Knowledge Transfer of Nature-based Solutions through education to Enhance Climate Change Adaptation and Resilience in Uganda (**NbS-4-Climate**) 101178503

NbS-4-Cliamte

FINAL COURSES

Nbs-4-Climate D3.2. Key Competencies D7.3. Teaching tuning workshop

1. Course description

1.1. NbS-5001 - NbS for Disaster Risk Management

Module title	Nature Based Solutions for Disaster Risk Management
Number of credits allocated	*4 CU*
Short description of the module	Climate change is impacting many human ecosystems but more severely communities and livelihoods situated in disaster prone environments. Nature-based Solutions (NBS) can be applied as a sustainable and integrated approach to disaster risk management. This module examines how ecosystems and natural processes can be harnessed to reduce hazard exposure, enhance community resilience, and contribute to climate change adaptation and mitigation. It emphasizes the role of wetlands, forests, mangroves, rangelands, and urban green systems in mitigating disasters such as floods, landslides, droughts, and fluvial erosion. Practical sessions and case studies will enable students to design, implement, and evaluate NBS interventions that integrate local knowledge, scientific evidence, and policy frameworks for resilient and sustainable development
Goal (main objective) in connection with specific competences	Understand how different Nature based solutions (NBS) can be applied in a sustainable and integrated manner in disaster risk management (DRM).
Objectives (specific objectives in connection with competences)	1. Explain the principles and theoretical foundations of Nature-based Solutions in DRM. 2. Examine the role of ecosystems and biodiversity in hazard mitigation and community resilience. 3. Analyze case studies of successful NbS interventions for different hazard contexts. 4. Design NbS strategies and plans tailored to local environmental and socio-economic conditions. Evaluate the policy, institutional, and financing mechanisms that support the integration of NbS in DRM.

1.2. NbS-5002 – NbS to sustain livelihoods in Sub-Sahara

Module title	Nature-based Solutions to sustain livelihoods in Sub-Sahara
Number of credits allocated	5
Short description of the module	Climate change is impacting many human ecosystems but more severely rural communities and their livelihood. Nature-based solutions can mitigate climate change impacts while at the same time providing a potential new income for rural people. Through this module different types of nature-based solutions (e.g., agroforestry, agricultural NbS and ecotourism) will be presented and described on how to be implemented so they can be a source of revenue for rural communities.
Goal (main objective) in connection with specific competences	Understand how different NbS can be utilized particularly in rural areas to sustain their livelihoods
Objectives (specific objectives in connection with competences)	1. Understand how NbS can contribute to sustain livelihood, particularly of rural areas in sub-Sahara Africa 2. What Circular economy is and how it is correlated to NbS: what are the advantages and disadvantages 3. Presentation of the concept of Agroforestry. Examples and how they can be utilized in the Sub-Sahara Africa and their benefits in mitigating climate change 4. The implementation of NbS in the agricultural sector and what are the pros can cons of their incorporation in agricultural practices. 5. Why moving from tourism to ecotourism is essential, particularly in rural areas and how it can provide economic benefits while at the same time protect natural ecosystems

1.3. NbS-5003 - Urban development with NbS

Module title	*Urban development with Nature-based Solutions*
Number of credits allocated	5
Short description of the module (maximum 10 lines)	This module introduces the role of Nature-based Solutions (NbS) in urban development. It highlights how NbS contribute to climate resilience, sustainable urban planning, and the provision of ecosystem services. Students will analyze international case studies and explore how NbS can be adapted to sub-Saharan African cities.
Goal (main objective) in connection with specific competences	The main goal is to equip students with knowledge and skills to integrate NbS into urban planning and management, strengthening climate adaptation and resilience.
Objectives (specific objectives in connection with competences)	1. Understand key concepts and types of NbS in urban areas. 2. Analyze environmental, social, and economic benefits of NbS. 3. Evaluate best practices from Europe and Africa and adapt them locally. 4. Develop planning and management competences for sustainable cities.

1.4. NbS-5004 - NbS for climate change adaptation in the Sub-Sahara

Module title	*Nature-based Solutions for climate change adaptation in the Sub-Sahara*
Number of credits allocated	*4*
Short description of the module	*Climate change is impacting many human ecosystems but more severely rural communities. This module provides a critical and applied study of Nature-based Solutions (NbS) as a core strategy for helping communities and ecosystems in Sub-Saharan Africa adapt to the impacts of climate change. The module explores how the sustainable management and restoration of ecosystems (such as wetlands, forests, coastal zones, and agricultural lands) can effectively reduce climate vulnerability, particularly for rural and urban livelihoods dependent on natural resources. It moves beyond traditional conservation by focusing on the dual benefits of NbS: simultaneously achieving ecological resilience (e.g., habitat protection, flood retention) and socio-economic benefits (e.g., food security, income generation, water security).*
Goal (main objective) in connection with specific competences	To equip students with the technical and applied expertise necessary to design, implement, and spatially monitor sustainable Nature-based Solutions that effectively reduce climate risk and enhance the adaptive capacity and resilience of both ecological systems and local livelihoods across Sub-Saharan Africa.
Objectives (specific objectives in connection with competences)	To critically analyze and assess the nature and extent of climate-related risks and resulting livelihood vulnerabilities across diverse ecological zones in Sub-Saharan Africa (SSA). To design and justify appropriate Nature-based Solutions (NbS) for specific SSA adaptation challenges, explicitly integrating local knowledge and identifying the trade-offs and co-benefits across ecological and socio-economic outcomes. To Utilize Geospatial Information Systems (GIS) and Remote Sensing techniques to map climate vulnerability, monitor land cover change, and spatially assess the ecological efficacy of NbS interventions over time. To Construct comprehensive Monitoring and Evaluation (M&E) frameworks that incorporate both ecological indicators and socio-economic metrics that measure the resulting reduction in climate-related livelihood risk achieved by an NbS project.

1.5. NbS-5005 - Entrepreneurship & Nature-based Solutions

Module title	*Entrepreneurship & NbS*
Number of credits allocated	*5*
Short description of the module (maximum 10 lines)	*Nature-based solutions are being embraced as an ideal practice to mitigate climate change both in urban and natural environments. This provides the potential for a new market and jobs that deal with environmentally friendly solutions for both urban and rural areas. Through this course first part basic knowledge on entrepreneurship and how to establish a business and micro-business will be taught. In the next section more specialized information will be taught to better understand green entrepreneurship, Nature-Positive Economy & Capital and Circular Economy and Nature will be provided. In addition, how nature-based solutions fit in with these economic concepts. The students will also learn how to move from nature-based solutions to nature-based enterprises. Regarding Nature-based Enterprises the advantages and risks of the establishing will be illustrated.*
Goal (main objective) in connection with specific competences	*The benefits and risks of nature-based enterprises and how to establish one.*
Objectives (specific objectives in connection with competences)	*What is an enterprise and how to develop a business plan.* *Green entrepreneurship and green microbusiness.* *What is nature-positive economy and circular economy.* *How do nature-based solutions fit with these economic concepts, climate change mitigation and adaptation and the creation of new job opportunities.* *The advantages of Nature-based Enterprises and the potential risks.* *How to determine opportunities for Nature-based Solutions*

1.6. NbS-5006 - Nature-based Solutions in ecosystem and catchment restoration

Module title	NbS in ecosystem and catchment restoration
Number of credits allocated	3
Short description of the module (maximum 10 lines)	*This module examines how nature-based solutions (NbS) can be used to restore ecosystems and catchments in order to improve biodiversity, water security and climate resilience. Students learn about hydrological processes, ecological principles and sustainable management techniques that use natural systems to solve urgent environmental problems. Students will study how rehabilitating forests, wetlands, rivers, and agricultural landscapes can provide a number of advantages, including better water quality, reduction of floods and droughts, carbon sequestration, and support for livelihoods. In order to create successful restoration programs, emphasis is placed on combining scientific knowledge with community involvement and policy frameworks*.
Goal (main objective) in connection with specific competences	*To equip undergraduate students with the knowledge, skills, and values necessary to understand, design, and apply Nature-based Solutions (NbS) for restoring degraded ecosystems and catchments, enhancing biodiversity and strengthening climate resilience, while ensuring sustainable development for both people and nature.*
Objectives (specific objectives in connection with competences)	• *Describe the hydrological and ecological functions of catchments and how they support ecosystem services and restoration.* • *Analyze the causes of catchment/ ecosystem degradation (e.g., deforestation, agriculture, urbanization, pollution, climate change and unsustainable land.* • *Design and evaluate restoration strategies such as riparian buffer strips, wetland rehabilitation, reforestation, soil conservation, urban green infrastructure and agroforestry* • *Employ GIS, remote sensing and hydrological models to assess ecosystem/ catchment health and monitor restoration progress* • *Establish indicators to measure ecological, hydrological, and socio-economic outcomes of NbS interventions.* • *Develop site-specific catchment restoration plans, policy briefs, or project proposals that integrate ecological science with social and economic considerations.*

	• *Connect catchment restoration efforts to broader sustainable development objectives (e.g., SDG 6: Clean Water, SDG 13: Climate Action, SDG 15: Life on Land).* • *Evaluate how NbS contribute to flood control, water quality improvement, climate resilience,disaster risk reduction and sustainable livelihoods.* • *Select appropriate species and strategies to enhance ecological succession, habitat connectivity, and biodiversity recovery.* *Facilitate participatory approaches, incorporate indigenous/local knowledge, and co-design restoration initiatives with stakeholders*

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Capacity building in the field of higher education Strand 1

"Knowledge Transfer of Nature-based Solutions through Education to Enhance Climate Change Adaptation and Resilience in Uganda"

Acronym "NbS-4-Climate"

NbS-4-Climate Protect Management Team

Partners

Democritus University of Thrace, GREECE
Kyambogo University, UGANDA
University of Kisubi, UGANDA
Universidad Politécnica de Madrid, SPAIN
GrassRoots Ministry, UGANDA

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