-6.

6- Akrami, A., Javadi, A. Hassanein, M., Farmani, R., Tabor, G., Negm, A., Fath, H. (2019) Analysing the greenhouse ventilation using computational fluid dynamics, 2019 UKACM Conference City, 1-3 April, University of London. <http://hdl.handle.net/10871/36791>

8- Salah AH, Fath HES, Negm A, Akrami M, Javadi A. (2019) Modelling of a novel Stand-Alone, Solar Driven Agriculture Greenhouse Integrated With Photo Voltaic /Thermal (PV/T) Panels, 17th International Computing & Control for the Water Industry Conference, Exeter, United Kingdom, 1st - 4th Sep 2019.

9- Porcheron M, Akrami M, Javadi A, Farmani R, Negm A, Fath HES. (2019) A stand-alone Zero-Liquid-Discharge greenhouse model with rainwater harvesting capability, 17th International Computing & Control for the Water Industry Conference, Exeter, United Kingdom, 1st - 4th Sep 2019.

10- Hassan Awaad, Abdelazeem Negm, Hassan Fath, and Akbar Javadi (2019), Feasibility of Crop Production using Greenhouse Fed by Desalination: A Review, EMCEI 2019, 10-13 Oct., Susse, Tunisia.

11- Salah, A.H.; Fath, H.E.S.; Negm, A.; Akrami, M.; Javadi, A, Simulation Of Agriculture Greenhouse Integrated With On-Roof Photo-Voltaic Panels: Case Study For A Winter Day, IAPE '20, Second Edition of the International Conference on Innovative Applied Energy, 15-16 Sept. 2020, Exeter, UK, ISBN: 978-1-912532-18-6.

### **Publications in Local Conference**

12- Hassan Awaad, Abdelazim Negm, Mohammed M Abd- El- Hamed Ali1, El-Sayed Mansour and Mohamed Abu-hashim, Greenhouse Productivity Using

a Recirculating Desalination System Supported By Solar Energy: A Review, IWTC2019, Ismailia,10-13 Sept., 2019, <http://iwtc2019.website2.me/iwtc-2019>

13- M. A. A. Abdrabbo, Abdelazim Negm, Hassan E. Fath and Akbar Javadi, Greenhouse Management and Best Practice in Egypt, IWTC2019, Ismailia,10-13 Sept., 2019, <http://iwtc2019.website2.me/iwtc-2019>.

14- Ahmed A. Elkhoully, Abdelazim M. Negm and Akbar A. Javadi, Propagation and Cultivation of some common Halophytes As Fodder Crops in Egypt”, IWTC2019, Ismailia,10-13 Sept., 2019, <http://iwtc2019.website2.me/iwtc-2019>.

15- Khalid Z. Kewan, Ahmed A. Elkhoully, Abdelazim M. Negm, and Akbar Javadi, “Feedstock Values of Some Common Fodder Halophytes in the Egyptian Desert”, IWTC2019, Ismailia,10-13 Sept., 2019, <http://iwtc2019.website2.me/iwtc-2019>.

16- Negm, A., Bassiony, H., Salah, A., Fath, F., Gamal, G., Javadi, A.A. (2022) Techno-financial Prefeasibility Study of a Stand-alone Solar-driven Agriculture Greenhouse- Desalination System, Proc. Of 4th International Euro-Mediterranean Conference on Environmental Integration, 1-4 Nov., Sousse, Tunisia (Accepted for presentation), Springer Int. Publishing House (extended abstract 5 pages).

### **Poster:**

1-Mansour E., Arisha, M.H., Al-Sagheer, A.A., Javadi, A.A., Negm, A., Awaad, H.A. (2021), Feasibility Of Producing Indoor And Outdoor Crops Using Solar-Powered Desalinated Water: Prospects For Mena Region, The virtual conference of AQUA≈360: Water for All - Emerging Issues and Innovations 31st August 2021 – 2nd September 2021, University of Exeter, United Kingdom (Poster)

### **Published State-of-the-art Books and Book Chapters**

1- Hassan Awaad, Mohamed Abu-hashim, Abdelazim Negm, (Ed.) (2021) Mitigating Environmental Stresses for Agricultural Sustainability in Egypt, Springer Water Series, Springer Cham, <https://link.springer.com/book/10.1007/978-3-030-64323-2>

2- Ahmed A. Elkhoully, Abdelazim Negm, (Ed.) (2021) Management and Development of Agricultural and Natural Resources in Egypt's Desert, Springer Water, Springer Cham, <https://link.springer.com/book/10.1007/978-3-030-73161-8>

- 3- Abdelazim Negm, Ahmed Elkhoully, (Ed.) (2021) Groundwater in Egypt's Deserts, Springer Water Series, Springer Cham, <https://link.springer.com/book/10.1007/978-3-030-77622-0>
- 4- Mohamed Abu-hashim, Faiza Khebour Allouche, Abdelazim Negm, (Ed.) (2021) Agro-Environmental Sustainability in MENA Regions, Springer Cham. <https://link.springer.com/book/10.1007/978-3-030-78574-1>, <https://doi.org/10.1007/978-3-030-78574-1>
- 5- Erina Iwasaki, Abdelazim M. Negm, Salwa F. Elbeih, (Ed.) (2022) Sustainable Water Solutions in the Western Desert, Egypt: Dakhla Oasis, Springer Cham, <https://link.springer.com/book/10.1007/978-3-030-64005-7>
- 6- Nasr, M and Negm,A (Ed.) (2023) Cost-efficient Wastewater Treatment Technologies: Engineered Systems, Springer Cham, <https://link.springer.com/book/9783031129018> (In Press and contains two chapters with an acknowledgement for the project).
- 7- Nasr, M and Negm, A (Ed.) (2023) Cost-efficient Wastewater Treatment Technologies: Natural Systems, Springer Cham, <https://link.springer.com/book/9783031129179> (In Press and contains two chapters with an acknowledgement for the project).

The project team contributed to the above books more than 15 book chapters and 4 book chapters are coming soon in the last two books (in press).

### **Keynote Talks in Internal and local Conferences:**

- 1- 16<sup>th</sup> International Conference INTER-ENG 2022, Interdisciplinarity in Engineering, 6 - 7 October 2022, organized by U.M.F.S.T. Târgu Mureș, Romania, **with Zagazig University as partner.**
- 2- International Conference of International Association of water, Energy, environment and Society on 17-19 Nov.2021, organized jointly by IMESA and IAWEES, South Africa Keynote talk in session 7 (virtual Keynote Talk).
- 3- 2nd International Conference on Civil Engineering (ICCE2021), October 30-Nov. 2, 2021, Hurghada, Egypt (organized by Assiut University) (Keynote talk).

### **Talks in conferences**

- 4- 1st International Water Symposium on “Sustainable Water Solutions”, 6-7 September 2022, Four Seasons Hotel, organized by Center of Excellence for Water, Alexandria University, Alexandria **with collaboration of Zagazig University** and other partners (oral in-person presentation to disseminate the project results and its impacts to stakeholders of the water industry).

- 5- 4<sup>th</sup> edition of Cairo Water Week conference, 24th-29th October, 2021, Cairo, Egypt, Center of Excellence for Water. (Oral in-person presentation).
- 6- Also, I delivered several talks in conferences after the end of the project for dissemination of the project outcomes and show its contribution to the SDGs.

### **Talks in international Webinars (jointly organized with Zagazig University)**

- 7- International Webinar on Water Energy Food Nexus and its connectivity to SDGs, on 1st March 2022, is organized by California Santa Cruz University and **Zagazig University**.
- 8- International Webinar on Greenhouse management and practices for different crops in Egypt Saving water and means of climate change mitigation in water sector, on 7th June 2022, is organized by California Santa Cruz University and **Zagazig University**.
- 9- International Webinar on Optimal Utilization of Marginal Water and Saline Lands Improving livelihood of smallholder farmers in salt affected regions of Egypt through optimal utilization of marginal water and saline lands: A case study, on 2nd August 2022, is organized by California Santa Cruz University and **Zagazig University**.

### **TV talks**

I delivered 2 TV talks. One in Health and beauty channel on (قناة الصحة والجمال), the second in channel no. 8 on (قناة الصعيد)

TV media in channel no. 8:

Link: <https://www.youtube.com/watch?v=V6IX3-8EhY&t=18s>

Minutes: 19:18-23:20

TV media in Health and beauty channel: See photos No. 3,4

Link: <https://www.youtube.com/watch?v=gVV9hMQcv7U&t=1067s>

Minutes: 10:12 -14:32

Project website: ([www.smart-gh.net](http://www.smart-gh.net))

## Partners

### Leading institutions

United Kingdom, College of Engineering Mathematics and Physical Sciences, University of Exeter. Prof. Dr. Akbar Javadi (PI)



Egypt, Water and Water Structures Eng. Dept., Faculty of Engineering, Zagazig University. Prof. Dr. Abdelazim Negm (PI)



### Partners from Egypt

Faculty of Agriculture, Zagazig University



Egyptian Japan University of Science and Technology, Borg El-Arab, Alexandria, Egypt



### Partners Stakeholders

Desert Research Center, Ministry of Agriculture and Land Reclamation



Agriculture Research Center, Ministry of Agriculture and Land Reclamation



Sharkia Governorate

November 2023

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