



**UNITED NATIONS  
UNIVERSITY**

**Duty Station: Dresden, Germany**

**VACANCY ANNOUNCEMENT  
Doctoral Researcher  
(DAAD Scholarship)**

**Organisational Unit** : United Nations University Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES)

**Reference Number** : 2021/UNU/FLORES/DR/DAAD/53

**Closing Date** : 20 June 2021

**About UN University**

The United Nations University (UNU) is an international community of scholars engaged in policy-oriented research, capacity development and dissemination of knowledge in furthering the purposes and principles of the Charter of the United Nations. The mission of UNU is to contribute, through research and capacity building, to efforts to resolve the pressing global problems that are the concern of the United Nations and its Member States.

For the past four decades, UNU has been a go-to think tank for impartial research on human survival, conflict prevention, sustainable development, and welfare. With more than 400 researchers in 12 countries, UNU's work spans the 17 Sustainable Development Goals' full breadth, generating policy-relevant knowledge to effect positive global change. UNU maintains more than 200 collaborations with UN agencies and leading universities and research institutions across the globe. For more information, please visit <http://unu.edu>.

**United Nations University for Integrated Management of Material Fluxes and of Resources (UNU-FLORES)**

UNU-FLORES develops strategies to resolve pressing issues in the sustainable use and integrated management of environmental resources such as water, soil, waste, energy, and other geo-resources that are of concern to the United Nations and its Member States – particularly in developing and emerging economies. Based in Dresden, Germany, the Institute engages in research, capacity development, postgraduate teaching, advanced training, and knowledge dissemination to advance the Resource Nexus in the UN-System. <https://flores.unu.edu/>

**Doctoral Research**

UNU-FLORES is delighted to announce a Doctoral Researcher opportunity as part of the [DAAD Graduate School Scholarship Programme](#). The successful candidate will have the opportunity to conduct research work under **one** of three topic areas under the guidance of supervisors at both UNU-FLORES and Technische Universitaet Dresden. Students will also collaborate with fellow doctoral students and senior scientists in research, event organisation and participation, publications where possible, and contribute to the Implementation Plan of UNU-FLORES and the mission of the United Nations. As a facet of the project, the

students must consider the impact of their research on communities, and the potential for their research to be transferred upon completion of the doctorate.

### **Project 1 "Managing a just transition to electric mobility: A Resource Nexus approach to end-of-life vehicles in the Global South."**

The main objectives of this doctoral research are to conduct a meta-study on the known environmental and public health impacts of electronic waste disposal in countries of the Global South. The successful candidate's research will have a particular focus on end-of-life (EOL) lithium-ion batteries (LIBs) but also building on general experiences with waste electrical and electronic equipment (WEEE). The student will analyse regulatory deficits within this project and the gap between waste volumes and capacities for safe recycling and disposal while considering multiple environmental compartments and exposure pathways (e.g. water, soil and air pollution; bioaccumulation of toxic substances in the food chain). As part of the project, the student will select at least two international trade flows of used (electric) vehicles spanning the Global North to the Global South (e.g. the USA to Mexico, Germany to Nigeria, Japan to Mongolia), and develop scenarios for future export volumes while considering the following: the age of the vehicles and remaining lifespan, the expected electronic waste generation in destination countries - particularly from EOL LIBs, the relevance of national export and import regulations, as well as international agreements, and environmental and public health threats. Finally, the thesis shall formulate policy recommendations for international trade regarding used electric vehicles, recycling, and disposal strategies for countries in the Global South, and the extended producer responsibility (EPR) of electric vehicle and battery manufacturers.

#### **Project 1 Responsibilities:**

- Research, write and publish papers in peer-reviewed scientific journals;
- Develop a methodology to forecast future electronic waste streams to the Global South, focusing on international trade with used electric vehicles;
- Support the development of a Resource Nexus approach for assessing the expected environmental and public health impacts of electric vehicle disposal in the Global South, comparing business-as-usual and sustainability-oriented scenarios;
- Undertake field visits, data collections, statistical analysis and model evaluation required for achieving research goals and implement the research plan;
- Develop approaches for the possible dissemination and transfer of knowledge to other regions that face similar challenges;
- Organise activities such as workshops related to the research project;
- Work closely alongside the supervising team, with the eventual goal of co-supervising master theses in the research field;
- Report research progress to the supervising team and in the project management system of UNU;
- Responsible for maintaining the database of the research project;
- Contribute to the Institute's educational programme and events, such as academic seminar, Dresden Nexus Conference, teaching activities, etc.;
- Perform other duties as assigned by the supervisors and the Director.

#### **Project 1 Required Qualifications and Experience:**

- An excellent academic profile including a Master's degree (grade 2.5 or [equivalent](#)) in Environmental or Chemical Engineering, Environmental Sciences, Circular Economy, Waste Management or related fields;
- The master's degree must be complete before starting the fellowship, and the last master's degree must have been completed within the six years before the nomination;
- Applicants must not have resided in Germany for more than fifteen months at the time of nomination;
- Must have two years of practical experience related to waste management and/or recycling;
- Proven experience in inter and transdisciplinary research, including interactions with relevant authorities and stakeholders;

- [Demonstrated](#) proficiency in English, with excellent writing and presentation skills; knowledge of the native language/s of the chosen case study areas is considered an advantage;
- Knowledge and experience of software for environmental impact/environmental health assessment (preferably free and open software) would be an asset;
- Strong planning, organisation and time management skills, with the ability to communicate clearly and efficiently;
- Must be flexible with the ability to establish priorities and work within prescribed timeframes;
- An excellent team player with strong interpersonal skills, as demonstrated by the ability to work in a multicultural, multi-ethnic environment with sensitivity and respect for diversity.

## **Project 2 "Integrating Soil-Forest-Water Nexus in Payments for Watershed Ecosystem Services: Conception and Application in Dryland Regions"**

Declining freshwater availability (blue vs green water) and the increased risk of climate change with the associated hydrological extremes (droughts and floods) are key challenges that many developing and emerging countries face. These challenges have sparked incentive-based policy for the purpose of linking water producers to water consumers, for example, through Payments for Watershed Services (PWS). However, little is known about the best design methods for PWS schemes to effectively address multiple resource issues with cross-cutting measures, according to local cultural, social, political, and environmental conditions.

The main objective of the doctoral project is to define a scientifically rational, technologically advanced, economically feasible, and socially acceptable PWS scheme. The watershed to be studied is located in the dryland Loess Plateau region of NW China. The watershed has an under-developed economy and suffers from severe soil erosion and increasing water shortage. Moreover, water use conflicts are growing in severity due to increased water demand by various users - both upstream and downstream. The watershed streamflow (an indicator of water availability) has decreased due to climate change and the consequence of undifferentiated forest/vegetation restoration measures that aimed to control soil erosion and alleviate poverty. A refined PWS (also called eco-compensation) scheme is to be designed and applied in this study area. To achieve this goal, the research work will (i) assess the impact of different land uses and vegetation cover (i.e., forest cover and structure), and their spatial patterns on the ecosystem services (including water and soil-related ones) at the watershed level from a supply perspective, (ii) quantify the demand of watershed ecosystem services from a protective and consumer perspective, and (iii) predict the possible environmental and economic benefits of revised PWS scheme scenarios through extensive investigation of stakeholders' interests.

The research outputs will contribute to advancing the Resource Nexus in land (i.e. forest, soil and water conservation) management as an integral component of watershed management, climate change adaptation, and overcoming Resource Nexus application barriers at a watershed scale. Results may be compared to other dryland regions (e.g. in East Africa, South America).

### **Project 2 Responsibilities:**

- Research, write and publish papers in peer-reviewed scientific journals;
- Develop a robust methodology to measure and quantify water and soil-related ecosystem services demand and supply, and interpret possible ecological and economic consequences;
- Support the development of a Resource Nexus approach for integrated watershed resource management and incentive design to bridge science and policy;
- Undertake field visits, data collections, statistical analysis and model evaluation required for achieving research goals and implement the research plan;
- Develop approaches for the possible dissemination and transfer of knowledge to other regions that face similar challenges;
- Organise activities such as workshops related to the research project;
- Work closely alongside the supervising team, with the eventual goal of co-supervising master theses in the research field;
- Report research progress to the supervising team and in the project management system of UNU;
- Responsible for maintaining the database of the research project;

- Contribute to the Institute's educational programme and events, such as academic seminar, Dresden Nexus Conference, teaching activities, etc.;
- Perform other duties as assigned by the supervisors and the Director.

### **Project 2 Required Qualifications and Experience:**

- An excellent academic profile including a Master's degree (grade 2.5 or [equivalent](#)) in Environmental Sciences, Water and Soil related Land Resources Management, Hydro Science or Hydrology, Economy, or related fields;
- The master's degree must be complete before starting the fellowship, and the last master's degree must have been completed within the six years before the nomination;
- Applicants must not have resided in Germany for more than fifteen months at the time of nomination;
- Must have basic knowledge and strong interest in modelling linked terrestrial and aquatic systems;
- Proven skills in statistical analysis and fieldwork experience are mandatory;
- Proven experience in inter and transdisciplinary research, including interactions with relevant authorities and stakeholders;
- Research experience in the field of PWS or Payment for Ecosystem Services (PES) would be highly advantageous;
- Experience with the application of hydrological models would be desirable;
- [Demonstrated](#) proficiency in English, with excellent writing and presentation skills; knowledge of the native language of the study area is considered an advantage;
- Strong planning, organisation and time management skills, with the ability to communicate clearly and efficiently;
- Must be flexible with the ability to establish priorities and work within prescribed timeframes;
- An excellent team player with strong interpersonal skills, as demonstrated by the ability to work in a multicultural, multi-ethnic environment with sensitivity and respect for diversity.

### **Project 3 "Climate Change and Water Availability in Data Scarce Arid Regions – Advancing the Nexus of Water-Soil-Atmosphere by a Combination of Remote Sensing and SVAT-Modeling"**

The project will focus on the water – soil – atmosphere nexus in rain-fed and irrigation farming in arid regions. Water availability in arid regions is scarce and episodic in character. In agriculture, traditional sustainable systems must rely on the harvesting of rainwater to mitigate dry periods, or risk using precious groundwater. The focus of water management systems concentrate is to safeguard or improve groundwater recharge, while traditional cropping systems - though versatile and drought-resilient (both supported by high biodiversity) - are often not very productive. Although "modern agriculture" often results in immediate benefits, they also risk permanent aquifer damage and loss of the original subsistence at a family level, leading to migration and loss in biodiversity.

As Climate Change (CC) projections have so far failed to provide accurate data for pertaining to rainfall in arid regions, CC poses additional challenges, with 'zero rainfall' statistically showing to be the most probable outcome. A lack of existing ground data intensifies this situation, with the most accelerated form of mitigation being the improvement of data access, and enhancing of current CC projections with additional data (such as remote sensing).

The main objectives of the research will include the investigation of spatial patterns of rainfall and (groundwater-based) irrigation in arid regions using remote sensing. In addition, the successful candidate will design models and improve CC projections in arid regions. Finally, a DSS system will be designed to implement (a) the irrigation scheduling of farmers, and (b) guidelines for CC adaptation.

### **Project 3 Responsibilities:**

- Research, write and publish papers in peer-reviewed scientific journals;
- Develop a robust methodology to identify, measure and interpret indicators of rainfall or irrigation;
- Support the development of a Resource Nexus approach for assessing water-soil-vegetation-atmosphere interactions in drylands;

- Undertake field visits, data collections, statistical analysis and model evaluation required for achieving research goals and implement the research plan;
- Develop strategies for the possible dissemination and transfer of knowledge to other regions that face similar challenges;
- Organise activities such as workshops related to the research project;
- Work closely alongside the supervising team, with the eventual goal of co-supervising master theses in the research field;
- Report research progress to the supervising team and in the project management system of UNU;
- Responsible for maintaining the database of the research project;
- Contribute to the Institute's educational programme and events, such as academic seminar, Dresden Nexus Conference, teaching activities, etc.;
- Perform other duties as assigned by the supervisors and the Director.

### **Project 3 Required Qualifications and Experience:**

- An excellent academic profile including a Master's degree (grade 2.5 or [equivalent](#)) in Hydro Science, Agricultural Science, Atmospheric Science, Water Engineering, Geography, or related fields;
- The master's degree must be complete before starting the fellowship, and the last master's degree must have been completed within the six years before the nomination;
- Applicants must not have resided in Germany for more than fifteen months at the time of nomination;
- Proven experience in inter-and transdisciplinary research, including interactions with relevant authorities and stakeholders;
- Script programming skills such as Python or R is mandatory, and experience handling big data and modelling, including AI, would be an asset;
- Experience in arid hydrology and remote sensing would be highly advantageous;
- [Demonstrated](#) proficiency in English, with excellent writing and presentation skills; knowledge of the languages of arid regions (such as Arabic) is considered an advantage;
- Strong planning, organisation and time management skills, with the ability to communicate clearly and efficiently;
- Must be flexible with the ability to establish priorities and work within prescribed timeframes;
- An excellent team player with strong interpersonal skills, as demonstrated by the ability to work in a multicultural, multi-ethnic environment with sensitivity and respect for diversity.

### **Duration and remuneration**

The [DAAD-GSSP](#) pays a monthly stipend of EUR 1200 for the duration of the Doctoral Research (up to a maximum of four years). The stipend is expected to cover all living and education expenses. While the Doctoral programme is tuition-free, [semester fees](#) of approximately EUR 250-300 will need to be paid directly to TU Dresden for enrollment. For additional information on the programme and the admission procedure, please visit our [website](#). The DAAD can also provide health insurance and introductory German classes. An additional allowance for travel or research will be part of the scholarship offered by the DAAD. Details will be shared with nominated candidates.

### **Contract specification**

This position is being offered as a full-time position and on a one (1) year Student Agreement with UNU-FLORES. The possibility of renewal is subject to satisfactory work performance and completion of specific milestones. The combined duration of the agreement shall not exceed four (4) years.

The successful candidate will be enrolled as a student based in Dresden, Germany.

Please note that due to the ongoing situation with COVID-19 and the travel restrictions imposed by national authorities, the selected candidate may be required to start the appointment remotely until further notice.

## Application Procedure

Interested applicants should submit their application for **one** of the three topic areas via [Impactpool](#) along with the following **required** documents:

1. A completed and signed Doctoral Programme [application form](#);
2. A letter of motivation confirming **which project** you are applying for;
3. A Curriculum Vitae;
4. A list of publications;
5. A summary of the doctoral project (max. 1 page);
6. A work schedule and timetable for the doctoral project, including details of any upcoming phases abroad/field research;
7. Copies of **ALL** university degrees and transcripts;
8. Proof of internships completed;
9. Evidence of language skills (see application form);
10. Abstract of MSc thesis (or equivalent);
11. Two [recommendation forms](#) (from **two** of your university professors).

This is a two-round selection process whereby students first apply for the position via UNU-FLORES. Any candidate who does not submit all required documents will be rejected. **Please note that only shortlisted candidates will be contacted.**

### First round:

Shortlisted candidates will be contacted for an interview. **Tentative interview dates are 05-16 July 2021.** As part of this interview, candidates will be asked to prepare and present a research proposal. Following the interviews, UNU-FLORES will nominate candidates for the scholarship to DAAD.

### Second Round:

Nominated candidates will be requested to submit their complete application documents electronically via the DAAD portal **within four (4) weeks** of nomination. UNU-FLORES will promptly issue the confirmation to nominated candidates along with a link to the DAAD application portal and a guide for international students.

### Special notice

The candidate do not hold international civil servant status nor are they considered a “staff member” as defined in the United Nations Staff Rules and Regulations and may not represent UNU in any official capacity.

UNU is committed to diversity and inclusion within its workforce, and encourages all candidates, irrespective of gender, nationality, religious and ethnic backgrounds, including persons living with disabilities to apply. Applications from developing countries, and from women are strongly encouraged.

UNU has a zero-tolerance policy on conduct that is incompatible with the aims and objectives of the United Nations and UNU, including sexual exploitation and abuse, sexual harassment, abuse of authority and discrimination.

### Information about UNU rosters

UNU reserves the right to select one or more candidates from this vacancy announcement. We may also retain applications and consider candidates applying to this post for other similar positions with UNU at the same grade level and with similar job description, experience and educational requirements.

### Scam warning

UNU does not charge any application, processing, training, interviewing, testing or other fee in connection with the application or recruitment process. Should you receive a solicitation for the payment

of a fee, please disregard it. Furthermore, please note that emblems, logos, names and addresses are easily copied and reproduced. Therefore, you are advised to apply particular care when submitting personal information on the web.