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Greening TVET – guidelines for institutions in South Sudan

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Greening TVET – guidelines for institutions in South Sudan

These Greening TVET guidelines provide a comprehensive framework to promote sustainable development within TVET institutions. By showing how to embed environmental sustainability and gender equity into institutional practices, the guidelines aim to equip TVET institutions with the tools needed to foster a green economy. They outline actionable strategies to integrate greening into institutional culture, curriculum, professional development, campus operations and community engagement, while emphasizing inclusivity and equitable participation across all genders. These efforts are essential for building resilient communities and sustainable futures.

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List of abbreviations

CPD	Continuing professional development
ESD	Education for sustainable development
GHG	Greenhouse gas
ICT	Information and communication technology
IDPs	Internally displaced persons
IGP	Institutional greening plan
KPIs	Key performance indicators
M&E	Monitoring and evaluation
NGO	Non-governmental organization
OECD	Organization for Economic Co-operation and Development
SDGs	Sustainable Development Goals
SML	Sustainability maturity level
TVET	Technical and Vocational Education and Training
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO-UNEVOC	UNESCO International Centre for Technical and Vocational Education and Training
UNFCCC	United Nations Framework Convention on Climate Change

Definition of key terms in greening

Biodiversity:
The variety of life in all its forms, including genetic, species and ecosystem diversity, which is crucial for maintaining ecological balance and resilience.

Carbon footprint:
The total amount of greenhouse gases emitted directly or indirectly by human activities, typically expressed in equivalent tons of carbon dioxide (CO2e).

Climate change:
Long-term changes in temperature, precipitation, wind patterns and other aspects of the Earth's climate system, often attributed to human activities, such as burning fossil fuels.

Climate resilience:
The ability of a system, community or society to withstand and recover from the impacts of climate change, including extreme weather events and long-term changes in climate patterns.

Energy efficiency:
The practice of using less energy to perform the same task or produce the same outcome, thereby reducing energy consumption and environmental impact.

Environmental sustainability:
The responsible management of natural resources and the environment to prevent degradation and ensure long-term ecological balance.

Green curriculum:
An educational curriculum that incorporates environmental education and sustainability concepts, aiming to equip students with the knowledge and skills needed to address environmental challenges.

Green economy:
An economic model that aims for sustainable development without degrading the environment. It is characterized by low carbon emissions, resource efficiency and social inclusivity.

Green jobs:
Employment in industries or sectors that contribute to preserving or restoring environmental quality, including renewable energy, energy efficiency, waste management and conservation.

Green technologies:
Technologies that reduce environmental impact and promote sustainability, including renewable energy technologies, energy-efficient systems and waste-management technologies.

Greening TVET:
The process of adapting knowledge and practices in technical and vocational education and training to align them with the overarching concept of sustainability. 'Greening TVET' goes far beyond what is taught. It reaches into all aspects of an institution's operations or enterprises. When adapted to an institution's educational and training activities, greening could lead to an incremental and systemic change that has an impact on the practices, culture and mindset.

Institutional greening:
The implementation of sustainable practices, such as energy conservation, waste reduction and sustainable procurement, within the operations and infrastructure of an educational and training institution.

Renewable energy:
Energy derived from natural sources that are replenished constantly, such as solar, wind, hydro and geothermal power.

Skills for the green transition:
The skills needed to live in, develop and support a society that aims to reduce the negative impact of human activity on the environment. They refer not only to 'generic skills', which include minimizing the use of resources, reducing greenhouse gas emissions, recycling, using environmentally friendly products, protecting the natural environment, and so on, but also to those specialized technical skills that need to be mastered by people who engage in green jobs.

Stakeholder engagement:
The process of involving individuals, groups or organizations that may be affected by or have an interest in a particular initiative, such as greening TVET.

Sustainable development:
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It involves balancing economic growth, environmental protection and social equity.

Introduction to greening

In South Sudan, integrating greening principles into TVET aligns with the country's need to build a resilient economy while addressing environmental challenges unique to its context, such as land degradation, deforestation and climate-related vulnerabilities that affect agriculture and livelihoods.

Embedding sustainability within South Sudan's TVET system would prepare learners with critical skills for green jobs that support sustainable agricultural practices, energy management and environmental conservation. These sectors are essential for national growth given the country's economic dependence on natural resources and agriculture. This approach would also encourage TVET institutions in South Sudan to adopt practices such as resource-efficient campus management, use of renewable energy sources and curriculum updates that focus on environmental stewardship.

Furthermore, greening TVET in South Sudan could help address the needs of a transitioning labour market by providing training on climate-smart technologies, green energy solutions and sustainable farming techniques. As the global demand for green skills rises, South Sudan's efforts to align its educational and vocational programmes with sustainable development goals could foster a workforce that is better prepared for the green economy, promoting social equity and creating employment opportunities.

About the guide

These guidelines offer practical guidance and resources for integrating greening into TVET programmes. Some aspects of the global guidelines developed by UNESCO-UNEVOC informed the development of this document in the specific context of South Sudan. The document highlights key concepts, strategies and activities for incorporating environmental sustainability into curricula and operations. The guide emphasizes the importance and benefits of greening in the TVET context, benefiting learners, institutions and communities.

It provides guidance on adapting curricula to include green skills and sustainable practices relevant to emerging industries. The guide also explores teaching methods such as experiential and project-based learning and the use of green technologies. It details practical steps for greening institutional operations, such as energy efficiency, waste management and sustainable procurement.

Additionally, strategies for engaging stakeholders, including industry, government and communities, are outlined. Tools for assessing the impact of greening efforts and ensuring continuous improvement are also provided. This comprehensive resource equips TVET trainers and managers with actionable insights and tools to promote a culture of sustainability in educational institutions, empowering educators and learners to contribute to a greener future.

How to use this guide?

This guide serves as a practical resource for TVET trainers, managers and stakeholders aiming to integrate greening principles into their programmes and operations. Readers should start by reviewing the introductory sections to understand the core concepts of greening and its importance in TVET, providing a foundation for the guide's objectives and scope.

Organized into distinct sections, the guide covers approaches in curriculum development and pedagogical adaptation, teaching and learning strategies, and embedding environmental awareness, knowledge and practice in different areas of institutional operations, including engagement with the community, stakeholders and companies. It can be read sequentially or with a focus on the sections readers find most relevant. Each part includes practical strategies, examples and case studies, along with step-by-step instructions to tailor these initiatives to specific contexts. The guide shows how to engage stakeholders, including industry, government and community partners, to enhance the impact of greening initiatives. The monitoring and evaluation section provides tools to track progress, assess effectiveness and identify areas for improvement.

This flexible guide can be customized to fit an institution's unique needs, and encourages continuous updates as greening evolves. By following its strategies, readers can learn how to foster a culture of sustainability in TVET programmes and equip learners with the skills necessary for a greener economy.

Target audience

This guide was designed with South Sudan's unique challenges and opportunities in mind, especially where they relate to environmental sustainability and green skills development within TVET. Recognizing the specific needs and conditions of South Sudan, which include limited infrastructure, emerging economic sectors and the need for resilience in conflict-affected settings, the guide contextualizes greening strategies to be feasible and impactful in this environment. Tailoring these approaches to South Sudan's social, economic and environmental landscape is essential for effective implementation, making it a relevant and actionable resource for stakeholders involved in TVET programmes. It offers TVET trainers and educators practical strategies for integrating green skills and sustainability concepts into teaching. TVET managers and administrators will find guidance on how to foster a sustainable organizational culture and align institutional practices with environmental goals.

Curriculum developers can use the guide to embed greening principles into course content, while policy-makers will find valuable information for shaping education policies related to green and sustainable development. Industry partners and employers can learn how greening aligns with workforce needs in green sectors, and community organizations and non-governmental organizations (NGOs) can use it to promote environmental awareness.

While primarily targeting educators and administrators, the guide also benefits students by highlighting the importance of sustainability in their careers. Overall, it serves as a comprehensive resource to foster collaboration and equip all stakeholders with the tools to promote sustainability in TVET.

1. Introduction

In recent years, the impacts of climate change and environmental degradation have become increasingly evident, with new temperature records set annually and more frequent destructive weather events (World Meteorological Organization, 2024). Habitat loss due to forest destruction and agricultural expansion poses significant threats to wildlife, especially insect pollinators that are crucial for our ecosystems (World Wildlife Fund, 2018). However, it is not too late to act. While the window for achieving climate-resilient development is narrowing, the choices we make now and in the near future will significantly affect the extent of change that future generations experience. Adopting green economic and social practices can help prevent further environmental harm, create new job opportunities and promote socio-economic equality through a just green transition.

Climate change results from human activities such as burning fossil fuels, deforestation, land development and greenhouse gas emissions, along with some natural causes such as volcanic activity, orbital variations, and ocean currents. Addressing climate change requires both a reduction in emissions and adaptation to its effects, with global awareness and commitment critical. The United Nations Framework Convention on Climate Change (UNFCCC) emphasizes the importance of education, training and public awareness in combating climate change. Education empowers individuals to make informed decisions and engage in climate policy discussions. In South Sudan, while the environment is a theme in the National Curriculum Framework, there is little focus on climate change. This is an important deficit since climate change education is a key component of greening TVET and education for sustainable development (ESD).

Climate change, ecological degradation and biodiversity loss threaten educational stability and the essential natural processes and ecosystems that sustain life on Earth, such as clean air, water filtration, fertile soil for agriculture, pollination of plants and climate regulation. Education is crucial in addressing these issues by promoting sustainability and equipping the younger generation with relevant skills. Greening TVET aims to integrate sustainable practices in education and the workforce, fostering green skills and contributing to the green economy. In South Sudan, high youth unemployment and the small private sector underscore the need for skilled labour in emerging industries. However, the TVET sector in South Sudan faces challenges such as political instability, economic constraint, infrastructure deficiencies and a lack of skilled trainers, which hinder the development and implementation of effective greening initiatives. Increasing the budget for general education, as per the General Education Act 2011, could support the development and maintenance of education programmes, despite these challenges.

Environmental impact of deforestation

1.1 What is the rationale for greening TVET in South Sudan?

Greening TVET is essential for South Sudan's post-conflict recovery and sustainable development. It offers a pathway to economic growth, social stability and environmental sustainability by integrating green skills into vocational education. This strategy addresses high youth unemployment, leverages emerging economic sectors, and provides constructive alternatives to violence, aligning with the Sustainable Development Goals (SDGs) to promote quality education (SDG 4), decent work (SDG 8) and climate action (SDG 13). The foundational elements underpinning the rationale for greening TVET in South Sudan include these critical needs and opportunities.

TABLE 1: Key elements and their importance and potential benefits

Topic	Description	Potential benefit
High youth unemployment	South Sudan has 50 per cent youth unemployment, worsening poverty and social instability.	Green skills can create jobs in renewable energy, agriculture and eco-friendly construction.
Emerging economic sectors	Growth sectors such as construction, hospitality and industries involved in the buying and selling of goods and services (including retail, wholesale, and distribution) are adopting sustainable practices.	Green skills enhance employability and support sustainable growth in key sectors, offering competitive advantages.
Youth demographics	70 per cent of the population is aged 16–32, requiring tailored vocational training for future opportunities.	Green TVET programmes can equip youth with skills for sustainable livelihoods, fostering economic and social stability.
Conflict and instability	Youth involvement in civil war due to lack of education, skills and opportunities.	Green vocational training offers alternatives, reducing conflict and supporting peacebuilding and sustainable development.
Sustainable Development Goals	South Sudan's commitment to SDGs through greening TVET aligns with quality education (SDG 4), decent work (SDG 8) and climate action (SDG 13).	Green TVET supports global goals by preparing a green workforce and promoting environmental sustainability.
Environmental sustainability	Climate change threatens livelihoods in South Sudan.	Green skills in energy efficiency, waste management and sustainable agriculture help mitigate climate impacts and promote sustainability.
Community and economic resilience	Communities face economic shocks and environmental changes.	Greening TVET diversifies skills, promotes sustainable activities and builds resilience against external pressures.

FIGURE 1: Economic, social and environmental contexts of greening TVET in South Sudan (Elaborated by authors)

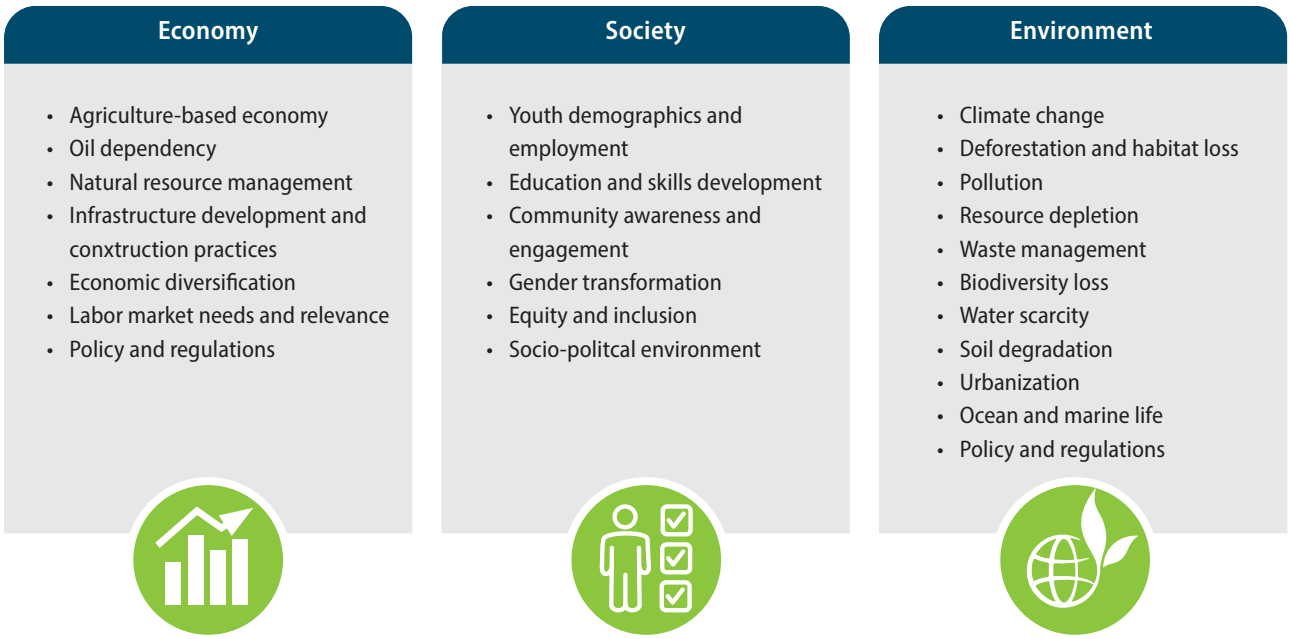


Table 1 summarizes the key elements while highlighting their importance and potential benefits.

1.2 Economic, social and environmental contexts in greening TVET in South Sudan

National governments and international agencies recognize greening TVET's potential to address youth unemployment and support a just energy transition. Despite weak systems for identifying and implementing new green competencies, integrating sustainable practices into TVET is crucial in addressing climate change, environmental degradation and socio-economic inequalities. In South Sudan, greening TVET can leverage natural resources and a youthful population to promote sustainable development and resilience. Understanding the environmental, economic and social contexts of greening TVET underscores its strategic importance for the country's growth and development.

1.2.1 Economic context in greening TVET

The economic context of greening TVET in South Sudan underscores its significant potential for driving job creation and sustainable economic growth, and attracting investment. By integrating green skills and practices into TVET programmes, South Sudan can build a resilient and environmentally friendly economy. Key economic factors relevant to this integration include:

- Agriculture-based economy: Given that agriculture is a major sector in South Sudan, greening TVET can introduce sustainable agricultural practices, enhancing productivity and resilience while preserving natural resources.
- Oil dependency: As South Sudan relies heavily on oil, transitioning to green energy alternatives and diversifying away from oil dependency through TVET can support long-term economic stability and environmental sustainability.
- Natural resource management: Effective management of natural resources is crucial. TVET programmes can provide skills for sustainable resource use and conservation, contributing to environmental protection and resource efficiency.
- Infrastructure and construction: Greening TVET can address the need for sustainable construction practices and infrastructure development, promoting eco-friendly building techniques and materials.
- Economic diversification: Integrating green skills into TVET supports economic diversification by preparing the workforce for emerging green industries, reducing reliance on traditional sectors and fostering innovation.
- Labour-market needs: TVET programmes can align with labour-market needs by equipping individuals

with skills for green jobs, enhancing employability and addressing skills gaps in the evolving jobs market.

- Policy and regulatory environment: Effective policies and regulations are essential for greening TVET. Aligning TVET programmes with national policies on sustainability and environmental protection can ensure coherence and support for green initiatives.
- Community and cultural context: Understanding and integrating local community and cultural contexts into TVET programmes is vital for the successful adoption of green practices and ensuring that they are relevant and acceptable to the local population.
- International support and collaboration: Leveraging international support and collaboration can provide resources, expertise and funding to enhance greening efforts in TVET, facilitating knowledge transfer and capacity building.

1.2.2 Social context in greening TVET

Greening TVET in South Sudan is not only an environmental and economic necessity but also a crucial social initiative. Understanding the social context is key to effectively implementing greening initiatives and ensuring their sustainable impact. The social context encompasses several important aspects:

- Youth demographics and employment: South Sudan has a young population with high unemployment rates. Greening TVET can offer pathways to green jobs and skills development, reducing youth unemployment and providing new opportunities for career growth in sustainable industries.
- Education and skills development: Access to quality education and relevant skills training is vital to successfully greening TVET. Tailoring TVET programmes to include green skills ensures that students are prepared for emerging green sectors and can contribute effectively to sustainable development.
- Community engagement and awareness: Engaging communities and raising awareness about the benefits of greening TVET are essential in gaining local support and ensuring the adoption of sustainable practices. Community involvement can drive grass-roots initiatives and enhance the relevance and effectiveness of TVET programmes.
- Gender issues: Addressing gender disparities in TVET is crucial for inclusivity. Greening initiatives should promote equal access to training and job opportunities for all genders, supporting women and marginalized groups in participating fully in green sectors and benefiting from related opportunities.
- Socio-political environment: The socio-political landscape of South Sudan, including its governance, stability and policy frameworks, affects the implementation of greening TVET. Effective greening efforts must navigate and align with the socio-political context to gain support and overcome potential challenges.
- Social equity and inclusion: Ensuring that greening TVET initiatives are socially equitable and inclusive is vital. This involves providing opportunities for disadvantaged and marginalized communities to participate in and benefit from green training programmes, fostering social cohesion and equity

1.2.3 Environmental context in greening TVET

South Sudan faces significant environmental challenges, including climate change, ecological degradation and biodiversity loss, which threaten natural resources and well-being. These issues have led to altered weather patterns, reduced agricultural productivity and increased water scarcity. Greening TVET can address these challenges by equipping individuals with green skills that promote sustainable practices, enhance resource management and foster a green economy. This approach not only aids environmental conservation but also supports community and economic resilience in South Sudan. The following key environmental challenges could be addressed by greening TVET and its transformative impact on the country's environmental landscape:

- Climate change: Greening practices can reduce greenhouse gas emissions through energy efficiency, renewable energy use and sustainable land management.
- Deforestation and habitat loss: Greening involves reforestation, afforestation and sustainable forestry practices, which can protect ecosystems and biodiversity.
- Pollution: Implementing green technologies and practices can reduce air, water and soil pollution. This includes reducing industrial emissions, promoting clean transportation and managing waste more effectively.
- Resource depletion: Greening promotes the sustainable use of resources, such as water, minerals and fossil fuels, ensuring that they are conserved for future generations.
- Waste management: Effective waste-management

practices, such as recycling, composting and reducing single-use plastics, are part of greening efforts that help minimize environmental impact.

- Biodiversity loss: Protecting and restoring natural habitats and ecosystems through greening initiatives helps preserve biodiversity and maintain ecological balance.
- Water scarcity: Greening can involve water conservation techniques, such as rainwater harvesting, efficient irrigation systems and the protection of water sources, to address water scarcity issues.
- Soil degradation: Sustainable agricultural practices, including crop rotation, organic farming and the use of natural fertilizers, can improve soil health and prevent degradation.
- Urbanization: Greening urban areas through the development of green spaces, green buildings, and sustainable transportation systems can mitigate the environmental impacts of urbanization.
- Oceans and marine life: Greening practices can address marine pollution, overfishing and the destruction of marine habitats, promoting the health of oceans and marine biodiversity.

1.3 Challenges that are hindering greening initiatives in South Sudan

- Political instability: Ongoing conflict and instability disrupt education and training programmes, shift government priorities and deter foreign investment needed for greening initiatives.
- Economic constraints: High poverty rates, limited financial resources and poor economic infrastructure restrict investment in green technologies and training programmes, while individuals and businesses struggle to afford greener alternatives.
- Infrastructure deficiencies: Inadequate transportation, energy and communication networks limit access to education and green technologies, hindering their adoption and distribution.
- Lack of skilled trainers: Inadequate training and a brain drain of skilled professionals means that South Sudan lacks qualified educators in green technologies, limiting the effectiveness of greening TVET programmes.
- Lack of awareness and cultural resistance: A lack of understanding of greening initiatives and resistance to changes in traditional practices can limit the adoption of new technologies and sustainable practices.
- Limited access to technology and resources: Green technologies and resources, such as renewable energy and sustainable materials, are scarce and expensive, with access further hindered by logistical challenges.
- Insufficient policy and regulatory frameworks: A lack of comprehensive environmental policies, regulations and enforcement mechanisms undermines the promotion of greening initiatives.
- Low educational attainment and skills levels: The general low level of education and skills limits the effectiveness of TVET programmes, limiting the pool of individuals prepared for specialized training in green technologies.
- Security concerns and safety issues: In conflict-affected regions, security concerns limit access to training centres and educational facilities, deterring participation in greening programmes.
- Climate change and environmental degradation: Existing climate-related challenges, such as extreme weather and resource scarcity, strain resources and complicate the implementation of greening initiatives.
- Lack of policy reinforcement and coherence: While environmental topics are mentioned in the national curriculum, there is a need for stronger policy coherence to integrate sustainable development and climate education into the curriculum more comprehensively.

1.4 Opportunities in the current system

Greening TVET in South Sudan offers a vital opportunity to tackle environmental challenges while promoting economic growth and social stability. As the country rebuilds from a complex history of conflict, political instability and economic challenges, and seeks pathways to sustainable development, integrating green skills into TVET can be transformative. Identifying and leveraging current opportunities and entry points is essential for successfully implementing greening TVET initiatives. The

TABLE 2: Key opportunities and how they can facilitate the greening of TVET in South Sudan

Opportunities	Facilitating green practices
1. Integration into existing educational frameworks	• Integrate sustainability and green skills into existing curricula. • Prepare students for emerging green jobs. • Start with pilot programmes and expand to all levels of TVET.
2. Collaboration with international organizations	• Leverage technical assistance, funding and expertise from organizations, such as UNESCO and UNESCO-UNEVOC. • Utilize global best practices and resources for effective implementation.
3. Partnerships with the private sector	• Engage companies in construction, hospitality and renewable energy. • Provide training opportunities, internships and job placements. • Encourage private-sector investment in green technologies and practices.
4. Government policy and support	• Enact policies promoting sustainable development and green jobs. • Provide funding for green TVET programmes. • Offer incentives for businesses to adopt sustainable practices. • Ensure green skills are part of national education and employment strategies.
5. Community involvement and local initiatives	• Engage communities through local councils, NGOs and community-based organizations. • Focus on sustainable agriculture, renewable energy and resource management. • Provide practical training opportunities and promote grass-roots adoption of green practices.
6. Leveraging technology and innovation	• Utilize online learning platforms, mobile apps and other digital tools. • Implement innovative teaching methods, such as experiential learning and project-based learning.
7. Enhancing teacher training and capacity building	• Invest in training and capacity building for TVET educators. • Equip teachers with knowledge and skills for delivering green education. • Provide access to updated teaching materials and professional development opportunities.
8. Linking TVET with national development goals	• Align greening TVET initiatives with national development goals in South Sudan. • Contribute to broader socio-economic objectives, such as economic growth, job creation and environmental sustainability. • Integrate greening TVET into the country's development strategy.

following table outlines key opportunities and how they can facilitate the greening of TVET and contribute to a sustainable future for South Sudan.

1.5 Entry points for greening skills and training in South Sudan

Identifying and leveraging entry points for greening skills and training in South Sudan is essential for advancing sustainability and fostering economic development. These entry points provide strategic avenues for integrating environmental sustainability into TVET programmes, addressing the country's unique challenges and opportunities. By focusing on different sectors, TVET can play a pivotal role in driving sustainable practice and supporting long-term resilience. This approach ensures that training programmes not only meet current needs but also contribute to a greener and more inclusive future for South Sudan. These entry points are:

Emerging economic sectors
TVET can harness the growth potential of the private sector by strengthening sustainable practices across key industries such as construction, hospitality and industries involved in the buying and selling of goods and services (including retail, wholesale and distribution). By aligning training programmes with the needs of these sectors, TVET can promote the adoption of green skills and practices that contribute to both environmental and economic sustainability.

Youth demographics
TVET can effectively leverage South Sudan's youthful population by equipping young people with skills for sustainable livelihoods. This approach addresses high unemployment rates and prepares the younger generation for careers in emerging green industries, thus supporting their economic empowerment and contributing to long-term sustainability.

Environmental sustainability
Training in green skills, such as energy efficiency, waste management and sustainable agriculture, can empower communities to adopt environmentally friendly practices. This helps ensure the sustainable use of natural resources and fosters a culture of environmental stewardship within the community.

Conflict and instability
TVET can offer alternative pathways for individuals in conflict-affected areas, reducing their involvement in conflict and supporting peacebuilding efforts. By addressing unemployment and promoting sustainable community development, TVET can contribute to stability and resilience in regions experiencing instability.

Economic, social and environmental contexts
Integrating greening principles into TVET can leverage South Sudan's natural resources and youthful population to drive sustainable development. By aligning TVET programmes with the country's economic, social and environmental contexts, South Sudan can build resilience and promote progress towards a more sustainable future.

FIGURE 2: Entry points for greening skills and training in South Sudan

Source: Authors

- **Emerging economic sectors**
  TVET can harness growth potential of the private sector and strengthen sustainable practices in the sectors construction, hospitality and trading.
- **Youth demographics**
  TVET can harness youth demographics and equip youth with skills for sustainable livelihoods.
- **Environmental sustainablility**
  Training in green skills (e.g. energy efficiency, waste management and sustainable agriculture) can help communities adopt practices and ensure sustainable resource use.
- **Conflict and instability**
  TVET can offer alternative pathways by reducing involvement in conflict, supporting peacebuliding by addressing unemployment and promoting sustainable community development.
- **Economic, social and environmental contexts**
  Greening TVET can leverage natural resources and a youhful population to promote sustainable development and resilience.

2. Policy and institutional framework

Policy enablers are essential for the successful implementation and sustainability of greening TVET programmes in South Sudan. A robust policy framework is needed to integrate green skills into TVET curricula, ensuring the workforce is prepared for emerging green sectors. Effective policy actions include policies such as the Unified National TVET Policy 2022, legislative support, inter-ministerial coordination and government commitment, which align TVET initiatives with national development goals and sustainability standards. By prioritizing funding, incentivizing green practices and fostering public–private collaboration, these policies address systemic issues such as fragmented management and outdated curricula. This section explores the key policy enablers necessary for transforming South Sudan's TVET landscape, aiming to create a resilient system that promotes sustainable development, economic growth and social inclusion, as enshrined inthe Transitional Constitution with the right to free and compulsory education as part of the country's commitment to eradicating illiteracy and promoting universal access to basic education. The key enablers for greening TVET in South Sudan are:

National TVET policy framework
A unified TVET policy is essential for integrating environmental education and sustainable development goals into all training programmes. This policy should include the formulation of a comprehensive national policy that embeds green skills and sustainability into TVET curricula, making environmental education a core component of vocational training. Additionally, sector-specific green policies should be developed for industries such as agriculture, construction, energy and manufacturing to address unique environmental challenges within each sector. Legislative support is also crucial, including the enactment of laws that mandate the inclusion of green skills in all TVET curricula and require TVET institutions to conduct regular sustainability audits and comply with green standards.

Government commitment and support
Strong political commitment is necessary to prioritize and support green TVET initiatives. This includes ensuring that TVET receives adequate funding in national budgets, with a specific focus on greening efforts and establishing a high-level inter-ministerial committee dedicated to overseeing the implementation of green policies. Effective coordination among various ministries is vital, and this should involve collaboration between the ministries of education, environment and labour to streamline green TVET initiatives and avoid duplication. Joint programmes and projects involving multiple government bodies can ensure a holistic and integrated approach to greening TVET.

Funding and investment
Securing financial resources is critical for the development and sustainability of green TVET projects. National budgets should allocate specific funds for green TVET projects, and international financial support, such as grants and loans from institutions like the World Bank or African Development Bank, should be sought to supplement national funding. Incentives for green practices can encourage investment, including tax incentives for private companies investing in green TVET programmes and subsidies for institutions adopting renewable energy solutions.

Curriculum development and quality assurance
Developing and standardizing a green curriculum is essential for aligning TVET programmes with environmental goals. This includes incorporating modules on climate change, renewable energy and sustainable agriculture into existing programmes and partnering with international organizations to ensure high-quality, globally relevant curriculum content. Establishing standards and accreditation processes assures the quality and credibility of green TVET programmes and should include the creation of green certification programmes for graduates and the setting up of accreditation bodies to ensure institutions meet green standards.

Capacity building and professional development
Investing in the professional development of TVET educators is crucial for effective green training. This should include organizing workshops and training programmes on the latest green technologies and sustainable practices, and partnering with international experts to enhance local trainers' knowledge and teaching capabilities. Upgrading the infrastructure and resources of TVET institutions, such as by installing solar panels or creating demonstration farms, and providing modern tools and equipment for teaching green skills, supports effective green training.

Public–private partnerships
Collaboration with the private sector can enhance the relevance and impact of green TVET programmes. Industry partnerships can result in internships and apprenticeships in green technologies and sustainable farming practices, linking education with industry needs. Work-based learning opportunities, such as green construction apprenticeships and industry-led training modules, provide students with practical experience and relevant skills.

Research and innovation
Encouraging innovation within TVET institutions can drive the development of new green technologies and practices. Establishing innovation hubs to support research and development and funding research projects focused on sustainable practices are essential. Facilitating knowledge exchange through conferences, seminars and online platforms ensures that best practice and innovation are widely disseminated.

Community and stakeholder engagement
Engaging communities and stakeholders helps ensure that TVET programmes are relevant and meet local needs. Involving local communities in the design and implementation of programmes and engaging NGOs and community groups can provide valuable insights and support. Awareness campaigns, including media campaigns and community events, help build support for green TVET programmes and recruit students and stakeholders.

Environmental and climate policies
Aligning TVET programmes with national environmental and climate strategies ensures that training initiatives support broader sustainability goals. Integrating TVET programmes with national climate action plans and contributing to South Sudan's Nationally Determined Contributions (NDCs) under the Paris Agreement helps achieve sustainability objectives. Supporting the SDGs, particularly SDG 4 (quality education), SDG 8 (decent work and economic growth) and SDG 13 (climate action), through TVET programmes ensures that education initiatives contribute to global sustainability targets and prepare students to tackle environmental challenges.

These policy and practice enablers can support and enable action by TVET managers and teachers on greening across different key elements and in different ways, as **Table 3** shows.

TABLE 3: National policies and practices that can support TVET managers and teachers in greening

Element	Supporting greening in TVET: National policies and practices
Institutional planning and culture	• Set clearly defined national objectives for the green transition that include a clear national vision and objectives for sustainability in TVET, linked to all other relevant national policies on the environment, industrial/sectoral development, skills, inclusion, etc. • Provide opportunities for TVET managers and board members to develop clear green visions, objectives and culture change programmes, e.g. through networking, peer learning and facilitated workshops with external experts. • Support green champions in schools through funding that gives teachers the motivation, incentive and space to develop their role in this area.
Curriculum and pedagogy	• At national level put in place methods to anticipate green skills needs in the economy that can be used by TVET institutions in their curriculum planning. • Ensure systematic incorporation of green skills into programmes and qualifications. • Adopt clear policies on how to upskill and reskill adults for the green transition and the role to be played by TVET institutions.

Element	Supporting greening in TVET: National policies and practices
	• Enable TVET institutions to make local adaptations to national programmes and offer qualifications to better meet the green skill needs of local businesses. • Adopt a generic sustainability competence framework that can be used by TVET institutions. • Ensure careers guidance provision is equipped to provide advice on green employment opportunities. • Promote and encourage learner-centred pedagogies and opportunities for the use of digital tools around green learning, including through teachers' professional development.
 Teacher and trainer professional development	• Integrate teacher and trainer professional development into national and sectoral green policies. • Ensure initial teacher education is greened and supports continuing professional development (CPD) at institution level. • Where CPD is a formal requirement for teachers to keep their licence to practice, ensure the availability of options on the green transition. • Support CPD efforts at institutional level by, for example, developing national short courses on greening for teachers and making dedicated funding available to institutions to cover the costs of CPD (e.g. to pay for teaching cover). • Ensure teacher and trainer professional development is an intrinsic part of green skills development programmes and is appropriately funded.
 Campus and learning environment	• Provide TVET institutions with space to exercise some autonomy in relation to developing or adapting the campus for the green transition. • Support institutions to implement new laws or regulations such as green building codes, e.g. by using their leverage in the financial markets to make finance available on favourable terms. • Introduce programmes to recognize and celebrate TVET institutions' progress with campus greening, e.g. through 'green awards' schemes
 Greening for the community, the workplace and lifelong learning	• Recognize the wider role of TVET institutions as an agent of change to support the green transition in their local areas. • Provide appropriate national policy and funding frameworks to support the role of TVET in working with local communities and businesses, e.g. fund and promote the role of skills development in community development projects. • Ensure national programme/qualification frameworks and policies on informal/non-formal learning enable TVET institutions to develop and implement informal learning opportunities linked to formal qualifications to support lifelong learning.
 Research, innovation and enterprise	• Recognize and support the role of TVET in research, innovation and enterprise development in relevant national policies, strategies and funding mechanisms. • Promote and support TVET to establish centres of vocational excellence and to play a role in regional development strategies, partnerships and knowledge triangles.

3. Greening as part of TVET institutional DNA

3.1 Overview of greening

Greening TVET involves embedding sustainability into systems and making it part of an institution's core identity, shaping its long-term direction and influence. This approach ensures that sustainability becomes a fundamental part of the prevailing education and training system, and is central to the institution's culture, curriculum and operations, preparing learners for the green economy while fostering environmentally responsible practices across all levels.

Greening TVET can be implemented through the adoption of a multi-pronged approach, involving both government and institutions, that promotes greening objectives and goals, and sets the priorities at the system and institutional levels.

Greening TVET goes beyond simply teaching sustainable practices; it requires an institutional transformation that integrates sustainability into every facet of education, operations and community engagement. To achieve this, six key elements constitute a comprehensive framework for guiding TVET institutions towards becoming leaders in sustainability. These elements provide a roadmap

BOX 1: Multi-pronged approach

Whole-of-government approach

While managers, teachers and trainers play the central role within their institutions in advancing the green transition in TVET, they operate within a framework of government regulations, policies, plans and funding. It is important that these frameworks enable – rather than restrict – TVET institutional greening so that the actions described in this guide can take place. For example, governments should ensure that:

- skills development and the role of TVET are clearly articulated in policies and funding related to the green transition;
- national qualifications are tuned to sectoral green skills needs;
- teachers receive appropriate professional development opportunities to green their own competencies;
- at regional and local levels, TVET is integrated into innovation and enterprise development actions.

Whole-institutional approach

When a whole-institution approach is used, 'learners and the institutional community become meaningfully engaged in sustainable development. Through democratic participation, institutions become living laboratories for participation and active citizenship, equity and gender equality, health, connections with nature and respect for the environment, energy efficiency and sustainable consumption, and where learning is experiential, action-oriented, localized and culturally specific, allowing learners to learn what they live and live what they learn.' (UNESCO, 2021, p. 63)

Some lessons learned

Although the overall goal should be that greening ultimately takes place across the whole institution, this can feel like an overwhelming proposition. Below are a few lessons from TVET practitioners that can help institutions move forwards:

- Greening is not a 'destination', or a one-time 'makeover'. It is an **evolving process**.
- There is merit in starting with **small steps**. People need to buy into new developments and that means showing the real benefits of greening.
- Obtain **top-level commitment** from TVET leaders and managers and the board of management. Their interest can 'be catalysed by adopting an institutional charter or vision for greening.
- **Seek out partners**, those people who already have an interest and would be keen to take things forward. Forming a working group can be a key step in securing this wider engagement.

Source: Adapted from UNESCO-UNEVOC and Cedefop. Forthcoming. Greening TVET for a greener future. UNEVOC-Cedefop practical guide (Volume 1)

for embedding environmental consciousness into the institutional DNA, ensuring that sustainability is reflected in policies, teaching, infrastructure and partnerships.

The six elements of greening TVET (**Figure 3**) are interrelated, working together to create a holistic approach to sustainability. They comprise institutional planning and culture; curriculum and pedagogy; professional development for teachers and trainers; campus and learning environment; community and workplace engagement; and research, innovation and enterprise. Each of these elements plays a vital role in fostering a sustainable future, equipping learners with the skills needed for the green economy while making TVET institutions role models in environmental stewardship.

FIGURE 3: Links between the six elements of greening TVET

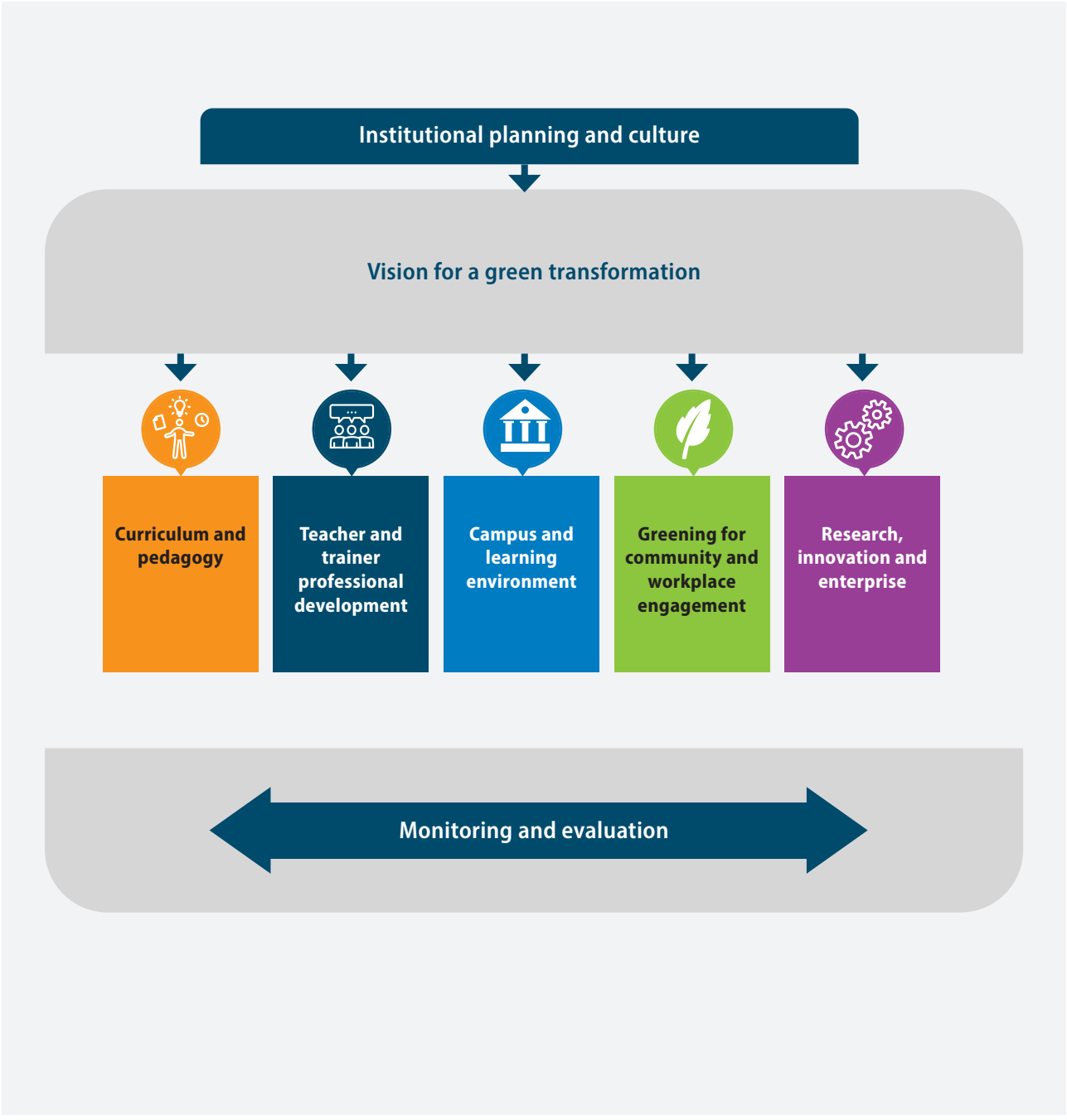


Table 4 provides an overview of the six elements of greening TVET and the key areas of action.

TABLE 4: Overview of the six elements of greening TVET and institutional approaches

Element	Key actions
Institutional planning and culture	• Develop an institution-wide sustainability policy that includes measurable goals and outcomes (for learners, teachers, the community and the employment sector). • Foster a culture of sustainability across the institution. • Align institutional strategies with national greening initiatives.
 Curriculum and pedagogy	• Embed sustainability topics across all programmes. • Encourage problem-solving approaches to environmental challenges. • Use project-based learning to enhance practical green skills.
 Teacher and trainer professional development	• Organize regular training workshops on green technologies and practices. • Incorporate sustainability into teacher certification and development programmes. • Foster peer-to-peer learning and sharing of best practice.
 Campus and learning environment	• Install renewable energy systems and energy-efficient technologies. • Implement waste reduction and recycling programmes. • Create green spaces for practical learning and environmental stewardship.
 Greening for community and workplace engagement	• Develop partnerships with local businesses for green internships and projects. • Engage with community initiatives on environmental issues. • Offer continuous learning opportunities in green skills for alumni and community members.
 Research, innovation and enterprise	• Establish research programmes focused on green technologies and solutions. • Support student entrepreneurship in the green economy. • Partner with industry to drive green innovation.

3.2 Setting goals for managers and teachers to initiate planning of greening TVET

Greening TVET involves embedding environmental sustainability into technical and vocational education programmes to ensure alignment with global sustainability goals such as SDG 4 (quality education), SDG 8 (decent work and economic growth) and SDG 13 (climate action). SDG 5 (on gender equality) is also pivotal, particularly in empowering women through green education and creating opportunities for them in the green economy.

Establishing clear goals for managers and teachers is crucial in guiding planning and implementation for greening TVET. These goals should be structured to align with the six elements of greening TVET. Setting such objectives can support a systematic approach to integrating sustainability, ensuring that every level of the institution is involved in creating environmentally responsible practices.

Key areas for goal-setting include:

- Institutional goals: Ensuring policies are created and implemented to embed sustainability into the organizational culture, creating a roadmap for green transition in the institution.
- Educational goals: Developing curricula that prioritize green skills and sustainable practices, preparing students for green jobs.
- Operational goals: Implementing sustainable practices within the campus environment, such as reducing energy consumption, waste management and promoting biodiversity.

Table 5 outlines the specific goals associated with each of the six key elements, providing a detailed blueprint for implementing and achieving a greener and more sustainable educational environment.

TABLE 5: Goals for managers and teachers for each element

Element	Goals for managers and teachers
Institutional planning and culture	• Ensure senior level buy-in and ownership of the greening process. • Develop and adopt a green vision and overall institutional priorities based on clear sustainability principles. • Ensure values and ethics consistent with sustainable development are integral to the institutional culture. • Ensure the institution's culture around greening is aligned with plans and strategies. • Apply green skills and principles in day-to-day life and decision-making, including interactions with institutional stakeholders. • Enable teachers to be key agents of green cultural changes.
Curriculum and pedagogy	• Identify and integrate into all curricula the broader green competencies and basic green skills required by all learners. • Consult employers on their green skills needs and identify ways to reflect these in curricula while respecting national qualification/ programme requirements. • Reach out to local communities to identify expertise that can provide new materials for greening the curriculum. • Enhance teaching, learning and assessment practices to equip learners with a sense of agency regarding the green transition through more learner-centred pedagogies. • Consider how digital learning technologies can be harnessed to support greener curricula and pedagogies.

Element	Goals for managers and teachers
 Teacher and trainer professional development	• Integrate green induction processes and CPD into institutional planning. • Provide teachers and trainers with a basic, common understanding of why greening is important in TVET and how it supports wider environmental, social and economic goals. • Demonstrate how greener curricula and pedagogy can help to make improvements in TVET generally and enhance its attractiveness as a pathway for learners. • Enable teachers and trainers to access opportunities for CPD related to greening on a regular basis. • Provide opportunities for the sharing of good practice in curricula and pedagogy within and between TVET institutions, e.g. through networks.
 Campus and learning environment	• Develop the campus to reduce its environmental impact and to support green learning goals. • Take stock of existing campus facilities and, on this basis, formulate and implement a plan to reduce and better manage the institution's environmental impact, and to make it a better and more inclusive place to learn and work. • Examine wider activities such as procurement, food and transportation to see how they might be greened. • Engage all non-teaching staff in greening through training and development to ensure institution-wide participation. • Link the physical campus to learning goals, using it as a resource to support greener curricula and pedagogy.
 Greening for community and workplace engagement	• Work with local communities and businesses to reduce negative environmental impacts while giving learners opportunities to acquire green skills. • Use the green agenda to enhance opportunities for learning in informal contexts, recognizing existing skills and upskilling the local workforce, linking informally acquired skills into formal learning pathways. • Work with businesses not only on an individual basis but also by developing broader partnerships with clear goals and measurable outcomes. • Ensure ownership of these developments among TVET staff by ensuring they are integrated into institutional visions and plans and by setting up working groups and other structures/processes to link with local enterprises and communities.
 Research, innovation and enterprise	• Build a research element into greening activities to generate lessons that can be fed back into the curriculum and wider aspects of greening in the institution. • Become part of wider greening activities through partnerships with other stakeholders that are linked to wider economic and social goals, e.g. through centres of vocational excellence. • Be part of regional development strategies and 'knowledge triangles' focused on innovation and enterprise development for the green transition, linking learners' skills development and TVET applied research activities to new product/service creation.

3.3 Implementation of greening TVET in the institutional setting

Institutions are invited to consider their priority actions in alignment with the six key elements of greening TVET. This helps ensure a holistic approach that engages everyone in the institutional environment and supports a whole-institutional process of greening. It can improve and enrich the 'DNA' of the institution, helping develop the appropriate environmental consciousness, while, at the same time, developing the skills and competences necessary for staff and learners to thrive in a green society and economy.

3.4 Key element 1: Institutional planning and culture

a) Overview

In the context of greening TVET, the sustainability vision and mission are critical components that define an institution's commitment to integrating sustainability into its core planning and culture. These statements reflect the institution's dedication to fostering environmental, social and economic sustainability and act as a guiding framework for shaping institutional strategies, policies and actions to align with the SDGs. They are essential in embedding sustainability into the institution's DNA, influencing decision-making processes and operational practices.

b) Vision statement

The sustainability vision outlines the institution's long-term aspirations in terms of greening TVET. It serves as a forward-looking declaration that expresses the ideal future the institution aims to achieve in terms of sustainability. This vision should be both inspiring and ambitious, while also being aligned with global sustainability priorities such as the SDGs, ensuring that the institution contributes meaningfully to broader sustainability efforts. The vision plays a pivotal role in shaping institutional culture by promoting a shared commitment to sustainability.

c) Mission statement

The mission statement focuses on the institution's present actions and strategies to achieve the sustainability vision. It outlines how sustainability will be integrated into every facet of the institution, from its curriculum and operations to community and workplace engagement. The mission should be specific and actionable, providing a clear pathway for embedding sustainability into institutional planning and fostering a culture of green practices. It serves as a foundation for guiding day-to-day activities that promote environmental stewardship and social responsibility within the institution.

d) Developing the vision and mission

To align sustainability with institutional planning and culture, a comprehensive and inclusive approach is required, including the following:

- Engage stakeholders: Involve students, staff, faculty and external stakeholders in shaping the sustainability vision and mission statements to ensure that they resonate institution-wide and are embraced by all.
- Assess current initiatives: Review the institution's existing sustainability efforts, identifying strengths and areas for improvement. This assessment will provide insights that help refine the vision and mission, ensuring they are grounded in the institution's context.
- Define core values: Establish core sustainability values, such as environmental protection, social inclusion and economic resilience, which will drive the institution's planning and operational culture.
- Draft and refine: Develop draft statements for the sustainability vision and mission, iterating based on feedback from stakeholders to ensure clarity, alignment and shared ownership of the goals.

e) Implementation and monitoring

Once the sustainability vision and mission are established, they should be incorporated into the institution's strategic planning and become an integral part of its culture. These statements must guide policy formulation, curriculum design and institutional activities, fostering a culture of sustainability. Ongoing monitoring and evaluation will ensure that progress is tracked and that goals are achieved, with the flexibility to adapt to emerging sustainability challenges and opportunities.

f) Goals, objectives and action plans

The institutional sustainability plan should start with broad goals that embody the institution's commitment to greening. These goals must reflect a comprehensive approach to sustainability, encompassing operations, pedagogy and community engagement. They should be further broken down into specific, measurable objectives, providing clear outcomes to work towards.

BOX 2: Examples of activity to consider during institutional planning for greening

Student admissions: e.g. to what extent do learners already have green skills and how should these skills be reflected in curricula?

Curriculum and pedagogy: e.g. to what extent do curriculum and teaching, learning and assessment currently equip learners for green jobs?

Teachers and trainers: e.g. how can we recruit more teaching staff with greener mind-sets?

Career guidance: e.g. are career guidance services equipped with the right information and knowledge to support learners in accessing green jobs?

Overall campus management and procurement procedures (as described in other sections)e.g. what is the carbon footprint of our building stock?

Other central functions such as quality assurance (QA), monitoring and evaluation and human resources (HR): e.g. how can the green transition be reflected in performance appraisals.

Community and business engagement: e.g. how can we work more closely with the local community and businesses to jointly take forward more sustainable activities?

Research, innovation and enterprise: e.g. how can we support wider regional development agendas concerning the circular economy?

Action plans should detail how the institution will implement these objectives, embedding sustainability within its institutional culture and day-to-day practices. This process fosters a holistic integration of greening into every aspect of the institution's planning and culture.

Sample action plan

Purpose and objectives	Situation analysis (Current state assessment)	Area of focus	Action, steps and activities	Timeframe	Responsible person/ team	Resources and budget	Success indicators

Value-chain analysis as a tool to inform planning

The United Nations Environment Programme (UNEP) defines a green economy as one that enhances human well-being and social equity while reducing environmental risks and resource scarcities. It contrasts with a brown economy, which continues current, less sustainable practices. To transition from a brown to a green economy, public policies and businesses must focus on creating value chains that minimize negative environmental and social impacts. Educators can support this shift by using value-chain analysis to prepare TVET institutions to tackle socio-ecological and socio-economic challenges. This approach helps identify

and develop the skills needed throughout the value chain, ensuring that TVET graduates are equipped to address environmental issues in their various roles and can adapt to the changing world of work.

Institutional planning acts as a guiding force that aligns all other greening elements. It ensures that sustainability is not only part of the institution's strategy but is systematically integrated across curriculum development, professional development, campus operations, community engagement and research initiatives. Without thoughtful planning, these elements would remain disjointed, but with it, they function as an interconnected system, driving the institution's sustainability agenda forward.

3.5 Key element 2: Curriculum and pedagogy

Curriculum and pedagogy are essential for shaping the educational experience in TVET institutions, especially regarding sustainability. As demand for skilled professionals in the green economy grows, TVET programmes must integrate sustainability principles into their curricula and teaching methods. This includes incorporating green skills and adopting innovative pedagogical approaches that promote active learning and critical thinking. The curriculum should align with industry need and environmental challenges, ensuring students gain relevant skills for a sustainable future. Effective pedagogy also engages students and fosters collaborative learning environments to explore real-world sustainability issues. The following section will discuss the key elements of curriculum and pedagogy in greening TVET.

3.5.1 Skills for the green transition: What to teach

'Skills for the green transition' (also known as 'green skills') include not only skills and competencies but also knowledge, abilities, values and attitudes needed to live, work and act in resource-efficient and sustainable economies and societies. They can be divided into:

- **Technical skills:** The skills required to adapt or implement standards, processes, services, products and technologies to protect ecosystems and biodiversity and to reduce energy, materials and water consumption. Technical skills can be occupation-specific or cross-sectoral.
- **Transversal:** Linked to sustainable thinking and acting, relevant to work (in all economic sectors and occupations) and life. Alternatively referred to as 'sustainability competencies', 'life skills', 'soft skills', or 'core skills' (based on the definitions agreed by the Inter-Agency Group for TVET Working Group on Work-based Learning, Work-based learning and the green transition, IAG-TVET Working Group on Work-based Learning: Cedefop, European Commission, ETF, ILO, OECD, UNESCO (2022).

Transversal skills are essential across all industries and occupations as they enhance the values and abilities needed to improve current and future conditions. Among these, generic green skills related to environmental issues and technological processes serve as a foundation for further green skills development. These skills are crucial for supporting the green transition, as environmental challenges are central to restructuring efforts. When developing green skills strategies, it is important to consider the hierarchy of skills, starting with a green mindset and generic skills. This approach ensures a solid foundation for occupation-specific green skills, influencing the design of new training and curricula, where teachers must integrate these generic skills early in their courses.

3.5.2 Addressing transversal skills for the green transition

When deciding which transversal green skills to prioritize, it is crucial to remember that giving students an in-depth understanding of a limited number of ideas is preferable to giving them generic knowledge of a wider range of concepts when it comes to ensuring meaningful, deep and transformative learning (Åhlberg, 2003). Thus, when developing new curricula, it is crucial to select those specific green concepts related to the environmental, eco-economic and social-environmental dimensions most relevant to the work students are likely to engage in, once they have finished their course. The following table gives some examples of green jobs and skills in different occupation sectors.

TABLE 6: Occupation sector and example of jobs and skills impacted by greening

Occupation sector	Green jobs and skills
Agriculture and forestry	• Agro-ecological farmer • Agroforestry • Organic farmer • Water quality technician • Agricultural engineer
Construction	• Green design architect • Landscape architect • Building inspector • Living roof and wall gardener • Alloy and metal worker • Entrepreneur • Energy efficiency builder
Energy	• Renewable energy installer • Energy auditor/broker/trader • Smart grid operator • Solar engineer • Landfill gas collector
Transportation	• Green automotive technician • Transportation planner • Clean car engineer/mechanic • Logistics analyst • Fuel cell engineer
Environmental protection	• Forester • Sustainability educator • Travel coordinator

Source: UNEP cited in TESDA Labour Market Intelligence Report (2023)

3.6 Key element 3: Teacher and trainer professional development

The role of teachers and trainers in shaping future generations is pivotal, especially as the demands of the modern world shift towards sustainability and green economies. To meet these evolving needs, professional development for educators is crucial. Continuous training equips them with the necessary skills and knowledge to deliver high-quality education that integrates sustainability, technological advancements and industry trends. Investing in professional development not only enhances educators' capacity but also ensures that students are prepared for the challenges of the twenty-first century workforce, particularly in promoting environmental responsibility and innovation.

3.6.1 Skills for the green transition: What do teachers need to know?

- **Greening curricula and pedagogy in TVET depends on the capacity of educators.**
  The effectiveness with which sustainability is integrated into TVET programmes depends on the skills and knowledge of teachers. Educators need to be capable of delivering training that addresses environmental, social and economic sustainability.

BOX 3: Training courses in TVET institutions

TVET institutions such as the **Kenya Technical Trainers College** and the **National Industrial Training Authority** have introduced courses on solar energy technologies, biogas systems installation and sustainable agriculture. These subjects include practical training, enabling students to understand green technologies and how they apply to real-life industries such as energy and agriculture.

Curricula on energy-efficient construction techniques are taught, focusing on sustainable building materials (e.g. using locally sourced materials with a low carbon footprint).

Source: Kenya Ministry of Education website

- **Highest sustainability maturity level (SML) may be reached if attitudes among teaching staff and programme administrators are prioritized.**
  Achieving the highest sustainability maturity in institutions requires a shift in attitudes towards sustainability among both teachers and administrators, fostering a culture that prioritizes green practices.

- **Educators – as change agents – are at the centre of renewing curriculum and making it more sustainability-oriented.**
  Teachers play a pivotal role in updating curricula to reflect sustainability. As change agents, they work to integrate environmental concepts and practices into education to prepare students for the green economy.

- **Educators must ensure that instructors specializing in sustainability are available to develop the sustainability competencies of their students.**
  It is important to have qualified instructors specializing in sustainability to help students develop essential green skills, ensuring they are well-prepared for roles in the sustainable workforce.

- **The green capacity of trainers and educators can be enhanced through teacher training and professional development programmes.**
  Continuous training and professional development are necessary for educators to stay up to date with sustainability trends and technologies, helping them improve their green teaching capacity.

- **Teachers need to develop broad sustainability competencies and be equipped with technical competencies.**
  Educators should possess both broad sustainability knowledge and specific technical skills related to green practices, enabling them to provide comprehensive training that equips students for a green economy.

Other than basic green skills, teachers need to develop broad sustainability competencies and be equipped with the technical competencies of their profession in order to design and implement more learner-centred pedagogies appropriate to the green transition. **Table 7** shows what competencies for greening should be incorporated into teachers' professional knowledge, practice and engagement.

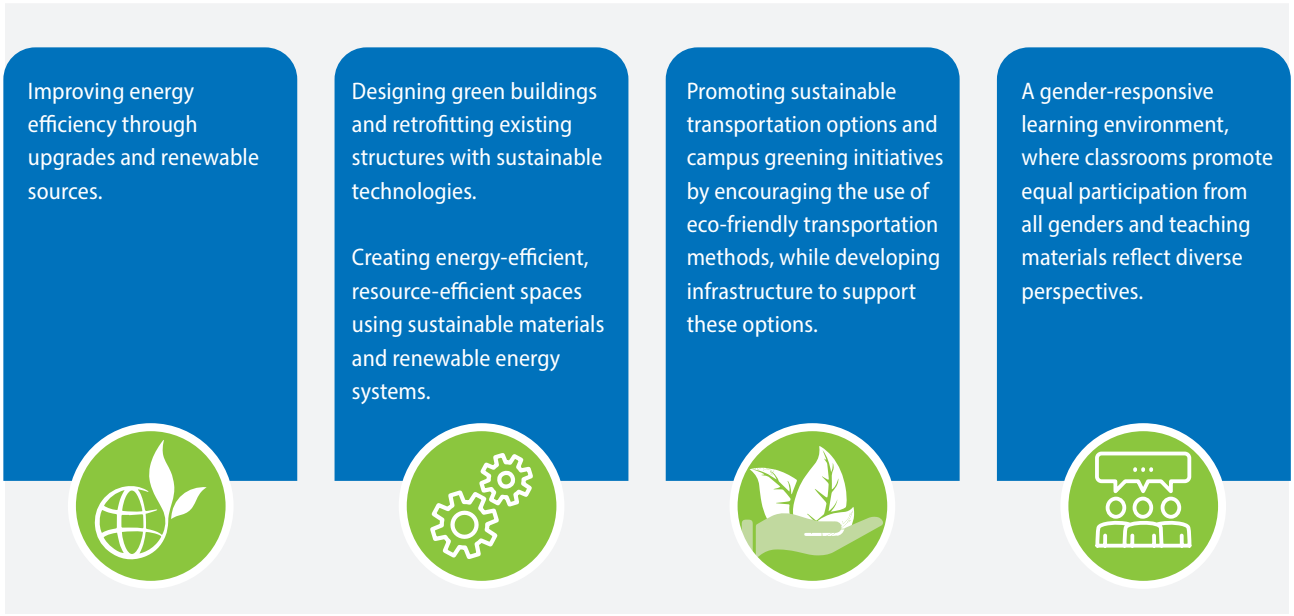
TABLE 7: Teachers' standards specific for greening curricula

Standard	Focus area	Proficiency
Professional knowledge	Content and teaching strategies	• Demonstrate knowledge and understanding of the sustainable development concepts that form the basis for greening curricula.
		• Demonstrate understanding of generic green skills and their role in greening curricula and in the development of students' green mindset and generic competencies in the context of greening.
		• Demonstrate knowledge and understanding of student-centred strategies that can support active students' engagement into learning about greening.
	Content selection and organization	• Organize concepts into themes or modules to be taught across different subjects or as a separate subject.
		• Organize content in a logical sequence to achieve effective learning and teaching.
	Curriculum assessment and reporting	• Design and implement teaching related to greening effectively; use assessment as a tool for learning and a way to provide feedback to students.
		• Implement assessment that is aimed at evaluating students' thinking capacity, their ability to find innovative solutions to problems, to explore, debate, etc.
Professional practice	Establish challenging learning goals	• Set clear learning goals (challenging but achievable) for all students for each learning activity that explore sustainable development concepts, industry-based case-studies, etc.
	Plan, structure and sequence learning programmes	• Plan each activity within or across several lessons, at a workplace or extra-curricular, in a coherent and structured way to engage students effectively.
	Use teaching strategies	• Choose and apply a variety of teaching strategies, use effectively student-centred approaches to engage students in critical thinking, problem-solving and innovation within the context of greening.
Professional engagement	Develop, select and use resources	• Select and design resources that are appropriate to your institutional context and industry greening practices in your region/country.
	Identify and plan professional learning needs	• Demonstrate an understanding of the areas in relation to sustainable development concepts that they need to address in their professional development.
	Engage in professional learning and improve practice	• Understand and identify sources for professional learning in relation to greening curricula.
	Engage with professional teaching networks and the broader community	• Understand the importance of external professional networks and actively participate in networks and forums to broaden knowledge in relation to greening curricula and improve practice.

3.7
Key element 4: Campus and learning environment

TVET institutions can create sustainable, inclusive and gender-responsive campuses by designing campus infrastructure that supports environmental sustainability, such as energy-efficient buildings and green spaces, while also being inclusive through facilities such as gender-neutral restrooms and accessible pathways. This can be achieved through:

FIGURE 4: Key aspects of creating a campus and learning environment



Fundacion Paraguay

- Fundación Paraguaya established the Self-Sufficient School model, providing low-income youth with opportunities to 'learn by doing, while earning and saving'.
- Under this model, the schools offer the officially-recognized secondary school curriculum as well as training in practical skills such as growing vegetables, raising livestock and crafting furniture.
- The Self-Sufficient Schools go beyond the type of training provided by conventional vocational training programmes, by providing real-life marketplace contexts enable students to come into contact with real customers.

3.8 Key element 5: Greening community and workplace engagement

Greening initiatives in TVET extend beyond the confines of the institution, positively impacting the community and workplace and promoting lifelong learning. Greening communities and workplaces requires the development of local skills and resources to support sustainable markets and enterprises. TVET institutions can play a crucial role in this process. Most people worldwide work in informal sectors, which often lack skills development and contribute to environmental problems due to their unregulated nature. By engaging in greening activities, TVET institutions can benefit both communities and businesses, as informal work is integral to the social fabric and often involves activities such as waste collection and recycling. Greening TVET can address poor skills development and improve the local environment by utilizing sustainable Indigenous practices and promoting a just and inclusive transition. Even in areas where informal economic activity is less prominent, TVET institutions should leverage their influence to help local businesses and communities tackle environmental challenges. Through fostering sustainability in these areas, TVET institutions contribute to broader environmental goals and prepare students for a sustainable future in the following ways:

- **Local community engagement**
  TVET institutions and workplaces can engage with local communities by organizing sustainability-focused activities such as workshops and real-world projects, promoting environmental stewardship while providing students with practical experience.

- **Partnership**
  Building partnerships with industries, NGOs and government bodies enables students to participate in sustainability-focused internships and projects, while also sharing resources and expertise to enhance green education and create lifelong learning opportunities.

- **Sustainability**
  Sustainability is integrated into curricula by teaching green concepts across all sectors. Lifelong learning opportunities, such as professional courses, ensure that students and professionals continue to develop green skills throughout their careers.

BOX 4: Example of an initiative aimed at greening the community

Tackling community water security needs through TVET

The Seychelles Institute of Technology (SIT) has adapted its teaching and learning to address water security challenges, partnering with government institutions, NGOs and businesses. Through the Water Warriors programme, SIT's plumbing students perform tasks such as fixing leaky pipes, building rainwater harvesting tanks, and constructing gabion barrage dams for agricultural water storage during droughts. Collaborating with Sustainability for Seychelles, SIT also launched an in-house initiative, Greening the SIT Campus. These efforts aim to upgrade occupational trades with innovative skills that align with national development goals and address community needs while also greening the campus.

To learn more about this practice, read:
https://unevoc.unesco.org/pub/ihub-sit.pdf

3.9 Key element 6: Research, innovation and enterprise

Research, innovation and enterprise are essential for promoting sustainability within TVET institutions. By fostering a culture of inquiry and creativity, TVET can develop new environmental solutions and contribute to economic growth. Research is critical for institutional greening, though capabilities vary among institutions. Even small-scale projects, installing solar panels, for example, can provide valuable insights and engage the entire institutional community in co-creating knowledge. This supports learner-centred, inquiry-based teaching while advancing greening efforts. TVET also plays a key role in the green transition by developing entrepreneurial skills, creating green business incubators and promoting circular businesses that recover or recycle resources. This can be achieved through the following steps:

- Encourage research initiatives that focus on sustainability and green technologies to advance knowledge and solutions in these fields.
- Support research by providing funding, resources and access to facilities for projects that explore sustainable practices, renewable energy and environmental conservation.
- Foster innovation and entrepreneurship to develop new solutions and technologies that address sustainability challenges.
- Create supportive environments for students and researchers to develop and test green technologies and sustainable business ideas (incubators, innovation labs, mentorship programmes and networking opportunities).
- Celebrate and promote successful innovations and start-ups to inspire further entrepreneurial activity in the field.
- Build strong partnerships with industry leaders and research institutions to enhance efforts to drive green innovation.
- Undertake collaborative projects with these entities to provide valuable insights, technical expertise and practical applications for sustainability research.

BOX 5: Example of greening research

- The **Kenya Climate Innovation Center (KCIC)** collaborates with TVET institutions such as **Kabete National Polytechnic** to research and develop **renewable energy solutions**. Students engage in research projects focusing on **climate-smart technologies** such as small-scale **biogas plants** and **solar-powered irrigation systems**.
- Through **public–private partnerships**, TVET institutions in Kenya are working on projects related to **sustainable farming techniques**, including **drought-resistant crops** and **green building technologies t**hat reduce environmental degradation.
- The **Technical University of Mombasa** is involved in research focusing on **sustainable tourism** and the impact of climate change on coastal ecosystems. Their findings are applied to developing green tourism strategies, fostering eco-tourism in the region.

Sources: KCIC and World Bank reports on Kenya's innovation in climate-smart technologies

FIGURE 5: Approach for Greening TVET institutions

Curriculum and pedagogy

Curriculum and pedagogy are essential for shaping the educational experience in TVET institutions, especially regarding sustainability. As demand for skilled professionals in the green economy grows, TVET programmes must integrate sustainability principles into their curricula and teaching methods. This includes incorporating green skills and adopting innovative pedagogical approaches that promote active learning and critical thinking. The curriculum should align with industry needs and environmental challenges, ensuring students gain relevant skills for a sustainable future. Effective pedagogy also engages students and fosters collaborative learning environments to explore real-world sustainability issues.

Can be effectively enforced if enabled by policies that support:

- Identification of skills needs for the green transition
- Flexible integration of green skills and competencies
- Industry-relevant curricula
- Provision for practical training
- Adaptable pedagogy
- Curriculum alignment with global trends and local climate policies

Teacher and trainer professional development

Professional development for teachers and trainers is critical in the effort to integrate sustainability into TVET institutions. As educators play a vital role in shaping the next generation of skilled professionals, continuous training ensures they possess the knowledge and competencies needed to deliver a curriculum focused on green practices effectively. By investing in their development, institutions not only enhance educational outcomes but also promote a culture of sustainability within the learning environment.

Can be effectively enforced if enabled by policies that support:

- Teacher competency gap assessments
- Teacher standards and continuous training and professional development
- Tailored professional development programmes (hands-on, experiential, etc.)
- Collaboration and peer-networking opportunities
- Evaluation and feedback mechanisms
- Up-to-date training and facilitation materials

Institutional planning and culture

Sustainability in TVET institutions requires a comprehensive approach that integrates sustainability into core operations and culture, driven by two key elements: institutional planning and culture. Effective institutional planning involves creating a strategic framework for curriculum development, resource allocation, stakeholder engagement and monitoring sustainability efforts. Concurrently, fostering a supportive institutional culture is crucial, supported by leadership commitment, education, community building, daily green practices and recognition. By embedding these principles, TVET institutions can instil sustainability as a fundamental aspect of their identity and operations.

Can be effectively enforced if enabled by policies that support:

- Strategic frameworks and vision
- Resource allocation
- Stakeholder engagement
- Leadership autonomy and commitment
- Curriculum planning and development

Research, innovation and enterprise

Research, innovation and enterprise are integral to advancing sustainability within TVET institutions. When a culture of inquiry and creativity is nurtured, TVET can drive the development of new solutions and practices that promote environmental stewardship and economic growth. Research is a vital tool for institutional greening in TVET institutions, though their experience and capacity for research vary. While some institutions, especially at post-secondary and tertiary levels, have intrinsic research capabilities, others may find the idea of conducting research daunting. However, small-scale projects can offer valuable insights into greening and provide opportunities for teachers, trainers and learners to co-create knowledge. For instance, installing solar panels can be a research project involving the entire institutionalcommunity and businesses, exploring concepts and practical solutions for managing greening efforts.

Can be effectively enforced if enabled by policies that support:

- Local research projects and initiatives
- Green curriculum innovation
- Green enterprise development
- Funding and grants for sustainable project creation
- Evaluation and impact assessment

Greening the community and workplace engagement

Greening initiatives in TVET extend beyond the confines of the institution, positively impacting the community and workplace and promoting lifelong learning. Greening communities and workplaces requires the development of local skills and resources to support sustainable markets and enterprises. TVET institutions can play a crucial role in this process. Most people worldwide work in informal sectors, which often lack skills development

and contribute to environmental problems due to their unregulated nature. By engaging in greening activities, TVET institutions can benefit both communities and businesses, as informal work is integral to the social fabric and often involves activities such as waste collection and recycling. Greening TVET can address poor skills development and improve the local environment by utilizing sustainable Indigenous practices, promoting a just and inclusive transition. Even in areas where informal economic activity is less prominent, TVET institutions should leverage their influence to help local businesses and communities tackle environmental challenges. Through fostering sustainability in these areas, TVET institutions contribute to broader environmental goals and prepare students for a sustainable future.

Can be effectively enforced if enabled by policies that support:

- Community engagement
- School-based livelihood creation
- Work-based training integration
- Partnerships and own initiatives for the creation of lifelong learning opportunities
- Stakeholder collaboration
- Promotion of school sustainable practices to community and external partners

Campus and learning environment

The term 'campus' encompasses a wide range of physical elements that can be greened, including buildings, landscaping, maintenance procedures and campus services. The primary objectives are often to reduce costs associated with resource consumption, such as energy, water and waste, and to minimize the institution's greenhouse gas footprint. The savings generated from these initiatives can then fund the overall greening plan of the institution (UNESCO-UNEVOC, 2017). The campus and learning environment play a crucial role in supporting the implementation of sustainability initiatives within TVET institutions.

A well-designed learning environment not only facilitates effective teaching and learning but also serves as a living laboratory of ideas, skills and innovation for sustainable development. Greening the campus can also improve the environment for staff, making them more attractive places in which to work and can also deliver benefits in terms of reductions in operational running costs. Translating greener mindsets/ attitudes into greener behaviours is not necessarily an automatic or straightforward process (Wyss, et al. 2022) and a greener campus can help in this process. The campus provides a location in which learners and staff can put the 'theory' of greening into practice.

Can be effectively enforced if enabled by policies that support:

- Green-conscious campus operations and sustainable practices
- Sustainable infrastructure
- Green learning spaces
- Green local technology integration in campus operations
- Community engagement
- Curriculum integration
- Institutional community awareness building

3.10 Integrating gender-based approach in the greening process

Gender mainstreaming involves integrating gender perspectives into all aspects of planning, implementation and evaluation to ensure equality and address the specific needs of all genders. Gender mainstreaming across the six key elements of greening TVET involves embedding gender equity in institutional policies, curricula and professional development, ensuring equal access to resources and opportunities for all genders. It emphasizes the creation of inclusive and diverse learning environments, from gender-sensitive curricula that reflect diverse contributions to sustainability, to teacher training that promotes gender inclusivity and addresses biases. The approach also extends to campus design, making facilities accessible for all gender identities and ensuring community and workplace sustainability efforts are inclusive. Additionally, research and innovation should be encouraged to be gender-inclusive, promoting equal participation in green entrepreneurship and addressing gender-specific environmental challenges.

Table 8 explores how gender mainstreaming can be integrated into the six key elements of greening TVET. By adopting a gender lens, institutions can ensure that their sustainability efforts are inclusive, equitable and responsive to the needs of all genders. Each element plays a crucial role in promoting gender equity. The table highlights practical strategies for fostering inclusivity and diversity in greening TVET initiatives.

TABLE 8: Gender mainstreaming strategies in the six key elements of greening TVET

Element	Gender mainstreaming lens
Institutional planning and culture	• Integrating gender considerations into institutional policies and plans • Promoting an inclusive institutional culture • Ensuring gender-balanced representation in leadership and decision-making • Monitoring and evaluating gender equality in institutional planning and culture
Curriculum and pedagogy	• Developing gender-responsive curriculum content • Ensuring equitable access to green skills training • Applying gender-responsive teaching methods • Promoting gender equality in learning outcomes • Integrating gender into lifelong learning and professional development
Teacher and trainer professional development	• Incorporating gender sensitivity in professional development programmes • Promoting equal access to professional development opportunities and offering flexible training options, ensuring diverse participation in greening TVET • Encouraging female leadership in green sectors • Developing gender-responsive teaching skills • Monitoring and evaluating gender impact in professional development • Creating gender-responsive mentorship and support networks • Encouraging collaboration and knowledge sharing • Addressing gender bias in evaluation and promotion • Building institutional capacity for gender mainstreaming • Advocating for policy support

Element	Gender mainstreaming lens
Campus and learning environment 	• Designing inclusive campus infrastructure • Promoting a gender-responsive learning environment • Encouraging equal access to resources and opportunities • Addressing gender-based violence and harassment • Integrating gender in sustainability initiatives • Monitoring and evaluation with a gender lens
Greening for community and workplace engagement 	• Inclusive community engagement • Gender equality in the workplace • Lifelong learning opportunities for all genders • Addressing gender-specific barriers • Monitoring and evaluation with a gender lens
Research, innovation and enterprise 	• Inclusive research practices • Gender-responsive innovation • Equitable enterprise development • Capacity building and empowerment • Monitoring and evaluating gender impact

4. Integration of planning, implementation, monitoring and evaluation in greening TVET

Effective greening of TVET institutions requires a comprehensive approach that seamlessly integrates planning, implementation, monitoring and evaluation across six key elements. This integration ensures that sustainability goals are met efficiently and effectively, while adapting to emerging challenges and opportunities.

Planning involves setting clear, actionable objectives that align with sustainability principles and address the needs of diverse stakeholders. Implementation focuses on translating these plans into concrete actions, ensuring that sustainability practices are incorporated into curricula, campus operations and community engagement. Monitoring and evaluation are critical for assessing progress, identifying areas for improvement and ensuring accountability. Through the integration of these processes across the six elements, TVET institutions can create a cohesive and sustainable framework. This approach not only supports the achievement of environmental goals but also fosters continuous improvement and adaptation in response to feedback and changing conditions. Table 9 shows what needs to be considered for each element to be integrated into planning, implementation, monitoring and evaluation in greening TVET.

TABLE 9: Integration of planning, implementation, monitoring and evaluation in greening TVET

Elements	Planning	Implementation	Monitoring	Evaluation
Institutional planning and culture	• Develop a sustainability vision and mission • Create a sustainability plan (goals, objectives and action plans) for greening TVET • Allocate budget and resources for sustainability initiatives	• Develop action plans • Allocate resources • Promote organizational change • Establish governance structures • Foster stakeholder engagement	• Establish key performance indicators (KPIs) for sustainability goals • Conduct regular sustainability audits and assessments • Use surveys and feedback tools to gauge the sustainability culture among staff and students • Publish annual sustainability reports	• Assess progress and impact • Review governance and accountability • Gather stakeholder feedback • Measure cultural shifts
Curriculum and pedagogy	• Embed sustainability concepts across all programmes and courses • Design and introduce specialized courses focused on green skills and sustainable practices	• Integrate sustainability into courses • Develop teaching materials • Train educators • Monitor and update content	• Assess the effectiveness of the curriculum through student performance and feedback • Track enrolment and completion rates in green courses	• Evaluate curriculum effectiveness • Monitor teaching practices • Analyse student performance • Review feedback from students

Elements	Planning	Implementation	Monitoring	Evaluation
	• Use interdisciplinary approaches to integrate sustainability into various subjects	• Promote experiential learning	• Evaluate curriculum updates and their alignment with industry standards and sustainability goals • Conduct regular curriculum reviews and updates to incorporate the latest green technologies and practices	
Teacher and trainer professional development 	• Develop and implement professional development programmes focused on green skills and sustainability education for teachers and trainers • Encourage teachers to participate in sustainability workshops, seminars and certification programmes	• Design training programmes • Encourage ongoing learning • Support peer learning • Develop certification programmes • Incorporate feedback mechanisms	• Track participation and completion rates of professional development programmes • Assess the impact of training on teaching practices and student outcomes • Use feedback from teachers and trainers to continuously improve professional development offerings	• Assess training outcomes • Review implementation of new skills • Solicit educator feedback • Track professional growth
Campus and learning environment 	• Develop a campus sustainability plan addressing energy use, waste management, water conservation, and biodiversity • Design green buildings and retrofit existing structures with sustainable technologies • Promote sustainable transportation options and campus greening initiatives	• Implement green infrastructure • Ensure accessibility • Promote sustainable practices • Implement green certifications. • Promote sustainability awareness	• Conduct regular environmental audits to track energy use, waste production, water usage and other sustainability metrics • Monitor the implementation and effectiveness of green infrastructure projects • Use real-time data monitoring systems for continuous tracking and reporting of environmental performance	• Conduct sustainability audit • Evaluate accessibility and inclusivity • Measure environmental impact • Gather feedback on campus experience

Elements	Planning	Implementation	Monitoring	Evaluation
Greening for community, and workplace engagement 	• Engage with local communities to promote sustainability and develop community-based projects • Partner with local businesses and industries to provide students with green internships and job placements • Offer lifelong learning opportunities focused on sustainability for the broader community	• Engage with community • Create partnerships • Offer lifelong learning • Develop community-based projects • Offer green career counselling	• Measure community engagement and participation in sustainability projects • Track the number and impact of industry partnerships and workplace training programmes • Assess the outcomes of lifelong learning initiatives through participant feedback and success stories	• Assess community engagement • Review lifelong learning outcomes • Measure impact on the workforce • Evaluate partnership effectiveness
Research, innovation, and enterprise 	• Promote and support research projects focused on sustainability and green technologies • Encourage innovation and entrepreneurship in the field of sustainability • Develop partnerships with industry and research institutions to drive green innovation	• Support research projects • Foster innovation • Promote circular economy • Encourage interdisciplinary research • Support start-up ventures	• Track research outputs, including publications, patents and practical applications of green technologies • Monitor the success of sustainability-focused start-ups and enterprises initiated by students and staff • Evaluate the impact of research projects on industry practices and environmental outcomes	• Evaluate research impact • Review innovation success • Analyse enterprise outcomes • Track research utilization

(Source: Authors)

Monitoring and evaluation (M&E) are critical components of effective project management, particularly in assessing the performance, outcomes and impacts of initiatives such as greening TVET. M&E indicators are essential for ensuring that sustainability objectives are met and that the process aligns with broader environmental and institutional goals. Here is how M&E indicators contribute to the greening of TVET:

- Tracking progress on sustainability goals: M&E indicators help monitor advancement towards predefined sustainability targets, ensuring that institutions are on the right path to achieving their green objectives.
- Measuring institutional change: By assessing shifts in institutional practices, culture and capacity related to sustainability, M&E ensures that greening efforts lead to meaningful and lasting changes within the TVET system.
- Informing decision-making: Data collected through M&E informs stakeholders and decision-makers about the effectiveness of ongoing greening efforts, allowing for evidence-based adjustments to strategies, plans and resources.
- Enhancing accountability: M&E indicators promote transparency by holding institutions accountable for meeting sustainability commitments. This ensures that initiatives are followed through and that progress is reported to stakeholders.
- Promoting continuous improvement: Regular monitoring and feedback through M&E enable institutions to identify challenges and areas for improvement, fostering an adaptive approach that continuously refines and strengthens greening initiatives.
- Assessing impact on the community and environment: M&E can measure how greening TVET initiatives affect the surrounding community and the environment, providing a holistic view of the outcomes and ensuring that the programme benefits all stakeholders.
- Supporting policy development: M&E data can be used to inform the creation and refinement of policies that support greening efforts, ensuring that institutional frameworks are in place to sustain long-term environmental goals.

Incorporating these M&E indicators into the greening TVET process guarantees that the initiatives are not only effective but also aligned with larger sustainability objectives, ultimately leading to more impactful and accountable outcomes. Table 10 shows some structured M&E indicators for each key element in greening TVET.

TABLE 10: Structured M&E indicators for the six elements

Greening TVET elements	Monitoring indicators	Monitoring indicators
Institutional planning and culture	• Inclusion of sustainability goals in vision and mission • Implementation of sustainability policies	• Alignment of strategies with sustainability goals • Effectiveness of leadership in implementing green practices
Curriculum and pedagogy	• Integration of green concepts in lessons • Frequency of curriculum updates for greening	• Impact on student green skills and knowledge • Application of green practices by graduates
Teacher and trainer professional development	• Participation rates in green-focused training programmes • Relevance of training to greening roles	• Improvement in staff knowledge and skills in sustainability • Application of new competencies
Campus and learning environment	• Resource consumption tracking (energy, water, waste) • Implementation of green practices on campus	• Reduction in resource use • Impact of environmental management practices on ecological footprint

Greening TVET elements	Monitoring indicators	Monitoring indicators
Community and workplace engagement	• Number of partnerships with green organizations • Student participation in community green projects	• Effectiveness of partnerships in promoting green careers • Impact of community engagement on sustainability
Research, innovation and enterprise	• Number of green research projects initiated • Engagement in green business development programmes	• Success of research in generating green solutions • Number of green enterprises supported or created

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