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RESEARCH

Interests Agriculture · Soil and water engineering · Water saving irrigation · Climate change · Agric Education

Areas Soil Science · Plant Science · Water Science and Technology · Renewable Energy, Sustainability and the Environment · Waste Management and Disposal · Ocean Engineering

RESEARCH SUMMARY

68	945	19	33	1.67	12%
Publications	Citations	h-index	i10-index	Field-weighted impact	World top 10%

Counted from the 68 publications listed below, 2013–2026. Field-weighted impact is the mean over the 50 works scored for it; 1.00 is the world average for works of the same field, type and year. 6 of the 50 papers scored for it are among the world's most cited tenth for their field, type and year.

PUBLICATIONS

Journal articles 65

1. Kwame Agyei Frimpong, Ransford Opoku Darko, Selorm Akaba, Isaac Boateng, Agnes Naa Abeley Abbey (2026). Assessing the influence of farmers' socio-economic orientation on the adoption of recommended soil fertility management practices. *International Journal of Agricultural Research Innovation and Technology*. <https://doi.org/10.3329/ijarit.v15i2.87914>
2. Faruk Kwansah Nyame, Livingstone Kobina Sam Amoah, Joshua Danso Owusu-Sekyere, Ransford Opoku Darko, Francis Kumi, Clement Nyamekye (2026). Effect of irrigation frequency on cocoa (*Theobroma cacao* L.) bean quality in Ghana's major production zone. *International Journal of Agricultural Research Innovation and Technology*. <https://doi.org/10.3329/ijarit.v15i2.87895>
3. Kwame Agyei Frimpong, Agnes Naa Abeley Abbey, Edward Akwasi Ampofo, Fatimah Von Abubakari, Ebenezer Manso, Flavio Odoi-Yorke, Ransford Opoku Darko (2026). Evaluating the socio-economic impacts of biochar initiatives on sustainable livelihoods among smallholder farmers. *Discover Agriculture*. <https://doi.org/10.1007/s44279-026-00633-0>
4. Flavio Odoi-Yorke, James Anthony Oppon, Emmanuel Bamfo-Agyei, Aaron Tony Turkson, Eric Awere, Seth Agbeve Mahu, Felix Koney Okpoti, Ransford Opoku Darko (2026). Green building in Sub-Saharan Africa: Exploring research trends, insights, and future directions (2005–2025). *Sustainable Futures*. <https://doi.org/10.1016/j.sftr.2026.102118>
5. Kwame Agyei Frimpong, Ransford Opoku Darko, Selorm Akaba, Isaac Boateng, Agnes Naa Abeley Abbey (2026). How Socio-Economic Factors Shape Soil Fertility Management in Ghana's Smallholder Farms. *Growing Africa*. <https://doi.org/10.55693/ga51.eyfw6809>
6. Agnes Naa Abeley Abbey, Kwame Agyei Frimpong, Edward Akwasi Ampofo, Kofi Atiah, Emmanuel Hanyabui, Flavio Odoi-Yorke, Ransford Opoku Darko (2026). Integrating biochar, NPK and green mucuna for sustainable soil fertility and yield optimization in sweet potato production. *Agroforestry Systems*. <https://doi.org/10.1007/s10457-026-01434-6>
7. Frank Ackah, Elijah Eduful, Emmanuel Afutu, Josiah Tachie-Menson, Ransford Darko (2026). Water stress and its synergistic effects on pest and disease dynamics in smallholder irrigated agriculture: Evidence from central region of Ghana. *Poljoprivredna tehnika*. <https://doi.org/10.5937/poljteh2601074k>

8. Agnes Naa Abeley Abbey, Kwame Agyei Frimpong, Flavio Odoi-Yorke, Edward Akwasi Ampofo, Ransford Opoku Darko (2025). A review of biochar's sustainability in climate-smart agriculture: Recent advances, emerging trends, and future directions. *European Journal of Agronomy*. <https://doi.org/10.1016/j.eja.2025.127690>
9. R. O. Darko, F. Odoi-Yorke, A. A. Abbey, E. B. Agyekum, L. K. Sam-Amoah (2025). A review of current trends and evolution of irrigation water management practices on greenhouse gas emissions. *International Journal of Energy and Water Resources*. <https://doi.org/10.1007/s42108-025-00448-7>
10. Flavio Odoi-Yorke, John Eshun Davis, Richard Nyarkoh, Agnes Abeley Abbey, Ephraim Bonah Agyekum, Francis Padi Lamptey, Gifty Serwaa Otoo, Sandra Ama Kaburi, Ransford Opoku Darko, Lawrence Atepor (2025). A review of research trends, innovations, and future directions in phase change materials for energy storage in solar drying systems: A bibliometric approach. *Journal of Energy Storage*. <https://doi.org/10.1016/j.est.2025.116233>
11. Ransford Opoku Darko, Paul Peprah Nsonowah, Joshua Danso Owusu-Sekyere, Mark Nyameche (2025). Assessment of wastewater quality for irrigation use in the Central Region of Ghana. *Discover Environment*. <https://doi.org/10.1007/s44274-025-00271-1>
12. Kwame Agyei Frimpong, Sampson Owusu, Ransford Opoku Darko, Emmanuel Hanyabui, Agnes Naa Abeley Abbey, Daniel Ako Tetteh (2025). Effect of biochar application rates on soil properties and growth of *Amaranthus caudatus*. *Discover Agriculture*. <https://doi.org/10.1007/s44279-025-00172-0>
13. Josiah Wilson Tachie-Menson, Catherine Owusu, Frederick Kwame Yeboah, Flavio Odoi-Yorke, Agnes Abeley Abbey, Frank Kwekucher Ackah, Ransford Opoku Darko (2025). Environmental impact of pesticide runoff in irrigated agriculture: evidence from Gomoa West field, Ghana. *Discover Environment*. <https://doi.org/10.1007/s44274-025-00268-w>
14. Ransford O. Darko, Prince C. Wadie, Emmanuel Afutu, Nana A. Kissi, Frank K. Ackah, Emmanuel Hanyabui (2025). Impact of deficit irrigation on sweet pepper (*Capsicum annuum* var. Simbard) performance: Assessing growth, yield, and water use efficiency under a four-day interval irrigation. *Egyptian Journal of Agricultural Research*. <https://doi.org/10.21608/ejar.2025.360782.1642>
15. Wisdom Eyrar Kwame Agbesi, Livingstone Kobina Sam-Amoah, Ransford Opoku Darko, Francis Kumi, George Boafo (2025). Numerical Models for Predicting Water Flow Characteristics and Optimising a Subsurface Self-Regulating, Low-Energy, Clay-Based Irrigation (SLECI) System in Sandy Loam Soil. *Water*. <https://doi.org/10.3390/w17142058>
16. Wisdom Eyrar Kwame Agbesi, Livingstone Kobina Sam-Amoah, Francis Kumi, Ransford Opoku Darko, George Boafo (2025). Optimal operating parameters for a subsurface self-regulating, low energy, clay-based irrigation (SLECI) system in sandy loam soil across multiple rooting depths. *Multiscale and Multidisciplinary Modeling Experiments and Design*. <https://doi.org/10.1007/s41939-025-01108-3>
17. Faruk Kwansah Nyame, Livingstone Kobina Sam-Amoah, Joshua Danso Owusu-Sekyere, Ransford Opoku Darko, Francis Kumi, Clement Nyamekye (2025). Optimizing Irrigation and Tree Age for Enhanced Cherelle Retention in Cocoa (*Theobroma cacao* L.) Production in Ghana. *Applied Fruit Science*. <https://doi.org/10.1007/s10341-025-01687-y>
18. Ransford Opoku Darko, Flavio Odoi-Yorke, Agnes Abeley Abbey, Emmanuel Afutu, Joshua Danso Owusu-Sekyere, Livingstone Kobina Sam-Amoah, Lawrence Acheampong (2024). A Review of Climate Change Impacts on Irrigation Water Demand and Supply - A Detailed Analysis of Trends, Evolution, and Future Research Directions. *Water Resources Management*. <https://doi.org/10.1007/s11269-024-03964-z>
19. Flavio Odoi-Yorke, Sandra Ama Kaburi, Rita Elsie Sanful, Gifty Serwaa Otoo, Francis Padi Lamptey, Agnes Abeley Abbey, Ephraim Bonah Agyekum, Ransford Opoku Darko (2024). A review of recent trends, advancements, and future directions in near-infrared spectroscopy applications in biofuel production and analysis. *Infrared Physics & Technology*. <https://doi.org/10.1016/j.infrared.2024.105692>
20. Darko Opoku, von Abubakar, Sam-Amoah Kobina, Owusu-Sekyere Danso, Mark Nyameche (2024). Assessing the effectiveness of participatory irrigation management approaches to improve water use efficiency and equity in Ghana. *Poljoprivredna tehnika*. <https://doi.org/10.5937/poljteh2402007o>
21. Gilbert Osei, Joshua Owusu-Sekyere, Livingstone Sam-Amoah, Francis Kumi, Harald Hansmann, Vincent Agyemang, Ransford Darko, Kezia Mensah, Delwyn Okhumai (2024). Bell pepper (*Capsicum annuum*)

response to self-regulating low energy clay-based irrigation (SLECI) system, burying depth and fertilizer application dosage. *Journal of Central European Agriculture*. <https://doi.org/10.5513/jcea01/25.4.4462>

22. Ephraim Bonah Agyekum, Flavio Odoi-Yorke, Paul C. Okonkwo, Wulfran Fendzi Mbasso, Ransford Opoku Darko (2024). Clean water production – A content and bibliometric review of two decades of research on green membranes for desalination. *Energy Reports*. <https://doi.org/10.1016/j.egy.2024.09.052>
23. Darko Opoku, Richmond Adjei, Owusu-Sekyere Danso, Sam-Amoah Kobina (2024). Effects of deficit irrigation and manure application on growth, yield and water use efficiency of onion (*Allium cepa* L.). *Poljoprivredna tehnika*. <https://doi.org/10.5937/poljteh2404054r>
24. Flavio Odoi-Yorke, Agnes Abeley Abbey, Anthony Kaku, Stephen Afonaa-Mensah, Ephraim Bonah Agyekum, Charles Benjamin Essuman, John Eshun Davis, Ransford Opoku Darko, Lawrence Atepor (2024). Evaluating the economic viability of decentralised solar PV-based green hydrogen for cooking in Ghana. *Solar Compass*. <https://doi.org/10.1016/j.solcom.2024.100078>
25. Emmanuel Baffour Gyau, Daniel Adu, Ransford Opoku Darko, Michael Opoku Adomako (2024). Green Energy Dynamics: Exploring the Nexus Between Renewable Energy Utilization and Environmental Quality in the Middle East and North Africa. *International Journal of Environmental Research*. <https://doi.org/10.1007/s41742-024-00634-1>
26. Ephraim Bonah Agyekum, Flavio Odoi-Yorke, Wulfran Fendzi Mbasso, Ransford Opoku Darko, Oluwatayomi Rereloluwa Adegboye, Agnes Abeley Abbey (2024). Towards a comprehensive understanding of atmospheric water harvesting technologies – a systematic and bibliometric review. *Energy Reports*. <https://doi.org/10.1016/j.egy.2024.09.059>
27. Ransford Darko, Clement Sagoe, Livingstone Sam-Amoah, Francis Kumi, Mark Nyameche (2023). Assessment of Irrigation water quality and selected soil parameters at Mankessim irrigation scheme, Ghana. *Poljoprivredna tehnika*. <https://doi.org/10.5937/poljteh2302034d>
28. Daniel Adu, Du Jianguo, Ransford O. Darko, Emmanuel Baffour G., Stephen N. Asomani (2023). Overcoming CO₂ emission from energy generation by renewable hydropower – The role of pump as turbine. *Energy Reports*. <https://doi.org/10.1016/j.egy.2023.09.155>
29. Ernest Teye, Charles L. Y. Amuah, Kofi Atiah, Ransford Opoku Darko, Thomas Abindaw, Kwadwo Kusi Amoah, Michael Miyittah, Emmanuel Afutu, Rebecca Owusu (2023). Quick Determination of Soil Quality Using Portable Spectroscopy and Efficient Multivariate Techniques. *Journal of Spectroscopy*. <https://doi.org/10.1155/2023/2024318>
30. Ransford Opoku Darko (2023). Rapid Evaluation of Mandarin Crop Water Stress Index using CWSI Infrared Camera. *Sensors & Transducers*. https://sensorsportal.com/HTML/DIGEST/may_2023/Vol_260/P_3287.pdf
31. Kingsley Anfom, Xu Xioyang, Daniel Adu, Ransford O. Darko (2023). The state of energy in sub-Saharan Africa and the urgency for small hydropower development. *Energy Reports*. <https://doi.org/10.1016/j.egy.2023.10.011>
32. Kelvin Edom Alordzinu, Sadick Amoakohene Appiah, Alaa AL Aasmi, Ransford Opoku Darko, Jiu hao Li, Yubin Lan, Daniel Adjibolosoo, Chenguo Lian, Hao Wang, Songyang Qiao, Juan Liao (2022). Evaluating the Influence of Deficit Irrigation on Fruit Yield and Quality Indices of Tomatoes Grown in Sandy Loam and Silty Loam Soils. *Water*. <https://doi.org/10.3390/w14111753>
33. Ernest Teye, Charles L. Y. Amuah, Kofi Atiah, Ransford Opoku Darko, Kwadwo Kusi Amoah, Emmanuel Afutu, Rebecca Owusu (2022). Feasibility Study on the Use of a Portable NIR Spectrometer and Multivariate Data Analysis to Discriminate and Quantify Adulteration in Fertilizer. *Journal of Spectroscopy*. <https://doi.org/10.1155/2022/1412526>
34. RO Darko (2022). In-situ Assessment of Mandarin Crop Water Stress Index Using CWSI Infrared Camera. *Sensors and Electronic Instrumentation Advances*. https://www.researchgate.net/profile/Sergey-Yurish/publication/375424050_Sensors_and_Electronic_Instrumentation_Advances_Proceedings_of_the_8th_SEIA_2022_Conference/links/654a1c4b3fa26f66f4e25139/Sensors-and-Electronic-Instrumentation-Advances-Proceedings-of-the-8th-SEIA-2022-Conference.pdf#page=61
35. Sadick Amoakohene Appiah, Jiu hao Li, Yubin Lan, Ransford Opoku Darko, Kelvin Edom Alordzinu, Alaa Al

Aasmi, Evans Asenso, Fuseini Issaka, Ebenezer Acheampong Afful, Hao Wang, Songyang Qiao (2022). Real-Time Assessment of Mandarin Crop Water Stress Index. *Sensors*. <https://doi.org/10.3390/s22114018>

36. Jianguo Du, Guanghui Chang, Daniel Adu, Agnes Abbey, Ransford Darko (2021). Development of solar and bioenergy technology in Africa for green development—Addressing barriers and untapped potential. *Energy Reports*. <https://doi.org/10.1016/j.egyr.2021.07.102>
37. Guanghui Chang, Du Jianguo, Daniel Adu, Kofi Baah Boamah, Pu Tianfeng, Ransford Darko (2021). Energy Production and its Emission Generation Impact on the Environment. *Current Science*. <https://doi.org/10.18520/cs/v121/i2/316-322>
38. F Kumi, R Adade, Ransford Opoku Darko (2021). Estimating okra leaf area index using unmanned aerial vehicle imagery. *Agricultural Engineering International: CIGR Journal*. <https://cigrjournal.org/index.php/Ejournal/article/view/6031>
39. Du Jianguo, Guanghui Chang, Daniel Adu, Ransford Darko, Muhammad A. S. Khan, Eric O. Antwi (2021). Numerical Simulation and Computational Flow Characterization Analyses of Centrifugal Pump Operating as Turbine. *Complexity*. <https://doi.org/10.1155/2021/9695452>
40. Daniel Adu, Jianguo Du, Ransford O Darko, Eric Ofosu Antwi, Muhammad Aamir Shafique Khan (2021). Numerical and experimental characterization of splitter blade impact on pump as turbine performance. *Science Progress*. <https://doi.org/10.1177/0036850421993247>
41. Ransford Opoku Darko (2021). Overview of modelling techniques for greenhouse microclimate environment and evapotranspiration. *International Journal of Agricultural and Biological Engineering*. <https://doi.org/10.25165/j.ijabe.20211406.3948>
42. Daniel Adu, Du Jianguo, Ransford O. Darko, Kofi Baah Boamah, Emmanuel A.-Boateng (2020). Investigating the state of renewable energy and concept of pump as turbine for energy generation development. *Energy Reports*. <https://doi.org/10.1016/j.egyr.2020.08.025>
43. Ransford Opoku Darko, Junping Liu, Shouqi Yuan, Livingstone K. Sam-Amoah, Haofang Yan (2020). Irrigated agriculture for food self-sufficiency in the sub-Saharan African region. *International journal of agricultural and biological engineering*. <https://doi.org/10.25165/j.ijabe.20201303.4397>
44. Ransford Opoku Darko (2020). Modeling evapotranspiration for cucumber plants based on the Shuttleworth-Wallace model in a Venlo-type greenhouse. *Agricultural Water Management*. <https://doi.org/10.5555/20203009858>
45. Ransford Opoku Darko, Shouqi Yuan, F Kumi, Junping Liu (2019). Effect of Deficit Irrigation on Yield and Quality of Eggplant. *International Journal of Environment Agriculture and Biotechnology*. <https://doi.org/10.22161/ijeab.45.5>
46. RO Darko, Yuan Shouqi, Liu Junping, Sam-Amoah Livingstone (2018). Droplet characterization and water distribution of fixed spray plate sprinkler used in linearly moved irrigation system. *Poljoprivredna tehnika*. <https://doi.org/10.5937/poljteh1802017o>
47. Ransford Opoku Darko (2018). Field Evaluation of Tomato Yield Affected by Uniformity of Sprinkler-Applied Water. *Acta Scientific Agriculture*.
48. Zakaria Issaka, Hong Li, Yue Jiang, Pan Tang, Chao Chen, Ransford Opoku Darko (2018). Hydraulic performance characteristics of impact sprinkler with a fixed water dispersion device. *International journal of agricultural and biological engineering*. <https://doi.org/10.25165/j.ijabe.20181106.4026>
49. RO Darko (2018). Modelling canopy resistance for estimating latent heat flux at a tea field in South China. *Experimental Agriculture*. <https://doi.org/10.5555/20183340905>
50. Desmond Appiah, Ransford O Darko (2018). Performance characteristics of pump-as-turbine for energy generation. *Indian Journal of Engineering*. <https://www.academia.edu/download/104746189/A28.pdf>
51. Zakaria Issaka, Hong Li, Jiang Yue, Pan Tang, Ransford Opoku Darko (2018). Water-smart sprinkler irrigation, prerequisite to climate change adaptation: a review. *Journal of Water and Climate Change*. <https://doi.org/10.2166/wcc.2018.017>
52. Ransford O Darko (2017). A case study of status and potential of small hydro-power plants in Southern

African development community. *Energy Procedia*. <https://www.sciencedirect.com/science/article/pii/S1876610217354486>

53. RO Darko (2017). Determination of crop and soil evaporation coefficients for estimating evapotranspiration in a paddy field. *International Journal of Agricultural and Biological Engineering*. <https://doi.org/10.5555/20173340662>
54. Ernest Teye, Philip Fiifi Owusu, Ransford Opoku Darko, Frank K. Ackah (2017). Evaluation of composite tea made from roselle (*Hibiscus sabdarffa*), ginger (*Zingiber officinale*) and turkey berry (*Solanum torvum*). <https://doi.org/10.25218/ajfia.2017.01.001.06>
55. Ransford Opoku Darko (2017). Optimization of movable irrigation system and performance assessment of distribution uniformity under varying conditions. *International Journal of Agricultural and Biological Engineering*. <https://doi.org/10.3965/j.ijabe.20171001.2293>
56. Ransford Opoku Darko, Yuan Shouqi, Jun-Ping Liu, Haofang Yan, Zhu Xingye (2017). Overview of advances in improving uniformity and water use efficiency of sprinkler irrigation. *International journal of agricultural and biological engineering*. <https://doi.org/10.3965/j.ijabe.20171002.1817>
57. RO Darko (2016). Agricultural science as a component of the curriculum of senior high school integrated science in Ghana. *Its Effects and the Wayford. IJRDO-Journal of Agriculture and Research Vol2 (6)*. <https://scholar.google.com/scholar?cluster=17025807006409240760&hl=en&oi=scholar>
58. Ransford Opoku Darko, Yuan Shouqi, Haofang Yan, Junping Liu, Agnes Abeley Abbey (2016). Calibration and validation of AquaCrop for deficit and full irrigation of tomato. *International journal of agricultural and biological engineering*. <https://doi.org/10.25165/ijabe.v9i3.1812>
59. RO Darko (2016). Characteristics of water and droplet size distribution from fluidic sprinklers. *Irrigation and drainage*. <https://doi.org/10.5555/20163355190>
60. Junping Liu and Francis Kumi %00 Ransford Opoku Darko, F Kumi (2016). Constraints encountered in teaching practical agriculture in selected senior high schools in the sekondi-takoradi metropolis. *International Journal of Information Research and Review*.
61. Ransford Opoku Darko, Shouqi Yuan, Sarah Frema Opoku, Christina Offei Ansah, Junping Liu, Nancy Ansah (2016). Gender Differences in Attitude towards the Learning of Agricultural Science in Senior High Schools in the Assin South District of the Central Region, Ghana. *Journal of Agricultural Science*. <https://doi.org/10.5539/jas.v8n9p143>
62. Ransford Opoku Darko (2015). Challenges in the teaching and learning of agricultural science in selected public senior high schools in the Cape Coast Metropolis. *Agricultural Science*. <https://scholar.google.com/scholar?cluster=8296109581565372488&hl=en&oi=scholar>
63. Ransford Opoku Darko, Shouqi Yuan, Li Hong, Junping Liu, Haofang Yan (2015). Irrigation, a productive tool for food security – a review. *Acta Agriculturae Scandinavica Section B - Soil & Plant Science*. <https://doi.org/10.1080/09064710.2015.1093654>
64. J.D. Sam-Amoah, RO Darko (2013). Calibration and Validation of AquaCrop for Full and Deficit Irrigation of Hot Pepper. *ARPJN Journal of Agricultural and Biological Science*.
65. Ransford Opoku Darko (2013). Water Requirement, Deficit Irrigation and Crop Coefficient of Hot Pepper (*Capsicum frutescens* var *legon18*) Using Irrigation Interval of Two (2) Days. *ARPJN Journal of Agricultural and Biological Science*.

Book chapters 2

1. L. K. Sam-Amoah, R. O. Darko, J. D. Owusu-Sekyere (2024). Calibration and Validation of Aquacrop for Hot Pepper (Legon 18) Irrigation. *Research Advances and Challenges in Agricultural Sciences Vol. 1*. <https://doi.org/10.9734/bpi/racas/v1/6631b>
2. Daniel Adu, Ransford O. Darko, Boamah Kofi Baah, Agnes Abbey (2023). The State of Renewable Energy in China and Way Forward in New Scenario Policies. *IntechOpen eBooks*. <https://doi.org/10.5772/intechopen.106492>

Theses 1

1. RANSFORD OPOKU DARKO (2017). Design and Hydraulic Performance of Linearly Moved Irrigation System. 江苏大学: <https://scholar.google.com/scholar?cluster=16241873723881725224&hl=en&oi=scholar>