EAST AFRICAN-EUROPEAN VIRTUAL EXCHANGE FOR ENVIRONMENTAL CONSERVATION AND CLIMATE ACTION (ECO-ACT) PROJECT.

ECO-ACT

WP2 NEEDS ASSESSMENT REPORT

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FORWARD

EXECUTIVE SUMMARY

The Needs Assessment report, developed collaboratively by all partner institutions, provides the foundation for designing the ECO-ACT Virtual Exchange (VE) programme. It deepens earlier analyses by reviewing climate-related programmes in Africa and Europe, surveying students to identify knowledge and skills gaps, and conducting staff interviews to validate needs and priorities. The assessment highlights critical disparities in digital infrastructure, faculty capacity, curriculum integration, and student readiness, underscoring the need for an inclusive and context-responsive VE model.

Findings show diverse strengths across East African and EU institutions, with strong alignment in environmental science, policy, research skills, and sustainability, but clear gaps in digital skills, climate governance, climate finance, justice, and practical application. Student surveys reveal moderate climate-change awareness, limited curriculum coverage, and high interest in further training. Staff interviews highlight challenges including inadequate funding, limited expertise, low student engagement, and insufficient practical learning opportunities, alongside emerging good practices such as green campus initiatives and curriculum reforms. Literature analysis reinforces the need for integrated, interdisciplinary climate education.

Overall, partners bring complementary capabilities, and there is strong demand for a VE programme that strengthens digital, technical, governance, research, and cross-cultural competencies to prepare graduates for effective climate action.

List of Figures

List of Tables

LIST OF ACRONYMS

Abbreviation	Full name
ECO-ACT	East African-European Virtual Exchange for Environmental Conservation and Climate Action
EU	European Union
UKSW	Cardinal Stefan Wyszynski University in Warsaw
UNWE	University of National and World Economy
KIBU	Kibabii University
UR	University of Rwanda
LU	Lira University
UBG	University of Bahr El Ghazal
VE	Virtual Exchange
EC/CC	Environmental Conservation and Climate Change
EU	European Union
EA	East Africa
HEI	Higher Education Institution
NGO	Non-governmental Organisation

TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

1.1 The ECO-ACT Project: What is it about?

The East African-European Virtual Exchange for Environmental Conservation and Climate Action (ECO-ACT) project, which consists of a consortium of 6 partner organizations, including 4 universities from East Africa (EA) and two from the European Union (EU), aims to improve management, administrative and instructional capacity of partner HEIs to provide equitable, future-oriented, digital and high-quality education on environmental conservation and climate change that promotes inclusiveness, diversity and sustainable growth opportunities in partner universities. The EU universities are Cardinal Stefan Wyszynski University (UKSW) in Poland and University of National and World Economy (UNWE) in Bulgaria. The East African Universities comprise Kibabii University (KIBU) in Kenya, University of Rwanda (UR) in Rwanda, Lira University (LU) in Uganda, and University of Bahr El Ghazal (UBG) in South Sudan.

The project is co-funded by the Erasmus-LS Programme of the European Union (ref. no: 101193492). The project intends to produce a transversal modular Virtual Exchange (VE) programme on environmental conservation and climate change which will be fully integrated into at least 2 curricula in each partner university. The VE programme is planned to include: **(a)** an open online course, consisting of 10 modules, which will present learning content in the form of short, 10-15 min. video lectures; **(b)** one webinar per module followed by an open semi-structured discussion; and **(c)** collaborative online international projects implemented by groups of students from different partner HEIs. The project foresees training of VE mentors who will facilitate the VE programme implementation.

1.2 Environmental Conservation in an Era of Climate Change

Environmental conservation refers to the protection, preservation, and sustainable management of the natural environment (UNEP, 2021). During an era of extreme global climate change, such as is being experienced at the present time, environmental conservation becomes even more critical, as ecosystems face new and intensified threats (IPCC, 2022). Conservation strategies must adapt to address the dual challenges of mitigating climate change and helping communities and ecosystems adapt to its impacts (CBD, 2022).

Climate change is increasing the frequency and severity of extreme weather events, such as floods, droughts, and wildfires. Healthy ecosystems can buffer these impacts. For instance, wetlands reduce flood risks (Ramsar Convention Secretariat, 2018), while forests regulate temperature and rainfall (FAO, 2020). Therefore, enhancing ecosystem resilience is a vital conservation strategy in climate adaptation. Forests, soils, and oceans act as carbon sinks, absorbing carbon dioxide from the atmosphere (IPCC, 2022). Conservation of these ecosystems is essential for climate mitigation. Protecting and restoring forests and other carbon-rich landscapes contributes to reducing greenhouse gas concentrations (Griscom et al., 2017).

Climate change alters habitats and endangers species. Conservation efforts focus on maintaining and restoring habitats, facilitating species migration, and preserving genetic diversity (WWF, 2023). Biodiversity underpins ecosystem stability and adaptive capacity (Diaz et al., 2019). Overexploitation of resources exacerbates environmental degradation and reduces the capacity of ecosystems to adapt. Conservation promotes sustainable practices in agriculture, forestry, and water use, which in turn support climate adaptation and food security (FAO, 2020).

Local communities and Indigenous Peoples often possess extensive ecological knowledge. Their participation in conservation efforts enhances sustainability and ensures culturally appropriate adaptation strategies (IPBES, 2019). Empowering these groups supports both environmental and social resilience. Nature-based solutions (NbS) involve using natural processes to address societal challenges. Examples include reforestation, wetland restoration, and green infrastructure. These strategies simultaneously support conservation and climate adaptation goals (IUCN, 2020). Effective environmental conservation in a changing climate requires strong policy frameworks and international collaboration. Agreements such as the Paris Agreement encourage nations to integrate conservation into their climate strategies and promote funding and cooperation for global conservation initiatives (UNFCCC, 2015).

Environmental conservation in the era of climate change is therefore not merely about protecting nature but is an essential strategy for climate resilience and sustainability. Through ecosystem restoration, sustainable practices, inclusive governance, and global cooperation, conservation can play a pivotal role in addressing climate challenges.

1.3 The Potential Roles that Universities Can Play in Environmental Conservation in the Era of Extreme Climate Change

Environmental conservation has become a critical priority in response to the growing impacts of climate change. As societies worldwide grapple with rising temperatures, extreme weather events, biodiversity loss, and environmental degradation, institutions of higher learning are uniquely positioned to lead transformational change. Universities serve not only as centers of knowledge and innovation but also as influential actors in shaping environmental policy, education, and practice. Some of the vital roles that universities can play in advancing environmental conservation in the era of extreme climate change are highlighted below.

Universities are key contributors to the global body of scientific knowledge on environmental and climate issues. Through interdisciplinary research, they explore climate change impacts, identify conservation strategies and develop technologies that support sustainability. Research outputs from university laboratories and fieldwork inform national and international climate adaptation and mitigation policies (IPCC, 2022). Innovations in renewable energy, carbon sequestration, biodiversity conservation, and climate-smart agriculture often emerge from academic institutions. For instance, Stanford University and the University of Nairobi have developed influential research on ecosystem resilience and climate modelling (Griscom et al., 2017).

Universities serve as neutral platforms for policy dialogue and advocacy. They provide evidence-based insights that inform local, national, and international environmental policies. Many academic experts contribute to key policy documents, such as Intergovernmental Panel on Climate Change (IPCC) reports, or serve as advisors to government bodies. Academic institutions also support curriculum development, participate in national consultations, and advocate for science-based decision-making in climate and conservation planning (CBD, 2022).

Universities engage directly with local communities, promoting environmental awareness and supporting grassroots conservation initiatives. They collaborate with Indigenous communities, farmers, and local organizations to implement context-specific, culturally relevant conservation strategies. This community-based approach enhances the effectiveness of conservation interventions and builds local ownership (IPBES, 2019). For example, Makerere University in Uganda works with rural communities to promote agroforestry, biodiversity conservation, and climate-resilient farming practices.

Universities can model sustainability through their own operations. By adopting green infrastructure, renewable energy, waste reduction, and sustainable procurement, universities turn their campuses into living laboratories for sustainability. Initiatives such as zero-waste campuses, water harvesting systems, and green buildings reflect a commitment to conservation in practice (IUCN, 2020). Arizona State University and the University of Cape Town are among institutions leading the way in carbon-neutral campus planning.

Universities actively participate in international networks that promote environmental collaboration and policy influence. Partnerships through platforms such as the UN Sustainable Development Solutions Network (SDSN), the Talloires Declaration, and the Global University Climate Forum enhance global learning and amplify the impact of local innovations. These partnerships also facilitate joint research projects, student exchanges, and knowledge sharing on effective environmental conservation and climate change adaptation strategies (UNESCO, 2021).

Nature-based Solutions (NbS), such as reforestation, wetland restoration, and green urban planning, are increasingly championed by universities. Academic institutions contribute to NbS through research, community projects, and training. They integrate local ecological knowledge with scientific tools like remote sensing and GIS to support effective ecosystem management (Ramsar Convention Secretariat, 2018).

Lastly, universities can play a central role in educating future leaders, scientists, and decision-makers. By integrating sustainability and environmental conservation into curricula across disciplines, universities prepare graduates to address climate challenges effectively. Specialized degree programs in environmental science, sustainability, and disaster risk management equip students with the knowledge and skills needed in a rapidly changing world (UNEP, 2021). Furthermore, universities contribute to lifelong learning through workshops, seminars, and professional development courses that promote awareness and action on environmental issues.

In conclusion, universities can be pivotal actors in the global effort to conserve the environment amidst escalating climate challenges. Their contributions to research, education, policy, and community engagement position them at the forefront of sustainable development. By strengthening their environmental programs, deepening community collaborations, and committing to sustainable operations, universities can significantly enhance climate resilience and environmental conservation outcomes. In the era of extreme climate change, the responsibility of academic institutions extends

beyond the classroom—they must lead by example, foster innovation, and build inclusive strategies for a sustainable future. For these reasons the ECO-ACT project initiatives are timely and important.

1.4 Virtual Exchange (VE) as a tool for Enhancing Environmental Conservation and Climate Change Education in Universities

Climate change and environmental degradation demand urgent, inclusive, and innovative educational approaches. Traditional physical exchanges are limited by cost, accessibility, and environmental impact. Virtual Exchange (VE), an educational practice that uses digital technology to connect learners from different cultures and geographic locations for meaningful, sustained intercultural dialogue and collaboration without the need to travel, offers a promising platform to expand and deepen climate education and conservation awareness globally.

VE fosters interdisciplinary knowledge sharing, builds global citizenship critical to addressing climate challenges, enhances students' understanding of diverse climate issues and cultural approaches, thus promoting global citizenship (UNESCO, 2021). It facilitates joint research and problem-solving on sustainability and climate resilience (O'Dowd, 2018), reduces barriers for students in resource-constrained settings, thus democratizing climate education (de Wit & Altbach, 2021). Action-oriented VE programs encourage sustainable practices and community engagement (Braskamp et al., 2019) and strengthen ties between universities and other stakeholders to foster shared climate goals (NAFSA, 2022).

However, VE also has some limitations: Limited internet and technology access in some regions restrict participation, online formats may lack experiential depth of in-person exchanges and requires faculty training, adequate resources, and program design expertise.

Therefore, effective VE requires investment in digital infrastructure to support broadband access and technological tools to ensure equitable participation, embedding virtual collaborative climate projects with experiential and action-based components, training educators in VE pedagogy to maximize student engagement and learning outcomes, encouraging cross-institutional and cross-sector collaboration to broaden VE impact, regular assessment of VE programs for inclusivity, learning gains, and behavioral impact to refine best practices.

In conclusion, Virtual Exchange is a powerful tool to advance environmental conservation and climate change education, making climate knowledge accessible and actionable worldwide. Strategic investment and thoughtful integration into higher education can amplify universities' role in fostering a sustainable future.

1.5 Rationale for Needs Assessment for the ECO-ACT Project

The needs assessment for the ECO-ACT project was crucial to ensure that all planned interventions effectively address the unique requirements of the partner universities in East Africa and the EU. Its primary purpose was to evaluate existing capabilities and gaps in areas such as digital infrastructure, faculty competencies, curriculum integration, and support services. Recognizing the differing contexts and academic environments of the institutions involved, the assessment aimed to tailor the Virtual Exchange (VE) programme to be relevant, inclusive, and adaptable.

Given the broad thematic focus on environmental conservation and climate change, the needs analysis was conducted to help identify the most pertinent regional challenges, policy frameworks, and sub-topics to include in the course content. Additionally, it was carried out to guide curriculum mapping to facilitate integration of the VE programme into existing university structures.

The analysis also aimed to support the design of effective mentor training by identifying faculty skill levels and needs. It assessed factors affecting student participation—such as digital access, literacy, and motivation—to promote inclusive and accessible learning.

By involving stakeholders, the assessment aimed to foster institutional ownership, smoother programme implementation, and long-term sustainability. Moreover, it provides critical evidence for needs-based planning, satisfying EU funding requirements for accountability and strategic alignment. Overall, the resulting Needs Analysis report is an essential foundation for the development, relevance, and impact of the ECO-ACT VE programme.

CHAPTER TWO

METHODS FOR NEEDS ANALYSIS

2.1. Methodology of the Needs Assessment

Needs analysis, which was WP2 of the ECO-ACT project, was divided into four tasks as follows:

a) Analysis of existing educational programmes in Europe and East Africa aimed at raising environmental and climate change literacy (T2.1a).

b) Literature review of selected topics in the field of Environmental Conservation and climate change (T2.1b)

c) Survey among partner HEI students aimed at assessing the level of environmental and climate change awareness and identifying skills gaps (T2.2a) .

d) Semi-structured interviews with partner HEIs' staff members aimed at identifying challenges in designing and delivering education in the field of environmental conservation and climate change as well as mapping the areas of interest for cooperation with European and East African partner HEIs (T2.2b).

2.2. Analysis of Existing Programmes in Europe and East Africa that aim to raise environmental and climate change literacy (T2.1a)

This task was conducted by all partner universities. Each of the 6 partner university reviewed at least 2 programmes or cross-cutting course units that aimed to raise environmental and climate change literacy in their region (i.e. EU partners reviewed programmes from Europe and EA partners reviewed programmes from East Africa). The programmes reviewed were chosen purposively- usually from the participating universities. Where curricula from non-partner universities were reviewed, accessibility of the curriculum document to the researcher was usually the main criterion for inclusion. A template (see Appendix 1) was developed which guided the partners on specific items to be documented, reviewed and/or analysed within the chosen programme/course units. Specifically the required items included: the name of the programme or course, the education institution where it is offered, the level (bachelor, master etc), the position in the curricula (programme, course unit etc), duration / workload, modality (face-to face, online etc), objectives and intended learning outcomes, syllabus (structure, topics, activities etc) and good practices. If good practices were found in the programme/course unit, further information was required. These included: the title, subject area within EC/CC (knowledge area, options for delivering etc), objective, highlight, application, transferability, success factors and constraints of the good practice.

Partner institutions supplied all the information required in the template and submitted the templates to Lira University for analysis. The data collected from the Study Programme / Course Review Template and Good Practice Template, were analysed using a mixed methods approach — combining quantitative and qualitative data analysis techniques.

2.2.1   Quantitative Data Analysis

Descriptive statistics (frequency counts and percentages) was used for the multiple-choice and checkbox items. These include: Level (Bachelor, Master, etc.), Position in the curriculum, Modality (Face-to-face, Blended, Online), Are there any good practices? (Yes/No) and Subject area of the good practice. Table, and Bar were used to visually present the results. Excel was used for analysis and data presentation.

2.2.2. Qualitative Data Analysis

We used thematic content analysis for open-ended questions which included objectives and intended learning outcomes and good practice. Thematic coding and categorization were employed to generate the themes. Each good practice in a curriculum was treated as a case study. Highlights (innovative teaching methods or tools used), success factors (enabling conditions) and constraints (challenges across the institution) for each good practice were extracted.

2.2.3. Synthesis

The insights obtained from quantitative and qualitative analysis were integrated to draw conclusions.

The data analysis method used is summarized in table 1 below.

Table 1: Summary of data Analysis Methods.

	Fields	**Analysis Method**
Quantitative	Level, Modality, Position, Subject Area, Yes/No questions	Descriptive statistics (frequencies, percentages)
Qualitative	Objectives, Highlights, Good Practices, success factors and constraints.	Thematic content analysis
Mixed	Overall analysis & interpretation	Integration of quantitative and qualitative insights

Figure 1: Level of understanding of clim 1

2.3. Survey among partner HEI students aimed at assessing the level of environmental and climate change awareness and identifying skills gaps (T2.2a)

An eight-part questionnaire consisting of 33 questions was developed to assess the awareness level of students on issuses relating to environmental conservation and climate change. The questionnaire

sought to acquire data on: Personal Information, Awareness of Environmental and Climate Change Issues, Environmental and Climate Action Knowledge, Skills and Competency to cope with climate change, Willingness to engage in climate action, Climate Change and Disaster knowledge, knowledge about Climate Change and Food Security, and Climate Change and Disease. All partner HEIs approved the questionnaire (Questionnaire is shown in Appendix 2). Use of identical questionnaires ensured comparability of findings at different partner HEIs. Invitation emails were sent to all students of selected faculties / schools / departments determined by the researcher. Generally, emails were sent to students who majored in ECC/CC programs or took some ECC/CC courses and those whose programs were not directly related to ECC/CC such as IT, Mathematics.

Data was collected online and analysed using a mixed methods approach — combining quantitative and qualitative data analysis techniques.

2.3.1. Quantitative Approaches

A number of methods were used to analyse quantitative data including:

i.   Descriptive statistics was used for categorical responses (gender, age group, educational level).
ii. Cross tabulation was used to see if awareness differs by gender.

2.3.2 Qualitative Analysis Methods

Thematic Analysis was used for open-ended responses (e.g., "Explain") to identify recurring themes in responses. A combination of coding approaches, including inductive, descriptive and pattern coding were used to group similar ideas. In addition, Narrative analysis, to explore how individuals describe their experiences or perceptions, was employed where the responses were considered rich and detailed.

2.4. Semi-structured interviews with partner HEIs' staff members

Semi-structured interviews aimed at identifying challenges in designing and delivering education in the field of environmental conservation and climate change as well as mapping the areas of interest for cooperation with European and East African partner HEIs. The interview guide (see Appendix 3) was developed and used to interview staff from the 6 HEIs in the project. The guide consisted of 25 questions divided into 5 sections (demographic and personal information, challenges in designing education programs, understanding issues in implementing EC/CC programs, exploring areas of interest for cooperation with European and East African Universities, and gathering actionable insights for future steps). A template (see Appendix 4) was used to document the responses from the interviews.

The use of identical interview guidelines and data templates ensured comparability of findings at different partner HEIs. Face-to face interviews were used by 4 HEIs and a group focus discussion used by one HEI. Purposive sampling was used to get views from experts in the field of EC/CC and key internal stakeholders involved in embedding ECC/CC into curricula.

Thematic Analysis was used to analyse data from the templates. Where the interviews were recorded, the interviews were first transcribed, then codes were assigned to key ideas (lack of faculty expertise, need for field trips, interest in joint research etc) and grouped into themes (Challenges in curriculum design, Resource limitations, Student preparedness, Opportunities for collaboration, Institutional support needs). Again a combination of coding approaches, including inductive, descriptive and pattern coding were used to group similar ideas. Themes were defined, named and finally interpreted. Coding and theme tracking were done manually using EXCEL.

2.5 Literature review on selected topics in the field of Environmental Conservation and climate change (T2.1b)

Each HEI in the project reviewed literature sources on the module that had been pre-selected by experts in the field of Environmental Conservation and Climate Change. These modules were considered as core for any programme in EC/CC and could be considered for the VE programme. Each partner HEI reviewed at least 5 articles. Table 2 below indicate the topics reviewed and institution that reviewed them.

Table 2: Topics for Literature review by partner HEIs.

S/N	University	Topic(s) for Literature Review
1	UKSW	● Environmental and climate change governance
2	UNWE	● Climate change and Environmental security ● Climate financing
3	Kibabii University	● Environmental Conservation ● Climate change: drivers and Impacts
4	Lira University	● Climate Change and Natural Resource Conservation and Management ● Climate Change and Development
5	University of Rwanda	● Concept of Environment

		● Strategies to deal with climate change
6	University of Behr El Ghazal	● Climate Change and Gender Mainstreaming

A template (see appendix 2) was developed to guide the literature reviews. The required items for inclusion in the template were: Title of article, reference, module topic, objective, highlight, application, transferability, success factors and constraints of the good practice. Partner institutions supplied all the information required in the template and submitted the templates to Lira University for analysis.

Objectives, highlights and success factors & constraints derived from all the templates were grouped together in a separate spreadsheet and recurring themes identified. Themes obtained from 'article objectives' were mapped to the ECO-ACT modules using Thematic Content Analysis to see the strength of alignment. Where alignment was weak or absent, additional articles in the area of weakness were added. Themes that emerged from 'article highlights' were analysed using qualitative thematic synthesis followed by narrative summarization to reveal the effects of climate change and the appropriate responses to them. Themes that emanated from 'success factors and constraints' were analysed using a narrative review approach to reveal enablers, and barriers for curriculum development and administration. The insights obtained from the analysis were integrated to draw conclusions.

CHAPTER THREE

FINDINGS FROM THE NEEDS ANALYSIS

3.1. Introduction

This chapter presents and interprets the findings of the needs assessment for the ECO-ACT project which aims to produce a transversal modular Virtual Exchange (VE) programme on environmental conservation and climate change. The findings are organized into four sections: **a)** Existing study programmes and/or courses in EC/CC in Africa and Europe, **b)** Results from Student survey **c)** Findings from Interviews with Staff at partner HEIs, and **d)** Insights from review of published articles in the area of EC-CC.

The section goes beyond presenting raw data—it also analyses and interprets the findings to inform the planning of interventions so that they effectively address the unique requirements of the partner universities in East Africa and the EU and help tailor the Virtual Exchange (VE) programme to be relevant, inclusive, and adaptable.

3.2. Existing study programmes and/or courses in EC/CC in Africa and Europe

3.2.1. Characteristics of study programmes analysed

A total of 25 programmes/course units were reviewed from EA and EU universities. The majority were stand-alone (18) course units and only 7 were full programmes. EC/CC stand-alone courses were offered in the departments of geography, public health, veterinary science and health science. Table 3 below shows the categories of the programmes/course units analysed and the frequency of their occurrence.

Table 3: Characteristics of the programmes/course units analysed and the frequency of their occurrence

S/n	Type of Programme/course units	EA (frequency)	EU (frequency)
1	Master	2	11
2	Post Graduate Diploma	2	0
3	Bachelor	10	0
4	Non-Formal Education	0	1
5	Face-to-face	10	7
6	Blended	5	4
7	Exclusively Online	0	1

As shown the majority of Master level programmes/course units were from the EU HEIs whereas the majority of undergraduate programmes/course units were from EA HEIs. Most of these programmes/ course units were conducted face-to-face (17/25) and only 9 were blended. There was only 1 programme that was exclusively online.

3.2.2. Study objectives and expected outcomes

In this section, the themes that emerged from analysis of the objectives and learning outcomes from curricula in EA and EU and how they align with the proposed 10 ECO-ACT modules are presented and discussed.

3.2.2.1. Themes that emerged from analysis of objectives and learning outcomes

Based on the objectives extracted from the East African and European Union university curricula, six key themes emerged; each clustering related objectives. The themes were **a)** Environmental Science and Sustainability, **b)** Research, Data Analysis, and Innovation, **c)** Pedagogy, Education, and Public Awareness, **d)** Technical and Professional Competencies, **e)** Policy, Governance, and Decision-making, and **f)** Ethics, Global Citizenship, and Intercultural Competence.

Table 4 below shows the themes, their attributes and example objectives.

Table 4: Themes for objectives of reviewed curricula/course units from EA and EU HEIs

S/N	Theme	Attributes	Example Objectives
1	Environmental Science and Sustainability	Understanding environmental issues; Sustainable development; Conservation and management of resources; Climate processes; Governance and circular economy	'Demonstrate in-depth knowledge of environmental issues…' (University of Rwanda); 'Evaluate critical issues in Bioresources policy…' (Kibabii, UBG); 'Solve environmental problems using scientific methods.' (UBG)
2	Research, Data Analysis, and Innovation	Independent/collaborative research; GIS/remote sensing; Data modeling; Research communication	'Plan and complete a research project…' (University of Rwanda); 'Apply research skills…' (University of Rwanda); 'Quantitative training with climate models' (University of Bristol)
3	Pedagogy, Education, and Public Awareness	Learner-centered strategies; Teaching sustainability; Promoting awareness; Integrating sustainability in education	'Apply learner-centered pedagogy…' (University of Rwanda); 'Apply teaching skills…' (Kibabii University); 'Raise awareness of environmental

			problems…' (Platform 21, Erasmas courses)
4	Technical and Professional Competencies	GIS/spatial analysis; Pollution control; Project management; Communication skills	'Utilize IT skills (maps, diagrams)…' (University of Rwanda); 'Training in lab, computer, field skills' (King's College, Landon)
5	Policy, Governance, and Decision-making	Climate/environmental policy; Governance frameworks; Decision-making in planning and risk mitigation	'Formulate disaster risk strategies' (Catholic University of Murcia & Structuralia); 'Role of scientific evidence in policy' (University of Bristol); 'Implement climate policies…' (The University of Wrocław)
6	Ethics, Global Citizenship, and Intercultural Competence	Global citizenship; Ethical decision-making; Responsible management	'Foster global awareness…' (University of Rwanda); 'Uphold ethical standards…' (University of Rwanda); 'Teach others to care for resources' (Platform 21, Erasmus Courses)

When the objectives for the 10 bachelor programmes/courses were analysed separately (**Note:** these programmes were exclusively from EA HEIs), shared and country-specific priorities were identified, revealing a strong emphasis on environmental knowledge, sustainability, technical competence, and global-local linkages. The findings highlight opportunities for alignment with ECO-ACT's goals of enhancing management, instructional, and digital capacity for climate change and environmental conservation education.

1. Rwanda (The University of Rwanda)

Thematic Priorities identified included:

a) Multidisciplinary Integration – Linking geography, economics, and education to address environmental, socio-economic, and pedagogical challenges.

b) Sustainability Orientation – Analysing economic and geographical phenomena for sustainable development.

c) Pedagogical Competence – Emphasis on learner-centred, competency-based approaches in inclusive contexts.

d) Digital and Analytical Skills – Use of IT tools, mapping, and data visualisation for environmental problem-solving.

e) Research & Innovation – Applying creative and evidence-based solutions to contemporary challenges.

f) Global & Ethical Citizenship – Fostering intercultural competence, global awareness, and ethical environmental and financial management.

2. Kenya (Kibabii University)

Two undergraduate programmes/course units in EC/CC were analysed from Kibabii University, Kenya, which revealed the following thematic priorities:

a) Environmental Awareness & Education – Recognising the environment's central role in sustaining life and understanding natural systems.

b) Education for Sustainable Development (ESD) – Embedding sustainability principles into subject-specific teaching.

c) Historical & Policy Literacy – Understanding milestones and key policy issues in environmental education.

d) Technical & Professional Competence – Skills for conservation, resource management, and communication of bioresource knowledge.

e) Digital Pedagogical Tools – Integration of virtual environments, simulations, and interactive technologies for teaching.

f) Applied Conservation Knowledge – Bridging ecological, sociological, technical, and economic concepts for sustainable resource use.

3. Uganda (Lira University)

The curricula from Lira University prioritized the following themes:

a) Environmental Health Emphasis – Understanding environmental health concepts, history, and impacts on human populations.

b) Pollution & Climate Change Literacy – Addressing causes, effects, and control measures for air, water, and soil pollution, as well as global warming.

c) Public & Occupational Health Linkages – Connecting environmental issues to employment opportunities and community health.

d) Applied Problem-Solving Skills – Identifying and addressing current environmental health issues through analytical approaches.

e) Awareness of Emerging Issues – Linking global environmental challenges with local and regional contexts.

4. South Sudan (UBG)

UBG offers many programs in EC/CC. A thematic analysis revealed the following priorities.

a) Gender–Climate Change Nexus – Understanding gender inclusion barriers in climate change adaptation and environmental conservation.

b) Natural Resource Awareness & Stewardship – Recognising benefits of natural resources and promoting conservation for future generations.

c) Physical Geography & Environmental Diversity – Exploring climatic and landform diversity and its implications for human–environment relationships.

d) Impact of Human Activities – Assessing the environmental effects of industrial, social, and technological developments.

e) Global–Local Case Study Approach – Using Sudan as a contextual reference for examining environmental problems.

f) Environmental Problem-Solving – Applying scientific methods to address pollution, waste management, and resource degradation.

A comparative synthesis of the themes for the bachelor programmes in EC/CC in the four EA countries is summarized in table 5 below.

Table 5: Comparative Synthesis of themes for the bachelor programmes in EC/CC in the four EA countries

Theme	Rwanda	Kenya	Uganda	South Sudan
Environmental knowledge & awareness	☑	☑	☑	☑
Sustainable development & conservation	☑	☑	○	☑
Pedagogical competence	☑	☑	○	○
Digital skills for environment	☑	☑	○	○
Research & analytical skills	☑	☑	☑	☑
Policy & governance context	○	☑	○	○
Global–local perspectives	☑	○	○	☑
Ethics, values & responsibility	☑	☑	○	☑
Environmental health focus	○	○	☑	○
Gender & inclusivity in environment	○	○	○	☑

Legend: ☑ = the theme is addressed in current curricula; ○ = the theme is absent in current curricula.

The table reveals that across the four EA countries, common themes include environmental literacy, research analytical competence, and shared commitment to sustainability. Rwanda and Kenya place stronger emphasis on pedagogical skills and digital integration, aligning closely with ECO-ACT's VE objectives. Uganda contributes a unique focus on environmental health, while South Sudan integrates gender considerations and localized case studies.

This thematic mapping can inform curriculum alignment in the EA partner HEIs, capacity building priorities, and cross-country knowledge exchange within ECO-ACT to maximize impact.

3.2.2.2. Will the proposed ECO-ACT modules enrich the undergraduate programmes/course units in EA HEIs?

ECO-ACT project has proposed the following 10 modules for the VE programme: **a)** Environment and climate change governance, **b)** Climate change and environmental security, **c)** Climate financing, **d)** Environmental conservation, **e)** Climate change drivers and impacts, **f)** Climate change and natural

resources conservation and management, **g)** Climate change and development, Concept of environment, **h)** Strategies to deal with climate change, **i)** Climate change and gender mainstreaming.

Analysis of the complementarity of proposed ECO-ACT VE Modules with existing curricula, through thematic content analysis of programme objectives, is shown in table 6 below:

Table 6: Complementarity of Proposed ECO-ACT VE Modules with Existing Curricula

Proposed Module	Rwanda	Kenya	Uganda	South Sudan
Environment and climate change governance	✅	✅	✚	✅
Climate change and environmental security	○	○	○	○
Climate financing	✚	✅	✚	✚
Environmental conservation	✅	✅	✚	✅
Climate change drivers and impacts	✅	✅	✅	✅
Climate change and natural resources conservation and management	✅	✅	✚	✅
Climate change and development	✅	✅	✚	✅
Concept of environment	✅	✅	✅	✅
Strategies to deal with climate change	✅	✅	✅	✅
Climate change and gender mainstreaming	✚	✚	✚	✅

Legend: The signs in the table should be interpreted as shown below.

✅ = The module aligns well with themes already present in that country's existing curricula and will **reinforce and deepen** existing content.

✚ = The module addresses a **missing or weak area** in that country's curricula

○ = No clear thematic mapping to the country's current curriculum themes. Will require curriculum adaptation to integrate.

The current offerings in partner EA HEIs show gaps in the following areas which the VE has potential to address: **a)** Advanced climate governance and financing mechanisms, **b)** Digital skills applied to

environmental issues, **c)** Ethical dimensions and environmental justice, and **d)** Community-based participatory approaches.

3.2.2.3 Analysis of post graduate objectives

The objectives and learning outcomes of fifteen postgraduate curricula (post graduate diploma and masters) derived from the University of Rwanda, UGB, UNWE, UKSW and other EU countries, were subjected to thematic analysis. Table 7 below shows the themes that emerged.

Table 7: Summary of themes that emerged for analysis of seven post graduate programmes

Theme	Description	Examples from Curricula
Environmental Knowledge	Understanding environmental issues and sustainability	UR II, UBG7, UKSW1, UKSW3, UKSW7
Technical and Analytical Skills	GIS, remote sensing, climate modeling, data analysis	UR II, UKSW1, UKSW4, UKSW10
Research Skills	Project design, execution, proposal writing	UR II, UKSW1, UKSW2
Policy and Governance	Environmental governance, climate policy	UNWE1, UNWE2, UKSW5, UKSW9, UKSW10
Interdisciplinary and Applied Learning	Case studies, fieldwork, experiential projects	UNWE1, UKSW8, UKSW9
Communication and Engagement	Reporting, stakeholder communication	UR II, UKSW1, UKSW7
Sustainability and Resource Management	Conservation, circular economy	UBG2, UKSW9, UKSW10, UKSW8
Disaster Risk and Resilience	Risk mitigation and adaptation strategies	UNWE2, UKSW2, UKSW3
Ethics and Environmental Education	Awareness raising, ethical responsibility	UKSW7

The postgraduate programmes show strong complementarity and breadth. They combine rigorous technical training, research competence, policy understanding, and interdisciplinary application. The focus on communication, ethics, and disaster resilience further equips graduates to address complex environmental challenges holistically. Alignment of these themes with the 10 suggested ECO-ACT modules is shown in figure 8 below.

Table 8: Alignment Between ECO-ACT Thematic Curriculum Analysis and ECO-ACT Proposed Modules

ECO-ACT Module	Related Themes from Curricula	Alignment and Complementarity
1. Environment and Climate Change Governance	Policy, Governance and Management; Environmental Knowledge	Strong alignment: curricula emphasize governance, policy formulation, and management of climate and environmental issues.
2. Climate Change and Environmental Security	Environmental Knowledge; Disaster Risk and Resilience	Partial to strong alignment: some programmes address climate impacts and disaster risk, with emerging focus on security aspects.
3. Climate Financing	Policy, Governance and Management	Moderate alignment: governance modules touch on climate finance indirectly; explicit financial mechanisms less prominent in curricula.
4. Environmental Conservation	Sustainability, Conservation, and Resource Management	Strong alignment: conservation and sustainable resource management are key themes in multiple programmes.
5. Climate Change Drivers and Impacts	Environmental Knowledge	Strong alignment: foundational understanding of climate drivers and impacts is a common objective.
6. Climate Change and Adaptation	Disaster Risk and Resilience; Policy, Governance and Management	Strong alignment: adaptation strategies and resilience building are present, linked to governance and disaster risk modules.
7. Sustainable Development	Sustainability, Conservation, and Resource	Moderate alignment: sustainability and interdisciplinary approaches incorporate SDGs

Goals (SDGs) Integration	Management; Interdisciplinary and Applied Learning	conceptually, though not always explicitly stated.
8. Digital Tools for Environmental Action	Technical and Analytical Skills; Research Skills	Strong alignment: heavy emphasis on GIS, remote sensing, data analysis, modeling, and research methods match digital tools module.
9. Environmental Ethics and Justice	Ethics, Education and Awareness Raising	Partial alignment: ethics and awareness raising present in some curricula, but environmental justice specifically less emphasized overall.
10. Community Engagement and Participatory Approaches	Communication and Stakeholder Engagement; Ethics, Education and Awareness Raising	Moderate alignment: communication and education themes support participatory approaches, though explicit community engagement training varies.

As shown in the table, there is Strong Alignment with modules related to governance (#1), environmental knowledge (#5), technical skills (#8), conservation (#4), and adaptation (#6). Modules on SDGs (#7), community engagement (#10), and disaster risk (#2 & #6) appear integrated but could be strengthened or made more explicit. Climate financing (#3) and environmental justice (#9) appear less directly covered in current curricula, indicating poor alignment.

3.2.3. Highlights of programmes/course units in EA and European HEIs

Program highlights were also identified from the curricula reviewed. These are defined as distinctive feature, activity, or approach within the programme/course unit that stands out because it adds unique value, enhances learning outcomes, or demonstrates good practice.

Table 9: Thematic categories of Program Highlights

Thematic Category	Institutions & Examples
Experiential, Field-Based, and	Kibabii University – Field excursions, role play, industrial attachments; teacher training for environmental action in schools. University of Rwanda– Field-based data collection, visits to conservation sites and weather stations,

Community Learning	tree planting, local awareness campaigns, NGO partnerships. UKSW 3 – Living labs like rain gardens, practical workshops using real-world cases. UKSW 4 – Classes integrated with civil society and public sector engagement.
Integration of Theory, Practice, and Policy	Kibabii University – Lab work integrated with bio-resource management. University of Rwanda – Practical lab sessions on environmental samples. UKSW – Merging classroom knowledge with hands-on biodiversity and sustainability modules. UNWE – Simulations, case studies, policy labs. UKSW – Real-world practice through collaboration with business, government, and NGOs.
Technology and Digital Tools	University of Rwanda – GIS, remote sensing, maps, videos, online learning tools. UKSW – Digital learning environment, access to international climate data. UKSW – Digital literacy and fact-checking.
Interdisciplinary and Systems Thinking	UKSW – Links climate with economics, social sciences, communication. UKSW – Natural science with spatial planning and nature-based solutions. UNWE – Energy security, climate, and national security. UKSW – Ecosystem and biodiversity education with regulatory applications.
Research and Inquiry-Based Learning	University of Rwanda – Independent research using local data. UKSW – Interdisciplinary research, climate system science, project development. UKSW – Critical thinking and independent fact-checking.
Collaborative and Group-Based Learning	Kibabii University – Group learning sessions. University of Rwanda 1 & 2 – Group-based problem solving, team projects. UKSW 3 – Interdisciplinary training and collaborative workshops.

The programme highlights in the table can be very useful for the Virtual Exchange (VE) under ECO-ACT because they essentially serve as a menu of proven, context-specific teaching and learning strategies that can be adapted, integrated, and scaled across the partner institutions. For example, experiential & field-trip based learning can be adapted into virtual field trips or interactive simulations in the VE platform, ensuring students still gain "hands-on" experience even in an online setting and the use of GIS, remote sensing, and multimedia in current programmes can be standardized and shared across partner universities through the VE, giving all students access to the same powerful tools, regardless of their local infrastructure limitations.

3.2.4. Success factors and constraints

The curriculum reviewers extracted enabling conditions in the programme and reported them as success factors. Table 10 below presents all the success factors mentioned in the curricula reviewed.

Table 10: Success factors for EC/CC curricula reviewed by ECO-ACT partners

S/N	Success Factor	Description
1	Experiential Learning	Integration of fieldwork, excursions, lab experiments, and simulations to connect theory with real-world application.
2	Community Engagement	Students engage in local environmental projects, increasing relevance and impact of learning.
3	Interdisciplinary Approach	Combines natural sciences, economics, policy, and communication, broadening student perspectives.
4	Collaborative & Peer Learning	Group-based research and discussions promote teamwork and collective problem-solving.
5	Access to Experts	Involvement of academics, military, business, and NGO professionals enriches the learning process.
6	Use of Modern Technology	Integration of GIS, remote sensing, and audio-visual tools supports hands-on and digital learning.
7	Policy and Practice Link	Policy labs, case studies, and workshops link theoretical learning to real-life governance challenges.
8	International Research Exposure	Partnerships with international climate networks and universities provide access to cutting-edge research.
9	Student-Centered Research	Emphasis on independent inquiry encourages critical thinking and knowledge creation.
10	Living Laboratories	Real-world test sites like rain gardens make environmental concepts tangible.

Institutional challenges that impede program development, execution and administration were also highlighted. They are summarized in Table 10.

Table 11: Constraints for EC/CC curricula reviewed by ECO-ACT partners

S/N	Constraint	Description
1	Lack of Climate-Specific Training Materials	Some programs lack detailed guidelines or structured content on critical topics like climate fact-checking.

2	Over-reliance on Qualitative Data	Frameworks like ACT rely heavily on expert-based qualitative input, limiting robust, data-driven decisions.
3	Limited Technical Capacity	Advanced modeling tools (e.g., climate projection, GIS) require skills that not all students or facilitators possess.
4	Insufficient Weather Data/Equipment	Some regions lack the infrastructure for environmental monitoring or climate-related data collection.
5	Curriculum Gaps in Practical Integration	A few programs emphasize theory without fully embedding practical/field-based applications.
6	Digital Divide	Online and remote learning tools require reliable internet and digital literacy—often a barrier in some contexts.
7	Fragmented Institutional Collaboration	In some cases, cross-sector or inter-university cooperation is not well institutionalized.

The ten success factors offer a blueprint for building an ECO-ACT VE curriculum that is practical, engaging, and globally relevant whereas the seven constraints highlight potential pitfalls that should be proactively managed. The success factors should guide the VE curriculum to be innovative and student-centered, while constraints should remind us to stay realistic about existing challenges. The encouraging fact is that many success factors—like interdisciplinary learning and international research—align well with the VE's mission to connect East African and European institutions. By building in solutions for the constraints from the outset, the VE program will be more likely to be scalable and replicable.

3.3. Findings from Student survey

3.3.1. Demographic information

Table 12 below shows the gender, age, and educational distribution of students who responded to the survey.

Table 12: Gender and age distribution of students who responded to the survey

Gender		Age groups		Education Level	
Gender	Freq	Age group (years)	Freq	Level	Freq.

Male	209	18-25	278(76.8%)	Certificate	4(1.1%)
Female	153	26-32	52(14.4%)	Undergraduate	310(86.1%)
Others	0	33 and above	32(8.8%)	Postgraduate	32(8.9%)
				Masters	8(2.2%)
				Doctorate	1(0.3%)
				Diploma	2(0.6%)
				Average	3(0.8%)
TOTAL	**362**		**362 (100%)**		360(100%)

As shown, the population is predominantly male (60%), with females making up 40%. A large majority (over 70%) of the population falls within the 18–25 age bracket, indicating a youthful demographic; characteristic of undergraduate students which form 86% of the sampled students. These students came from a variety of study fields including ecology, medicine, philosophy & environment, public health and pedagogy. As shown, the majority of respondents were undergraduate students (86.1%). Two respondenrs did not indicate their educational level. The number of students who responded to the questionnaire by university is shown in table 13.

Table 13: Number of students who responded to questionnaires by university

S/N	Partner Institution	No. of males	Number of females	Total
1	UKSW	9	29	38 (10.5%)
3	Kibabii University	56	39	95 (26.2%)
4	Lira University	26	8	34 (9.4%)
5	University of Rwanda	90	44	134 (37%)
6	UNWE	28	33	61(16.9%)

Total		209 (57.8%)	153(42.2%)	362 (100%)

The table shows that the majority of respondents were from the University of Rwanda (37%), followed by Kibabii university (26.2%) and UNWE (16.9%). Lira university and UKSW contributed about 10% each. UBG did not administer the questionnaire due to internet problems.

3.3.2. Level of awareness of Climate Change Issues

When asked about their level of understanding of climate change issues (Figure 1) only 27% had advanced knowledge; the rest had moderate (43%), basic (27%) or no understanding (3%), suggesting that the proposed VE programme could reinforce understanding of EC/CC concepts for the majority of students. It is encouraging to note that the majority of students have a decent baseline knowledge of climate change issues (basic and moderate).
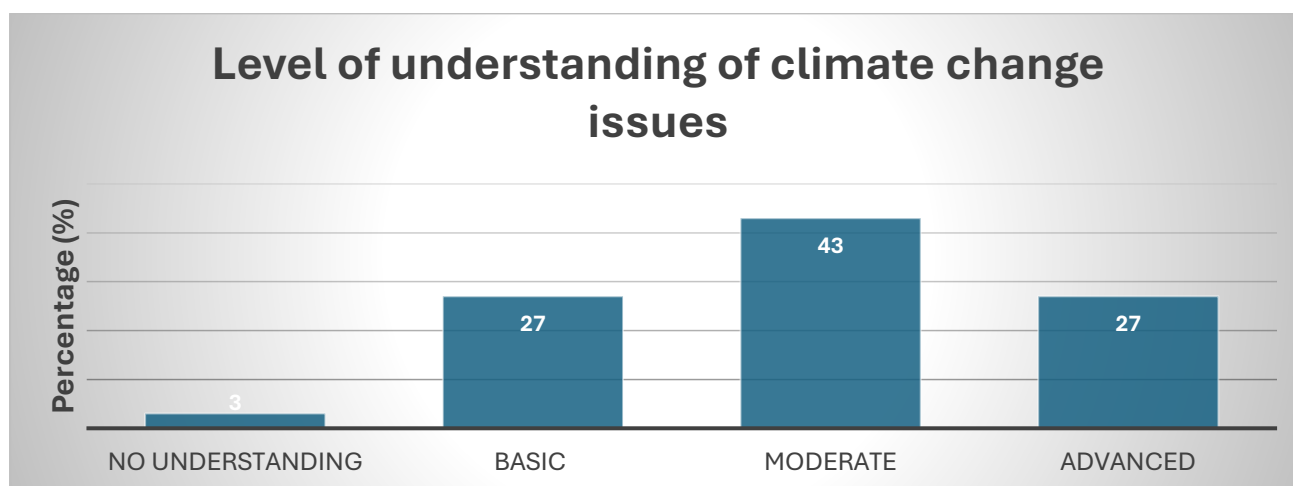
Figure 1: Level of understanding of climate change issues

Awareness level to climate change issues, segregated by country, is shown in table 14 below. The table reveals that overall moderate understanding is the most common level of awareness, accounting for 43% of the total sample. Rwanda, which forms the largest share of respondents (44.7%), records the highest awareness levels with 20.7% indicating moderate and 14.3% advanced understanding. Kenya shows relatively strong awareness as well, with 14% reporting moderate and 10.7% reporting advanced understanding. The majority of respondents in the rest of the countries in the partnership indicated average to moderate understanding. Only 2% of all respondents reported having no understanding of

climate change issues, suggesting that climate change awareness is generally present across all countries, though the depth of understanding varies.

Table 14: Level of awareness of climate change issues by country

	Country					
Awareness	Kenya	Poland	Rwanda	Uganda	Bulgaria	Total
Advance/in-depth Understanding	32 (33.7%)	5(13.2%)	43(32.1%)	4(11.8%)	3(4.9%)	87 (24%)
Moderate/Average Understanding	42 (44.2%)	10 (26.4%)	62(46.3%)	16(47%)	24(39%)	154 (42.5%)
Basic Understanding	21(22.1%)	22(57.9%)	27(20.1%)	14(41%)	31(50.8%)	115 (31.7%)
No Understanding	0(0%)	1(2.6%)	2 (1.5%)	0 (0%)	3(4.9%)	6 (1.7%)
Total	95 (100%)	38(100%)	134(100%)	34((100%)	61(100%)	362 (100%)

Cross-tabulation of age-group with understanding of climate change is shown in Figure 2 below.

Level of Climate Change Knowledge by Age Group
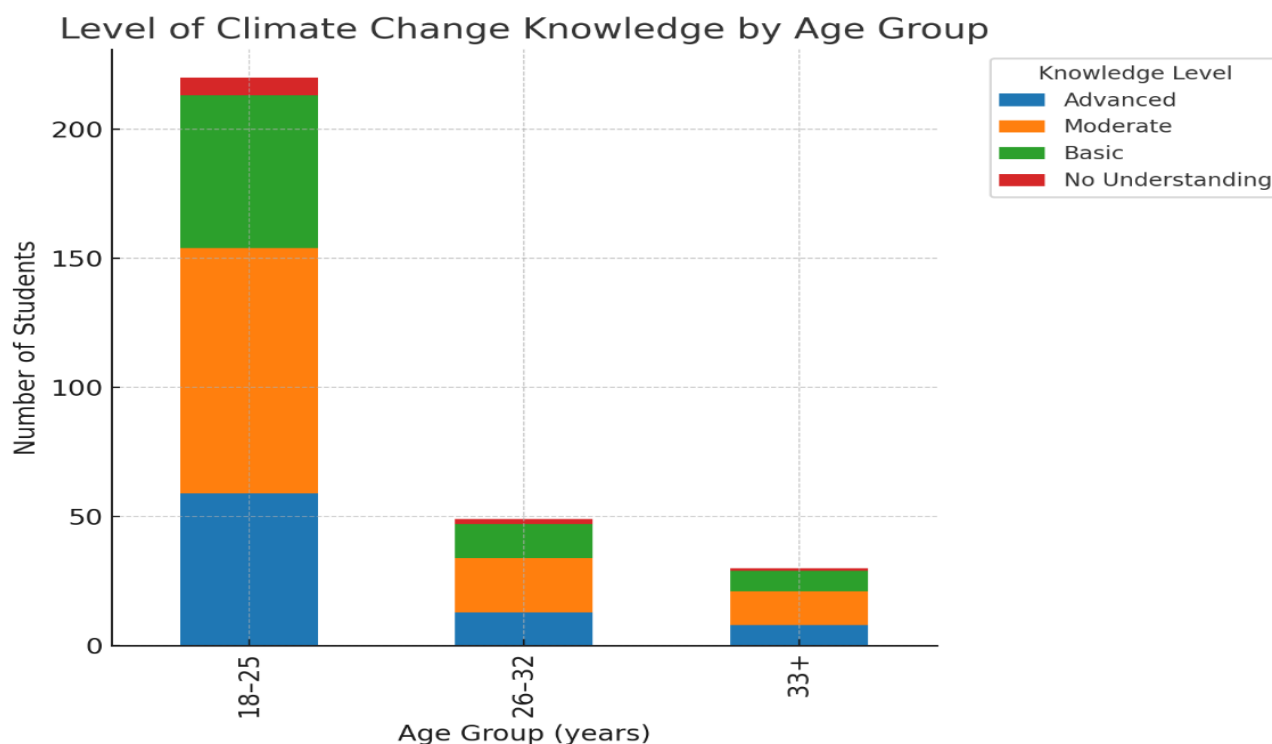
Figure 2: Level of students' knowledge of Climate Change by Age group.

The majority of students have moderate/basic knowledge across all age groups. Hence age-specific tailoring of the VE programme might not be necessary. Instead, the focus should be on content depth and engagement strategies to move the bulk of students towards advanced knowledge, especially in the large 18-25 bracket.

When asked to rate their level of familiarity with key EC/CC concepts such as climate resilience, biodiversity conservation, carbon footprint, circular economy and renewable energy sources, it became clear that some concepts, such as carbon print and circular economy need reinforcement because more than 69% of respondents did not know **(See figure 3).**
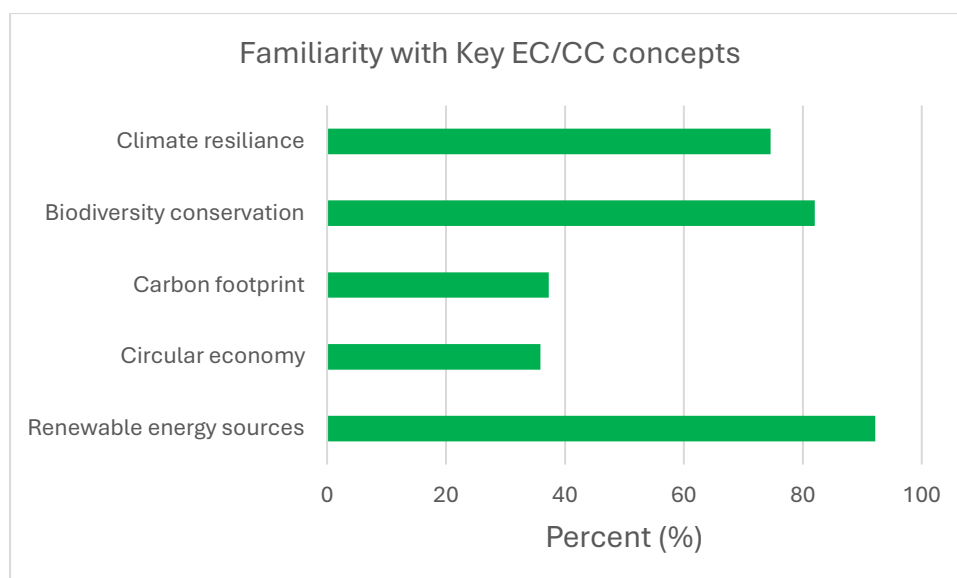
Figure 3: Students' familiarity with key EC/CC concepts

Table 15 show the number of key concepts respondents were familiar with by country. As shown, only 51.1% of respondents were familiar with all the 5 core concepts in EC/CC. The countries with the highest familiarity were Bulgaria (8.5%) and Poland (76.4%). The percent of respondents from EA countries who were aware of all 5 concepts were remarkably less compared to EU respondents, with Kenya scoring the highest (53%) and Uganda the least (21.45). This data underscores the need for the VE programme to emphasize these concepts for the benefit of the EA countries.

Table 15: Level of familiarity with key EC/CC concepts by country

	Familiarity with 5 concepts: Renewable energy sources, Circular economy,Carbon footprint, Biodiversity conservation, Climate resilience	Familiarity with 4 concepts: Renewable energy sources, Biodiversity conservation,Climate resileince	Familiarity with 3 concepts: Renewable energy sources, Biodiversity conservation	Familiarity with 1 concept: Renewable energy sources	Total
Kenya	44 (53%)	25 (30.5%)	6 (7.3%)	7 (8.5%)	82 (30.6%)
Poland	13 (76.4%)	1 (5.9%)	2 (11.8%)	1 (5.9%)	17 (6.3%)
Rwanda	45 (42.8%)	37(6.7%)	15(14.3%)	8(7.6%)	105 (39.2%)
Uganda	6 (21.4%)	15 (53.6%)	5(17.8%)	2(0.71%)	28 (10.4%)

| Bulgaria | 29 (80.5%) | 4 (11.1%) | 1(2.8%) | 2(5.6%) | 36 (13.4%) |
| Total | 137 (51.1%) | 82(30.6%) | 29 (10.8%) | 20(7.5%) | 268 (100%) |

3.3.3. Knowledge of Climate change challenges

When asked to rate their knowledge of climate change challenges (e.g. drought, deforestation and flooding) the majority indicated moderate or comprehensive knowledge as shown in **Figure 4.**
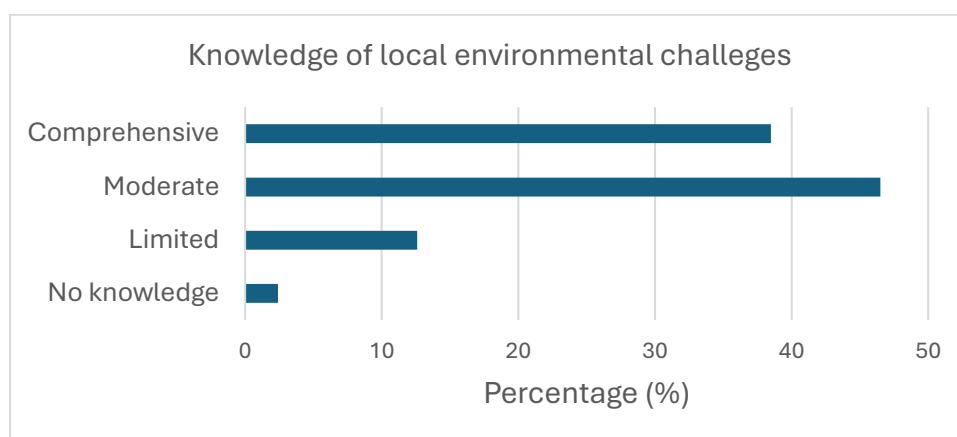
Figure 4: Students' level of knowledge of local environmental challanges

Cross tabulation with age revealed that across all age groups, the largest segment reported moderate knowledge which mirrors the overall chart trend (46%). Most of the younger age group (18-25 years) are in this category, suggesting exposure but possibly lack of depth. The older age groups (26+ years) have a higher share of comprehensive knowledge relative to group size indicating more accumulated experience or education as shown in **Figure 5.**
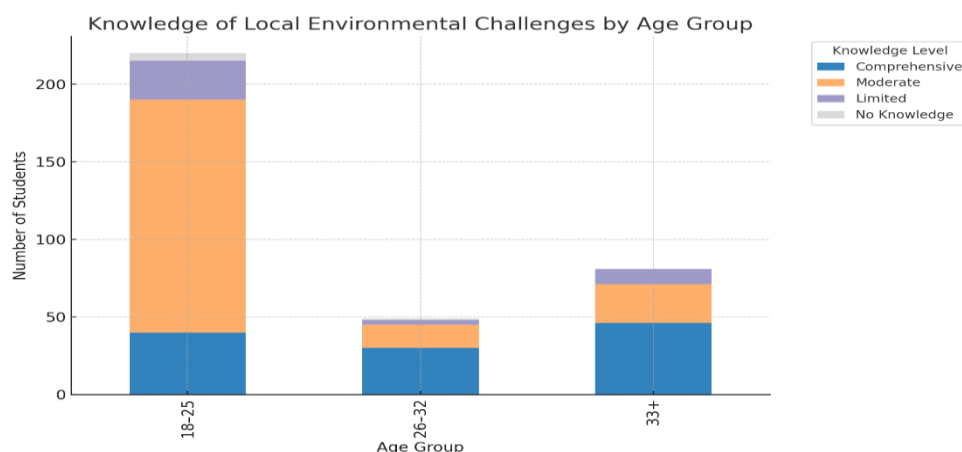
Figure 5: Students' knowledge of local environmental challanges

The majority of students could identify deforestation (89%), industrial emission (84%) and natural processes (63.5%) as the major causes of climate change and are aware of the UN SDG on climate action (76.4%).

3.3.4. EC/CC in HEI curriculum

The majority of students (248/361) reported that aspects of EC/CC were present in one or more course units. Table 16 below shows the distribution of respondents whose curriculum do not incorporate climate change and those who have it in at least one module across universities in East Africa and Europe. Proportions of respondents from East African Universities who said EC/CC is included in their curriculum is seamingly higher than the proportions in Europe. These proportions are 85.3%, 70.9%, 64.7% for Kenya, Rwanda, and Uganda respectively. These percentages are significantly higher than the proportion in Poland (57.1%) and Bulgaria (45.9%).

Table 16: Inclusion of EC/CC in the curriculum

If EC/CC is included in the curriculum	Kenya	Poland	Rwanda	Uganda	Bulgaria	Total
No	14(14.7%)	16(42.1%)	39(29.1%)	12(35.3%)	33(54.1%)	114(27%)
Yes	81(85.3%)	22(57.1%)	95(70.9%)	22(64.7%)	28(45.9%)	248(73%)

| Total | 95(100%) | 38(100%) | 134(100%) | 34(100%) | 61(100%) | 362(100%) |

Of those that had EC/CC in their curriculum, only 14% had an entire programme, 38.8% had 1 module, 24.6% had 1 course unit and 22.5% had 2 or more course units. (How does this compare between African and EU HEIs?).

Table 17 shows the distribution of the extent of curriculum coverage across different countries.

Table 17: The extent of curriculum coverage across different countries

Extent of EC/CC in Curriculum	Kenya	Poland	Rwanda	Uganda	Bulgaria	Total
One module within one or more units	31 (29.2%)	13 (12.3%)	41(38.7%)	8(7.5%)	13 (12.6%)	106 (39.6%)
A entire program concerned with EC/CC	11 (32.4%)	1 (2.9%)	20(58.9%)	2(5.9%)	0	34 (12.7%)
Only one course unit in the program	25 (34.2%)	7 (9.6%)	19 (26%)	8 (10.9%)	14 (19.2%)	73 (27.2%)
Two or more course	17 (30.9%)	4 (7.2%)	28 (50.9%)	5 (9.1%)	1 (1.8%)	55 (20.5%)

units in the program						
Total	84 (31.3%)	25 (9.3%)	108 (40.3%)	23 (8.5%)	28 (10.4%)	268 (100%)

Rwanda shows the strongest integration of Environmental/Climate Change (EC/CC) content across curricula, leading in full EC/CC programs, multi-course coverage, and single-module inclusion. Kenya follows with moderate integration, mainly through one module or one course unit. Poland, Uganda, and Bulgaria show lower levels of integration, with most cases limited to single modules or isolated course units. Overall, EC/CC is most commonly included as one module within existing units (39.6%), while fully dedicated programs remain least common (12.7%), indicating that integration is generally partial rather than comprehensive. Thus, the VE programme can serve as a critical supplement by offering integrated and comprehensive content on climate and environmental topics that may be lacking in their home institutions. Given that most students are exposed to EC/CC through only a module or a few course units, the VE programme should emphasize modular, flexible learning units. This would allow students from diverse curricula to engage meaningfully without needing to commit to a full programme. Since a significant number of students in both African and European Universities have limited exposure (Table 17), the programme should focus on deepening understanding and connecting theoretical concepts with practical applications in climate and environmental issues.

Most respondents (83.4%) feel equipped to deal with EC/CC challenges, but readiness varies widely by country (Table 18). Rwanda (91.1%) and Kenya (89.5%) show the highest confidence, reflecting stronger curriculum integration and awareness. Uganda also reports high readiness (82.4%) despite lower curricular coverage; possibily due to non-curricular exposure such as media. In contrast, Poland has the lowest preparedness, with 57.8% feeling unequipped. Bulgaria is evenly split, with about half feeling prepared. Overall, while regional readiness is generally strong, significant disparities indicate uneven capacity to address EC/CC challenges across countries.

Table 18: Readiness to deal with EC/CC challenges across differeent countries

Feel equiped to deal with	Kenya	Poland	Rwanda	Uganda	Bulgaria	Total

EC/CC challenges						
No	10 (10.5%)	22 (57.8%)	12 (8.9%)	6 (17.6%)	30 (49.2%)	50 (16.6%)
Yes	85 (89.5%)	16(42.2%)	122 (91.1%)	28 (82.4%)	31 (50.8%)	251(83.4%)
Total	95 (100%)	38 (100%)	134(100%)	34 (100%	61 (100%)	301(100%)

Although majority of respondents from East African Universities feel equiped to deal with EC/CC challenges, the majority (95%) indicated that they would be willing to participate in further training and in short video lectures (93%). Although the majority of European respondents also expressed willingness to participate in further training, the percentage is lower compared to EA respondents; 73.7% for Bulgaria and 73.7% for Poland. The majority of respondents from both Europe and EA believe that knowledge of research and data analysis (81.1%), project management (61%), policy advocacy (67.4%), community engagement (79.4%) and technical skills (74.4%) are critical for addressing climate change. Interestingly, a well-designed Virtual Exchange (VE) programme, such as the ECO-ACT programme, can absolutely address those concerns and build on students' existing confidence. For example, joint online research projects where students from different institutions collect, share and analyse environmental/climate data from their region can boost knowledge of research and data analysis.

3.3.5. Barriers to Climate change action

When asked to identify the major barriers to EC/CC action, the following 4 barriers emerged most strongly: Lack of training (81.4 %), Limited funding (73%), Insufficient awareness (74.8%) and low interest (52.5%). Table 19 shows these barriers among the partner countries.

Rwanda and Kenya report the highest barriers to EC/CC capacity building, together accounting for over 80% of all challenges. Their main issues include limited training access, funding shortages, insufficient awareness, and low interest. Uganda shows moderate barriers but far fewer cases. In contrast, Poland and Bulgaria report very low barrier levels, suggesting stronger institutional support, better funding, and easier access to training. Overall, the data reveals a clear regional divide: East

African countries face significant structural challenges, while European countries experience minimal obstacles.

Again, it is possible for the proposed ECO-ACT VE programme to address all these barriers significantly. For example, interactive live sessions on topics like renewable energy technology, climate-smart agriculture, or waste management, led by experts with Q&A segments, can address the lack of training barriers. A centralized digital library of open educational resources, toolkits, and case studies accessible to all VE participants for free can address funding limitation, inviting activists, scientists, and policymakers to share insights and stories via live streams and interactive sessions could increase awareness and lastly, interactive quizzes and other strategies to motivate and reward participation could be factored in the design of the programme.

Table 19: Top four barriers to EC/CC action by countries

	Lack of access to training programs, limited funding or resources, insuffucuent awareness, low interest	Lack of access to training programs, limited funding or resources, insuffucuent awareness,	Lack of access to training programs	Lack of access to training programs,Insufficient awareness, low interest	Lack of access to training programs, limited funding	Total
Kenya	26(29.2%)	25(35.7%)	9(47.4%)	6 (26.1%)	3(17.6%)	69(34.8%)
Poland	3(3.4%)	1(1.4%)	0(00%)	3(13%)	1(5.8%)	8(4.1%)
Rwanda	37(41.6%)	33(47.1%)	9(47.4%)	7(30.4%)	11(64.7%)	97(49%)
Uganda	13(14.6%)	8(11.4%)	1(5.2%)	1(4.3%)	1(5.8%)	24(12.1%)

Bulgaria	10(11.2%)	3(4.3%)	0(00%)	6(26.1%	1(5.8%)	20
Total	89(100%)	70(100%)	19(100%)	23(100%)	17(100%)	198(100%)

3.3.6. Climate change and disasters

Awareness of climate–disaster relationships is highest in East Africa and significantly lower in European countries (Table 20). Kenya, Uganda, and Rwanda show near-universal understanding of both rainfall–disaster and temperature–disaster links, reflecting frequent climate-related events and strong public exposure. Poland shows moderate awareness, especially lower for rainfall impacts. Bulgaria has the lowest awareness, with fewer than half recognizing the rainfall–disaster link. Overall, temperature–disaster awareness is slightly higher than rainfall awareness, but clear regional disparities indicate that climate risk understanding is strongest where climate impacts are most directly experienced.

A VE programme could turn students' high awareness into practical engagement and action through online scenario-based simulations (e.g., floods, droughts, heatwaves) where students make real-time decisions and see the outcomes or provide hands-on remote training in disaster risk assessment by using GIS for hazard mapping, and community vulnerability analysis.

Table 20:Awareness of relationship between changes in rainfall and temperature with disaster

Country	Awareness of Rainfall – Desaster relationship			Awareness of Temperature – Desaster relationship		
	Yes	No	Total	Yes	No	Total
Kenya	94 (99%)	1(1%)	95 (100%)	92(96.8%)	3 (3.1%)	95(100%)
Poland	24(63%)	14 (37%)	38 (100%)	32 (84.2%)	6 (15.8%)	38 (100%)
Rwanda	122(91%)	12(9%)	134 (100%)	115(85.8%)	19 (14.2%)	134 (100%)
Uganda	33(97%)	1(3%)	34 (100%)	33 (97.1%)	1 (2.9%)	34 (100%)

Bulgaria	29(47.5%)	32(52.5%)	61 (100%	45 (75.8%)	16 (26.2%)	61 (100%
Total	302 (83.4%)	60 (16.6%)	362 (100%)	317 (87.6%)	45 (12.4%)	362 (100%)

An overwhelming majority of students (93.7%) know that climate change impacts food production through drought (87%), soil degradation (83%), and pests & diseases (75.7%) but awareness of food security strategies shows strong regional disparities (Table 21). Kenya, Rwanda, and Uganda report high awareness levels (about 66–68%), reflecting the prominence of food security challenges and active national programs. In contrast, awareness is extremely low in Poland (10.5%) and Bulgaria (about 6.6%), where most respondents are unaware of existing strategies. Overall, African countries demonstrate much greater engagement with food security issues, while European respondents show limited visibility or perceived relevance of such strategies, indicating a clear divide in public understanding.fewer (60.1%) are aware of the strategies being promoted to ensure food security in their region..

Table 21: Awareness of the strategies being used to promote food security by Country

	Kenya	Poland	Rwanda	Uganda	Bulgaria	Total
Yes	65(68.4%)	4(10.5%)	89(66.4%)	23(67.6%)	4(6.6%)	185(100%)
No	30(30.6%)	34(89.5%)	45(32.8%)	11(32.4%)	57(%)	177(100%)
Total	95(100%)	38(100%)	134(100%)	34(100%)	61(95.1%)	362(100%)

Most (93.4%) have experienced or heard of food shortages or price increases in their areas as a result of climate change events and 84.4% think that their institution is doing a good job of educating students about the relationship between climate change and sustainable agriculture. Again, the ECO-ACT project could move students from awareness of climate-food challenges to practical knowledge and collaborative problem-solving on sustainable agriculture strategies. For example, the project could curate videos, manuals, and policy briefs on climate-smart agriculture, and make them available to all partner institutions.

Lastly, about 85% of students have noticed recent changes in disease patterns and are aware that diseases like malaria, cholera, dengue fever are caused by climate change. However, only half believe that their communities are equipped to handle the health challenges linked to climate change as shown in table 22.

Table 22: Beliefs that communities are equiped to handle health challenges by countries

	Kenya	Poland	Rwanda	Uganda	Bulgaria	Total
Yes	47 (49.5%)	14 (40%)	83 (61.9%)	5 (14.7%)	27 (44.3%)	176 (49%)
No	48 (50.5%)	21 (60%)	51 (38.1%)	29 (85.3%)	34 (55.7%)	183 (51%)
Total	95	35	134	34	61	359 (100%)

The data shows that perceptions of community preparedness for health challenges vary widely across countries. Overall, responses are nearly evenly split, with 49% believing communities are equipped and 51% believing they are not. Rwanda shows the highest confidence (61.9%), reflecting strong public health programs, while Kenya is evenly divided (49.5% yes). Uganda reports the lowest confidence (14.7%), indicating major perceived vulnerabilities. European countries, Poland (40% yes) and Bulgaria (44.3% yes), show moderate skepticism despite higher resources. The data reveal clear regional disparities, with East African countries generally being more confident than Uganda, and European countries expressing cautious perceptions, highlighting gaps in perceived community health readiness globally.

About 63.8% of respondents reported that their institutions offer information or campaigns about climate-related health risks (Table 23). However, there are clear differences across countries. Kenya (86.3%) and Rwanda (80%) report strong institutional engagement, indicating active communication on climate-health issues. In contrast, Poland (28.9%), Uganda (35.3%), and Bulgaria (31.1%) show low levels of institutional outreach, with majorities in these countries indicating that such information is not offered. The pattern suggests stronger climate-health communication efforts in East African countries, while European countries and Uganda show weaker institutional activity, reflecting differences in policy prioritization and communication capacity. VE could supplement existing institutional efforts by, for example, running online drills for outbreaks of malaria, cholera, or dengue fever under climate-change scenarios.

Table 23: Whether Institutions offer information or campaign about climate-health related risks by Countries.

	Kenya	Poland	Rwanda	Uganda	Bulgaria	Total
Yes	82 (86.3%)	11 (28.9%)	107 (80%)	12 (35.3%)	19 (31.1%)	231(63.8%)
No	13 (13.6%)	27 (71.1%)	27 (20%)	22 (64.7%)	42 (68.9%)	131(36.2%)
Total	95	38	134	34	61	362(100%)

3.3.7 Summary and Conclusion

The student survey revealed that most respondents were young undergraduates (18–25 years) with moderate to basic climate change knowledge but strong interest (95%) in further training. While 83.4% felt equipped to address climate challenges, key gaps remain in areas such as climate financing, environmental security, and applied technical skills. Students identified major barriers as lack of training, limited funding, and insufficient awareness. High awareness exists on climate impacts on disasters, food security, and health, but practical engagement is limited. The findings suggest that the ECO-ACT VE programme can bridge knowledge gaps, enhance skills, and foster cross-regional collaboration.

3.4. Findings from Interviews with Staff at partner HEIs

Semi-structured interviews with staff members from 5 HEIs aimed at identifying challenges in designing and delivering education in the field of environmental conservation and climate change as well as mapping the areas of interest for cooperation with European and East African partner HEIs was conducted.

3.4.1 Demographics

A total of 33 staff members from 5 HEIs were interviewed. Table 14 shows the distribution of staff.

Table 14: Characteristics of staff members interviewed

HEIs	Academic Staff EC/CC	Academic staff Other	Admin staff	Total
Kibabii University	7	3	0	10
Lira University	4	2	0	6
University of Rwanda	1	2	0	3

UBG	1	4	3	8
UNWE	2	3	1	6
Total	**15**	**14**	**4**	**33**

As shown, the majority were staff who taught courses related to EC/CC such as ecology and geography. Academic staff labelled as **'others'** in the table came from other fields such as computer sciences, history, veterinary sciences etc. Admin staff comprised categories such as Deans of faculties, academic registrars and university engineers, etc.

3.4.2 The Key challenges and gaps for all HEI

This section highlights institutional challenges and opportunities in advancing EC/CC education, research, and outreach.

3.4.2.1. Challenges

Seven challenges were highlighted by staff from partner HEIs. These included:

1. **Funding Constraints**

All HEIs highlighted funding gaps for various purposes. Kibabii University pointed out limited financing for curriculum development and accreditation processes, Lira University for support of EC/CC initiatives, University of Rwanda for ECO-ACT Infrastructure investment, UBG for EC/CC programming and UNWE for research.

2. **Low Awareness & Engagement**

Partners pointed out general lack of public awareness and student engagement in EC/CC across institutions. UNWE staff pointed that sustainable development remains under-prioritized at their university. There was some progress in this area at Lira University through community-based learning.

3. **Training & Expertise Gaps.**

Faculty shortages in climate modeling, limited interdisciplinary educators, and reliance on lecture-based teaching was echoed in all EA HEIs. UBG and UNWE see the greatest value in strengthening

capacity for interdisciplinary, practice-oriented EC/CC teaching. face particularly low capacity for interdisciplinary and practical EC/CC teaching.

4. Curriculum Gaps

Some partner staff members (UGB and Kibabii) pointed out that EC/CC content was outdated and/or insufficiently integrated across disciplines. Some positive examples include Lira university's public health integration and UNWE's EC/CC-focused degree programs.

5. Limited Practical Experience

Most universities lack practical training opportunities, extracurricular EC/CC activities, or adequate lab facilities. For example, UBG expressed concern that only theory-based learning is offered.

6. Infrastructure Deficits

Challenges that were revealed range from lack of labs and textbooks (Rwanda) to poor power and internet connectivity (UBG). Kibabii struggles to implement EC/CC programs due to resource shortages.

7. Socio-Economic Barriers

Economic reliance on unsustainable practices such as charcoal production mentioned by UBG and students balancing work and studies (UNWE) limits participation in EC/CC activities.

3.4.2.2. Notable Positive Practices

Despite the many challenges, there were some notable positive initiatives. For example, Lira University has integrated EC/CC into Public health programmes and internal research funds can be awarded for well-written EC/CC research proposals. UBG has some biodiversity and climate change content in their programs. UNWE has a promising green campus initiative, adapted renewable energy usage, EC/CC degree programs and a leadership role in SDSN Bulgaria.

3.4.2.3. Recommendations

It is recommended that partner HEIs establish dedicated EC/CC Funding Streams by creating national and regional grant programs to support curriculum upgrades, research, and infrastructure. Furthermore, they should implement targeted training in climate modeling, interdisciplinary EC/CC pedagogy, and

community engagement strategies to enhance Faculty Capacity. Importantly, they should begin to integrate EC/CC across curricula by embedding sustainability topics into diverse disciplines. They should urgently invest in practical learning infrastructure by providing labs, field stations, and experiential learning programs. Also, expansion of Outreach & Community-Based Learning by partnering with local governments, NGOs, and industry for public awareness and hands-on projects is recommended. Lastly, Socio-Economic constraints should be addressed by introducing flexible learning schedules and incentives for sustainable livelihoods.

3.4.3. Challenges in Implementing EC/CC education by partner Universities

Across the partner institutions there is a shared recognition of the importance of Environmental and Climate Change (EC/CC) education. However, systemic challenges continue to hinder its effective integration and delivery.

1. Funding remains a foundational obstacle.

Kibabii University struggles with inadequate financial support for EC/CC activities and resources, while Lira University has no budget allocation for a dedicated EC/CC programme. The University of Rwanda faces limited funding, particularly for equipment and learning materials. At UBG, EC/CC is not budgeted for at all, and UNWE similarly faces resource constraints in advancing the mainstreaming of EC/CC education across curricula. This financial gap restricts innovation, resource development, and faculty training across the board.

2. Curriculum integration is uneven and underdeveloped.

Kibabii University and UNWE have yet to fully embed EC/CC across all its courses. Lira University offers only a few EC/CC-related units, primarily in Public Health and Geography, without a comprehensive programme. The University of Rwanda has not integrated EC/CC as a cross-cutting theme, and UBG's curriculum has not been revised in a long time, leaving it outdated and disconnected from current climate realities.   UNWE lacks a strategic plan altogether to incorporate EC/CC across its academic offering

3. The relevance of EC/CC content is also a concern.

Kibabii University's training methods are outdated and lack modern EC/CC approaches. Lira University's content is limited and fragmented, confined to isolated units. At the University of

Rwanda, coverage is uneven, with some programmes entirely missing EC/CC components. UBG faces low lecturer awareness of EC/CC's importance, and UNWE's curricula could be further improved by mainstreaming EC/CC issues in bachelor and master programmes, and by integrating innovative teaching methods and technologies that would allow students to connect EC/CC theory to real life. .

4. Faculty expertise is insufficient across all institutions.

Kibabii University has minimal specialised staff and limited faculty training in EC/CC. Lira University similarly lacks qualified personnel in this field. The University of Rwanda faces a shortage of EC/CC-trained staff, especially outside STEM disciplines. UBG's faculty has low awareness of EC/CC issues, and As an economic university, UNWE does not have a dedicated faculty specializing exclusively in EC/CC.

5. Practical exposure for students is severely limited.

Kibabii University offers few field trips, and large class sizes further reduce engagement. Lira University rarely organizes hands-on training, and the University of Rwanda provides limited practicals and tutorials outside STEM fields. UBG suffers from inadequate research facilities, and UNWE does not provide field-based learning opportunities related to EC/CC, since it does not have degree programmes designed to incorporate such activities. .

6. Learning resources and infrastructure are inadequate.

Kibabii University faces shortages in textbooks, modelling software, and basic infrastructure. Lira University has limited teaching materials and facilities, while the University of Rwanda struggles with poor access to digital resources and internet connectivity. UBG's research infrastructure is weak.

7. Assessment and skill development are also problematic.

Kibabii University offers limited opportunities for continuous faculty development. At Lira University, staff express dissatisfaction with how EC/CC is delivered and assessed. The University of Rwanda relies heavily on written tests, with little diversity in assessment methods. UBG reports high student failure rates in some programmes, and UNWE lacks interdisciplinary and applied training approaches in the field of EC/CC that are essential for climate education.

3.4.4. Potential Areas of co-operation among partner HEIs

There is a strong and growing commitment to regional and international cooperation in advancing Environmental and Climate Change (EC/CC) education. Each institution in this ECO-ACT partnership brings distinct strengths and shared aspirations that align well with Erasmus+ priorities.

3.4.4.1. Possible areas of co-operation

Partner institutions highlighted 8 areas of collaboration as follows:

1. Joint research projects.

This is a central area of interest for all five universities. Kibabii, Lira and UNWE Universities already participate in funded collaborations with both local and international partners, demonstrating their capacities to lead and contribute to multi-institutional research. The other universities—Rwanda and UBG—have expressed clear interest in joining such initiatives, particularly those focused on climate resilience, sustainability, and green innovation.

2. Curriculum development and review

Curriculum co-development is another priority. All EA partner universities have formally identified this as a strategic area, and would like the partnership to help them refine or develop new EC/CC curricula. Lira University, in particular, sees value in collaborative curriculum design, and the University of Rwanda, UBG, and UNWE all support efforts to modernize academic programmes through joint input and shared expertise.

3. Faculty and staff capacity building

This initiative is widely supported by all partner HEIs. Kibabii University actively engages in workshops, trainings, and conferences to strengthen its academic workforce. The other universities emphasize the need to enhance research capacity and expand postgraduate training opportunities. This shared focus creates fertile ground for professional development through mobility, mentorship, and joint academic programmes.

4. Student exchange and mobility

Student exchange is encouraged across all five institutions. Kibabii University promotes experiential learning and exchange programmes, while Lira, Rwanda, UBG, and UNWE support both staff and student mobility. These universities are ready to engage in cross-cultural learning and academic collaboration.

5. Technology and resource sharing

This initiative is currently practiced at Kibabii University, which has initiated efforts to share digital tools and teaching resources. While the other institutions have not yet formalized such initiatives, they present opportunities for future collaboration, particularly in digital transformation and e-learning.

6. Summer school and holiday programmes

Kibabii University is currently providing students with intensive, hands-on learning experiences during academic breaks. This model could be replicated or expanded across partner institutions to enhance EC/CC engagement.

7. Joint capacity-building activities

These kinds of activities, such as workshops and trainings, are already underway at Kibabii and Lira Universities. These efforts can be scaled to include the other institutions, creating a regional network of climate education champions.

8. Collaboration with NGOs

This is another area where Kibabii University stands out, working with local organizations on environmental conservation projects. This experience can inform and inspire similar partnerships at the other universities.

3.4.4.2. Complementary contributions from European and East African partners

The EA-EU complementarity enriches the cooperation landscape. EU institutions provide technical expertise, support curriculum development, and promote research and postgraduate training. East African partners contribute indigenous knowledge and region-specific insights into climate and environmental challenges, ensuring that solutions are locally grounded and culturally relevant.

3.4.4.3. Key topics for cooperation

These include renewable energy—such as solar gardens—smart agriculture, eco-friendly waste management, water resource management, and sustainable farming practices. These themes are shared across all five universities, reflecting a unified commitment to addressing climate change through practical, community-driven innovation. Finally, credit transfer mechanisms are supported by all institutions, facilitating smooth academic mobility and recognition of learning outcomes across borders.

3.4.5. Actionable insights for future steps

This section outlines the key support needs and strategic recommendations for the six universities. It emphasizes the importance of funding, capacity-building, and collaborative problem-solving to build resilient academic partnerships. The key support needs are presented below.

Across Kibabii University, Lira University, the University of Rwanda, UBG, and UNWE and UKSW, there is clear momentum for deeper regional and international collaboration in Environmental and Climate Change (EC/CC) education.

Joint research emerges as a unifying priority, with Kibabii already leading multi-partner projects and others eager to join initiatives in climate resilience, sustainability, and green innovation. Collaborative curriculum development is equally valued, with partners ready to co-create and modernize EC/CC programmes, ensuring relevance and alignment with global best practices. Faculty and staff capacity building—through research training, postgraduate opportunities, and academic mobility—is widely recognized as essential.

All institutions support student and staff exchanges, providing fertile ground for mobility schemes that build cross-cultural competencies. Digital transformation and resource sharing present new opportunities, especially in e-learning, where Kibabii's initiatives could be scaled across the network. Proven models like Kibabii's summer schools and NGO collaborations offer replicable approaches for experiential learning and community engagement.

European partners bring advanced technical expertise and research infrastructure, while East African universities contribute deep local knowledge and context-specific solutions—ensuring that joint projects are both innovative and grounded. Shared thematic priorities—renewable energy, climate-smart agriculture, sustainable waste and water management—point to high-impact areas for co-investment.

With mutual commitment to credit transfer and recognition, these partnerships can deliver transformative EC/CC education, research, and innovation, linking Africa and Europe in a sustainable knowledge alliance.

Some of the strategic focus areas that emerged from the interviews include renewable energy development, smart agriculture and eco-friendly waste management, water resource management and curriculum innovation for sustainability.

3.5. Insights from review of published articles in the area of EC-CC

We performed a comprehensive review of literature related to the 10 proposed modules for the ECO-ACT VE curriculum. As mentioned earlier, the 10 proposed modules were: Environmental and climate change governance, Climate change and Environmental security, Climate financing, Environmental Conservation, Climate change: drivers and Impacts, Climate Change and Natural Resource Conservation and Management, Climate Change and Development, Concept of Environment, Strategies to deal with climate change and Climate Change and Gender Mainstreaming. A total of 52 articles were reviewed.

The primary reason for the literature review was to identify knowledge gaps and priority needs in climate change education to ensure that the proposed modules respond to real challenges (IPCC, 2022). Secondly, literature review served to highlight both success factors and barriers in order to enrich the curriculum with practical case studies and problem-solving exercises. Furthermore, literature reviews enabled ECO-ACT partners to benchmark against international frameworks, including the Paris Agreement and the Sustainable Development Goals (UNFCCC, 2015; United Nations, 2015), to provide global relevance while integrating local realities. By synthesizing these insights, the literature review intends to inform ECO-ACT VE curriculum development to ensure that it is interdisciplinary, innovative in delivery, and designed to equip learners with the knowledge and applied skills necessary to address complex climate and environmental challenges.

As mentioned in the Methods section of this document, information about the articles (title, reference, objectives, highlights, success factors and constraints) were recorded on templates.

3.5.1. Mapping of ECO-ACT VE modules to reviewed articles

First, the articles reviewed were mapped to the ECO-ACT modules to see the strength of alignment. To achieve this, a thematic content analysis of article objectives was used. The exercise revealed that the articles reviewed aligned strongly-moderately with modules.

Table 15: Mapping of ECO-ACT VE modules to reviewed articles

ECO-ACT Module	Mapped Articles / Resources

1. Environmental and Climate Change Governance	• Rashaidin Umar Magdi & Junaidi: sustainable principles, environmental laws (CC-BY) • Casado-Asensio et al.: policy coherence for sustainable development
2. Climate Change and Environmental Security	• Articles on environmental policy literacy & security (Brian R., *Ádám* C. and Erika M. 2022; Godwell N., Lazarus C., Gideon W. M. *2025;* T. Rashaidin Umar Magdi ; Junaidi Junaidi 2024).
3. Climate Financing (Strengthened)	• *Financing Climate Change Adaptation: International Initiatives (MDPI, 2021)* • *Josephson et al. (2024): Economics of climate adaptation (arXiv)* • *Li et al. (2025): Bridging gaps with carbon market mechanisms (arXiv)* • COP29 policy insights (Le Monde, 2024) • Economist perspectives on $1T financing feasibility (The Guardian, 2024) • Private sector case: Bank of America's $1.5T sustainable finance (TIME, 2024)
4. Environmental Conservation	• Adaptation for Conservation Targets (ACT) Framework, *Environmental Management* 50 (3), 2012. ● Cindy G. Azuero-Pedraza, Pekka Lauri, Andrey Lessa Derci Augustynczik, and Valerie M. 2024, , Levin LA, Wei C-L, Dunn DC, et al. 2020
5. Climate Change: Drivers and Impacts	• Articles on pollution, emissions, and industrial impacts • Regional perspectives on climate-induced vulnerabilities
6. Climate Change and Natural Resource Conservation & Management	• ACT Framework (application to resource management) • NHS (2022). *Microsoft – search;*

7. Climate Change and Development	• Rashaidin Umar Magdi & Junaidi: sustainable principles, environmental laws (CC-BY). • Casado-Asensio et al. (2021): aligning SDGs with climate action
8. Concept of Environment	• Introductory environmental law & natural resource governance literature (Rashaidin Umar Magdi) ● Brian R., *Ádám* C. and Erika M. 2022. • Reviews on ecological awareness
9. Strategies to Deal with Climate Change	• Regional adaptation strategies (policy & conservation) • Cross-university case studies on mitigation & resilience
10. Climate Change and Gender Mainstreaming (Strengthened)	• *Angula et al. (2021): Gender responsiveness in Namibia's GCF adaptation programme (MDPI)* • *FAO (2020): Gender mainstreaming in Zambia's cashew adaptation sector* • *WRI (2023): Gender equity in locally-led adaptation in Africa* • Mashonganyika (2024): Gender mainstreaming in Zimbabwe climate policy • FAO report (2024): Female-headed households & climate vulnerability

The systemic review of articles related to the modules showed that: a) Foundational texts such as Rawat and Agarwal (2015) on biodiversity and Critchfield (2003) on climatology provide essential grounding for introductory modules, b) Empirical research, including Godwell et al. (2025) on extreme weather in South Africa and Levin et al. (2020) on deep-sea resource extraction, contextualizes climate drivers and risks, c) Applied frameworks such as the Adaptation for Conservation Targets (ACT) (Cross et al., 2012) and case studies on soil and forest conservation (Brian et al., 2022) inform strategies for adaptation and resource management, f) Governance and policy are supported by Casado-Asensio et al. (2021), while emerging themes in climate financing and gender are strengthened through Josephson et al. (2024) on economics of adaptation and Angula et al. (2021) on gender-responsive programmes.

This balanced integration ensures that the ECO-ACT VE curriculum is programmed to progress from conceptual foundations to applied learning, equipping students with the knowledge and skills needed to address climate change through inclusive, evidence-based approaches.

3.5.2. Analysis of the highlights from reviewed articles

As mentioned earlier, highlights from reviewed articles were recorded in the 'article review template'. To analyse the content of these highlights, a qualitative thematic synthesis was employed. This research method involves combining systematic review of the highlights, thematic coding, and narrative summarization to extract and condense the main insights from multiple articles into a summary.

The analysis (of the highlights) revealed that climate change drives environmental degradation, biodiversity loss, and extreme weather events, resulting in floods, droughts, famines, displacement, and socio-economic disruptions (Godwell et al., 2025; Levin et al., 2020). Effective responses require integrated strategies encompassing conservation, adaptation, governance, education, finance, and community engagement as follows:

a) Conservation and Adaptation: Ecosystem-based Adaptation, Nature-based Solutions, and climate-smart technologies build resilience. Strategies such as soil and water conservation, habitat restoration, protected area expansion, and frameworks like the Adaptation for Conservation Targets (ACT) integrate scientific planning with local knowledge to enhance environmental protection (Cross et al., 2012; Brian et al., 2022).

b) Governance and Policy: Robust multi-level governance ensures equitable climate action. Policies should address social inequalities, involve diverse stakeholders, and promote justice-based approaches. International collaboration is critical for advancing climate security and global standards (Casado-Asensio et al., 2021).

c) Climate-Responsive Education: Embedding climate literacy across curricula fosters critical thinking, problem-solving, and action-oriented learning. Training programs for educators and local authorities, combined with digital tools, participatory learning, and scenario planning, enhance institutional capacity and community resilience (Rawat & Agarwal, 2015).

d) Climate Finance and Green Innovation: Bridging the climate finance gap is essential for adaptation and mitigation. Innovative instruments such as green bonds, renewable energy initiatives, and green industrialization support sustainable development, while coordinated policies and monitoring ensure efficient resource use (Josephson et al., 2024; Li et al., 2025).

e) Awareness and Disinformation Management: Critical thinking, media literacy, and pre-bunking strategies empower learners to identify and counter climate disinformation. Storytelling and community engagement promote behavioural change and strengthen local resilience.

f) Integrated Approach: Sustainable climate action requires a holistic, interdisciplinary approach linking science, governance, finance, education, and social engagement. Solutions must be inclusive, equitable, and contextually adapted while aligning with the Paris Agreement, UN Sustainable Development Goals, and global climate finance mechanisms.

In conclusion, by integrating conservation, policy, education, finance, and community participation, the ECO-ACT project will equip students, educators, and stakeholders with the knowledge, skills, and tools to address climate change and promote sustainable environmental stewardship.

3.5.3. Success factors and Constraints

The ECO-ACT project aims to strengthen climate-responsive education and training through integrated, multi-level strategies. However, its success is influenced by many factors including a combination of institutional, technological, educational, social, and financial factors. A review of literature identified the "Success factors and constraints" which was analysed using a Narrative review approach. The following themes emerged:

a) Established policy frameworks, such as national climate strategies, dedicated environmental institutions, and alignment with international programs, provide a strong foundation for implementation (Kashif et al., 2022; Kagawa, 2022; Venegas Marin et al., 2024). Multi-stakeholder engagement, including indigenous knowledge holders, local communities, NGOs, and the private sector, enhances project reach and effectiveness, while participatory and experiential learning fosters climate literacy and active citizenship (Kashif et al., 2022; Malik & Ford, 2024).

b) Technological opportunities, including climate-smart tools, early warning systems, and blended learning platforms, support evidence-based planning, capacity building, and continuity of education during climate disruptions (Kashif et al., 2022; World Economic Forum, 2023). Similarly, the integration of climate change topics into curricula and teacher training programs,

combined with youth and community engagement, strengthens education for sustainable development (Kagawa, 2022; Ayanlade et al., 2025).

c) However, several constraints may impede implementation. Financial limitations, high capital costs, and short-term project funding pose risks to sustainability and scalability (Nachilala, 2024; Marbuah, 2020). Capacity gaps, limited access to climate data and ICT tools, curriculum rigidity, and low technical expertise further challenge effective execution (Korosuo et al., 2023; Venegas Marin et al., 2024). Social and cultural barriers, including structural inequalities and resistance to adopting green practices, may also reduce community participation and the uptake of innovative interventions (Ayanlade et al., 2025; World Economic Forum, 2023).

d) Opportunities exist in leveraging climate finance, green bonds, donor support, and interdisciplinary collaboration to enhance long-term resilience and innovation (Nchofoung & Monkam, 2023; Economic Report on Africa, 2024). Adaptive planning, risk-informed decision-making, and education that motivates climate action are critical to mitigating the impacts of climate uncertainty and extreme weather events (Toromade et al., 2024).

By addressing these enablers and barriers, ECO-ACT can transform education and training into a catalyst for climate resilience, sustainable development, and inclusive green growth across partner institutions and communities.

CHAPTER FOUR

IDENTIFIED SKILLS TO BE TARGETED THROUGH THE ECO-ACT VIRTUAL EXCHANGE (VE) PROGRAMME AND MATCHING PARTNER HEI STRENGTHS WITH IDENTIFIED NEEDS

4.1 Introduction

The ECO-ACT VE programme aims to address pressing environmental conservation and climate change challenges by targeting essential thematic and cross-cutting skills. This chapter identifies these skills based on a comprehensive analysis of partner HEI curricula, student survey data, and staff interviews and related literature. Furthermore, it matches the strengths of partner Higher Education

Institutions (HEIs) with the identified skill gaps, thus providing a strategic framework for the VE programme's design and implementation.

4.2 Skills to target through the VE Programme

1. **Core Thematic Skills**

The core thematic skills focus on key areas within environmental science and climate change education that require enhancement to produce competent graduates capable of effective climate action (Sterling et al., 2017).

a) **Environmental Science & Sustainability:**

Understanding of ecosystems, sustainable development, and conservation principles remains a foundational area that benefits from deepening through virtual experiential learning (Kates et al., 2012).

b) **Research, Data Analysis & Innovation:**

Advanced technical skills in GIS, climate modelling, and data visualization are necessary to support evidence-based policy and innovation (Cohen et al., 2019).

c) **Pedagogy, Education & Public Awareness:**

Developing effective education strategies and public engagement methods is critical to amplify climate awareness and community participation (UNESCO, 2020).

d) **Technical & Professional Competencies:**

Practical skills such as project management and pollution control technologies are vital to climate action implementation (IPCC, 2022).

e) **Policy, Governance & Decision-Making:**

There is a recognized gap in climate policy literacy and governance frameworks across partner HEIs, necessitating targeted training (Adger et al., 2009).

f) **Ethics, Global Citizenship & Intercultural Competence:**

Integrating ethical considerations, gender mainstreaming, and intercultural dialogue fosters inclusive climate solutions (Leicht et al., 2018).

g) Climate Financing & Environmental Security:

Understanding climate finance mechanisms and environmental security remains largely missing and is crucial for programme success (Peters et al., 2020).

h) Climate Change Health Linkages:

Addressing the health impacts of climate change, particularly in vulnerable regions, is increasingly important (Watts et al., 2018).

2. Cross-cutting Skills

Cross-cutting skills such as digital literacy, interdisciplinary problem-solving, collaborative research, and virtual experiential learning adaptability are essential to the VE programme's success (Bozkurt et al., 2020).

4.3 Matching Partner HEI Strengths with VE Needs

Leveraging partner strengths enables the VE programme to address skill gaps effectively through regional and institutional collaboration. Partner strengths and VE needs are depicted in Table 16 below.

Table 16: Partner HEI Strengths and VE Needs to Address

Partner HEI	Strengths	VE Needs to Address
University of Rwanda	Multidisciplinary integration, research innovation, digital skills, pedagogy, ethics	Enhance governance, climate financing, gender integration
Kibabii University (Kenya)	Environmental awareness, policy literacy, conservation, digital pedagogy	Build environmental security, climate financing, intercultural competence

Lira University (Uganda)	Environmental health, pollution control, problem-solving	Broaden climate-health linkages, governance, technical skills
University of Bahr El-Ghazal (South Sudan)	Gender-climate linkages, natural resource management, scientific problem-solving	Expand digital skills, climate finance, pedagogy, security
UKSW	Advanced postgraduate programmes, policy expertise, digital learning	Support governance, financing, experiential learning models
UNWE	Climate change and sustainability, ESG, nuclear security and climate-related governance.	Mainstreaming EC/CC education across the curricula, experiential learning models

These alignments build on existing institutional strengths to foster a robust, context-sensitive VE curriculum (Knight, 2015).

4.4 Implications for VE Programme Design

Based on the identified skills and partner strengths, the VE programme should:

a) Build on Rwanda's digital pedagogy and research excellence to strengthen digital tools and governance education (Dede, 2020).

b) Harness Kenya's applied conservation and policy literacy for community engagement and environmental security modules (Republic of Kenya, 2018).

c) Utilize Uganda's environmental health expertise to lead modules on climate-health linkages and disaster preparedness (WHO, 2021).

d) Integrate South Sudan's gender-mainstreaming and natural resource stewardship experience to advance ethical and inclusive climate education (UN Women, 2019).

e) Address gaps in climate financing, environmental security, and gender mainstreaming through dedicated VE modules.

f) Incorporate virtual experiential learning such as simulations and virtual field trips to compensate for limited physical resources (Means et al., 2014).

g) Foster intercultural competence and ethical decision-making to nurture global citizenship (Deardorff, 2006).

4.5 Skills Identified from Student Survey Findings

The student survey highlights priority skills areas for VE targeting. These priorities are supported by literature as indicated:

a) Research & Data Analysis: High student interest (81.1%) in gaining practical, cross-institutional research skills supports joint GIS and climate data training (Baker et al., 2019).

b) Project Management: Recognized by 61% of students as critical, practical project management skills will be emphasized (PMI, 2021).

c) Policy Advocacy & Governance Literacy: With 67.4% identifying its importance, modules on climate governance and financing are necessary (OECD, 2020).

d) Community Engagement: Training in communication and participatory methods addresses gaps in awareness and practical engagement (Fisher et al., 2018).

e) Technical Skills: Training in digital tools such as GIS and modelling meets the 74.4% student demand for technical competencies (Goodchild & Glennon, 2010).

f) Climate Concept Mastery, Disaster Preparedness, Food Security, Health Linkages, and Ethics. These are addressed through interactive content and scenario-based learning to close knowledge-action gaps (IPCC, 2022; FAO, 2019).

4.6 Skills Identified from Staff Interviews and supporting literature

Staff interviews emphasize:

a) The need for modernized, interdisciplinary EC/CC curricula integrated across disciplines (Sterling et al., 2017).

b) Faculty capacity building in climate science, pedagogy, and applied research (Dede, 2020).

c) Joint research collaboration facilitated virtually to overcome funding and infrastructure limitations (Cohen et al., 2019).

d) Digital skill enhancement to mitigate ICT infrastructure gaps (Bozkurt et al., 2020).

e) Experiential learning through virtual labs and community projects (Means et al., 2014).

f) Curriculum inclusion of policy, governance, and finance to fill existing gaps (Adger et al., 2009).

g) Flexible, inclusive learning formats to accommodate socio-economic realities (Knight, 2015).

4.7 Summary and Recommendations

The VE programme should:

a) Offer modular, flexible content adaptable across diverse academic contexts.

b) Focus on practical and interactive methodologies such as joint research, virtual simulations, and gamified learning.

c) Bridge awareness and practice gaps through deep conceptual content and applied case studies.

d) Leverage partner HEI strengths for knowledge sharing and cross-institutional learning.

e) Promote faculty and student capacity building in digital, research, pedagogical, and policy competencies.

f) Embed ethical, gender-sensitive, and intercultural perspectives to nurture inclusive global citizenship.

g) Be designed with flexibility and inclusivity to address diverse student needs and socio-economic constraints.

This strategic skills framework ensures the ECO-ACT VE programme produces competent climate change professionals equipped to meet regional and global challenges effectively (Sterling et al., 2017; IPCC, 2022).

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APPENDICES

Appendix 1: Template for Programme Review

Review Template

Name of the programme or course:	
Education institution / provider:	
Link:	
Level:	☐ Bachelor ☐ Master ☐ Specialization ☐ PhD ☐ VET or adult education ☐ Non-formal education ☐ Other (please specify):
Position in the curricula:	☐ Full degree or diploma programme, part of education offer of the respective institution ☐ ***Stand-alone course offered within a degree or diploma programme **** ☐ Environmental conservation or climate change **topics** included in other courses ☐ Non-formal course, not part of a degree or diploma programme ☐ Other (please, specify):
Duration / workload:	In semesters / years: In hours: In credit points/credit units:
Modality:	☐ Face-to-face ☐ Blended ☐ Online ☐ Other (please, specify)
Objectives and intended learning outcomes:	Please, describe:
Syllabus (Structure / topics / activities):	Please, describe:
Are there any good practices that can be extracted from the analysis of the study programme or course unit or topic? ☐ Yes ☐ No If yes, please describe the good practice using a separate template.	

Good Practice Template for programmes/ courses

Title of good practice (GP):	
Source / Reference citation:	Please use the Harvard referencing style https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/library/public/harvard.pdf
Link to publication:	
Subject area:	☐ Definition and main characteristics of Environmental conservation/climate change (EC/CC) ☐ Options for delivering EC/CC education at universities ☐ Stakeholder involvement in EC/CC education ☐ Knowledge areas and skills relevant for EC/CC education ☐ Teaching/learning approaches and methods used in EC/CC education ☐ Approaches and methods for assessing the impact of EC/CC education
Objective:	(Please, describe aims and objectives of the good practice)
Highlight:	(Please, describe activities, methods, approaches, or strategies that enable or facilitate design and delivery of education and training in the field of EC/CC)
Application:	(Please, explain where this good practice has been applied and what results it has brought about)
Transferability:	(Please evaluate the extent to which this good practice can be replicated in the context of higher education institutions)
Success factors and constraints:	(Please indicate factors that can support and/or hinder the implementation of this good practice in the context of higher education institutions)

Appendix 2: Awareness Survey for Students of HEIs in East Africa

Dear Participant,

We kindly invite you to take part in this important questionnaire as part of the ECO-ACT project: East African-European Virtual Exchange for Environmental Conservation and Climate Action (Ref. No. 101193492). The purpose of this questionnaire is to assess the awareness of students in Higher Education Institutions in East Africa towards Environmental conservation and Climate change issues. Your responses will inform the development of targeted support initiatives, strengthen stakeholder engagement, and enhance the effectiveness of education in Higher Education Institutes through the ECO-ACT project. Participation is voluntary, and all responses will remain confidential and used solely for research and program development purposes. Thank you for your valuable contribution.

Disclaimer: Although the project is funded by the European Union, views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency (EACEA). Neither the European Union nor the EACEA can be held responsible for them.

Please indicate your willingness to participate in this survey by choosing **Yes** or **No** below.

☐ Yes

☐ No

Part 1: Personal Information

1. What is your age group?

　☐ 18–25

　☐ 26–32

　☐ 33 and above

2. What is your gender?

　☐ Male

　☐ Female

3. What is your current level of education?

　☐ Undergraduate

　☐ Postgraduate

　☐ Other (please specify): _____

4. What is your field of study? _____

5. Name of your higher education institution. _____

Part 2: Awareness of Environmental and Climate Change Issues

6. How would you rate your understanding of climate change?

☐ No understanding

☐ Basic understanding

☐ Moderate understanding

☐ Advanced understanding

7. Are you aware of the United Nations Sustainable Development Goal (SDGs) on Climate Action?

☐ Yes

☐ No

8. Which of the following do you think are causes of climate change? (Select all that apply)

☐ Deforestation

☐ Industrial emissions

☐ Overfishing

☐ Natural processes

☐ Other (please specify): _____

9. How often do you participate in discussions or events related to climate change?

☐ Never

☐ Occasionally

☐ Frequently

10. Do you think climate change is something to be worried about?

☐ No

☐ Yes

11. Is environmental conservation and climate change (EC/CC) part of your curriculum at the university?

☐ Yes

☐ No

12. If yes to 11 above, to what extent is it part of your curriculum

☐ Aspects of EC/CC is a module within one or more course units.

☐ I have only one course unit of EC/CC in my program

☐ I have two or more course units of EEC/CC in my program.

☐ I am taking an entire program that is concerned with EC/CC.

Part 3: Environmental and Climate Action Knowledge

13. Are you familiar with the following concepts? (Select all that apply)

☐ Renewable energy sources

☐ Circular economy

☐ Carbon footprint

☐ Biodiversity conservation

☐ Climate resilience

14. Rate your knowledge of **local** environmental challenges (e.g., drought, deforestation, flooding):

- ☐ No knowledge

- ☐ Limited knowledge

- ☐ Moderate knowledge

- ☐ Comprehensive knowledge

Part 4: Skills and Competency to cope with climate change

15. Do you feel equipped with the skills to contribute to climate change mitigation and adaptation efforts?

☐ Yes

☐ No

16. Which skills do you think are critical for tackling climate change? (Select all that apply)

☐ Research and data analysis   ☐ Project management   ☐ Policy advocacy

☐ Community engagement   ☐ Technical skills (e.g., renewable energy installation)

☐   Other   (please   specify):
_____

17. In your opinion, what are the biggest barriers preventing students from gaining the skills in 16 above? (Select all that apply)

☐ Lack of access to training programs

☐ Limited funding or resources

☐ Insufficient awareness

☐ Low interest

☐   Other   (please   specify): _____

Part 5: Call to Action

18. Would you be interested in participating in learning programs on climate change and environmental conservation?

☐ Yes

☐ No

19. Would you consider participating in short (10-15 min) online lectures as part of your education on EC/CC?

☐ Yes

☐ No

20. What additional resources or opportunities would help you contribute to environmental and climate action? _____

Part 6: Climate Change and Disaster

21. Have you learned about the connection between climate change and natural disasters (e.g., floods, droughts, storms) in your courses or through public awareness campaigns?

☐ Yes

☐ No

22. Are you aware of how changes in rainfall patterns might contribute to disasters in your region?

☐ Yes

☐ No

23. Are you aware of how rising temperatures might contribute to disasters in your region?

☐ Yes

☐ No

24. Do you believe your community is adequately prepared to deal with climate-related disasters?

☐ Yes   Explain? _____

☐ No   Explain? _____

25. Have you participated in any disaster preparedness or climate resilience initiatives at your institution or in your community?

☐ Yes

☐ No

Part 7: Climate Change and Food Security

26. Do you know how climate change can impact food production?

☐ Yes

☐ No

27. If yes to question 24 above, how? (Select all that apply)

☐ By causing drought

☐ Through Soil degradation

☐ By causing pest and disease outbreaks

☐   Indicate   other   means.
_____

28. Are you aware of any strategies being promoted to ensure food security in your region amidst changing climatic conditions (e.g., climate-smart agriculture)?

☐ Yes Give examples: _____

☐ No

29. Have you observed or heard of food shortages or price increases in your area that are linked to climate events like droughts or floods?

☐ Yes

☐ No

30. How well do you think your institution is educating students about the relationship between climate change and sustainable agriculture?

☐ Very well

☐ Well

☐ Not well

Part 8: Climate Change and Disease

31. Are you aware of how climate change may contribute to the spread of diseases like malaria, cholera, or dengue fever?

☐ Yes

☐ No

32. Have you noticed any recent changes in disease patterns (e.g., increase in outbreaks or shifts in disease-prone areas) that you associate with climate change?

☐ Yes

☐ No

33. Does your institution offer information or campaigns about climate-related health risks?

☐ Yes

☐ No

34. Do you think communities in your region are equipped to handle health challenges linked to climate change?

☐ Yes

☐ No

35. If No to 32 above, what do you think is lacking?

_____

_

Appendix 3: Template for Staff of Higher Education Institution Interviews

Section 1: Obtain "Informed Consent" from Staff of each HEI being interviewed.

1. Introduce yourself and your organization.

   I am ---------------------------- (interviewer name) from ---------------------------- (University/name of institution). I am a member of a research team consisting of European and East African partners aiming to improve Environmental Conservation and Climate Change Education in East Africa.

2. State the purpose of the interview:

   "We are conducting this interview in order to:

   a) Identify challenges in designing and delivering education in Environmental Conservation and Climate Change Education and
   b) Map areas of interest for cooperation between European and East African partner HEIs

   By having this knowledge, we shall design an intervention to solve the problems that we shall have identified".

3. Confirm confidentiality:
   All that we shall discuss during this session will be confidential and neither you name nor personal identifiers will appear in any report or publication. All your personal information will be kept under lock and key and backed up in a secure computer.

4. Your participation is purely voluntary and you are free to withdraw from the interview any time without any consequence - We shall spend approximately spend about 30 min and the session shall be recorded. In the event of any challenges or enquiry, please call _____ (Research Administrator) on telephone _____.

5. If you accept to participate, please write your name and signature below.

   Participant Name: ---

   Participant Signature; _____. Date: --------------------------

   Interviewer signature; --. Date: --------------------------

Section 2: Type the recorded answers for each question in the space provided

Part 1: Demographic and personal Information		
Qn #	Question	Response
1	What is your current role at this institution, and how long have you been in this position?	
2	What is your background or expertise in environmental conservation and climate change education?	
Part 2: Challenges in Designing Education Programs		
1	What are the main challenges your institution faces when developing environmental conservation and climate change education programs?	
2	How does your institution address topics like climate change, biodiversity loss, and sustainable development in your courses?	
3	Are there gaps in resources, faculty expertise, or student engagement? If so, could you elaborate?	
4	What processes were followed when the current educational programme in EC/CC was designed?	
Part 3: Understanding issues in implementing EC/CC programs		
1	Describe how you implement the EC/CC programs or Course units at your HEIs?	
2	Are you satisfied with the way EC/CC programs are implemented?	
3	What are the main challenges your institution encounters when delivering these programs (e.g., teaching	

	methods, access to technology)?	
4	Have there been any notable successes or failures in delivering environmental education? What contributed to these outcomes?	
5	Have there been any notable successes or failures in delivering environmental education? What contributed to these outcomes?	
6	Do you think your students are well equipped to contribute to climate change mitigation measures after graduation?	
7	What do you consider to be successful outcomes of the EC/CC education that you offer at your institution?	
8	Do your students get hands-on practical training in EC/CC education?	
9	How do you examine your students?	
10	Do you undertake field trips to expose your students to the effects of climate change?	
Part 4: Exploring areas of interest for cooperation with European and East African Universities?		
1	Does your institution currently collaborate with any local or international partners in this field? If so, what has worked well?	
2	What areas of research or teaching would you prioritize for potential partnerships (e.g., curriculum development, joint research, capacity-building)?	

3	How could European and East African HEIs complement each other's strengths in this field?	
4	Are there specific topics or challenges (e.g., renewable energy, water resource management, sustainable agriculture) where collaboration could have the most impact?	
5	Do you think staff mobility programmes within EAC and with European partners can help you to deliver EC/CC education more effectively?	
6	Credit transfer from other HEIs in EA	
Part 5: Gathering actionable insights for future steps.		
1	What kind of support does your institution need to enhance education in this field?	
2	How can international collaborations address the challenges you've mentioned?	
3	Do you have any recommendations for building strong partnerships with European and East African HEIs?	

Title of Article (2):	
Source / Reference citation:	Please use the Harvard referencing style https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/library/public/harvard.pdf
Link to publication:	http://edis.ifas.ufl.edu.
Module Topic:	☐ Concept of Environment ☐ Environmental Conservation ☐ Climate change: drivers and Impacts ☐ Environmental and climate change governance ☐ Climate Change and Gender Mainstreaming cation ☐ Climate change and Environmental security ☐ Strategies to combat climate change ☐ Climate Change and Natural Resource Conservation and Management ☐ Climate Change and Development ☐ Climate Financing
Objective:	(Please, describe aims and objectives of the article)
Highlight:	(Please, describe activities, methods, approaches, or strategies mentioned in the article that can enable or facilitate design and delivery of education and training through the ECO-ACT project)
Application:	(Please, explain where the ideas/practices mentioned in this article has been applied and what results it has brought about)
Transferability	Please evaluate the ease and extent to which the ideas/methods found in this article can be used profitably in the ECO-ACT project
Success factors and constraints:	(Please indicate factors that can support and/or hinder the implementation of the ideas raised in this article in the context of ECO-ACT project)

Appendix 4: Template for Literature Reviews

Template 2: Literature review on module topic

LEAD PARTNER

Uniwersytet
Kardynała Stefana Wyszyńskiego
w Warszawie

PARTNERS

Co-funded by
the European Union