中荷 AGD-CSC 项目招生课题目录

Proposal List for 1+3 AGD-CSC Students Call in 2026

This proposal list presents a selection of projects available to prospective PhD candidates for the Sino-Dutch Agriculture Green Development PhD Program (AGD-PhD Program), Phase 3, Round 1. Candidates are invited to carefully review the project options and indicate their preferences in the application form.

No.1 Greening aquaculture production: Expansion in Hainan and transfer to Africa (GreenAqua)

This project investigates the sustainable expansion of tilapia aquaculture in Hainan under the new free trade policies and via China-Africa cooperation under the umbrella of China's Global Development Initiative and Belt and Road Initiative. The project includes two PhD candidates: 2+2 PhD who aim to graduate at China Agricultural University (CAU) and 1+3 PhD who aim to graduate at Wageningen University (WUR).

The 1+3 PhD project will examine how China promotes overseas aquaculture growth and sustainable production in the Global South. Using Hainan as a launching pad, the project will focus primarily on international partnerships in East Africa. Research will include fieldwork in East Africa, assessing the extent to which there is successful dissemination of on-farm sustainable modernization and "beyond-farm" industrial models (e.g., aquaparks), and a comparison between Chinese and European cooperation frameworks. The successful candidate will spend their first year at CAU before spending the next three years at Wageningen University where they will graduate.
Both PhD students will work within an integrated CAU-WUR supervision team (Profs. Simon Bush and Shenggen Fan). They will collaborate on joint fieldwork in Hainan and contribute to high-level debates on trilateral (China-EU-Africa) sustainability cooperation with the FAO.

We look for candidates with a proven background in socio-economic or interdisciplinary (social-natural) sciences related to aquaculture, environment or agrifood.

No.2 Biodiversity and productivity in black pepper – Areca nut intercropping systems in Hainan, China

We have a PhD student position available focused on enhancing understanding on biodiversity-productivity relationships in black pepper-Areca nut intercropping systems in Hainan, China, within the WUR-CAU Agricultural Green Development programme. The project focuses on effects of intercropping on biodiversity (arthropod diversity and belowground diversity), yield, and ecosystem services provisioning, and relationships between biodiversity, ecosystem services and yield. You will spend one year in China (including considerable periods of field work in Hainan) and three years at Wageningen University in the Netherlands to work on data analysis and thesis writing.

Candidates who meet the following requirements are invited to apply:

- MSc degree in agronomy, (agro)ecology or a related field
- Affinity with perennial cropping systems is an advantage
- Affinity with entomology is an advantage
- Proven proficiency in English is required (written and spoken)
- Strong analytical skills
- Field work experience
- Strong quantitative skills in R
- A team player

No.3 PATHWAYS Malawi: Pathways to Upgrading Smallholder Farming and Market Systems for Food Security, Incomes and Sustained Productivity in Malawi

We are looking for a PhD student to conduct research on improved smallholder farming and market systems for maize-soyabeans (and maize-pigeon peas) in Malawi. The PhD candidate will use both qualitative and quantitative research methods, including a field experiment. The candidate is expected to work closely with project partners and stakeholders in Malawi. The candidate will live in China to work on a research proposal in the first year and in the Netherlands for the following three years, with shorter periods to stay in Malawi. We are looking for a candidate with a background in the social sciences, such as business studies, agricultural economics, or development studies. A strong interest in academic research in general, and in smallholder agriculture, development, marketing, agronomy, and business research more specifically, is essential, as are excellent social and networking skills, fluency in English (preferably with proof from an IELTS or TOEFL test), and preferably experience working in and traveling to sub-Saharan Africa.
Planned starting date: 1-9-2026

No.4 Towards healthy and sustainable food systems in Hainan and the Global South

PhD Positions for 1+3: Co-creation and quantification of transformation pathways to ensure healthy and sustainable tropical food systems in the Global South.

This position focuses on food systems in Sub-Saharan Africa, in collaboration with the other 2+2 PhD working on Hainan. **We are looking for a candidate** with a good understanding of tropical food systems and their interconnections, including diet, sustainability, health, soil, land use, water quality, greenhouse gas emissions, biodiversity, and nutrient cycles. This candidate should have a stronger focus on food system (biophysical) modelling, and be interested in participatory methods and stakeholder engagement. This PhD candidate will collaborate with the other PhDs within the theme on regional agricultural green development.

NO.5 Sustainable role for livestock systems in Hainan: Agroforestry, environmental budgets and free trade

In Hainan, a diverse range of meat-based dishes is commonly featured in local cuisine and widely consumed by both residents and tourists. But have you ever considered where this food comes from and how it is produced? And what can we do to transition towards more sustainable livestock production systems in such a tropical region?

We invite applications for two PhD positions (one 1+3 track and one 2+2 track) within an interdisciplinary research project, which aims to investigate the role of sustainable livestock systems in Hainan. In this project, PhD candidates will gain in-depth insights into the livestock farming patterns in Hainan and collaborate closely in data collection (e.g., via farm surveys). The 2+2 PhD candidate will identify opportunities for local resource utilization, with an emphasis on agroforestry-based livestock integration, while the **1+3 PhD candidate** will focus on environmental outcomes along the supply chain and explore the balance between localization and trade. Approaches integrating animal production, environmental impact modelling, and artificial intelligence will be adopted.

The project is embedded in an international and interdisciplinary research environment, offering strong opportunities for academic development and collaboration. **Candidates are expected** to have a background in environmental sciences, animal sciences, or a related field, with an interest in shaping more sustainable futures for livestock systems using a systems approach. We welcome applications from highly motivated candidates, who have quantitative (modelling) skills, and are open and capable of developing skills and knowledge in interdisciplinary research and systems thinking.

NO.6 Model-informed design of adaptive and multifunctional cropping and farming systems in tropical regions

Farming in tropical regions like Hainan is challenging due to the inherent low fertility of the weathered soils, the abundance of pests, diseases and weeds, and the unpredictable weather conditions. Undulating landscapes further create internal agroecological gradients, while seasonal droughts, typhoons and climate change amplify climatic unpredictability.

Multifunctional cropping systems offer a robust solution by dynamically adapting to spatial heterogeneity and temporal variability. These systems deliver agricultural, environmental and socio-economic benefits. Well-designed crop rotations, tailored to diverse farm niches and combining productivity, economic viability and environmental indicators, can sustainably boost yields while improving soil health. At farm level, integrating crops with non-crop habitats further enhances livelihoods and nutritional security, demonstrating the potential of adaptive, context-specific farming strategies.

This project builds on existing research focusing on cropping system diversification and the use of intercropping and cover crops, and tools developed to assess the productivity and sustainability of cropping and farming systems. It aims to develop and apply innovative planning tools to design the adaptive, multifunctional cropping and farming systems to support decision making on plot- and farm-level resource allocation and inform farmers and other stakeholders about the consequences of planning decisions for system performance.

Project activities include two parts:

PhD 1（2+2）: Model-based design and adaptive experimentation with cropping systems, including 1) Assessment of agronomic requirements, suitability and performance of crops under contrasting conditions in tropical landscapes; 2) Developing and testing a modelling tool to design adaptive, multifunctional cropping systems; 3) Adaptive experimentation with designed cropping systems to determine productive, socio-economic and environmental performance and stability.

PhD 2（1+3）: Model-based design of adaptive, multifunctional farming systems, including 1) Mapping spatial heterogeneity and temporal variability in selected farming systems. Developing a methodological framework for adaptive management of multifunctional systems; 2) Developing and testing a modelling tool to design adaptive, multifunctional farming systems by integrating cropping systems and other production activities; 3) Optimizing resource allocation (nutrient, water, labour) use in the farming systems to foster adaptive improvement of system performance.

Requirements: candidates are expected to have a MSc degree in agronomy, geography, spatial planning or a related field. They should have strong affinity and good command of quantitative methods. For 1+3 PhD experience with geographical information systems (GIS) is important. Experience with statistical and GIS software (R, ArcGIS, QGIS) or software development (for instance in C, C++, C#, Java or Python) is desirable.

No.7 A large language aGRIcultural Model for Integrated Nutrition–water–climate–yielD–quality intelligence in the Tropics (AgriMind-Tropics)

Are you passionate about artificial intelligence, crop modelling, and sustainable production of high-quality fruits and vegetables? Do you want to pursue a PhD project at the intersection of Large Language Models (LLMs), data science, and tropical crop production? If so, an exciting opportunity is waiting for you. China Agricultural University (CAU) together with Water Systems and Global Change Group, the Agricultural Biosystems Engineering Group, as well as the Horticulture and Product Physiology Group at Wageningen University, is seeking three highly motivated PhD candidates to join the AgriMind-Tropics project. The project aims to develop LLM-based approaches for predicting tropical crop yield and quality by integrating heterogeneous agricultural data sources. A particular focus will be placed on tropical pepper, dragon fruit, and pineapple production systems in Hainan, leveraging data generated within the companion AGD project "Crop–soil–microbiome interactions driving distinctive tropical quality of Pineapple in Hainan". This provides a unique opportunity to develop and validate AI models using real-world field observations, physiological outcomes, and multidisciplinary datasets.

In this AgriMind-Tropics, you will be involved in the following key objectives:

- Developing and fine-tuning LLM-based models for tropical crop yield and quality prediction;
- Integrating data from crop models, field experiments, remote sensing, and sensor networks into AI-driven prediction frameworks;
- Assessing data quality, uncertainty, and reliability across heterogeneous agricultural datasets;
- Evaluating model performance using tropical crop datasets, with particular emphasis on dragon fruit, pepper, and pineapple production systems;
- Collaborating with interdisciplinary teams to support data-driven decision making for sustainable tropical agriculture;
- Contributing to scientific publications and international research collaborations.

The 1+3 PhD applicant should hold an MSc degree in Agricultural Engineering, Crop Science, Computer Science, Data Science, Artificial Intelligence, or a related field. Strong programming skills (Python or R), experience with machine learning frameworks (e.g., PyTorch or TensorFlow), and a strong interest in AI applications in agriculture are required. Good English communication skills are essential.

No.8 Root structure, fungal networks and nitrogen-fixing bacteria: harnessing belowground symbioses in sugarcane and sorghum on Hainan's acid soils

Are you fascinated by the hidden world beneath the soil and the role of root structure, fungi and bacteria in sustainable agriculture? We are looking for an enthusiastic PhD candidate to join an international research project investigating how the root systems of tropical crops interact with beneficial soil fungi and nitrogen-fixing bacteria under the acid soil conditions of Hainan Island, China.

The project is a collaboration between China Agricultural University (CAU) in Beijing and Wageningen University and Research (WUR) in the Netherlands, and is funded through a CSC scholarship as part of the AGD Phase 3 programme.

As the 1+3 PhD candidate, you will spend your first year at CAU, participating in field sampling across sugarcane fields in Hainan and preparing for the main experimental phase. You will then spend three years at WUR, where you will lead a greenhouse experiment using custom-designed rhizotube systems. Your research will focus on the microscopic root structures that control how water and nutrients enter the plant, using fluorescence microscopy, chemical analysis including GC-MS, and physiological measurements of root hydraulic conductivity. A key crop in your research will be sugarcane, potentially in combination with a second tropical crop.

We are looking for a candidate with a Master's degree in plant biology, plant physiology, crop science or a related field and Chinese nationality. Experience with microscopy, root physiology or biochemical analysis is an advantage. You are curious, motivated and enjoy working in an international and interdisciplinary team.

No.9 Policy Interactions, Free Trade, and Sustainable Food Systems: An Integrated Environmental-Economic Analysis of Hainan, China

The project focuses on Hainan Province, China—a rapidly transforming region shaped by the Free Trade Port policy and ecological sustainability initiatives. The research aims to analyse how economic development, agricultural systems, and environmental processes interact to influence sustainable food systems and rural livelihoods.

We seek highly motivated candidates with strong academic backgrounds, quantitative skills, and an interest in sustainability, agricultural development, and policy analysis.

The 1+3 PhD candidate will focus on Policy Interaction & welfare (Synthesis)

Candidate should have:

- A Master’s degree in economics, environmental economics, agricultural economics, environmental/sustainability science, or a related field
- Strong quantitative and analytical skills

- Experience or strong interest in mathematical modelling, input–output analysis, or environmental-economic modelling
- Programming skills, preferably in GAMS
- Chinese nationality (required for programme eligibility)
- Strong motivation for academic research and interdisciplinary work
- Excellent command of English (written and spoken)
- Ability to work independently and collaboratively in an international research environment

NO.10 Agriculture Green Development (AGD) Strategies of Ecosystem Restoration to Address Environmental Degradation under Anthropogenic Pressure in Hainan

This project will monitor the dynamics of land use, forest types, land surface temperature, air pollution and Greenhouse gases (GHGs) between 2000 and 2026 in the whole Hainan island. The project will analyze the interlinks and interactions among land use, urban expansion, tourism, agricultural activities, land surface temperature, air pollution and GHG. The project will highlight the influence of anthropogenic activities (including tourism-driven activities, agricultural activities and urban expansion) on ecosystem degradation. The project will also provide policy strategies to support the sustainable agriculture, tourism, and urban planning.

The 1+3 PhD project will focus on:

1. What are the spatial and historical change characteristics of land surface temperature, air pollution and GHG between 2000 and 2026.
2. What are the interactions of intensified human activities (e.g., urban expansion, unplanned infrastructure construction, agriculture activities, tourism) with land surface temperature change, air pollution, and GHG.
3. What models and approaches can effectively uncover the relationships between human activities and land surface temperature change, air pollution, GHG dynamics and identify the key underlying drivers.
4. What actionable policy and management recommendations can be made to mitigate these impacts and ensure sustainable tourism, agriculture green development, and the advancement of sustainable infrastructure and urban planning.

Position requirements for the 1+3 PhD:

- MSc degree in GIS, remote sensing, data science, climate science, or related disciplines.
- Basic knowledge and skills in QGIS, ArcGIS and satellite image analysis.
- Experience and skills in big remote sensing data analysis and cloud computing.
- Possesses proficiency in Python or R for big data analysis; knowledge of machine learning is considered an advantage.
- Demonstrates a strong interest and experience in processing and acquiring satellite-based data of land surface temperature, air pollution and GHGs.
- Interest in ecosystem restoration, development of related policies and strategies. Interest in identifying and assessing environmental degradation and anthropogenic threats, as well as in restoration interventions.
- Willing to support policy making for the sustainable development of agriculture, tourism and urban planning.