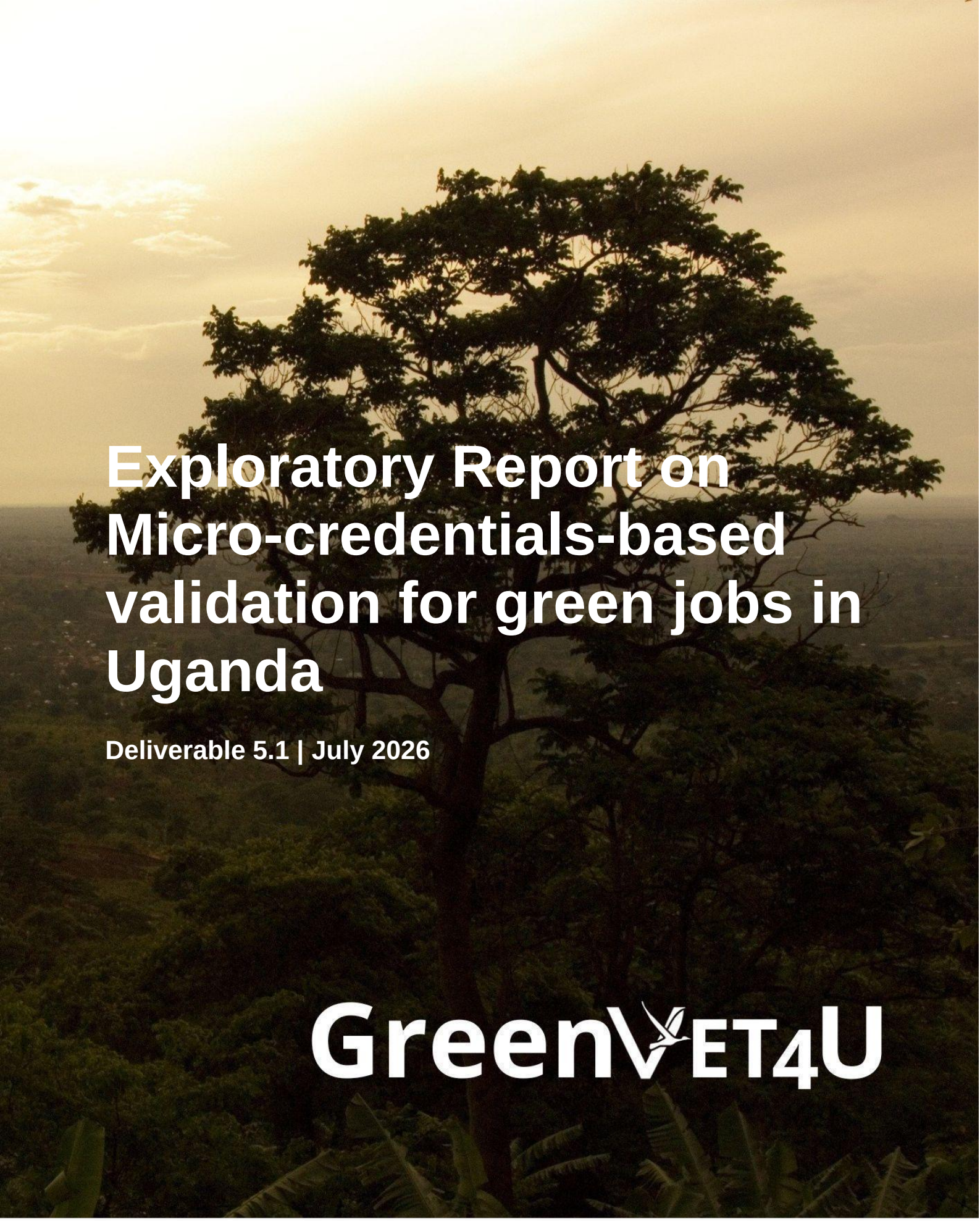


Exploratory Report on Micro-credentials-based validation for green jobs in Uganda

Deliverable 5.1 | July 2026

GreenVET4U

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GreenVET4U

Building the capacity of VET providers and private entities to cooperate designing and delivering innovative curricula in skills for Green Jobs in Uganda

greenvet4u.eu

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1. Introduction

The deliverable **Exploratory Report on Micro-credentials-based validation for green jobs in Uganda** (D5.1) examines the potential role of micro-credentials in supporting the validation of competences related to green jobs in the Ugandan context. The report is positioned as an analytical and preparatory output within the project, intended to provide a structured basis for the subsequent piloting and validation activities.

The report has been developed through a collaborative process involving the project partners and combining desk research, comparative analysis, and partner contributions. Its function is to connect the project's work on competence design, digital tools, and pilot implementation, with a specific focus on how micro-credentials can support the recognition, transparency and portability of learning outcomes in green sectors.

In this respect, D5.1 contributes to the overall objective of GreenVET4U project by exploring how competence-based and digitally supported validation approaches may strengthen the responsiveness, quality and visibility of VET pathways for green jobs in Uganda.

1.1 Purpose and scope of the report

The purpose of the present report is to analyse the conditions for the possible implementation of a micro-credentials-based approach to the validation of competences for green jobs in Uganda.

To this end, the report:

- examines the policy and institutional context relevant to skills validation and recognition in Uganda;
- analyses the relevance of micro-credentials in relation to green jobs, with particular reference to the eco-tourism and waste-management sectors;
- reviews selected European and international experiences and reference frameworks;
- identifies key enabling factors, challenges and implementation conditions for the adoption of micro-credentials in the project context;
- provides an analytical basis for the design of the project's piloting and digital validation activities.

The scope of the report is exploratory. The document does not aim to define a formal national validation model, nor to propose an immediate large-scale implementation framework. Rather, it seeks to assess the relevance, feasibility and potential added value of micro-credentials as a flexible instrument for recognising learning outcomes acquired in green-job pathways.

The report focuses on the two sectors addressed by the GreenVET4U project, namely **eco-tourism and waste-management**, which represent the main fields of application for the project's competence development, training and pilot activities.

In this respect, the document is intended both to support the internal work of the consortium and to provide a reference for further reflection among VET providers, private sector stakeholders and relevant institutional actors.

1.2 Links with WP3, WP4, and WP5 activities

The present deliverable is closely linked to the activities implemented under WP3, WP4 and WP5, and should be considered as part of the integrated logic of the GreenVET4U project.

The **Competences Matrix on Design and Delivery of Innovative Curricula in Skills for Green Jobs** (D3.2), and the related **Units of Learning Outcomes** from **WP3**, provide the conceptual and methodological basis for a micro-credentials-based validation approach, as the latter requires learning outcomes that are clearly defined, assessable and transparent. In this sense, D5.1 builds on the results of WP3 by exploring how the competences identified by the project can be validated and recognised through a micro-credentials perspective.

The link with **WP4** is equally relevant. WP4 focuses on the design and development of the project's digital training and competence assessment tools, including the online platform (D4.1), e-learning courses (D4.2) and the **GreenVET4U Competence Assessment Webapp** (D4.3). In this context, D5.1 supports WP4 by clarifying the conceptual assumptions, methodological framework and operational requirements underpinning the validation process, thereby contributing to the design of digital tools for the assessment and recognition of competences.

The strongest operational link is with **WP5**, under which the present deliverable has been produced. WP5 is dedicated to piloting and **micro-credentials-based validation**, including the definition of

the testing methodology, the implementation of pilot activities in Uganda, and the preparation of recommendations based on project results. Within this work package, D5.1:

- provides the exploratory and analytical foundation for the subsequent activities;
- supports the preparation of the pilot phase and contributes to defining the validation approach to be tested in the project context.

2. European and international reference models

Micro-credentials have gained increasing relevance as a flexible instrument to support lifelong learning, skills development and employability, particularly in the context of the green transition. As labour markets evolve in response to climate objectives and sustainability policies, education and training systems are exploring new ways to certify short, targeted learning experiences that respond to emerging skills needs in green jobs.

Within this context, the **European Union** has developed a set of policy and technical reference frameworks aimed at improving the transparency, quality and recognition of micro-credentials across education and training systems. These frameworks provide common principles for defining learning outcomes, ensuring quality assurance, and fostering trust among learners, training providers and employers. Although developed in the European context, they offer structured approaches that can inform the design and validation of micro-credentials beyond the EU.

At the international level, organisations such as UNESCO, and in particular the **UNESCO Institute for Lifelong Learning**, have documented a range of national experiences related to the recognition, validation and accreditation of learning outcomes, especially within Technical and Vocational Education and Training (VET) systems. These experiences highlight diverse institutional arrangements and policy approaches that address similar challenges to those faced in developing contexts.

This section introduces key European and international reference models that serve as a conceptual and analytical basis for the exploratory assessment of micro-credentials in skills for green jobs in Uganda. Rather than proposing direct transfer or replication, the frameworks and

case studies presented in the following sub-sections are used to identify principles, mechanisms and lessons that may be relevant when considering the Ugandan VET context.

2.1. Summary and analysis of the Council Recommendation, with implications for the Ugandan context

The **Council Recommendation of 16 June 2022**[1] on a European approach to micro-credentials for lifelong learning and employability establishes a common framework to support the design, delivery and recognition of micro-credentials across education and training systems. The Recommendation responds to the growing need for flexible learning pathways that can address rapidly evolving labour market demands, including those linked to the green transition, while promoting transparency, quality assurance and trust among stakeholders.

At the core of the Recommendation is a shared definition of **micro-credentials as certified learning outcomes resulting from short learning experiences, assessed against transparent standards**. By standardising the information attached to micro-credentials, the Recommendation seeks to improve their portability and recognition across institutions, sectors and countries.

A key principle of the European approach is the **focus on learning outcomes** rather than learning pathways. This principle allows micro-credentials to capture skills and competences acquired through diverse forms of learning, including formal, non-formal and informal contexts. In the context of green jobs, this outcome-oriented approach supports the recognition of emerging and transversal competences related to sustainability, environmental responsibility and digitalisation.

Quality assurance is another central pillar of the Recommendation. It highlights the role of existing quality frameworks and encourages the application of proportionate and fit-for-purpose quality assurance mechanisms to micro-credentials. This is particularly relevant in vocational education and training, where the involvement of employers and sectoral stakeholders is essential to ensure labour market relevance and credibility.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022H0627(02)

From an international perspective, the Recommendation does not prescribe a single institutional model, but rather outlines a set of **ten principles** that can be adapted to different education and training systems:

- **Quality** – Micro-credentials are subject to internal and external quality assurance by the system producing them.
- **Transparency** – Micro-credentials are measurable, comparable and understandable with clear information on learning outcomes, workload, content, level, and the learning offer, as relevant.
- **Relevance** – Micro-credentials should be designed and issued as distinct, targeted learning achievements and learning opportunities leading to them are to be updated necessary, to meet identified learning needs.
- **Valid assessment** – Micro-credential learning outcomes are assessed against transparent criteria.
- **Learning pathways** – Micro-credentials are designed and issued to support flexible learning pathways, including the possibility to validate, recognise and 'stack' micro-credentials from across different systems.
- **Recognition** – Micro-credentials are recognised, where possible, by competent authorities for academic, training or employment purposes, based on transparent information on learning outcomes and standardised elements, in order to ensure their signalling value and comparability across education and labour market systems.
- **Portable** – Micro-credentials are owned by the credential-holder (the learner) and may be stored and shared easily by the credential-holder, including through secure digital wallets
- **Learner-centred** – Micro-credentials are designed to meet the needs of the target group of learners.
- **Authentic** – Micro-credentials contain sufficient information to check the identity of the credential-holder (learner), the legal identity of the issuer, the date and place of issuance of the micro-credential
- **Information and guidance** – Information and advice on micro-credentials should be incorporated in lifelong learning guidance services and should reach the broadest possible learner groups, in an inclusive way, supporting education, training and career choices.

While developed within the European policy context, these principles are described as **universal and potentially applicable across sectors and regions**. For contexts such as Uganda, where

VET plays a strategic role in skills development and employability, these principles offer a useful reference for exploring how short learning programmes could be designed and recognised in a coherent and transparent manner.

2.2. Integration of EQF, EQAVET, GreenComp and DigComp

The design and validation of micro-credentials in skills for green jobs can be supported by the combined use of several European reference frameworks that address **complementary dimensions of learning, quality assurance and skills description**. While these frameworks were developed within the European context, their integrated use provides a coherent methodological approach that can inform exploratory work in other vocational education and training systems, including Uganda.

The **European Qualifications Framework (EQF)** offers a structured reference for describing learning outcomes in terms of knowledge, skills and competences across different qualification levels. In the context of micro-credentials, the EQF supports the clear articulation of learning outcomes and their level of complexity, facilitating transparency and comparability. Applied functionally, EQF principles can help ensure that micro-credentials in skills for green jobs are positioned consistently in relation to existing qualifications within a VET system. In the Ugandan context, the **Ugandan Vocational Qualifications Framework** (UVQF)[2] aligns with the EQF in its approach to describing learning outcomes, which it refers to as Occupational Standards. Although its structure differs from that of the European EQF, it is also based on a competence-centred approach, following the principles of Competence-Based Education and Training (CBET).

EQAVET complements this approach by providing a reference framework for quality assurance in vocational education and training. Its emphasis on continuous improvement, stakeholder involvement and evidence-based evaluation is particularly relevant for short learning programmes such as micro-credentials. When adapted proportionally, EQAVET principles can support the credibility and labour market relevance of micro-credentials without imposing excessive administrative burdens on providers.

[2] https://uil.unesco.org/fileadmin/keydocuments/LifelongLearning/en/Uganda.pdf?utm_source=chatgpt.com

The content dimension of micro-credentials in skills for green jobs can be informed by European reference competence frameworks such as GreenComp and DigComp. **GreenComp** defines a shared understanding of sustainability competences, including systems thinking, environmental responsibility and future-oriented problem-solving. **DigComp**, in turn, outlines key digital competences increasingly required across green sectors, such as data literacy, digital collaboration and the use of digital tools in sustainable practices. Together, these frameworks support the identification and structuring of transversal competences that are relevant across multiple green occupations.

An integrated use of these four frameworks allows for a coherent approach in which learning outcomes are clearly defined and levelled (EQF), quality and relevance are supported (EQAVET), and green and digital competences are systematically embedded (GreenComp and DigComp). For the Ugandan context, this integration does not imply direct adoption, but rather offers a structured reference to explore how micro-credentials could be designed in alignment with existing VET qualifications, sectoral needs and institutional capacities.

2.3. Relevant international case studies

International experiences related to the recognition, validation and accreditation of learning outcomes provide useful reference points for exploring the potential role of micro-credentials in vocational education and training systems. Although the selected case studies do not always explicitly use the term “micro-credentials”, they present mechanisms that are functionally comparable, particularly in terms of recognising short learning experiences, validating skills acquired outside formal education, and supporting employability. The following cases, documented by the UNESCO Institute for Lifelong Learning[3], illustrate diverse approaches across different regional and institutional contexts.

Case study 1: Namibia – Recognition of Prior Learning as a pathway to inclusive skills certification

The Namibian case study addresses the long-standing challenge of recognising skills and knowledge acquired outside formal education, particularly among individuals who were excluded

[3] https://web.archive.org/web/20230610185835/https://uil.unesco.org/lifelong-learning/recognition-validation-accreditation/rva-case-studies

from schooling due to the country's struggle for independence prior to 1990. As a result, many Namibians have remained disadvantaged in accessing further education, training and employment, as their competences were undocumented and not formally recognised.

To address this issue, **Recognition of Prior Learning (RPL)** was introduced as a policy instrument to redress past injustices and promote inclusion within the education and training system. The Namibia Qualifications Authority (NQA) and the National Training Agency (NTA) play central roles in this process. The NQA is responsible for setting qualification standards and overseeing accreditation, assessment and validation within the Namibian Qualifications Framework (NQF), while the NTA coordinates the development of competency standards, curricula and assessment criteria for vocational education and training up to NQF Level 5.

Through a formal agreement between the two institutions, registered training providers are empowered to implement RPL policies, assess candidates and award credits for unit standards or full qualifications aligned with the NQF. The development and approval of a national RPL policy, following a consultative process led by the NQA and NTA and endorsed by the Minister of Education, has provided a coherent framework for **recognising learning outcomes acquired in formal, non-formal and informal settings**. This approach supports greater mobility within the education system, facilitates progression along the qualifications framework, and strengthens the integration of vocational and general education pathways in Namibia.

Case study 2: India – Modular skills training aligned with labour market needs

The Indian case study addresses the need to provide market-relevant and formally recognised skills to a diverse workforce, including school leavers, informal workers and unemployed individuals. Traditional vocational pathways, delivered through Industrial Training Institutes and apprenticeship-based training, have not always been flexible enough to respond to rapidly changing labour market demands or to reach all target groups.

To address this gap, the **Modular Employable Skills (MES)** initiative was introduced as a **competency-based and modular training and certification system**. MES delivers short, flexible courses aligned with industry needs, enabling learners to acquire specific skill sets within relatively limited timeframes. The initiative is overseen by the Directorate General of Training under the Ministry of Skills Development and Entrepreneurship and operates at national scale.

MES involves multiple stakeholders, including trade committees that define industry-relevant competences, an apex committee responsible for accreditation and quality oversight, independent assessment bodies, and a large network of vocational training providers. Through its modular structure, broad sectoral coverage and strong labour market orientation, MES demonstrates how short, standardised learning units can support employability and skills development across diverse economic sectors.

Case study 3: Germany – Documenting competences through structured guidance systems

The German case study addresses the challenge of making competences acquired through non-formal and informal learning visible and usable for education, employment and career development. Many individuals, particularly those in transition phases such as job seekers, migrants, early school leavers or people at risk of unemployment, face difficulties in articulating and documenting their skills in ways that are recognised by education and labour market actors.

To respond to this challenge, Germany has developed the **ProfilPASS system** as a structured instrument for documenting and reflecting on individual competences. Initiated with support from the Federal Ministry of Education and Research and the European Union, and coordinated nationally by the German Institute for Adult Education – Leibniz Centre for Lifelong Learning, ProfilPASS combines a competence portfolio with professional guidance delivered by trained counsellors.

The system involves multiple stakeholders, including national coordination bodies, regional dialogue centres, educational institutions and certified counsellors. Individuals are supported through guided reflection processes that help them **identify, document and assess their competences** across different life contexts. Quality assurance is ensured through standardised counsellor training, certification and periodic evaluation of the system.

By providing a transparent and structured way to document competences, ProfilPASS supports individual empowerment, employability and informed career decision-making. Its wide uptake and continuous monitoring demonstrate how non-formal and informal learning outcomes can be systematically captured within a trusted framework, offering a relevant international reference for approaches to competence recognition in vocational and lifelong learning systems.

3. Context analysis – Uganda

Uganda is experiencing rapid demographic and economic change, with a growing youth population, high unemployment, skills mismatches, and increasing climate pressures. National priorities emphasise industrialisation, job creation, and sustainable resource management, creating a strong demand for green skills.

The TVET system is being reformed to deliver competence-based, modular, and industry-aligned training. These reforms, led by the Ministry of Education and Sports and National Curriculum Development Centre, establish a supportive environment for micro-credentials.

Green jobs and labour-market drivers

Key sectors demanding green skills include:

- **Renewable energy**: solar installation, energy-efficient technologies
- **Climate-smart agriculture**: sustainable land use, agro-processing
- **Waste management and circular economy**: recycling, resource recovery
- **Eco-tourism and conservation**
- **Green construction**: energy-efficient building, eco-friendly materials

Challenges in the labour market include youth unemployment, skills shortages in emerging sectors, and reliance on informal learning. Micro-credentials can address these gaps by providing short, targeted, stackable, and certified learning aligned to labour-market needs.

TVET readiness and opportunities

Uganda's TVET system supports modular training, competency-based assessment, work-based learning, and industry engagement. Development partners, including GreenVET4U, are supporting the design and delivery of innovative curricula in Skills for Green Jobs through capacity building, digital resources and competence validation tools.

Advantages of micro-credentials in this context
▪ Flexibility for learners to acquire targeted skills ▪ Rapid responsiveness to emerging occupations

▪ Recognition of non-formal and work-based learning ▪ Support for lifelong learning and professional development ▪ Inclusion of youth, informal workers, and rural populations
Constraints to address
▪ Limited awareness ▪ Gaps in national standards ▪ Uneven provider capacity

Hence in conclusion, Uganda's national priorities, TVET reforms, and labour-market demand provide a favourable environment for micro-credentials in green jobs. They offer a strategic mechanism to develop green competences, strengthen work-based learning, and enhance employability and workforce adaptability.

3.1 Micro-credential validation in the National VET system and policy framework

The foundation for competence recognition in Uganda's TVET system is the **Technical and Vocational Education and Training Act (Act 3 of 2025)**. The Act reorganised the national skills ecosystem and established a unified governance structure for accreditation, assessment, certification, and qualifications development. Although micro-credentials are not explicitly mentioned, the Act creates a legal and institutional environment for validating competences acquired through modular, short-cycle, and work-based learning.

Validation mechanisms supporting micro-credentials

- **Accreditation of providers and programmes** (Sections 35–44): Ensures modular and short-cycle courses meet national standards.
- **Registration and licensing of trainers** (Sections 63–75): Promotes professional accountability.
- **Assessment and certification** (Sections 94–95): Supports competency-based certification and continuous assessment.
- **TVET Qualifications Framework** (Section 28): Defines levels, equivalency, and progression pathways, enabling stackable learning units.

Alignment with micro-credential principles

While the Act does not explicitly mention micro-credentials, it enables their recognition by providing:

- Modular learning pathways
- Flexible assessment approaches
- Competency-based certification
- Equivalency and progression systems

These mechanisms support short, targeted, and stackable learning achievements aligned to labour-market needs.

In summary, the **TVET Act 2025** provides a comprehensive legislative and institutional framework for competence recognition in Uganda. Its provisions on modular learning, accreditation, assessment, certification, and qualifications frameworks form the legal foundation for micro-credential validation. Within the GREENVET4U framework, this enables piloting and institutionalising micro-credentials for emerging sectors, including green jobs, thereby supporting workforce adaptability and lifelong learning.

In addition to the TVET Act (Act 3 of 2025), the BTVET Act 2019 established structures for regulating private and public TVET providers and for defining occupational standards, laying the groundwork for modular and short-cycle learning. The TVET Policy (2019) further promotes competency-based training, lifelong learning, and flexible pathways, explicitly encouraging recognition of skills acquired through non-formal and informal learning. Together, these frameworks ensure that micro-credentials can be developed, assessed, and certified in alignment with national standards, occupational requirements, and labour-market needs.

3.2 Green jobs landscape: eco-tourism competence gaps and skills demand

Eco-tourism is growing quickly and is often promoted as a key contributor to green jobs, conservation, and community development. In practice, however, many eco-tourism businesses struggle to deliver on these promises because staff are not adequately trained in practical green skills. While eco-tourism roles already exist across the sector, the “green” part of these jobs is often informal, poorly defined, and learned through trial and error.

This short overview looks at the current green jobs landscape in eco-tourism, highlights the main competence gaps, and outlines the skills that the sector is increasingly demanding. It provides a practical basis for how GreenVet4U can respond through vocational education and training.

Green Jobs Landscape in Eco-Tourism

Green jobs in eco-tourism are usually not separate, specialist positions. Instead, they are existing tourism jobs that come with added environmental and social responsibilities. These jobs are found mainly in small and medium-sized enterprises, eco-lodges, community tourism initiatives, protected areas, and nature-based destinations.

Typical roles include:

- Eco-lodge and sustainable tourism operations staff
- Nature and cultural guides
- Community tourism coordinators
- Conservation and biodiversity support staff
- Destination sustainability and responsible tourism officers

In many cases, staff are expected to manage waste, save water and energy, protect nature, and work with communities — but without clear guidance or formal training. As a result, sustainability practices are inconsistent, and many businesses rely on good intentions rather than solid skills.

Key Competence Gaps in the Eco-Tourism Sector

Environmental and Climate Skills

Many eco-tourism workers have a general understanding of sustainability but lack practical knowledge of how environmental systems work and how tourism activities affect them. Common gaps include:

- Understanding climate change impacts on tourism operations and destinations
- Basic knowledge of ecosystems, biodiversity, and sensitive habitats
- Applying good practices for water, waste, and energy use
- Identifying environmental risks and reducing negative impacts

Without these skills and this knowledge, eco-tourism activities can unintentionally harm the very environments they aim to protect.

Operational and Technical Skills

There is a clear lack of hands-on skills linked to day-to-day operations, especially in smaller businesses. Gaps are often seen in:

- Operating and maintaining green technologies such as solar power, water systems, and eco-sanitation
- Sustainable procurement and local sourcing
- Tracking basic environmental performance (for example, waste volumes or energy use)
- Understanding eco-certification requirements and sustainability standards

These gaps limit businesses' ability to improve efficiency, reduce costs, and meet growing sustainability expectations from markets and regulators.

Social and Community Skills

Eco-tourism depends heavily on good relationships with local communities, yet many workers are not trained in how to manage these relationships responsibly. Common gaps include:

- Building fair and respectful partnerships with communities
- Sharing benefits in a transparent, sustainable and inclusive way
- Involving women, youth, and vulnerable groups
- Protecting and presenting cultural heritage appropriately

Weak skills in this area can lead to conflict, mistrust, and loss of community support for tourism activities.

Green Leadership and Behaviour

At supervisory and management levels, sustainability is often treated as an "extra task" rather than part of core business operations. Gaps include:

- Leading teams towards sustainable practices
- Motivating staff to follow environmental procedures

- Guiding visitors to behave responsibly
- Avoiding superficial or misleading sustainability claims

Without strong leadership skills, sustainability efforts remain fragmented and short-lived.

Skills Demand in the Eco-Tourism Sector

Across the eco-tourism sector, there is growing demand for practical, easy-to-apply green skills rather than academic knowledge. Employers are looking for staff who can combine tourism service skills with environmental awareness and responsible decision-making.

Priority skills demand includes:

- Basic climate and environmental literacy for tourism workers
- Resource efficiency and waste reduction practices
- Biodiversity-friendly guiding and experience design
- Simple monitoring, reporting, and certification readiness
- Community engagement and socially responsible tourism practices
- Green leadership for small and medium tourism enterprises

These skills are increasingly important for competitiveness, compliance, and long-term sustainability.

Relevance for GreenVet4U

GreenVet4U is well positioned to respond to these needs by focusing on vocational, job-based skills for green jobs in eco-tourism. Training should target frontline staff, supervisors, and staff members that work with the communities and be closely linked to real work situations.

By offering practical modules, tools such as checklists and SOPs, and skills that can be applied immediately, GreenVet4U can help close existing competence gaps and support the eco-tourism sector in creating genuine, high-quality green jobs.

Avoiding Greenwashing in Eco-Tourism

As sustainability becomes more important in tourism marketing and funding, there is a growing risk of greenwashing in the eco-tourism sector. Many businesses use sustainability language without fully understanding or applying responsible practices. This is often not intentional, but a result of limited skills, unclear standards, and lack of practical guidance.

Addressing competence gaps is therefore essential not only for environmental performance, but also for credibility and trust. By building real, job-based skills for green jobs — such as monitoring impacts, following clear procedures, and communicating honestly — GreenVET4U can help eco-tourism operators move beyond labels and claims towards genuine, measurable sustainability practices.

3.3 Green jobs landscape: waste-management competence gaps and skills demand

This section presents a comprehensive Training Needs Assessment (TNA) built on interviews with six Ugandan Ministries, Departments and Agencies- MDAs (MoES, UVTAB, KCCA, AICAD, and NCHE), and Total Energies, sixteen TVET trainers drawn from nine technical institutes, examining institutional mandate, policy alignment, trainer familiarity and classroom practice, and institutional readiness to embed green entrepreneurship in TVET curricula, examining the state of green entrepreneurship within Uganda's Technical and Vocational Education and Training (TVET) sub-sector.

Building on triangulated evidence, a single, stackable, competency-based course is proposed, the "**Certificate in Green Entrepreneurship for Waste Management (CB-GEWM)**" delivered through two linked cohort pathways: a direct enterprise-facing pathway for waste-company workers, supervisors and owner-managers, and a train-the-trainer (ToT) pathway for TVET instructors who cascade the same competency units to their students. Both pathways share a common Foundation Certificate, elective Specialist Tracks matched to waste sub-sectors, an explicitly strengthened green-business/incubation strand, and a Recognition of Prior Learning (RPL) route, all designed for accreditation through UVTAB and alignment with NEMA's statutory requirements for hazardous-waste handling.

Findings

The state of waste management skills in Uganda
Readiness and willingness are universal; capacity is the binding constraint.

All 11 waste enterprises said they would release workers for short practical training, and all 16 TVET trainers said they are willing to undertake further training and rate green entrepreneurship as "very important." The problem is the absence of accredited, practical, well-resourced training pathways.
The entrepreneurial/business half of the skill set is weaker than the technical/ environmental half. Enterprise owners named financial management, costing/pricing and value-addition thinking as major gaps even though most are themselves entrepreneurs; trainers independently rated business incubation as their single largest training need (75%), ahead of any technical green-skill area. Both datasets therefore argue for weighting business-model, costing and incubation content at least as heavily as technical waste-handling content, not treating it as an add-on.
Hands-on, practical, project-based delivery is preferred over classroom/lecture instruction in both datasets. Employers described valuing demonstrated "practical" competence over paper qualification; trainers preferred hands-on projects (56.3%) to workshops (43.8%).
Certification is wanted, but only if it is criteria-based and credible. Employers want RPL grounded in demonstrated competence rather than blanket recognition; MDAs and UVTAB independently point to the need for a gazetted, assessable competency standard rather than an informal add-on to existing trades.
Waste management is a live, tangible entry point for green-entrepreneurship skilling in both datasets. It is naturally the entire subject of the enterprise TNA, and it is independently the single most-emphasised current green-skill area among TVET trainers (62.5%) more than renewable energy, agriculture or eco-production combined among the technical categories reported.
Trainer/supervisor capacity-building is a named priority in both datasets. Enterprises flagged that the people currently training others (supervisors experienced workers) have rarely themselves been trained to teach; MDAs and trainers independently flagged insufficient instructor training (62.5%) and absence of curriculum materials (37.5%) as leading institutional barriers.
Policy priority versus practice reality. MDAs most frequently name renewable energy (67%) as the strategic green sub-sector to prioritise, yet trainers' actual classroom emphasis and the enterprise-level evidence both centre on waste management. The Needs Assessment itself names this a "policy-

practice mismatch," plausibly explained by the higher equipment/safety barriers to teaching renewable-energy content relative to waste-management content, which requires less specialised equipment to teach and assess. This divergence is a reason to prioritise waste management as the pilot sub-sector for the course precisely because it is where practical readiness already exists, while noting that a renewable-energy-focused module would need dedicated equipment investment the current evidence does not support prioritising first.
RPL enthusiasm is conditional and not unanimous among employers. Most enterprises support RPL if criteria-based, but at least one enterprise (Swift Waste Masters) explicitly prefers fresh, repeated training because "these things keep changing," a caution the MDA/trainer dataset does not directly address since it discusses RPL/assessment mainly at the standard-setting level (UVTAB) rather than the shop-floor level. The course design below reconciles this by making RPL available but always paired with a mandatory short gap-filling/refresher unit, never a one-time blanket exemption.
Different entry points into the same gap. The enterprise report's natural target learner is the frontline worker or owner-manager already inside a waste enterprise; the TVET report's natural target learner is the trainer/institution, with students reached indirectly through a cascade. Neither report, on its own, offers a single delivery model that reaches both; the triangulated course design therefore deliberately builds two linked cohort pathways onto one shared competency base, rather than picking one entry point over the other.
Different assumed course length and delivery envelope. The enterprise-facing course design in the TNA is built from short 1-2-day modular units (matching employers' preference for weekend/off-peak, minimally disruptive releases); the TVET-facing design in the Needs Assessment assumes a longer, structured 120-hour/8-week blended programme appropriate to an accredited diploma elective. The triangulated design keeps both: the same units of competency are offered as short stand-alone blocks for enterprise cohorts, and are bundled into the longer structured pathway (with applied capstone) for the trainer/student cohort.

Implications for Course Design

The triangulated evidence yields six specific design requirements that the course is built to satisfy:

- Competence-based, not time-based, assessment throughout direct observation, portfolios and oral defence, marked Competent / Not Yet Competent, consistent with both employer preference and UVTAB competency-standard practice.

- A genuinely strengthened, stand-alone green-business/incubation strand (costing, business model canvas, access to finance, market linkages) that is assessed with the same rigour as technical units, not folded into a single generic “entrepreneurship” lecture.
- Waste management retained as the pilot sub-sector the point where employer demand, trainer practice and equipment feasibility already align while the course structure is written to be extensible to other green sub-sectors (energy, agriculture) as equipment and curriculum resourcing catches up with policy priority.
- A dual cohort/dual pathway delivery model: a short, modular, off-peak-friendly enterprise pathway, and a longer, structured, ToT-cascaded TVET pathway, both built from the same shared units of competency so a worker and a TVET student can, in principle, earn the same credential.
- An RPL pathway available to experienced workers, but always paired with criteria-based assessment and, where a gap is found, a mandatory short gap-filling unit rather than blanket exemption responding directly to the one dissenting employer voice.
- Explicit design for stackability into the Uganda Vocational Qualifications Framework (UVQF), certification through UVTAB, assessment-standard partnership and statutory alignment with NEMA for hazardous/medical-waste content, so the credential carries recognised standing rather than remaining an informal institutional certificate.

Certificate in Green Entrepreneurship for Waste Management (CB-GEWM)

[See **Annex 1** for course overview table]

Design Principles

- Competence-based, not time-based: learners progress by demonstrating defined performance criteria, not by seat-time.
- Modular and stackable: short, self-contained units (1-2 days) for Cohort A; the same units bundled into a longer notional-hours structure for Cohorts B/C, so credit is portable between pathways.
- Foundation-plus-specialisation: a common Foundation Certificate for every learner, followed by elective Specialist Tracks matched to waste sub-sector.
- Business content weighted equally with technical content: a dedicated, assessed Green Enterprise Incubation unit sits inside the Foundation Certificate rather than as an optional extra.

- RPL-enabled but criteria-anchored: experienced workers are assessed directly against unit performance criteria; where a gap is found, only the specific short unit needed is required - full retraining is never blanket-imposed, but neither is exemption ever automatic.
- Train-the-trainer cascade: Cohort B trainers who complete the course and an added pedagogy unit are certified to co-facilitate Cohort C, multiplying reach without a proportional increase in master-trainer cost.
- Delivered where the work happens: practical sessions run on employer premises or partner-institute workshops using real equipment and waste streams, supported by a structured workplace-learning/internship framework.
- Built for accreditation from day one: mapped explicitly to UVQF levels, DIT occupational-standard format, and NEMA statutory requirements, rather than retrofitted for accreditation after piloting.

Target Learners and Dual Cohort Pathways

- **Cohort A - Enterprise pathway**. Frontline and technical workers, supervisors, in-company trainers and owner-managers within waste-management and recycling enterprises, including entrants with little formal education, delivered as short 1-5-day blocks scheduled around company operations (weekends/off-peak), on employer premises wherever feasible.
- **Cohort B - Trainer pathway (train-the-trainer)**. TVET trainers/instructors from technical institutes (welding/fabrication, motor-vehicle mechanics, electrical installation, construction, ICT, agriculture, entrepreneurship and related trades), who complete the full course plus a Training-of-Trainer's add-on and are certified as approved co-facilitators.
- **Cohort C - Student pathway (cascade).** TVET diploma/certificate students, reached indirectly through Cohort B trainers, who co-deliver an applied capstone (a live green micro-enterprise or eco-innovation pilot) as the culminating assessment.
- **Cross-cutting learners.** University/TVET interns undertaking structured work-based learning placements with waste-management host companies, using the workplace-learning and internship model.

[See **Annex 1** for programme structure table, Foundation Certificate Units FC-01 to FC-06; Specialist Elective Tracks ST-1 to ST-6, and Optional Add-On Units AO-1 to AO-3]

Delivery, Assessment, RPL and Certification Model

Delivery Model

- **Scheduling.** Cohort A Foundation units delivered in 2-5-day blocks, on weekends/evenings or company-identified low-activity periods; Cohort B/C delivered over 8 weeks, blended, 2 contact days/week, to fit institutional teaching schedules.
- **Location.** Practical units delivered on employer premises or partner-institute workshops using real equipment and waste streams wherever feasible, supplemented by MUBS facilities for classroom-based Foundation content.
- **Facilitation support.** A modest facilitation fund (transport/refreshments) is recommended for cohorts drawn from multiple districts, echoing both the enterprise TNA's logistics-barrier findings and the funding/CPD support trainers requested.
- **Cohort model.** Mixed cohorts of workers from several companies per specialist track improve viability while still allowing company-specific coaching within practical sessions; Cohort C is delivered within each host TVET institute by its own certified Cohort B trainers.
- **Digital/offline-friendly materials.** Printed facilitator and learner guides accompany digital materials to serve institutes with connectivity constraints (e.g., Nakapiripirit, Bududa), directly closing the curriculum-materials gap named by 37.5% of trainers.
- **Train-the-trainer pathway.** Cohort B trainers completing AO-1 and AO-3 are certified as approved workplace/classroom coaches, formally recognising and strengthening the informal peer-mentoring model already used by most enterprises.

Assessment Approach

Consistent with competence-based training (CBT) principles and with what employers described as valuing “practical” competence over paper qualification, assessment for every unit combines direct observation of practical performance against stated criteria; a short portfolio of evidence (a costing sheet, a concept note, a business-model canvas, a sample report); and oral questioning/defence, which also builds the communication confidence several employers said workers lack. Assessment is marked Competent / Not Yet Competent against explicit criteria (no norm-referenced grading); learners assessed Not Yet Competent are given a specific, short re-assessment opportunity rather than repeating the full unit.

Recognition of Prior Learning (RPL) Pathway

Given strong but conditional employer support for RPL - and one dissenting view that field-specific knowledge changes too quickly for a one-time assessment - a structured RPL pathway is proposed rather than either blanket recognition or mandatory full retraining:

- **Step 1 - Application and evidence gathering.** The worker (with employer support) compiles evidence of experience and any informal certificates.
- **Step 2 - Criteria-based practical assessment.** The candidate is assessed directly against the same performance criteria used in the taught units, through workplace observation and oral questioning.
- **Step 3 - Mandatory gap-filling.** Where a candidate is only partially competent, they complete the specific short unit(s) needed to close the gap - never the whole course, but never an automatic blanket exemption either, directly addressing the dissenting employer's concern that the field “keeps changing.”
- **Step 4 – Certification.** Successful candidates receive the same certificate as taught-pathway learners, with the assessment route (RPL vs. taught) recorded but not differentiated in the credential's standing.

For hazardous and medical waste handling specifically, this RPL pathway sits alongside, and explicitly does not substitute for, NEMA's own mandatory handler certification, which remains a legal requirement.

Certification and Accreditation Pathway

- The Foundation Certificate is awarded on successful completion (taught or RPL) of all six FC units.
- The full Certificate in Green Entrepreneurship for Waste Management is awarded on completion of the Foundation Certificate plus at least one Specialist Track.
- A Supervisor/Trainer endorsement is added for Cohort A supervisors completing AO-1, and for Cohort B trainers completing AO-1 and AO-3.
- Certificates are co-branded and issued by the MUBS Entrepreneurship and Innovation Centre, with a competency standard and assessment instrument developed jointly with UVTAB (building on UVTAB's existing NEMA curriculum-development partnership) and gazetted through DIT's occupational-standards process.
- Formal recognition is pursued through UVTAB/UBTEB so the credential is stackable within the Uganda Vocational Qualifications Framework (UVQF) and carries recognised standing

in the labour market, directly responding to founders' stated need for formal recognition of self-taught expertise and to MDAs' stated intent to fast-track a green-entrepreneurship occupational standard.

- Where a unit maps to an existing external certification requirement (notably NEMA hazardous-waste handling), the course explicitly prepares candidates for that external certification rather than duplicating or competing with it.

Implementation Roadmap and Recommendations

For the GreenVET4U Project and MUBS
▪ Pilot the Foundation Certificate with 2-3 of the interviewed enterprises representing different sub-sectors (e.g., one hazardous-waste operator, one plastics/recycling social enterprise, one organics/briquette producer) alongside 2-3 TVET institutes already engaged in green practice (e.g., a KCCA-affiliated urban institute and one or two rural institutes such as Nakapiripirit or Bududa), before wider roll-out. ▪ Formally engage NEMA early in course design, both to align ST-1 with NEMA's own certification requirements and to explore NEMA recognition or endorsement of Foundation Certificate elements for its own trainee pipeline. ▪ Establish, jointly with MoES, the sector-skills/green-TVET expert committee MoES itself proposed, with clear terms of reference to own curriculum development and standard-setting for this credential. ▪ Pursue accreditation of the Certificate through UVTAB/UBTEB/DIT and NCHE to give it recognised, portable standing within the UVQF, using the pilot cohort's capstone outputs as case studies for scale-up. ▪ Develop the structured workplace-learning/internship framework as a standalone product offered to companies not yet ready to commit to the full course, as a lower-cost entry point to the partnership.
For Waste Companies (Cohort A)
▪ Nominate at least one supervisor per company for AO-1 to build sustainable in-house training capacity rather than relying solely on external trainers. ▪ Where staff turnover after training is a concern, consider simple retention mechanisms already used successfully in the sector (e.g., service-linked bonding periods) rather than avoiding training investment altogether.

- Use the RPL pathway proactively to formally recognise existing experienced workers' skills, both motivating staff and strengthening the company's credibility with clients and regulators.

For TVET Institutions and Trainers (Cohort B/C)

- Update institution heads on the business case for green entrepreneurship (income diversification, donor-funding eligibility, student demand) ahead of curriculum rollout, addressing the "negative attitude of institution heads" risk one trainer flagged.
- Allocate workshop time and a modest materials budget to at least one live green micro-enterprise or eco-innovation project per cohort, operationalising the hands-on delivery preference trainers themselves expressed.
- Establish entrepreneurship/environmental clubs as a low-cost, near-term way to build student demand and instructor confidence ahead of full curriculum integration.

4. Implementation models

4.1 Digital infrastructure for validation

The implementation of a micro-credentials-based validation system requires a digital infrastructure capable of supporting the complete lifecycle of competence assessment, certification and verification. Beyond simply hosting learning resources or assessment activities, such an infrastructure must ensure that competence validation is transparent, reliable, scalable and accessible to all relevant stakeholders.

Within the GreenVET4U project, this digital infrastructure has been conceived as an integrated environment combining learning resources, competence assessment and digital certification. While the GreenVET4U Online Platform provides access to training materials, e-learning courses and pedagogical resources, the GreenVET4U Competence Assessment WebApp constitutes the core component supporting the assessment and validation of Skills for Green Jobs through micro-credentials. Both systems operate as complementary elements within the project's digital ecosystem, each fulfilling a distinct but interconnected function.

From a functional perspective, the digital infrastructure has been designed around five complementary components.

- First, it provides access to **structured information** on the available micro-credentials. Each micro-credential includes a clear description of its objectives, professional context, related green occupations, expected learning outcomes, competency standards, assessment methodology and associated skills for green jobs. This information enables learners and stakeholders to understand the competences being assessed before initiating the validation process.

- Second, the infrastructure supports **digital competence assessment** through standardised online questionnaires. Each micro-credential is associated with a predefined assessment composed of single choice and multiple-choice questions organised around the corresponding set of skills for green jobs. The assessment process is fully digital, allowing participants to complete the evaluation remotely while ensuring consistent assessment conditions for all candidates.

- Third, the system incorporates an **automated certification mechanism**. Once the required assessment threshold has been successfully achieved, the WebApp automatically generates a personalised digital micro-credential containing the relevant information on the certified competences, the issuing authority, the promoting organisation, the professional sector and the associated metadata. This automation considerably reduces administrative workload while ensuring consistency throughout the certification process.

- A fourth component concerns the **verification and traceability** of issued micro-credentials. Each certificate includes a unique credential identifier together with a verification URL and QR code, allowing employers, training providers and other interested organisations to verify the authenticity of the issued credential quickly and securely. This verification functionality contributes to increasing confidence in the certification process while facilitating the portability of recognised competences.

- Finally, the infrastructure has been designed following principles of **scalability and future adaptability**. Although the pilot phase focuses on the Hospitality, Tourism and Ecotourism, and Waste Management and Circular Economy sectors in Uganda, the overall architecture allows additional sectors, micro-credentials and promoting organisations to be incorporated in the future without requiring substantial modifications to the underlying validation model. The digital infrastructure therefore constitutes not only a project deliverable but also a potential foundation for the progressive expansion of competence-based validation systems beyond the project's initial scope.

Rather than representing a standalone technological solution, the GreenVET4U digital infrastructure should therefore be understood as an integrated framework supporting the transparent assessment, recognition and certification of Skills for Green Jobs. By combining digital assessment, automated certification and secure verification mechanisms within a single environment, the project demonstrates a practical implementation model for competence validation that may inform future developments in vocational education and training systems in Uganda.

4.2 Use of the GreenVET4U webapp

The GreenVET4U Competence Assessment WebApp provides a practical implementation of the project's competence validation model, enabling learners and VET practitioners to participate in a complete digital workflow for the assessment and recognition of **Skills for Green Jobs**.

For learners, the WebApp offers a structured pathway that begins with the exploration of the available micro-credentials. Before initiating the assessment, users can consult detailed information about each micro-credential, including its Green Skill Profile, Skills Framework, Learning Outcomes and assessment requirements. This information ensures that the validation process is transparent and that learners clearly understand the competences they are expected to demonstrate.

Once a suitable micro-credential has been selected, learners complete the corresponding online assessment questionnaire. The assessment is fully aligned with the GreenVET4U Competence Assessment Methodology and is designed to evaluate the application of competences in realistic professional situations rather than the memorisation of theoretical knowledge. Upon submission, responses are evaluated automatically, allowing learners to receive immediate feedback on the outcome of the assessment.

Successful candidates are automatically awarded a digital micro-credential, which can be accessed through their personal dashboard. Each credential includes comprehensive information on the certified competences together with secure verification mechanisms that enable employers, education providers and other stakeholders to confirm its authenticity.

The WebApp also supports **VET teachers, in-company trainers and other VET practitioners** through a dedicated functionality for the creation of new micro-credentials. Using the **Create your Micro-credential** feature, authorised users can submit proposals following the common GreenVET4U methodological structure. This functionality enables the continuous expansion of the micro-credential catalogue while ensuring that all newly developed credentials remain aligned with the project's competence assessment methodology.

The interaction between these two groups of users illustrates the collaborative nature of the GreenVET4U validation model. VET practitioners contribute by designing and proposing new competence assessment pathways, while learners use the platform to demonstrate the competences acquired through education, training or Work-Based Learning (WBL). The WebApp therefore acts not only as a digital assessment platform, but also as a shared environment that connects competence development, assessment and certification within a single ecosystem.

From an implementation perspective, this model offers several advantages for TVET systems. It simplifies the administration of competence assessment, ensures consistency in the application of assessment criteria, reduces the time required to issue certificates and facilitates the recognition of competences through secure digital credentials. At the same time, the possibility of continuously incorporating new micro-credentials makes the system adaptable to changing labour market requirements and emerging skills for green jobs.

Consequently, the GreenVET4U Competence Assessment WebApp demonstrates how digital technologies can support the practical implementation of competence-based validation systems while promoting transparency, accessibility, quality assurance and long-term sustainability.

4.3 Governance and quality assurance

The successful implementation of a micro-credentials-based validation system depends not only on the availability of appropriate digital technologies, but also on the establishment of robust governance and quality assurance mechanisms. For micro-credentials to be recognised and trusted by learners, education providers, employers and other stakeholders, the processes through which they are developed, assessed, certified and verified must be transparent, consistent and based on common standards.

The GreenVET4U implementation model addresses these requirements through an **integrated governance framework** combining common methodological principles, standardised assessment procedures and a shared certification model. Together, these elements ensure that all micro-credentials developed within the GreenVET4U ecosystem meet the same quality standards while remaining sufficiently flexible to respond to the evolving needs of different economic sectors and emerging skills for green jobs.

A fundamental element of this governance model is the use of a **common methodological architecture** for all micro-credentials. Every micro-credential follows the same structure, including General Information, Green Skill Profile, Skills Framework, Assessment Framework and Assessment Questionnaire. This standardisation ensures that all competence assessments are designed according to the same pedagogical principles and that learners are evaluated through comparable and transparent procedures regardless of the specific occupational field addressed.

Quality assurance is further reinforced through the use of **standardised assessment methodologies**. Assessment questionnaires are developed directly from the defined Learning Outcomes and Competency Standards, ensuring that every assessment measures the competences that learners are expected to demonstrate rather than isolated theoretical knowledge. Automatic evaluation within the WebApp guarantees that identical assessment criteria are applied consistently to every learner, eliminating variations that could arise from manual marking while providing immediate and objective assessment results.

The **GreenVET4U governance model** also introduces a clear distinction between the organisations responsible for developing micro-credentials and the organisation responsible for issuing them. Each micro-credential identifies the **promoting organisation**, recognising the institution that designed and proposed the competence assessment pathway. At the same time, all micro-credentials are issued by the GreenVET4U Certification Alliance, which acts as the common issuing body responsible for ensuring the consistency, credibility and integrity of the certification system. This separation enables a growing number of educational institutions, companies, sector organisations and other stakeholders to contribute new micro-credentials while maintaining a unified certification model.

The **GreenVET4U Certification Alliance** also provides an institutional mechanism for the long-term sustainability of the system. As additional organisations join the Alliance, the credibility, visibility and recognition of the certification model can progressively increase, strengthening confidence among learners, employers and the wider TVET community. In parallel, the continuous participation of new promoting organisations supports the expansion of the micro-credential catalogue while ensuring that newly developed credentials remain responsive to labour market developments and future skills for green jobs.

Finally, quality assurance is reinforced through **secure digital certification and verification mechanisms**. Every issued micro-credential incorporates a unique credential identifier together with QR-based verification and digital authentication features that enable third parties to confirm the authenticity of the credential quickly and reliably. These mechanisms contribute to preventing fraud, protecting the integrity of the certification process and increasing trust in digitally issued micro-credentials.

Taken together, these methodological, institutional and technological measures provide a comprehensive governance model capable of supporting the **sustainable implementation** of micro-credentials-based validation systems in Uganda. Rather than relying solely on digital technology, the GreenVET4U approach demonstrates that effective competence validation requires the integration of common methodologies, transparent governance, quality assurance procedures and trusted certification mechanisms within a coherent and scalable ecosystem.

5. Preliminary recommendations and conclusions

5.1 Synthesis of key findings

This report has combined three levels of evidence: the European and international policy landscape (Section 2), the Ugandan institutional and sectoral context (Section 3), and the digital implementation model developed within GreenVET4U (Section 4). Taken together, they indicate that the conditions for a micro-credentials-based approach to validating green job competences in Uganda are favourable, and that both pilot sectors provide a solid, complementary basis for moving into the piloting phase.

The Council Recommendation on micro-credentials and the complementary EQF, EQAVET, GreenComp and DigComp frameworks (Section 2) provide the methodological reference against which the project's approach has been checked throughout. The Ugandan legal and institutional context (Section 3.1) confirms that the TVET Act (2025), together with the BTVET Act (2019) and TVET Policy (2019), already creates space for modular, competency-based and stackable learning, even though micro-credentials are not yet explicitly regulated.

The two sector contributions, while developed through different methodologies, converge on a consistent picture. The eco-tourism analysis (Section 3.2) identifies green competences as largely informal, unevenly distributed across environmental, operational, social and leadership dimensions, and exposed to the risk of superficial “greenwashed” claims of sustainability in the absence of clear standards. The waste-management analysis (Section 3.3), based on a structured Training Needs Assessment involving Ugandan Ministries, Departments and Agencies, waste enterprises and TVET trainers, confirms a closely related pattern: strong readiness and willingness to engage in training, but a comparable lack of accredited, practical pathways, together with a specific need to strengthen business and entrepreneurial skills alongside technical ones.

Both sectors therefore point to the same underlying challenge: without a transparent, credible validation mechanism, genuine green competences remain difficult to distinguish from informal practice or superficial claims, limiting both employability and trust in the labour market.

Building on this shared diagnosis, MUBS has proposed a fully specified course model for waste-management (the Certificate in Green Entrepreneurship for Waste Management, detailed in Annex 1), including units of competency, a dual enterprise/train-the-trainer delivery pathway, a criteria-based Recognition of Prior Learning route, and an accreditation pathway involving UVTAB, DIT, NEMA and the Uganda Vocational Qualifications Framework (UVQF). This model should be read as one possible, concrete way of operationalising the principles and gaps identified across both sectors, rather than as evidence that the two pilot areas require fundamentally different approaches.

Indeed, its core design choices — competence-based assessment, a criteria-anchored RPL pathway, sector ownership of content, and a train-the-trainer multiplier — are directly consistent with the eco-tourism findings and with the European reference principles set out in Section 2, and can inform how the eco-tourism pilot is structured as well.

The digital infrastructure and governance model presented in Section 4 is compatible with both sectors. The common methodological architecture used for every micro-credential (General Information, Green Skill Profile, Skills Framework, Assessment Framework, Assessment Questionnaire) provides a shared format into which sector-specific content — whether derived from the eco-tourism competence gaps or from the waste-management units of competency — can be consistently translated, ensuring that the WebApp remains a unifying tool rather than a constraint favouring one sector's model over the other.

5.2 Strategic recommendations

Recommendation 1

Anchor micro-credentials to national institutions and existing legal provisions

Building on the enabling provisions of the TVET Act (Section 3.1) and on the concrete accreditation route identified for waste-management (UVTAB, DIT, NEMA), it is recommended that the consortium pursue institutional engagement for both sectors during the piloting phase. For eco-tourism, this means identifying the equivalent counterpart institutions (e.g., the Ministry of Tourism, Wildlife and Antiquities, and relevant tourism/hospitality occupational-standard bodies) and initiating a comparable dialogue, so that institutional recognition is pursued as a parallel track for both sectors rather than being anchored to the sector where it happens to be most advanced at this stage.

Recommendation 2

Adopt competence-based, criteria-driven assessment as the common reference model.

Both sectors point towards the value of assessing the genuine application of competences rather than theoretical knowledge alone – to avoid greenwashing in eco-tourism, and to meet employers' stated preference for demonstrated "practical" competence in waste-management. It is recommended that a shared competence-based assessment logic (clear performance criteria, evidence-based verification, transparent standards) underpin the micro-credentials for both sectors, adapting the specific instruments (observation, portfolio, questionnaire) to what is feasible and relevant in each case.

Recommendation 3

Consider a train-the-trainer / cascade dimension for both sectors.

The dual-pathway logic developed for waste-management (a direct enterprise pathway and a trainer pathway that cascades to students) illustrates a scalable mechanism for multiplying reach without a proportional increase in cost. Both GLS/NCDC and MUBS should assess, during piloting, whether a similar cascade model is feasible and useful for eco-tourism, without assuming that the specific model designed for waste-management must be replicated unchanged.

Recommendation 4

Apply a criteria-anchored RPL approach consistently, where RPL is used.

Where Recognition of Prior Learning (RPL) is considered for either sector, it should be paired with criteria-based assessment and targeted gap-filling rather than blanket recognition, consistent with the balanced view expressed by Ugandan stakeholders in the waste-management consultation and with the emphasis on valid, transparent assessment in the Council Recommendation (Section 2.1).

Recommendation 5

Preserve sector-specific ownership and periodic updating of competence content.

Both GLS and MUBS should retain a formal role in reviewing and updating the content relevant to their sectors over time, given how context-dependent green competences are shown to be in both the eco-tourism and waste-management analyses.

Recommendation 6

Use evidence from both sectors, jointly, to inform dissemination and impact messaging.

Rather than presenting waste-management as a more mature case, WP6 dissemination activities should draw on both sectors as complementary illustrations of the same underlying opportunity: to make informal, currently under-recognised green competences visible, credible and portable through micro-credentials.

5.3 Operational recommendations for the piloting phase

Bring both sectors to a comparable operational level ahead of piloting. For waste-management, the immediate task is to adapt the already-developed course model (Annex 1) to a qualification level applicable to the pilot activities. For eco-tourism, it is recommended that GLS, supported by NCDC, develop a corresponding set of assessable units of competency (learning outcomes, performance criteria, assessment method) building on the gaps identified in Section 3.2, so that both T5.6 and T5.7 generate evidence of a similar type and depth for D5.2.
Test contrasting pilot contexts within each sector. For waste-management, this means testing with enterprises and TVET institutes representing different sub-sectors and different levels of resource availability (as already proposed in Annex 1). For eco-tourism, a comparable diversity of pilot sites (e.g., different enterprise sizes, community-based vs. commercial operators) should be sought.
Map sector-specific competence content onto the WebApp's common architecture. Both the waste-management units of competency and the eco-tourism competence gaps should be reformulated into the WebApp's standard structure (General Information, Green Skill Profile, Skills Framework, Assessment Framework, Assessment Questionnaire), adapting the assessment method (auto-scored questionnaire, observation-based verification, or a hybrid) to what each competence area requires, rather than forcing a single format onto both sectors.
Provide offline-friendly materials as a standard feature for both sectors. Printed facilitator and learner guides, alongside digital materials, should be foreseen wherever pilot sites may face connectivity constraints, consistent with the project's inclusion objectives.
Engage relevant accreditation and sector bodies during, not after, piloting, Engage them for both waste-management (UVTAB, NEMA, DIT) and eco-tourism (tourism-sector institutional counterparts to be identified), so that feedback on institutional recognition feeds into D5.2 while the pilot is still running.
Track completion, drop-out and (where used) RPL uptake by target group. Thus, distinguishing direct beneficiaries from any cascade/trainer-mediated participants, consistently across both sectors.

5.5 Conclusions

This exploratory report has examined the conditions for implementing a micro-credentials-based approach to validating competences for green jobs in Uganda, drawing on European and international reference frameworks, the Ugandan policy and institutional context, and two sector-level contributions covering eco-tourism and waste-management.

Both sectors converge on the same central conclusion: skills for green jobs in Uganda's eco-tourism and waste-management sectors are largely real, in-demand and practically applied, but remain informal, unevenly recognised, and vulnerable to being confused with superficial claims of sustainability in the absence of a transparent, credible validation mechanism. Micro-credentials, designed and governed along the principles set out in Section 2 and supported by the digital infrastructure described in Section 4, offer a concrete way of addressing this gap in both sectors.

The waste-management contribution has usefully translated this shared diagnosis into a detailed, accreditable course model (Annex 1), although this model is aimed at a higher qualification level than that held by participants in the project's testing phase. Nevertheless, the consortium may regard this model as a valuable reference and starting point – not as a template to be mechanically replicated, but as a demonstration that the underlying approach can be put into practice in a way that is both pedagogically sound and institutionally realistic.

Annex 1 Proposed Micro-credential Certificate in Green Entrepreneurship for Waste Management (CB-GEWM)

Course Overview

Attribute	Specification
Course title	Certificate in Green Entrepreneurship for Waste Management (CB-GEWM)
Owning/accrediting partners	Makerere University Business School Entrepreneurship, Innovation and Incubation Centre, in partnership with UVTAB, and NEMA for hazardous/medical-waste content alignment
Qualification level	UVQF Level 3-4 equivalent; stackable as a TVET diploma elective or CPD/micro-credential
Target sub-sector (pilot)	Waste management and recycling green enterprise, selected as the pilot sub-sector
Cohorts	Cohort A - enterprise workers, supervisors and owner-managers (direct delivery) Cohort B - TVET trainers (train-the-trainer), who cascade to Cohort C - TVET diploma/certificate students
Pedagogical model	Competence-based training (CBT): direct observation, portfolio of evidence, oral defence; Competent / Not Yet Competent marking; no norm-referenced grading
Delivery mode	Hands-on, project- and workplace-based; short modular blocks for Cohort A, blended 8-week structure with applied capstone for Cohorts B/C
Certification outcomes	Foundation Certificate (6 core units); full Certificate (Foundation + at least 1 Specialist Track); Supervisor/Trainer endorsement (AO units); UVTAB-endorsed, UVQF-stackable

Programme structure

Tier	Content	Cohort A duration	Cohort B/C notional hours
Foundation Certificate (mandatory, all learners)	Six core units: - Waste literacy and segregation - OHS/hazardous-waste awareness - Green business and entrepreneurship fundamentals - Workplace professionalism and digital literacy - Circular economy and value addition - Green enterprise incubation and market linkages	8-9 days	55 hours facilitated + applied project work
Specialist Track (choose 1-2)	One or more of: - Hazardous and Medical Waste - Plastics and Polymer Recycling - Organic Waste and Bioenergy/ Briquettes - Textile and Creative Reuse - Construction Materials Recycling (Eco-Bricks) - Glass Recycling and Cullet	1-2 days each	Embedded as trade-specific breakout labs within the applied-project phase
Optional Add-On (supervisors/ trainers)	- Supervisory and Team Leadership - Monitoring, Evaluation and Green Business Data - Training of Trainers and Green-Entrepreneurship Pedagogy (Cohort B only)	1-2 days each	Mandatory for Cohort B; optional CPD unit for Cohort A supervisors
Applied Capstone (Cohort B/C only)	- Live green micro-enterprise or eco-innovation pilot - Peer review - Reflective lo - Final portfolio, including (for trainers) a ready-to-use lesson/club plan	N/A	40 hours

On completion of the Foundation Certificate plus at least one Specialist Track, a learner earns the full Certificate in Green Entrepreneurship for Waste Management. Cohort B trainers additionally completing the Training-of-Trainers unit earn a Supervisor/Trainer endorsement authorising them to co-facilitate Cohort C.

Foundation Certificate - Units of Competency

Each unit specifies learning outcomes, the performance criteria against which competence is assessed.

FC-01: Waste Identification, Classification and Segregation (1 day)	
Element	**Detail**
Learning outcomes	Classify waste by type (domestic/municipal, industrial, hazardous, medical, e-waste, glass, plastics, organics) and by risk level; correctly apply Uganda's waste colour-coding and labelling conventions.
Performance criteria (assessed)	Correctly sorts a mixed simulated waste stream into at least 6 categories with no cross-contamination; identifies mis-sorted hazardous/medical waste and explains correct escalation; explains why segregation at source matters to a hypothetical client.
Assessment method	Practical sorting exercise + oral questioning (individual, 45 minutes)
Triangulated evidence addressed	Enterprise TNA: single most frequently cited entry-level gap (7/11 companies). Trainer/MDA data: consistent with waste management being trainers' most-emphasised current practice area (62.5%), confirming this is a teachable, demonstrable entry unit.

FC-02: Occupational Health, Safety and Hazardous Waste Awareness (1.5 days)	
Element	**Detail**
Learning outcomes	Select and correctly use appropriate PPE for a given waste-handling task; apply basic first-aid and fire-safety response; describe NEMA's regulatory role and an enterprise's licensing/compliance obligations.
Performance criteria (assessed)	Demonstrates correct PPE donning/doffing for 3+ scenarios; demonstrates first-aid response to a simulated sharps injury and correct fire-extinguisher use; names the licences/permits required for their sub-sector.
Assessment method	Practical demonstration + simulated scenario response + short written/oral quiz

Triangulated evidence addressed	Enterprise TNA: OHS/PPE/HAZMAT gap (6/11) and regulatory-literacy gap (4/11). MDA data: KCCA names safe handling of hazardous materials as a named skill gap; UVTAB's existing NEMA curriculum partnership gives this unit a direct accreditation hook.

FC-03: Green Business and Entrepreneurship Fundamentals (2 days)	
Element	**Detail**
Learning outcomes	Prepare a simple costing and pricing structure for a waste/recycling product or service; maintain a basic financial record; develop a one-page business/growth plan with a customer-value proposition.
Performance criteria (assessed)	Produces an accurate cost-and-price sheet for a specified product; correctly records a week of sample transactions in a simple ledger; presents and defends a one-page business plan under questioning.
Assessment method	Portfolio (costing sheet + ledger extract + one-page plan) + oral defence
Triangulated evidence addressed	Enterprise TNA: financial-management gap (4/11). Trainer data: business incubation is trainers' single largest unmet training need (75%) - this unit and FC-06 together are the course's direct response to that finding.

FC-04: Workplace Professionalism and Digital Literacy (1 day)	
Element	**Detail**
Learning outcomes	Communicate professionally with clients, colleagues and supervisors; demonstrate reliability, honesty and teamwork; use basic digital tools (email, video-call platforms, simple documents/spreadsheets, mobile money).
Performance criteria (assessed)	Role-plays a professional client interaction without inappropriate language, escalating appropriately; correctly joins and participates in a video call; drafts a short work email and a one-page incident/activity report.
Assessment method	Role-play observation + practical digital-tools task

Triangulated evidence addressed	Enterprise TNA: attitude/professionalism is a universal (11/11) gap and top recruitment criterion; basic digital-literacy gap named by Yo Waste & Glass Recycling and WATSEPLUS even for graduate hires.

FC-05: Circular Economy and Value Addition ("Waste-to-Wealth") (2 days)	
Element	**Detail**
Learning outcomes	Distinguish reduce/reuse/repurpose/recycle/upcycle and identify which applies to a given waste stream; identify at least three viable value-added products from a locally available waste stream; explain the basic economics of value addition.
Performance criteria (assessed)	Correctly classifies 10 waste-transformation examples; presents a concept note for one new value-added product idea with expected cost and market; explains one realistic value-addition step for their own company's waste stream.
Assessment method	Concept note + presentation to peer group and assessor
Triangulated evidence addressed	Enterprise TNA: second most-cited current gap and the top-ranked anticipated future-skills theme, named by 5 of 11 companies. Trainer/MDA data: converges with the national policy emphasis on a circular-economy, green-growth pathway (UGGDS).

FC-06: Green Enterprise Incubation and Market Linkages (2 days)	
Element	**Detail**
Learning outcomes	Adapt a business-model canvas for a green/waste enterprise; identify access-to-finance options (savings groups, microfinance, green funds, donor/private-sector schemes); navigate the basic regulatory environment (NEMA compliance, UVQF/DIT standards, local-government licensing); build partnerships and market/off-take linkages for a green micro-enterprise.
Performance criteria (assessed)	Produces a draft business-model canvas and simple financial plan for a chosen green-enterprise concept; produces a one-page stakeholder/partnership map identifying at least three relevant partners or financing routes; correctly identifies the licences/standards applicable to their concept.

Assessment method	Business-model canvas + financial plan + stakeholder map, assessed by portfolio and oral defence
Triangulated evidence addressed	New unit added specifically to close the gap the triangulation identified as convergent but under-served by the enterprise-only design: trainers' top training need (business incubation, 75%) and the enterprise-side gaps in financial management, partnership development and regulatory navigation (Zaham Investments, Kusuubira Foundation, WATSEPLUS). Directly operationalises Needs Assessment Modules 3-4.

Specialist Elective Tracks

Learners (or their sponsoring companies/institutes) select one or two tracks matching their sub-sector. Each track builds directly on the Foundation Certificate and is drawn from the validated sub-sector evidence in the enterprise TNA.

Code	Track title	Duration	Focus / key competencies
ST-1	Hazardous and Medical Waste Management (NEMA-aligned)	2 days	Waste-category-specific handling protocols, chain-of-custody documentation, transport/labelling compliance, incineration/land-filling procedures; prepares candidates for (without duplicating) NEMA's own mandatory handler certification.
ST-2	Plastics and Polymer Recycling Technology	2 days	Plastic grading and sorting, washing/drying, pelletizing and crushing operations, quality-control checks, buy-back centre set-up, basic value-chain economics.
ST-3	Organic Waste and Bioenergy / Briquette Production	1.5 days	Agricultural/organic waste sourcing, carbonisation, briquette and eco-cookstove manufacture, quality/consistency control, basic production-line safety.

ST-4	Textile and Creative Reuse (Fashion and Crafts)	1.5 days	Sorting and grading textile/packaging waste, repurposing/upcycling techniques, basic pattern and product design, quality finishing for resale.
ST-5	Construction Material Recycling (Eco-Bricks and Green Building)	2 days	Plastic-bottle eco-brick construction technique, basic structural/safety principles, site coordination, working with casual/project-based labour.
ST-6	Glass Recycling and Cullet Processing	1 day	Glass collection and sorting by colour/grade, crushing to cullet, quality specifications for industrial buyers, safe handling of broken glass.

Optional Add-On Units (Supervisors, Trainers and Growth-Stage Entrepreneurs)

AO-1: Supervisory and Team Leadership for Waste Enterprises (2 days)	
Element	**Detail**
Learning outcomes	Plan, deliver and evaluate an on-the-job coaching session for a new worker; apply basic team-management and resource planning; apply basic conflict-resolution and performance-feedback techniques.
Performance criteria (assessed)	Delivers a 15-minute coaching demonstration with structured peer/assessor feedback; produces a one-week team and resource plan for a hypothetical 5-person crew; role-plays resolving a workplace-conflict scenario constructively.
Assessment method	Live coaching demonstration + resource-plan portfolio + role-play
Triangulated evidence addressed	Enterprise TNA: requests from WATSEPLUS, Zaham Investments and Pendeza Shelters for supervisor/trainer capacity-building. Trainer/MDA data: converges with the 62.5% of trainers citing insufficient instructor training as an institutional barrier.

AO-2: Monitoring, Evaluation and Green Business Data (1 day)	
Element	**Detail**

Learning outcomes	Design a simple set of indicators to track a waste/recycling enterprise's operational and environmental impact; record and summarise basic operational data using a simple digital tool.
Performance criteria (assessed)	Defines at least 4 relevant indicators for a given enterprise type and justifies their choice; produces a one-page monthly summary report from a sample dataset using a spreadsheet.
Assessment method	Indicator framework + sample report
Triangulated evidence addressed	Enterprise TNA: M&E/data gap raised by De Waste, WATSEPLUS and Yo Waste & Glass Recycling. MDA data: aligns with KCCA and NCHE's own interest in measurable outcomes for green initiatives.

AO-3: Training of Trainers: Green-Entrepreneurship Pedagogy and Curriculum Delivery (Cohort B only) (2 days)	
Element	**Detail**
Learning outcomes	Design and deliver an introductory green-entrepreneurship lesson, workshop or club activity appropriate to the trainer's own trade area; apply competence-based assessment methods (direct observation, portfolio, oral questioning) to their own students; co-facilitate a Foundation Certificate unit under mentorship.
Performance criteria (assessed)	Delivers a 20-minute micro-teaching demonstration of a green-entrepreneurship lesson to peers, with structured feedback; produces a ready-to-use lesson/club plan mapped to at least one FC unit; co-facilitates one full FC unit session with a mentor observing and provides written reflective feedback.
Assessment method	Micro-teaching demonstration + lesson-plan portfolio + co-facilitation observation
Triangulated evidence addressed	New unit added specifically to operationalise the Needs Assessment's train-the-trainer cascade model and to close the trainer-capacity and curriculum-materials gaps (62.5% and 37.5% of trainers respectively) that the enterprise-only design does not address. Certified completion authorises a trainer to co-facilitate Cohort C.