DR GEORGE ASHIAGBOR

Geospatial Scientist | Forest and Land-Use Monitoring | Deforestation-Free Supply Chains

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PROFESSIONAL PROFILE

Geospatial scientist with fifteen years' experience turning Earth observation data into decision-ready information for forest conservation, agricultural commodity supply chains and land-use policy in West Africa. I have led the independent validation of Ghana's national forest and land-cover products for the European Forest Institute and the World Bank, mapped cocoa-driven deforestation for WWF Japan, produced the national time-series of mining inside and outside forest reserves for the Nature and Development Foundation, and built the harmonised classification schemes that separate cocoa agroforestry from open forest under Forests 2020 and CIFOR. My work sits directly on the EUDR, REDD+ and MRV compliance pathway, and I combine it with applied research in precision agronomy, carbon accounting and habitat assessment. I hold a PhD in Geomatic Engineering, have mobilised more than US$1 million in project funding across eleven client assignments, and publish the methods I deliver — thirty-five refereed articles to date.

AREAS OF EXPERTISE

Forest cover mapping and regulatory compliance — forest/non-forest baseline mapping, independent validation of national land-cover products, EUDR due diligence, deforestation-free supply chains, REDD+ MRV	**Agro-commodity expansion and land-use change** — cocoa, rubber, cashew and oil palm frontiers; food cropland displacement and food self-sufficiency; land-sparing and land-sharing analysis
Mining-driven land degradation — time-series mapping of artisanal and small-scale gold mining, landscape pattern change, impacts on cropland, yield and water quality	**Habitat, biodiversity and conservation planning** — habitat connectivity and fragmentation modelling, habitat quality assessment, species distribution modelling, bioindicator monitoring
Carbon stocks and climate-change mitigation — aboveground carbon dynamics, carbon storage on mining concessions, carbon enhancement through tree crops and agroforestry	**Precision agronomy and UAV remote sensing** — multispectral UAV crop mapping, soil fertility archetyping, shade-tree canopy optimisation, pre-visual disease detection
Watershed and water resources assessment — GIS-based ecohydrological risk modelling, sediment yield under landscape change, multi-criteria decision analysis for basin management	**Geospatial methods and geo-information science** — machine and deep learning classification, object-based image analysis, radar and phenology-based mapping, CA–ANN land-change simulation

CONSULTANCY AND PROJECT ASSIGNMENTS

Senior GIS Officer — European Forest Institute (EFI) *Dec 2024 – Present*

- Independent validation and accuracy assessment of the 2020 forest/non-forest cover map of Ghana's cocoa-producing regions, produced by the Resource Management Support Unit (RMSC) of the Forestry Commission.
- The validated map underpins EUDR due diligence and traceability implemented by Ghana COCOBOD; Principal Investigator on the associated €49,864.50 award.
- Moderated and facilitated the EFI technical workshop finalising the 2020 Forest Map (Accra, November 2025).

GIS / Remote Sensing Consultant — Nature and Development Foundation (NDF), Ghana *Nov 2024 – Jan 2025*

- Produced national time-series maps of mining activity inside and outside forest reserves (1980–2023) under the Building Active Actors and Systems to Support (BAASS) Deforestation-Free Commodities project for Ghana and Liberia.
- Published as a public technical report and presented at the national validation workshop (February 2025).

GIS / Remote Sensing Consultant — WWF Japan *Aug 2023 – Feb 2024*

- Remote sensing mapping of cocoa-led deforestation across Ghana's cocoa–forest mosaic landscape, for EUDR due diligence under the deforestation-free cocoa supply chain programme (US$60,000).

Remote Sensing Consultant — The World Bank *Jan 2023 – Feb 2023*

- Independent validation of Ghana's 2015 national land use / land cover map produced by RMSC, Forestry Commission.

Geographic Information Systems Analyst — GAF AG, Germany *Oct 2022 – Mar 2023*

- Baseline assessment of the context, specifications and functional requirements for an upgraded Geological and Mineral Information Management System (GMIS) for the Ghana Geological Survey Authority.

GIS / Remote Sensing Specialist — Ecometrica, United Kingdom *June 2022 – July 2023*

- UK PACT-funded Forest Positive Exports Nigeria (FPEN) project, monitoring the impact of forest-risk commodities — cocoa, palm oil, beef and coffee.
- Strengthened partner capacity in Ghana and Nigeria to produce high-quality land cover maps for monitoring cocoa's impact on forests.

Principal Investigator / Remote Sensing Lead — African Plant Nutrition Institute (APNI) *May 2022 – Present*

- FRAME-Cocoa project (US$112,467): developed site-specific crop performance indicators from soil fertility, crop management, soil map and weather data.
- Assessed the feasibility of remotely sensed information for characterising crop performance, and used diagnostic surveys to identify gender-specific opportunities for adopting site-specific fertiliser interventions.

Co-Investigator — Gold Fields Limited *Sept 2022 – July 2023*

- Assessment of the carbon storage potential of vegetation on active mining concessions at Tarkwa and Damang Mines (GHS 475,288 / US$43,000).

Principal Investigator / GIS and Remote Sensing Technical Lead — CIFOR *Feb 2020 – Apr 2022*

- Governing Multifunctional Landscapes (GML) in Sub-Saharan Africa (EUR 125,300): field-tested land use / land cover maps for 2015, 2017, 2018 and 2020 covering Kwaebibirem Municipality and Atiwa West District.
- Methods complied with the national land-use mapping protocols agreed by Ghana's National REDD+ Technical Working Group.

GIS / Remote Sensing Technical Lead — Ecometrica, UK / UK Space Agency *Apr 2017 – Mar 2021*

- Forests 2020 Ghana, part of the UK Space Agency International Partnerships Programme (GBP 650,000 mobilised to the College).
- Developed a harmonised classification scheme for mapping Ghana's cocoa landscape and a mapping protocol for segregating cocoa agroforestry from open forest and other land-cover classes — a long-standing technical bottleneck in West African forest monitoring.

GIS and Remote Sensing Technical Lead — IUCN —

- Restoration in Supply Chains (RESUPPLY) — from zero net deforestation to positive action (US$22,970): independent land use / land cover maps for Wassa Amenfi from high-resolution imagery for 2016 and 2020, change analysis between the two epochs, and field validation of the maps.

TECHNICAL COMPETENCIES

Earth observation data	Sentinel-1 SAR, Sentinel-2, Landsat archive, PlanetScope and high-resolution commercial imagery; multi-temporal and time-series analysis
UAV systems	DJI Matrice 350 with MicaSense multispectral sensors; mission planning, radiometric calibration, orthomosaic generation and canopy metrics
Classification and modelling	Machine-learning and deep-learning classifiers, object-based image analysis (OBIA), pixel-based classification, vegetation phenology approaches, cellular automata–artificial neural network (CA–ANN) change simulation
Validation and quality assurance	Independent map validation, sampling design, accuracy assessment and error matrices, field verification campaign design and supervision
Spatial analysis	Multi-criteria decision analysis and analytical hierarchy process (AHP), habitat connectivity and least-cost path modelling, landscape pattern metrics, ecohydrological risk modelling
Carbon and MRV	Aboveground carbon stock estimation, REDD+ measurement, reporting and verification protocols, national forest inventory design
Survey and statistics	Diagnostic and household survey design, statistical modelling and inference, spatial statistics
Geodetic foundations	Coordinate reference systems and map projections, GNSS/GPS field data collection and training

EDUCATION AND PROFESSIONAL TRAINING

2024 – Present	**MPhil Climate Change and Integrated Natural Resources Management** (in progress), CSIR College of Science and Technology, Kumasi, Ghana
2021	**PhD Geomatic Engineering** — Applied Geo-Information in Environment and Natural Resources, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana
2011	**MPhil Geomatic Engineering** — Geo-Information Science, KNUST, Kumasi, Ghana
2007	**BSc Geodetic Engineering**, KNUST, Kumasi, Ghana
2019	Forest Degradation Mapping training, University of Edinburgh, United Kingdom
2018	Synthetic Aperture Radar (SAR) training (Certificate), Centre for Landscape and Climate Research, University of Leicester, United Kingdom

EMPLOYMENT HISTORY

Aug 2022 – Present	**Senior Lecturer**, Department of Wildlife and Range Management, Faculty of Renewable Natural Resources, KNUST, Kumasi (**Head of Department** since January 2025)
Aug 2018 – Jul 2022	**Research Fellow / Lecturer**, Department of Wildlife and Range Management, KNUST, Kumasi
Aug 2014 – Jul 2018	**Assistant Research Fellow**, Department of Wildlife and Range Management, KNUST, Kumasi
2011 – 2014	**GIS Analyst / Project Manager**, Agroforestry Practices to Enhance Resource-poor Livelihoods (APERL) Project, KNUST, Kumasi

CAPACITY BUILDING AND TRAINING DELIVERED

- Designed and led a three-day workshop on forest/non-forest mapping from satellite imagery for technical staff of Ghana COCOBOD and the Forestry Commission.
- Resource Person, Expert Review Workshop on the Forest/Non-Forest Mask Map for EUDR compliance (March 2025) and the 2024 National Land Cover Map Validation Exercise, RMSC–Forestry Commission (October 2025).
- Resource Person, National Forest Inventory Design Workshop, Ghana (July 2023).
- Resource Person, Stakeholder Validation Workshop on Land Use Change Maps for the Deforestation-Free Cocoa Programme, Solidaridad West Africa (March 2026).
- Resource Person and Trainer, GPS data collection for the field team of Knowledge for World Conservation, Kumasi (July 2024).
- Resource Person, Ecofrontiers International Workshop on cloud-based agri-information and GIS data for agricultural extension officers (June 2023).
- Resource Person for cocoa–forest land-use mapping, Cross River State, Nigeria (August 2022).

ADVISORY ROLES AND PROFESSIONAL SERVICE

- **Member**, Measurement, Reporting and Verification (MRV) Sub-Working Group, Climate Change Directorate, Forestry Commission of Ghana.
- **Taskforce Member**, Cocoa and Forest Initiative Technical Working Group, Ministry of Lands and Natural Resources, Ghana (2020); Member of the same working group under the IDH Sustainable Trade Initiative (2019).
- **Topic Editor**, *Frontiers in Sustainable Food Systems* (December 2025 – Present).
- **Jury Member**, Erasmus Mundus Master's Programme in Geo-Information Science and Earth Observation for Environmental Modelling and Management (GEM), 2024.
- **KNUST Focal Person and Associate Partner**, International Master in Soils and Global Change (IMSOGLO).
- **Peer reviewer** for *Environmental Earth Sciences*, *Environmental Monitoring and Assessment*, *Agriculture & Food Security*, *Wetlands Ecology and Management*, *Food Security*, *Scientific African*, *Geocarto International*, *Heliyon*, *Frontiers in Climate*, *Geography and Environment*, *Forests* (MDPI) and others.
- **Professional bodies**: Ghana Institution of Engineers (since 2017); Ghana Geospatial Society (since 2022); University Teachers Association of Ghana (since 2014).

SELECTED PUBLICATIONS

Thirty-five refereed journal articles and five institutional technical reports; 1,181 citations and h-index 17 (Google Scholar). A complete bibliography is available on request. Selected items most relevant to applied land-use monitoring:

1. **Ashiagbor, G.** (2025) *Production of time series maps of mining activities inside and outside forest reserves in Ghana*. Accra: The Nature & Development Foundation.
2. **Ashiagbor, G.** (2025) *Remote sensing mapping of cocoa deforestation in the cocoa–forest landscape of Ghana*. Tokyo: WWF Japan.
3. Critchley, M., Sassen, M., Rahn, E., **Ashiagbor, G.**, van Soesbergen, A. and Maney, C. (2022) *Identifying opportunity areas for cocoa agroforestry in Ghana to meet policy objectives*. Cambridge: UNEP World Conservation Monitoring Centre.
4. **Ashiagbor, G.**, Asante, W.A., Kyereh, B., Yakubu, M. and Callagher, E. (2021) *Land use and land cover mapping of Kwaebibirem Municipality and Atiwa West District, Ghana*. Nairobi: Centre for International Forestry Research.
5. **Ashiagbor, G.**, Essah, I.S., Baiden, P.P.K., Adjetey Bisa, A.A., Ahorlu, O., Enyinful-Andoh, G., … and Oberthür, T. (2026) 'Modelling the number of shade tree species needed to reach the optimal canopy target in cocoa agroforestry systems', *Agroforestry Systems*, 100(1), 36.
6. **Ashiagbor, G.**, Ahorlu, O.E., Essah, I.S., Gyamfi, M.O. and Asabere, S.B. (2025) 'A remote sensing approach for mapping teak (*Tectona grandis*) using vegetation phenology in Ghana's forest–savannah transition zone', *Heliyon*, 11(17).
7. Nyarko, H. and **Ashiagbor, G.** (2025) 'Can Ghana's Cocoa Forest REDD+ programme achieve its intended goals of promoting sustainable cocoa production and enhancing carbon stocks?', *Journal of Environmental Management*, 382, 125376.

8. **Ashiagbor, G.**, Arthur, P.S., Essah, I.S., Asabere, S.B., Antobre, O.O. and Asante, W.A. (2025) 'Cocoa eats the food: can land-sparing save farmers' food self-sufficiency in Ghana?', *GeoJournal*, 90(2), pp. 1–17.
9. Owusu-Sekyere, A. and **Ashiagbor, G.** (2025) 'Mapping the paths of giants: a GIS-based habitat connectivity model for forest elephant conservation in a West African forest block', *African Journal of Ecology*, 63(2), e70028.
10. **Ashiagbor, G.**, Sackey, M. and Gyampoh, B.A. (2024) 'Ecohydrological risk assessment model for the Pra River Basin using GIS and multi-criteria decision making', *International Journal of River Basin Management*, pp. 1–14.
11. **Ashiagbor, G.**, Asare-Ansah, A.O., Amoah, E.B., Asante, W.A. and Mensah, Y.A. (2023) 'Assessment of machine learning classifiers in mapping the cocoa–forest mosaic landscape of Ghana', *Scientific African*, 20, e01718.
12. **Ashiagbor, G.**, Asante, W.A., Forkuo, E.K., Acheampong, E. and Foli, E. (2022) 'Monitoring cocoa-driven deforestation: the contexts of encroachment and land use policy implications for deforestation-free cocoa supply chains in Ghana', *Applied Geography*, 147, 102788.
13. **Ashiagbor, G.**, Asare-Ansah, A.O., Laari, P.B. and Asante, W.A. (2022) 'Cashew expansion holds potential for carbon stocks enhancement in the forest–savannah transitional zone of Ghana', *Land Use Policy*, 121, 106318.
14. **Ashiagbor, G.**, Asante, W.A., Quaye-Ballard, J.A., Forkuo, E.K., Acheampong, E. and Foli, E. (2021) 'Mangrove mapping using Sentinel-1 data for improved decision support on sustainable conservation and restoration interventions in the Keta Lagoon Complex Ramsar Site, Ghana', *Marine and Freshwater Research*, 72(11), pp. 1588–1601.
15. **Ashiagbor, G.**, Forkuo, E.K., Asante, W.A., Acheampong, E., Quaye-Ballard, J.A., Boamah, P., Mohammed, Y. and Foli, E. (2020) 'Pixel-based and object-oriented approaches in segregating cocoa from forest in the Juabeso–Bia landscape of Ghana', *Remote Sensing Applications: Society and Environment*, 19, 100349.

REFEREES

Available on request.