Resource Nexus for Sustainability Transformations –

NEXtra Doctoral Scholarship Programme 2027

The NEXtra Doctoral Scholarship Programme offers the opportunity to conduct doctoral studies on one of the topics listed below.

*Applicants may apply for **up to two topics** by submitting **a single application package** that includes **two separate research proposals**, each tailored to one of the topics.*

Depending on your interests and expertise, a range of research avenues or directions are possible for a specific topic. In your research proposal, you must specify and justify why you propose a specific research approach and study area for the selected topic.

Topics (sorted alphabetically)

Topic 1. Building the Circular City: A Resource Nexus lens on planning barriers and urban revitalisation

Supervisors: Univ.-Prof. Dr.-Ing. Robert Knippschild (Faculty of Environmental Sciences, TU Dresden); Dr. Alekseenko, Alexey (UNU-FLORES); Dr.-Ing. Georg Schiller (IOER).

The construction sector is responsible for a significant environmental impact. New construction and demolition have ecological consequences in terms of land, emissions and resource consumption, with negative effects on the climate, biodiversity and water balance. Revitalisation approaches in urban development contribute to extending the service life of existing buildings and thus harbour considerable circularity potential. However, they encounter economic, legal, technical and mental barriers. The aim of this work is to gain a better understanding of these limitations through international comparison and to derive conclusions and recommendations for action to promote circular approaches in the planning sector from case studies in different climatic, economic, demographic and institutional contexts. The analysis applies a Resource Nexus lens, understood as the integrated management of material flows and interlinked resources across the urban system. This requires a multi-perspective and interdisciplinary approach.

Required qualification and background:

- Master's degree in Urban Planning, Architecture, Geography or a related field;
- Advanced skills in Knowledge and understanding of the fundamentals and applications of integrated concepts such as SETS.

Topic 2. Communicating Resource Nexus indicators through persuasive maps

Supervisors: Prof. Dr.-Ing. habil. Dirk Burghardt (Faculty of Environmental Sciences, TU Dresden); Prof. Dr. Serena Coetzee (Head of Education, UNU-FLORES / Extraordinary Professor, University of Pretoria); Dr. Eva Hauthal (Faculty of Environmental Sciences, TU Dresden).

A holistic understanding of scarce, interconnected, and interdependent environmental resources is essential for finding optimal solutions for the sustainable management of environmental resources (Brouwer et al. 2023). Indicators have been developed to measure synergies and trade-offs between different environmental resources (e.g., https://wefnexusindex.org/). Revealing the linkages and dependencies between different resources is often communicated through multi-variate thematic maps (Laspidou et al. 2020).

These multi-variate maps are complex and usually very scientific in appearance. They may be suitable for communicating information to decision-makers, but it is difficult to reach the average population with them. Maps of the persuasive cartography genre have an emotional appearance, aroused curiosity to engage with the content, and present facts in a simplified and selective manner. The latter is not meant to be understood as manipulation, but as emphasis. The criteria of clarity, accuracy, and objectivity used by academic cartography to assess maps cannot be applied to persuasive maps. Nevertheless, persuasive maps are a targeted means of communication and a legitimate form of maps that use its own design principles, visual grammar, and rhetorical devices (Muehlenhaus 2013).

A fusion of these two genres, i.e. persuasive scientific maps, appears promising for communicating information about scarce, interconnected and interdependent environmental resources to the public in a comprehensible, engaging and yet credible manner. This requires the development of strategies and guidelines for converting multi-variate datasets into simplified concepts and subsequently communicating and visualising these in a persuasive yet scientific manner.

The research must be conducted in the context of one specific UNU-FLORES focus area. Your research proposal must specify the focus area you selected and explain how your research will contribute to this focus area.

Brouwer, F., Caucci, S., Karthe, D. et al. (2023) Advancing the resource nexus concept for research and practice. *Sustainability Nexus Forum*, 31, 41–65.

Laspidou CS, Mellios NK, Spyropoulou AE et al. (2020). Systems thinking on the resource nexus: Modeling and visualisation tools to identify critical interlinkages for resilient and sustainable societies and institutions. *Science of the Total Environment*. 717 (2020) 137264, 1-18.

Muehlenhaus I. (2013): The design and composition of persuasive maps. *Cartography and Geographic Information Science* 40 (5): 401–414.

Required qualification and background:

- Master's degree in cartography, geoinformatics, geography, environmental science or a related field;
- Skills in designing and producing maps with GIS and/or publishing software;
- Experience in map design from conceptualization to production.

Topic 3. Construction follows availability – Resource Nexus strategies for urban-regional development minerals

Supervisors: Univ.-Prof. Dr.-Ing. Wende, Wolfgang **(**IOER, TUD Faculty of Architecture); Dr. Alekseenko, Alexey (UNU-FLORES); Dr.-Ing. Schiller, Georg (IOER); Dr.-Ing. Habil. Ortlepp, Regine (IOER).

Urbanisation represents a primary driver of global resource consumption and associated greenhouse gas emissions. To mitigate these impacts, strategies must be developed and implemented at the city-regional scale to address the increasing threat of regional resource scarcity. This necessitates a fundamental transition from linear to circular models of urbanisation that explicitly consider the spatially differentiated availability of both natural and anthropogenic resources.

Within this context, development minerals play a pivotal yet often overlooked role. Development minerals are non-metallic minerals and construction materials such as sand, gravel, clay, limestone, gypsum, and dimension stones (e.g. granite and marble) that are typically extracted in quarries and small- to medium-scale mines and used predominantly in domestic markets. Unlike high-value metallic minerals, they form the material backbone of housing, infrastructure, manufacturing, and agriculture, underpinning local economies, employment, and poverty reduction.

A resource-efficient urban-regional approach must therefore account for the sustainable extraction and utilisation of development minerals from peri-urban and hinterland areas, while simultaneously improving the management of anthropogenic material stocks within existing urban environments. This includes balancing quarrying activities with ecosystem resilience, land-use planning, and social acceptance, maximizing the potential for reuse, recycling and substitution of building materials and integrating secondary materials into the raw materials security system as a second pillar for ensuring the security of supply of development minerals.

The aim of this study is to assess the extent to which urban housing demand can be met through locally available primary and secondary development minerals, while safeguarding the ecological resilience of hinterland ecosystems and reducing dependence on long-distance material transport. Achieving this requires a comprehensive understanding of alternative, context-sensitive construction methodologies that align with regional material availability and integrate cross-life-cycle assessment frameworks.

The expected outcome is the identification of urban-regional strategies that reconcile housing and infrastructure development as well as development mineral security planning with circular economy principles, ecological resilience, and the sustainable governance of primary and secondary development mineral supply chains.

This topic will contribute to the UNU-FLORES focus area, *Sustainable Constructions and Buildings*.

Required qualification and background:

- Master’s degree in Urban and Regional Planning, Physical Geography, Geography, or a closely related discipline;
- Advanced knowledge of urban development and construction methods, including material flows and regional supply chains;
- Strong skills in spatial analysis and quantitative methods relevant to urban and regional studies;
- Advanced proficiency in geospatial analysis of satellite imagery using GIS software;
- Demonstrated experience in geospatial analysis projects, covering project design, data processing, analysis, and presentation of results;
- Ability to integrate spatial data with environmental, infrastructural, and socio-economic datasets.

Topic 4. Data-driven investigation into the spatial relationship between economic restructuring and the resource nexus in the context of developing countries

Supervisors: Univ.-Prof. Dr. sc. pol. Artem Korzhenevych (IOER / Faculty of Business and Economics, TU Dresden); Prof. Dr. Edel Günther (UNU-FLORES / Faculty of Business and Economics, TU Dresden); Prof. Dr. Serena Coetzee (UNU-FLORES / Extraordinary professor, University of Pretoria).

The negative ecological effects of urban and regional development are multifaceted: settlement sprawl leads to permanent loss of ecologically valuable soils, increased water demand, fragmentation of landscapes, and destruction of habitats for flora and fauna (biota). A significant amount of open space is converted into new infrastructure, industrial and commercial sites every day, often accompanied by rising pressure on local water resources, also in areas experiencing economic decline and population loss. The process is geographically uneven, as are economic structural changes (major shifts in activity and employment between economic sectors). On the policy side, public authorities in spatial planning and water governance likely influence how economic dynamics affect land and water consumption.

The link between economic structural change, land and water consumption, and resource-use regulation (soil, biota), however, is still insufficiently considered in spatial economics and geography, especially in the Global South context. Both economic restructuring and land- and water-use dynamics can be spatially heterogeneous, and understanding their interconnection thus must be based on the analysis of spatially detailed time-series data. This project will use geospatial data to disentangle the effects of structural change and economic dynamics on land and water consumption, establish causal mechanisms, and scrutinize the importance of specific economic sectors as well as policy initiatives for land and water use in the developing country context.

This topic will contribute to the UNU-FLORES focus area, *Transformed Landscapes*.

Required qualification and background:

- Master's degree in Economics or Economic Geography, or a related field;
- Advanced knowledge and experience in spatial statistics and GIS, access to time-series data on land and water consumption and on sector-specific economic variables (production, employment, tax rates) on fine spatial level (cities and regions or grid data), understanding of resource economics.

Topic 5. From Resource Nexus Thinking to Action: Fostering and Measuring Systems Thinking, Agency, and Behavioral Spillover

Supervisors: Prof. Dr. Thomas Köhler (Chair of Education Technology, Faculty of Education, TU Dresden); Prof. Dr. Serena Coetzee (Head of Education, UNU-FLORES / Extraordinary Professor, University of Pretoria); Dr. Mathias Hofmann (Center for Open Digital Innovation and Participation (CODIP, TU Dresden).

A holistic understanding of scarce, interconnected and interdependent environmental resource systems is essential for finding optimal solutions for their sustainable management and the future of the planet. The Resource Nexus approach addresses this need by considering the management and use of environmental resources from an integrated systems perspective.

To date, impacts on specific resources (e.g., greenhouse gas emissions, carbon footprint), systems thinking and specific combinations of resources (e.g. water-energy-food) have received attention in formal learning settings. However, a more holistic perspective in non-formal learning settings (e.g. community-based citizen science, NGOs, local initiatives) remains underexplored. This PhD project investigates how digitally supported, participatory Resource Nexus education can foster enduring pro-environmental behavior across multiple environmental resource systems (e.g. water, energy, biodiversity, waste) and enhance wellbeing. The focus is on non-formal learning settings in developing countries around the globe.

The PhD candidate will examine how integrated, nature-based citizen science activities may be facilitated by digital tools (apps, online platforms, ecological momentary assessment) and help learners to understand interdependencies between resources, experience nature and wellbeing, and allow them developing a sense of agency in local sustainability transformations. Key questions include:

- Under which conditions does “nexus thinking” translate into stable behavioral spillover (from one sustainable practice to others)?
- How do psychological and mechanisms such as environmental/nexus identity, self-efficacy under complexity, nature connectedness and value coherence mediate this process?
- And how do different forms of participation (from basic data collection to co-design, educative measures and community decision-making) shape these trajectories?

Concerning research methods, the PhD will combine quantitative longitudinal methods (e.g. app-based behavior tracking, repeated surveys) with qualitative approaches (e.g. interviews, participatory reflection workshops). Applicants with backgrounds in psychology, education, environmental or sustainability sciences, human–computer interaction, or related fields are welcome. A strong interest in

theory-driven research on behavior change, wellbeing, and participation in sustainability transformations is essential. And in case the research focus does even more deal with research method ultimately, the construction of a measurement instrument for nexus thinking could be addressed: How can one validly and accurately determine whether a person/community has truly internalized nexus thinking (after an intervention)?

The research must be conducted in the context of one specific UNU-FLORES focus area. Your research proposal must specify the focus area you selected and explain how your research will contribute to this focus area.

Required qualification and background:

- Master's degree in psychology, education, environmental or sustainability sciences, human–computer interaction or a related field;
- Skills and experience working with digital tools such as mobile apps and online platforms;
- Experience in educational settings and/or working with community-based initiatives or NGOs;
- Experience in a mixed methods approach using quantitative and qualitative research methods.

Topic 6. Geospatial data rescue from a Resource Nexus perspective

Supervisors: Prof. Dr. Lars Bernard (Faculty of Environmental Sciences, TU Dresden); Prof. Dr. Serena Coetzee (Head of Education, UNU-FLORES / Extraordinary Professor, University of Pretoria); Dr. Auriol Degbelo (Faculty of Environmental Sciences, TU Dresden).

A holistic understanding of interconnected and interdependent environmental resource systems is essential for finding optimal solutions for their sustainable management and the future of the planet. The Resource Nexus approach addresses this need by considering the management and use of environmental resources from an integrated systems perspective, where synergies and trade-offs are carefully managed and optimized.

To achieve this, the dependencies between environmental resources must be mapped, and assessed, quantitatively and/or qualitatively. For this, geospatial data is needed. However, important historical datasets providing baselines for understanding long-term trends are often at risk of permanent loss due to technological changes and institutional/financial factors (e.g. funding cuts, project termination or changing policy priorities).

For this topic, the focus would be on the challenges related to how institutions and researchers should prioritize the geospatial datasets to rescue with a view to assessing and monitoring the Resource Nexus and related changes. A second aspect addresses ways to assess how the loss of geospatial datasets may undermine long-term scientific understanding of environmental resource systems. The study would focus on a particular nexus at a specific scale / level (global, supra-national, national, sub-national). The results would support better informed decision-making from a Resource Nexus perspective.

The research must be conducted in the context of one specific UNU-FLORES focus area. Your research proposal must specify the focus area you selected and explain how your research will contribute to this focus area.

Required qualification and background:

- Master's degree in Geoinformatics, Computer Science, Information Systems, or a related field;
- Experience in geospatial data governance, e.g., in spatial data infrastructures or enterprise data architectures as data steward or in other roles.

Topic 7. Integrating remote sensing and the Resource Nexus for resilient post-mining land use

Supervisors: Prof. Dr. Matthias Forkel (Faculty of Environmental Sciences, TUD); Dr. Alexey Alekseenko (UNU-FLORES).

Post-mining landscapes present complex challenges for sustainable reuse, requiring integrated solutions that address soil degradation, water management, and community needs. This research combines remote sensing technologies (e.g., satellite imagery, LiDAR, hyperspectral data) with the integrated resource management framework to assess and optimize post-mining land rehabilitation.

The study will:

- Monitor land degradation and recovery using remote sensing to track soil quality, vegetation regrowth, and water systems in former mining areas.

- Evaluate trade-offs between different land-use options (e.g., reforestation, renewable energy, agriculture) using the Resource Nexus approach to balance environmental, economic, and social outcomes.

- Develop decision-support tools for policymakers and land managers, incorporating stakeholder input to ensure equitable and scalable solutions.

Case studies will focus on mining regions undergoing transition, with potential applications in the Global South and industrialized economies. By bridging geospatial analysis and Nexus thinking, this research aims to provide science-based strategies for resilient post-mining landscapes, contributing to global efforts in sustainable resource management.

This topic will contribute to the UNU-FLORES focus area, *Transformed Landscapes*.

Required qualification and background:

- Master's degree in Environmental Science, Geography, Geospatial Monitoring and Remote Sensing, or related fields;
- Skills in qualitative/quantitative methods (e.g., GIS, life cycle assessment, stakeholder interviews);
- Knowledge of land use policy frameworks;
- Familiarity with sustainability transitions theory or Resource Nexus approaches is advantageous.

Topic 8. Land Use Dynamics of Large-scale Infrastructure Projects in the Global South from a Resource Nexus Perspective

Supervisors: Dr. Behnisch, Martin (Environment Sciences Faculty, Chair of Spatial Information and Modelling, TU Dresden and IOER); Prof. Dr. Serena Coetzee (UNU-FLORES / Extraordinary professor, University of Pretoria); Dr.-Ing. Sikder Sujit Kumar (Research Area – Spatial Information and Modelling, IOER); Dr. Zarei, Azin (Research Associate, UNU-FLORES).

Large-scale infrastructure development projects driven solely by economic objectives often generate adverse climate impacts in many countries of the Global South, contributing to environmental degradation within broader global climatic dynamics. Although numerous countries articulate in their national land-use policies that no additional agricultural land should be converted to non-agricultural uses, measurable and enforceable targets for limiting land conversion are frequently absent, replaced instead by broad, aspirational statements.

This gap underscores the need for evidence-informed policymaking for large-scale land-consuming activities, grounded in integrated development approaches that consider human well-being with environmental sustainability alongside economic growth. A central hypothesis for such work is the existence of a trade-off between environmental carrying capacity and land consumption for major infrastructure development, particularly in the cases of data-poor regions of the Global South.

This doctoral research will address this gap through multi-level geospatial data analytics at least national, regional and local case studies. The analytical focus should extend toward the future—examining not only what places have become or are currently becoming, but also what they may evolve into under different development trajectories. Addressing these challenges requires hybrid modeling approaches combining geospatial and multi-criteria-based land use scenario; and the integration of multi-dimensional, interdisciplinary data sources. Such an approach strengthens the potential for generating actionable insights, and should be conducted from a Resource Nexus perspective that recognizes the interdependencies among land, water, energy, climate, and socio-economic systems.

Required qualification and background:

- Master's degree in Geography, Geoinformatics, Urban/Regional Planning, Spatial planning or similar;
- Experience in geospatial data modeling, analysis and interpretation using open remote sensing datasets e.g. JRC-GHSL, DLR-WUF;
- Advanced skills in GIS-related open-source software, including spatial and statistical packages/libraries in R and Python;
- Familiar with geospatial ETL-workflows, replication and reproducible open science practices.

Topic 9. Operationalizing transformative capacity for environmental resource governance: A mixed-methods assessment approach for urban and regional systems

Supervisors: Prof. Artem Korzhenevych (IOER / Faculty of Environmental Studies, TU Dresden); Prof. Marc Wolfram (IOER, Faculty of Arts, Humanities and Social Science); Prof. Dr. Serena Coetzee (Head of Education (UNU-FLORES) / Extraordinary Professor, University of Pretoria); Associate Professor Nerhene Davis (University of Pretoria).

As societal activities globally are exceeding planetary boundaries increasingly (seven out of nine in 2025), sustainability transformations in resource usage are urgently required. This demands improved understanding of transformative capacities in governance systems for interconnected resource usage. It equally demands to account for the crucial importance of geography and spatiality in building such capacities.

Comprehensive frameworks exist for identifying the relevant factors that shape transformative capacities (e.g., Wolfram 2016). More coarse-grained analyses may also focus e.g. on agency and structural constraints only, hypothesizing that transformative capacity increases where social agency is high (e.g. communities, networks, transformative leadership) and structural constraints are low (e.g., regulatory rigidity, material infrastructures, centralised governance). However, a significant research gap remains in operationalizing an efficient assessment and comparison of transformative capacities in cities and regions, based on empirical data.

This doctoral research will address this gap by developing and testing a spatial indicator approach for assessing transformative capacity in interconnected environmental resource governance involving a Resource Nexus perspective. A comparative case study should be conducted of 2-3 city-regions situated in the Global South focusing on nexus relationships between cross-scale processes of resource usage and management within a particular action domain (e.g. food, energy, mobility, construction and housing, circular economy) and identifying the respective transformation requirements.

The methodology should then explore indications of transformative capacities by linking quantitative spatial analysis with qualitative ground-truthing. It should juxtapose large-scale spatial datasets (e.g. remotely sensed data, resource flow data, socio-economic data proxies for agency forms) on the one hand, with empirical social research data on the other (e.g. governance structures and processes based on document analysis, interviews, focus groups) in order to determine which spatial data signals can reflect on-the-ground assessed transformative capacity in the selected city-regions. It should thus derive a valid and highly efficient assessment approach drawing only on selected quantitative and qualitative data sets.

Required qualification and background:

- Master's degree in social sciences or humanities, e.g. political sciences, (ecological) economics, sociology, human geography, spatial and planning studies, anthropology, sustainability sciences or a related field;
- Understanding of sustainability transition studies, environmental resource management, governance studies and spatial studies;
- Advanced knowledge in empirical social science methodology, including case study design, qualitative and quantitative data collection and analysis;
- Basic proficiency in geospatial data analysis and geovisual analytics using GIS software and Python, or a willingness to learn it.

Topic 10. Resource Nexus approach to the Quantification of Responsible Mobility in Transport Networks in Data Scarce Regions in the Global South

Supervisors: Prof. Dr. Waller, S. Travis (Transport and Traffic Sciences, TU Dresden); Prof. Dr. Serena Coetzee (Head of Education, UNU-FLORES / Extraordinary Professor, University of Pretoria); Univ.-Prof. Dr.-Ing. Regine Gerike (Transport and Traffic Sciences, TU Dresden).

Responsible mobility is an emerging concept that spans aspects including sustainability, equity, accessibility and livability. The UN Decade of Sustainable Transport underlines the importance of sustainable transport for driving sustainable development. The positive effects of transport networks, such as individual mobility and accessibility, must be balanced against negative effects, such as pollution from noise and emissions and the impact on biodiversity and ecosystems. While transport networks are critical for the basic needs of human mobility, it is often difficult to quantify responsible mobility, particularly in regions of data scarcity. Additionally, a Resource Nexus approach, aimed at a holistic understanding of interconnected and interdependent environmental resources required for and impacted by transportation is essential for finding optimal solutions.

Therefore, new methods are required that build on data science, machine learning in addition to traditional transport network modelling approaches such as network demand/supply equilibrium to develop the necessary analytics and planning models required to envision system improvements. For this topic, the doctoral candidate will develop and evaluate novel methods for assessing the social, environmental and economic impact of traffic and transportation systems in data scarce regions typically found in the Global South.

The research must be conducted in the context of one specific UNU-FLORES focus area. Your research proposal must specify the focus area you selected and explain how your research will contribute to this focus area.

Required qualification and background:

- Master's degree in Civil Engineering, Transportation, Environmental Sciences, Geography, Geoinformatics or a related field;
- Advanced skills in geospatial network analysis using GIS software;
- Experience in transportation modelling;
- Experience in geospatial analysis of projects from conception to execution and presentation would be an added advantage.

Topic 11. Rethinking coastal resources in the Global South: Material potential, conflicts of use and sustainable value creation of seagrass

Supervisors: Prof. Dr. Edel Günther (UNU-FLORES / Faculty of Business and Economics, TU Dresden); Dr. Matthias Walz (Associate Progamme Officer for Sustainable Finance, UNU-FLORES); Dipl.-Ing. Unbehaun Holger (TU Dresden, Chair of Wood Technology and Wood-based Bioeconomy); Dipl.-Ing. Guenther, Raphaela (TU Dresden, Chair of Space Systems).

The thesis examines seagrass as a renewable raw material from an interdisciplinary perspective at the interface of materials science, environmental and systems analysis, and sustainability and transformation research. Seagrass has been used for centuries as insulation and building material; current research also shows its potential as a high-performance material, e.g. for applications in space engineering or other technologically demanding industries. This wide range of possible applications makes seagrass a suitable case study for the analysis of sustainable material flow systems in the context of the resource nexus.

The thesis focuses on a holistic view of material flows throughout the life cycle of seagrass – from marine carbon sequestration to accumulation, collection and processing to various use paths and end-of-life options. The interactions between material properties, energy consumption, water and land use, and climate-relevant effects are systematically analysed. The construction sector is a key area of application, as it offers high potential for substituting conventional, resource- and emission-intensive materials. In addition, innovative fields of application are included in order to highlight competing uses, synergies and conflicting goals in the resource nexus.

There is a particular focus on coastal regions in the Global South, where large quantities of seagrass accumulate, there are high population densities, limited resource availability and socio-economic vulnerabilities. In addition to technical and ecological factors, economic conditions, local value creation potential, institutional structures and social acceptance are therefore also integrated into the analysis.

The aim of the doctoral thesis is to develop a robust basis for decision-making on sustainable uses of seagrass by combining materials science investigations with systemic and socio-economic analyses. The work thus contributes to the further development of regional bioeconomies and to the evaluation of renewable materials in the context of global resource and sustainability challenges.

Required qualification and background:

- Master's degree in Materials Science, Engineering (Environmental Engineering, Process Engineering, Civil Engineering, Industrial Engineering), Sustainability Sciences or a related field;

- Experience or demonstrable interest in quantitative assessment methods, e.g. Life Cycle Assessment (LCA), Material Flow Analysis (MFA), Material flow or system modelling;
- Basic understanding of renewable material properties and marine or coastal systems;
- In-depth knowledge in the field of sustainability, resource efficiency or bioeconomy;
- Ability to combine interdisciplinary methods (technical, ecological, socio-economic);
- Strong analytical and systematic thinking;
- Ability to familiarise yourself with new topics independently.

Topic 12. Sustainable resource management in peri-urban areas and/or informal settlements of developing countries: The role of land rights and access to connected environmental resources

Supervisors: Prof. Dr. Daniel Karthe (Honorary Professor, TU Dresden); Prof. Dr. Serena Coetzee (Head of Education (UNU-FLORES) / Extraordinary Professor, University of Pretoria); Associate Professor Nerhene Davis (University of Pretoria).

Based on the tenet that land tenure security cannot be granted by the state alone but that it must be derived from socially accepted practices and community membership (i.e., it must be "socially embedded"), this study will explore how land rights and access to land can be guided towards the integrated and sustainable management of environmental resources in peri-urban areas and/or informal settlements of developing countries.

Following a review of state-of-the-art knowledge about land rights and access to land in developing countries, the candidate will follow a mixed methods approach for collecting quantitative and qualitative data from local stakeholders. Based on this, sustainability of transition pathways towards socially embedded governance of land access in peri-urban areas will be developed and assessed.

The research must be conducted in the context of one specific UNU-FLORES focus area. Your research proposal must specify the focus area you selected and explain how your research will contribute to this focus area.

Required qualification and background:

- Master's degree in Geography or Environmental Sciences, or related field;
- Experience in a mixed methods approach using quantitative and qualitative research methods.

Topic 13. Translating Scientific Evidence on the Resource Nexus into Policy: Implementing Resource Nexus solutions on the ground

Supervisors: Prof. Dr. Daniel Karthe (UNU-FLORES); Prof. Dr. Anna Holzscheiter (Chair of Political Sciences with Focus on International Politics, TU Dresden).

In the past 15 years, the Water, Energy and Food (WEF) Nexus has become a popular instrument for the assessment and management of interdependent environmental resources and related policy issues/fields. While WEF has established itself as a key approach, there have been repeated calls for broadening the array of nexus approaches ("Resource Nexus") and linking environmental issues (and resources) to neighboring policy fields such as health. By now there is a considerable body of scientific literature on the original WEF resource nexus, its evolution, broadening, implementation and continued relevance in the work of the United Nations. But how has this scientific evidence been translated into policy and practice on the ground?

The goal of this doctoral thesis is to understand differences between the implementation of Nexus approaches in the work of the UN and the scientific state of the art. A multi-method approach is to be developed that systematically compares UN and member state policies (e.g., as documented in reports or policy briefs) to the scientific state-of-the art. It is encouraged to look at specific examples/member states, where core UN documents (e.g., Common Country Analysis, Sustainable Development cooperation framework) and the ongoing work of the UN (assessed via project websites, interviews, ...) can reveal additional insights. Ultimately, the assessment of the differences can help guide both scientific policy guidance and future research needs.

The research must be conducted in the context of one specific UNU-FLORES focus area. Your research proposal must specify the focus area you selected and explain how your research will contribute to this focus area.

Required qualification and background:

- Master's degree in Political Sciences, International Relations, (Human) Geography, Environmental Sciences, Development Studies or related fields;
- Experience related to the work of the UN, international organizations and/or in a development cooperation context would be an asset.
