1: Title and principal investigator

Full project title: Climate change, rural livelihoods, and nature protection in the Rufiji Delta. Acronym: ΔRufiji. Project coordinator (PI): Professor Henrik Meilby, Department of Food and Resource Economics, Faculty of Science, University of Copenhagen.

2: State of the art and rationale

This project investigates the differentiated environmental and social impacts of climate change, nature protection, and development projects in mangroves, and how local people respond to the interlinked climatic, biophysical, socio-economic, and political changes.

Mangroves are of great environmental, ecological, and socio-economic importance, protecting farmlands from storm flooding, as carbon sinks, tropical marine biotopes, and sources of income. However, climate change leads to changes in river flow, salinity, and seasonal risk of flooding, which together with increasing temperatures, conversion to other land uses (especially paddy farming and grazing), and unsustainable wood extraction affect mangrove ecosystems and livelihoods (NEMC, 2023). Indeed, mangroves decline rapidly worldwide and Tanzania is no exception (Sandilyan & Kandasamy, 2012; Benjaminsen & Bryceson, 2012; NEMC, 2023). Although Tanzanian mangroves are national forest reserves, they are degrading at an alarming rate, especially in the Rufiji Delta (Wagner & Sallema-Mtui, 2016; Mshale et al., 2017; Nyangoko et al., 2022; NEMC, 2023). By contrast, Participatory Forest Management, which was legislated in 2002, has yielded positive environmental and socio-economic effects in inland Miombo (Mshale et al., 2017; Noe et al., 2022; Brockington et al., 2022; Lund & Treue, 2008; Treue et al., 2014). Simultaneously, protected terrestrial and marine areas have grown substantially in size and coverage, built on complex partnerships between local communities, institutions and businesses (Noe et al., 2022). In June 2023, the Rufiji-Mafia-Kibiti-Kilwa (RUMAKI) Biosphere Reserve, which includes the Rufiji Delta, was declared under UNESCO's Man and Biosphere programme (NEMC, 2023).

The changing biophysical conditions in the Rufiji Delta, however, are not only a result of climate change. Additional factors include a growing human population, expansion of socio-economic activities, and development projects, such as the newly constructed Julius Nyerere Hydropower Plant and Dam, which modify the seasonal flooding patterns and reduce river flow and sediment supply, thereby greatly impacting the coastal and marine habitats (Shagude, 2016; Duvail et al. 2017; Kangalawe and Masao 2018; Enerdata, 2022). As these developments combine, the Rufiji Delta's institutional setup and biophysical conditions are rapidly changing. While some positive environmental effects emerge from nature protection initiatives in mangrove and coastal areas, the socioeconomic and sociopolitical outcomes are mostly negative (Noe et al., 2022). Despite appealing rhetoric and legislation on 'community-based conservation', local people have gradually suffered uncompensated losses of access to resources through conservation projects (Noe et al., 2022). Research from other contexts further shows how these losses are unequally distributed in local communities depending on already existing power structures such as class and gender (Begum et al., 2022; Peterson, 2015). While the Rufiji catchment has been studied intensively since the 1990s within a range of scientific disciplines, research gaps still exist to understand how the current developments contribute to livelihood transformations and climate (in-)justice.

To enable assessment of the climate mitigation capacity of mangroves, biomass models have been prepared for mangrove tree species, particularly in Southeast Asia (Komiyama et al.

2008), but also in East Africa including Tanzania (Njana et al. 2016a,b). Such models serve to estimate stand biomass and carbon stock (e.g. Monga et al. 2022 for the Rufiji Delta). Data on mangrove biomass dynamics, however, are sparse, and assessments of the role of mangroves as carbon sinks have often focused on litterfall and much less on the biomass accumulation in tree stems (Xiong et al. 2019), although biomass growth and its distribution are influenced by salinity and thus also by climate change (Ahmed et al. 2023). Very few studies exist on the growth and yield of mangrove tree species in East Africa (Njana 2018, 2020), and assessments of regeneration dynamics and degradation are mostly done through analysis of size structure (Macamo et al. 2018) or land cover change (Lagomasino et al. 2019) (*knowledge gap 1*).

The negative socio-economic effects of nature protection suggest issues of maladaptation, i.e. when the drivers of climate change vulnerability are overlooked and/or ignored and the unintended outcomes of project activities and processes create new, reinforce, deepen, or shift vulnerabilities amongst certain groups rather than decreasing them (Eriksen et al., 2021; Schipper, 2020; Atteridge & Remling, 2018; IPCC, 2022). Knowledge, however, is lacking on the global, national, and local contexts of vulnerability that shape the outcomes of nature protection projects and thus what causes maladaptation and vulnerability redistribution (Eriksen et al., 2021). Despite the vast literature documenting unequal gender impacts of climate change (e.g. Pearse, 2016), studies that take into consideration the differentiated gendered causes of maladaptation are lacking. This is particularly true in the Rufiji-Delta where peer-reviewed studies that document the socio-economic context are lacking. Meanwhile, local people are not passive but adapt to, accommodate, or resist new circumstances and rules through independent reflections and actions (McNay 2000; Katz 2004; Kangalawe and Masao 2018). These reflections and actions are responses to both material and emotional conditions, and anger over lost livelihoods, can, for example, spur action (González-Hidalgo and Zografos 2020). Recent studies from the Rufiji Delta have investigated the implications of ecosystem services and the perception of state management in communities (Nyangoko et al. 2022; Gayo 2022). Yet, despite their importance in shaping both experiences and outcomes of climate change and nature protection efforts, people's emotions and agency in these contexts are still relegated to the sidelines (Sultana, 2015; Glover et al., 2019) (*knowledge gap 2*).

People's responses to nature protection and climate change adaptation projects are closely connected with the institutional setup, and conflicts over resource rights are shaped by the political institutions holding, at times competing, authorities to define rules and rights (Lund, 2016). Often, the official institutional setup fails to shape and enforce the rights of local communities and protect their differentiated livelihood interests (Ribot 2004, 2014). In response, competing local-level public authority institutions emerge to (re-)gain or maintain access (the ability to benefit from) local resources (Ribot and Peluso, 2003; Peluso and Ribot, 2020; Lund 2022). Meanwhile, the tourist industry and conservation organisations have generated substantial incomes from exclusions established through new official institutions (Benjaminsen and Bryceson, 2012; Brockington et al. 2022). Findings by Kangalawe and Masao (2018) indicate such processes unfold yet, it is still unclear how this plays out in the Rufiji Delta after the recent establishment of the Biosphere Reserve. To understand the differentiated local livelihood outcomes of multiple factors (cf. Ribot, 2014: 676), it is thus important to understand the place-based processes of rulemaking, enforcement, and how people follow these, or not, and why (c.f. Peluso and Ribot, 2020) (*knowledge gap 3*).

The rudimentary understanding of institutional arrangements and contexts of (gendered) vulnerabilities, emotions, and agency partly results from the dominance of quantitative

approaches to understand social aspects of climate and ocean change, whereas qualitative approaches are needed for a more in-depth understanding of local people's differentiated, emotional experiences, agency, and resulting activities (Bercht, 2021; Peluso and Ribot 2020). Accordingly, to promote a socially just, sustainable mangrove and aquatic life conservation this project draws on interdisciplinary and mixed methods to establish a better understanding of the biophysical changes and how different groups of local people adapt to, take advantage of, resist, and suffer from biophysical and sociopolitical changes. In doing so, the project provides a holistic understanding, helping to identify the most important changes in exogenous factors including climate and conservation policy, assess their interactions, and document their combined effects on mangrove forest dynamics and livelihoods, including distributional aspects, vulnerabilities and emotional impact. Promoting this understanding of cause-effect relations is crucial to promote climate justice.

3: Relevance and context

Internationally, the biodiversity crisis is highlighted by IPBES (2019) and the Global Biodiversity Framework (2022), and the urgency of climate mitigation and adaptation, the threats to health and livelihoods of vulnerable groups, and the need to prioritize equity and justice are highlighted by IPCC (2022). The focus on livelihoods, conservation, management, and governance linkages in the Rufiji Delta will further inform decision-making concerning Sustainable Development Goals 1 (no poverty), 2 (zero hunger), 5 (gender equality), 10 (reduced inequalities), 13 (climate action), 14 (life below water), and 15 (life on land). Danish development priorities as outlined by MFAD (2024) will be informed especially through the project's emphasis on good governance, reduction of poverty and local inequality, local participation and the need for growth to become more inclusive and sustainable. The project also informs political decision-making related to the specific objectives in Tanzania's Five-Year Development Plan (FYDP-III, 2021: 4-5), particularly (viii) emphasizing inclusive economic growth and poverty reduction, and (xi) the role of Local Government Authorities in bringing about development in communities. Also, the project informs Tanzania Development Vision 2025, CCM Manifesto 2020-2025 (CCM 2020).

The Rufiji Delta is the largest mangrove forest in the East African region and the second largest river delta in Africa, covering 53,255 ha and representing about 34% of the total mangrove area in Tanzania (URT, 2018). The Rufiji River catchment area covers 20% of the country, making it the largest river in Tanzania (Wagner & Sallema-Mtui, 2016). The Rufiji District is home to more than 150,000 people, 30,000 of whom live in the remote delta (NBST, 2022; UNEP, 2021). People in the Rufiji Delta suffer from inadequate health, education, water supply and transport services. Hence, they are generally poor and depend on agriculture, fishing, and forest products for their livelihoods, which makes them vulnerable to restrictions in their access to local resources as they lack alternative opportunities (Kangalawe and Masao, 2018). Accordingly, the Delta's history of multiple and often competing interests associated with its biological and socio-economic significance makes it an ideal case for the project. This is also illustrated by the recent establishment of the RUMAKI Man and Biosphere Reserve (NEMC, 2023), previous debates about WWF Tanzania's listing of the Rufiji Delta as a REDD readiness site (Beymer-Farris & Bassett, 2012; Burgess et al., 2013), the Tanzania Forest Service's intentions to improve the conservation of mangroves (TFS 2022), the ongoing development of the Julius Nyerere Hydropower Plant, the flooding caused by the heavy rainfall in April 2024 (Kimambo et al., 2023), the long planned irrigated agricultural development further

downstream (Mwalyosi, 1990; Hamerlynck et al. 2010; Geressu et al. 2020), and the unauthorized conversion of mangrove to farmland, grazing areas, and salt-making solar evaporation pans for subsistence and commercial purposes (Kangalawe and Masao, 2018; Nyangoko et al. 2022; Ntibona et al. 2022, 2023).

The research will generate new knowledge and enhanced understanding of:

1. The productive capacity and economic potential of sustainable mangrove forest management, including how mangrove ecosystems respond to human interventions and climate change.
2. the economic costs and benefits households experience caused by changes in climate and socio-political conditions,
3. how local people respond, individually and institutionally, to climate change, conservation projects, the hydropower dam, and associated mechanisms of exclusion.

The University of Copenhagen (UCPH) and Sokoine University of Agriculture (SUA) have a long history of research collaboration on participatory forest and wildlife management focusing on biophysical, socio-economic and socio-political outcomes, and will team up with the University of Dar es Salaam (UDSM), which has considerable experience on the ecosystems, marine resources and land use in the Rufiji Delta. UDSM is involved in an MFA-supported development research project (Y-ENGAGE, 2021-2026) addressing young people's engagement with climate change in sub-Saharan Africa. Some PhD students in this project analyze the potential implications of the Julius Nyerere Hydropower project around the Rufiji River, including the possibility of increased drought. Youth and school children are already perceiving that the project is contributing to increased drought especially felt because of the decreased river flows. Although the project ends in 2026, it offers a very good basis for expanding the analysis to communities in the Rufiji Delta as proposed here. UDSM is also involved in a Norad-funded project; Building Capacity to Crosslink Coastal Pollution with Climate Change (BC5) that is implemented in the Coastal areas of Tanzania and Ghana. Although the Rufiji Delta is not part of BC5, ΔRufiji would provide an opportunity for enhanced south-south collaboration.

4: Objectives

Overall, the project aims to (i) enhance and develop the participants' research capacity (see sections 5 and 9) and (ii) promote socially just climate-resilient local livelihoods and nature conservation in the Rufij Delta. The latter is approached by enhancing our understanding of the interaction between mangrove ecosystems, local communities' livelihoods, and changes in climate and socio-political conditions in the Rufiji Delta. This is pursued through three research questions and associated hypotheses.

Research questions:

i) What is the growth and regeneration capacity and what is the rate, including the causes, of deforestation and degradation in the Rufiji Delta mangrove forest?
ii) How do the biophysical and socio-political changes in mangroves affect local livelihoods, and what are the implications in relation to agency, risk and resilience?
iii) What are the perceived impacts of, including socio-ecological responses to, management and conservation initiatives, and what institutional arrangements might in practice promote socially just climate-resilient local livelihoods and nature conservation?

Research hypotheses:

i) Mangrove ecosystems in the Rufiji Delta have a high growth rate and high capacity to regenerate after disturbance, but the institutional context results in net deforestation and degradation.
ii) Livelihood strategies are diverse and resilient to climate change. However, socio-political changes, including the institutional arrangements of conservation projects, challenge resilience and local governments' ability to influence the distribution of costs and benefits.
iii) Official institutional arrangements establish uncompensated restrictions on resource use, which local people perceive as illegitimate and whose criminalized resistance generates political tension while compromising conservation objectives.

5: Expected outcomes and outputs

We anticipate the project will generate new knowledge on differentiated experiences, agency, response, and resilience of communities and ecosystems towards impacts of climate change, conservation, and development projects. Specifically, we expect to identify challenges and opportunities concerning equitable, climate change resilient, and sustainable governance and management of mangrove forests and create attention to these matters both locally, nationally, and regionally. Through the listed specific outputs, we expect this will generate the following main outcomes:

1. Research outcome: Increased scientific attention to the resilience of ecosystems and agency and the response of rural communities towards complex developments in climate, economic, and socio-political conditions
   a. An annotated bibliography
   b. At least 10 co-authored international peer-reviewed articles
   c. At least 6 international conference presentations
   d. At least 6 national and regional conference presentations
2. Capacity development outcome: Increased capacity and attention to research on the effects of complex changes in climate and socio-political conditions on the resilience of ecosystems and communities
   a. Training three Tanzanian PhD students (1 at UDSM, 2 at SUA)
   b. Training one Tanzanian (UDSM) and one Danish (UCPH) postdoc
   c. Involving and training four Tanzanian (2 at UDSM, 2 at SUA) and four Danish (UCPH) MSc students
   d. Training the whole team in systematic literature research and review
3. Dissemination outcome: Increased local and national attention to and awareness of the implications of complex changes in climate, biophysical and socio-political conditions on the resilience of ecosystems and communities, particularly in the Rufiji Delta
   a. At least two policy briefs
   b. At least three annual community or town hall meetings in the research area
   c. Three photovoice exhibitions in 1) Rufiji Delta, 2) Dar es Salaam and 3) Copenhagen, and one online exhibition
   d. A national conference during the last year of the project

Aiming to inform Tanzanian policy and governance practice, the project will form a stakeholder committee composed of members from selected government agencies and non-governmental organisations, including the Tanzania Forest Services Agency (TFS), District Governments, Village Governments, Beach Management Units, Tanzania Fisheries Research Institute (TAFIRI), Wetlands International, and WWF Tanzania. During the project, we will organise annual meetings with local communities and organisations and at the end of the project we will organise a larger national conference at UDSM or SUA.

6: Methodology

This interdisciplinary project is implemented in three phases. Phase 1: Literature and archival studies, reconnaissance surveys, PhD student recruitment, and preparation of research instruments. Phase 2: Intensive fieldwork and MSc student recruitment. Phase 3: Data analysis, interpretation, reporting and community and stakeholder meetings and conferences. The project is structured by three work packages (WP), including WP 1 focusing on Ecosystem, growth, resilience and change, WP 2 on Livelihoods, resilience and responses, and WP 3 on Governance, equity and environmental justice. The three work packages include activities in all three phases and involve team members from all three institutions.

WP 1; Ecosystem, growth, resilience and change (involves Mwakalukwa, Masao, Lugendo, Kirway, Mabhuye and Meilby): Contributes to understanding growth, regeneration capacity and resilience of the mangrove ecosystem, extent and drivers of deforestation and degradation, including the underlying incentive structures. Quantitative approaches include remote sensing to determine tree cover and land use changes and field measurements of stock, regeneration, growth and harvesting. Field measurements include a repeated vegetation survey, which serves both to ground truth satellite image data and for assessment of tree growth, regeneration and harvesting of poles and firewood. They also include band dendrometer measurements of sample trees to assess the growth capacity of major mangrove species. Field sites are selected to cover a gradient of site types from frequently flooded to less frequently flooded sites. Qualitative approaches overlap with WP 2 and WP 3 and include key informants and group interviews to examine issues related to land use changes, drivers of change, nature protection approaches, and associated incentive structures.

WP 2; Livelihoods, resilience, and responses (involves Masao, Ngaga, Mabhuye, Kalokola, Mortensen and Treue): Focuses on livelihood issues concerning mangrove ecosystems, adaptation to change in climate and socio-political conditions, including the role of traditional ecological knowledge, and responses to changes. Qualitative methods overlap with WP 3 and include stakeholder analysis and consultations, participatory rural appraisal methods such as Key Informant Interviews and Focus Group Discussions, including gender perspectives. A participatory mapping exercise will be used to identify resource areas and risks related to changes in biophysical conditions (climate, salinity, water level). Photovoice will be used to understand people's agency and perceptions of developments. Generally, the field observations will serve to understand activities and processes in the area and the local perception of these. Quantitative methods overlap with WP 1 and include household surveys of resource use and extraction to document size, volumes, and economic importance. A 50/50 % gender representation is ensured in all activities with local communities, including gender-separated Focus Group Discussions.

WP 3; Governance, equity and environmental justice (involves Kalokola, Kicheleri, Mabhuye, Mortensen and Treue): This WP Links WPs 1 & 2 by mapping the institutional arrangements regulating people's ability to benefit from natural resources. Through archival studies and interviews with key institutional actors, local communities, and households (c.f. WP 2), we will trace the origin and process of official rulemaking, and document differences between what the rules say and what people do, including why. Hence, we aim to identify the underlying causes of institutional changes and document the biophysical and livelihood outcomes of local and external peoples' individual and collective responses to statutory rules, rule enforcement, conservation projects, biophysical resources, tourism, and market opportunities. A 50/50 % gender representation is ensured in all activities with local communities, including gender-separated Focus Group Discussions.

To observe legal requirements of research undertakings in Tanzania, research permits will be applied for through Tanzania's Commission for Science and Technology (COSTECH) and Tanzania Fisheries Research Institute (TAFIRI). The permits will then be submitted to the President's Office for Regional Administration and Local Government (PO-RALG) for regional, district and other local level introduction of the project.

The project involves research within rural communities and interviews with conservation organizations and district and national governments. We will ensure ethical clearance before conducting fieldwork and set up a GDPR agreement, and data management plan following UCPH standards that cover the overall project, including PhD and postdoc project components, which will further help to achieve a high level of research quality and integrity. The reconnaissance survey in Phase 1 will help to identify suitable study sites and pilot-testing of research instruments will serve to ensure data quality. Through long-term and in-depth engagement with marginalized communities, taking into consideration their different gender and socio-economic conditions, we navigate the local power dynamics and sensitivities to ensure a no-harm approach to our studies of livelihood activities, behaviour, and perceptions. To do so, we further ensure free informed prior consent, secure interview locations, anonymization, secure data storage and representing differentiated voices. Possible biases caused by non-response, or strategic or evasive responses, will be addressed through triangulation of methods and in the interpretation.

Based on experience, the level of risks and limitations is low. We expect smooth collaboration with villages, public authorities, managers and conservationists. At all partner institutions, the team includes members with different competencies. Hence, if a member leaves the team, the risks for the project, including co-supervision are limited. Previous projects have shown that the risk of being unable to fill PhD positions with highly qualified candidates is low.

7: Overview of the research plan

The first year of the project (2025-2026) is devoted to preparatory work (Phase 1), including literature and archival studies and compilation of historical data, analysis of map and remote sensing data and a scoping trip and reconnaissance surveys to identify suitable field sites. PhD students will be recruited in 2025 and begin their work in 2025-2026. Field data collection takes place in 2026-2027 with follow-up activities in 2028 (Phase 2). Analysis of field data is done in 2027-2029 and dissemination takes place locally through annual stakeholder workshops (2026-2029) and nationally through a conference in 2030 (Phase 3). A schematic overview of the plan is provided in Figure 1.

Year	2025		2026		2027		2028		2029		2030
(1): Jan.-June; (2): July-Dec.	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)
Phase 1: Preparatory work											
Literature study	1	1	1								
Archival studies	1	1	1								
GIS/Remote sensing data		1									
Annotated bibliography				M1							
Ethical clear. / dat.man.plan		M2									
Scoping trip		M3									
PhD students											
Recruitment of PhD students	M4										
PhD projects (stipends)		18	18	18	18	18	18	18	18	M5	
Research stays in Copenhagen				X		X		X			
Postdocs											
TZ postdoc employment period		6	6	6	6	6	6				
DK postdoc employment period				1	4	5	4	4			
Research stay in Copenhagen						X					
Phase 2: Joint field work											
WP1 Ecology			M6	2	2	2	2	2	1		
WP2 Socio-economics			M7	3	2	1					
WP3 Socio-politics		M8	2	2	2	1					
MSc students											
TZ students joining for one year					X	X	M9				
DK students joining fieldwork				X	X	M10					
Phase 3: Data analysis											
GIS/Remote Sensing data			1	1							
WP1 Ecological data							7	7	7	M11	
WP2 Socio-economic data						7	7	7	7	M12	
WP3 Socio-political data					7	7	7	7	7	M13	
Project/writing workshops		X				X		X			
Stakeholder involvement											
Start-up workshop		M14									
Stakeholder workshops			X		X		X		X		
End-of-project conference											M15

Figure 1. Schematic overview of research activities and main stakeholder involvement activities, including milestones (M) and estimated resource allocation (numbers = months). Milestones: M1: Submission of annotated bibliography; M2: Ethical clearance; M3: Scoping trip and reconnaissance survey completed and study sites selected; M4: Three PhD students recruited and enrolled; M5: PhD theses completed and submitted for defence; M5: Four TZ MSc theses completed and submitted; M6, M7 and M8: Research protocols and instruments developed; M9, M10: MSc theses submitted and approved; M11, M12, M13: Data analysis and manuscript writing completed; M14: Start-up workshop held; M15: National end-of-project conference held.

8: Organisation and management of partnership

Across the three institutions, the project team will include nine senior researchers, two named postdocs (TZ and DK) and three TZ PhD students (4 years). In addition, the project will recruit four TZ MSc students (1 year) to work alongside the PhD students. Four travel grants will enable the involvement of four Danish MSc thesis students.

The nine senior researchers include three females and six males. Both postdocs are females. When recruiting PhD and MSc students we will actively encourage females to apply. Moreover, throughout the project, we will promote equality and balance concerning roles and opportunities among the project team members.

Biophysical scientific fields are covered by 3 team members at UDSM, 1 at SUA and 1 at UCPH; Socio-economics is covered by 2 members at UDSM, 1 at SUA and 2 at UCPH, and Governance is covered by 1 at SUA and 2 at UCPH. Thus, the team is also well-balanced concerning disciplines, thereby facilitating cross-institutional co-supervision of PhD students and supporting the partnership's robustness.

The Project Coordination Team includes Henrik Meilby (PI) and Thorsten Treue (Co-PI) from UCPH, Catherine Masao and Ezekiel Mwakalukwa (effectively Co-PIs at UDSM and SUA, respectively). Each PhD student will be jointly supervised by at least one TZ and one DK supervisor. Each WP will involve one PhD student. The two postdocs will mainly be involved in WP 2 and WP 3, but collaboration among PhD students and postdocs will be encouraged.

The Project Coordination Team will meet online every 4-6 weeks; a tentative schedule will be prepared every year and updated successively; online meetings involving the entire project team will take place as needed, typically 1-2 months before major joint activities, or in connection with joint PhD seminars. Physical meetings will take place when enabled by major activities, i.e. the start-up workshop, joint field campaigns, writing workshops, and the end-of-project conference.

Career and promotion wishes will be discussed, and responsibilities in work packages and authorship aligned. Joint fieldwork will involve all participants on equal terms to facilitate knowledge sharing and promote a sense of community. In developing ideas and allocating tasks, the role of gender will be taken into account. PhD students and postdocs have key roles in the project and will be lead authors of core publications.

The project team is gender diverse and promotes opportunities for younger women scholars (postdocs) to strengthen their career opportunities. The hiring of PhD and Master's students will ensure equal opportunities across intersecting gender identities and prospective candidates will be selected based on merits. For equally well-qualified candidates, preference will be given to women. Local workshops, socio-ecological data acquisition and similar activities will be gender sensitive from the onset of the project.

9: Capacity strengthening

The project will involve two named young researchers as postdocs, one at UDSM and one at UCPH. In addition, the project will recruit three PhD students, one at UDSM and two at SUA. Finally, we will recruit four promising MSc students, two at UDSM and two at SUA, who will work alongside the PhD students and postdocs. At all institutions, the project offers early career team members (who were PhD students and postdocs in previous similar projects), postdocs, and PhDs an opportunity to maintain and strengthen current research and teaching capacity, which aligns with the expected generational change in the coming 10-15 years.

Through co-supervision and joint research planning, fieldwork and co-authorship, the project will also maintain and strengthen the capacity among all senior project team members. The three PhD students will be recruited through a competitive national-level call for applications and selected based on academic potential, considering a fair gender representation (see above). The PhD students will be enrolled as double-degree students at their TZ university and UCPH. To facilitate co-supervision and to meet (one of) UCPH's requirements for double-degree enrolment, the PhD students will spend a total of nine months at UCPH during their 4-year PhD project. The UCPH postdoc (Sofie Mortensen) will be funded for 18 months across three years, where she is otherwise funded through another research grant and teaching at IFRO/UCPH. The UDSM postdoc (Ritha Kalokola) will be funded for 36 months and will spend 3 months at UCPH to facilitate collaboration with the UCPH postdoc, the three PhD students, and their UCPH supervisors. To further strengthen the collaboration, TZ supervisors will join their PhD students during one of their stays in Copenhagen. To facilitate joint supervision and authorship, we will organize at least two writing workshops during the third phase of the project.

10: Publication and dissemination strategy

Across the lifetime of the project, we aim to prepare at least 10 international scientific articles. Each postdoc and PhD student is expected to lead-author at least one manuscript, which will result in 6-8 international scientific publications mainly related to individual work packages. In addition, we expect to prepare 2-4 joint interdisciplinary scientific articles based more broadly on the work packages, and on literature review and archival work in the first phase of the project. Furthermore, collaboration between PhD students and MSc students is expected to result in 2-3 additional publications.

In deciding about lead authorship and order of co-authorship, younger team members will generally be prioritized. To the extent possible, we will target good field journals within fields such as ecology, rural studies and policy (e.g. Fisheries Management and Ecology, Climate Change, Forest Policy and Economics). Results of a more general nature will target international medium or high-impact journals (e.g. Ambio, Journal of Rural Studies, Gender, Place & Culture), and results mainly of regional relevance will target journals with an African focus (e.g. African Journal of Ecology; African Journal of Rural Development; Western Indian Ocean Journal of Marine Science). During the project, PhD students, postdocs, and senior team members will participate in regional and international scientific conferences to present results and build and maintain scientific networks.

To disseminate the project's results to a wider academic and non-academic audience, we will prepare and maintain a project website hosted at IFRO/UCPH.

Through UDSM, the project will communicate its actions/activities through social media in Kiswahili such as WhatsApp, Facebook and X. Together with other dissemination packages including policy briefs, publications and project website, this will make the project visible to a wider audience including the policy members and local communities. To provide a physical forum for local involvement and discussion we will organise annual community and town hall meetings in the Rufiji area. Furthermore, we will organise photovoice exhibitions in several locations. Finally, through organising a national end-of-project conference we expect to be able to disseminate our results more broadly within the Tanzanian society.

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