

# ALUMNI RESEARCH GRANTS ROUND 5

**The Readiness of Cambodia's TVET System for Green Jobs:  
Challenges, Opportunities, and Career Prospects for Young People  
in Battambang Province**



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# EXECUTIVE SUMMARY

The Royal Government of Cambodia (RGC) aims to achieve an upper-middle-income status by 2030 and a developed-country status by 2050. To support this vision, the development of human capital through Technical and Vocational Education and Training (TVET) is prioritized as a key driver of economic growth. At the same time, Cambodia faces increasing environmental challenges, making the transition to a green economy essential. The green economy offers significant employment potential in sectors such as renewable energy (RE), energy efficiency (EE), electric vehicles (EV), and sustainable agriculture (SA), all of which contribute to reducing environmental impacts and supporting sustainable development.

Despite this potential, Cambodia's TVET system struggles to prepare young people for green jobs. This study was conducted with the following objectives:

1. To examine how gender, disability, and rural youth inclusion (GEDSI) are addressed within TVET institutions in the context of integrating green skills, by identifying key barriers, institutional practices, and strategies that support inclusive participation and success.
2. To identify systemic and institutional challenges preventing the Ministry of Labour and Vocational Training (MLVT) and TVET institutions from effectively integrating green skills into training programs, and to explore strategies that strengthen institutional readiness and youth participation in the green job sector.
3. To explore opportunities within the TVET system that can enhance young people's engagement in green skills training and improve their readiness for sustainable employment in the green job sector.
4. To review existing green job policies and strategies in Cambodia and evaluate how they support the development of green skills within the TVET system.

A mixed-methods explanatory approach was adopted for the study. Quantitative data were collected from 372 TVET students and 192 teachers from three TVET institutions in Battambang Province. Qualitative data was gathered through six focus group discussions (FGDs) with teachers (3 FGDs) and students (3 FGDs), as well as key informant interviews (KIIs) with TVET leaders, Directorate General Technical and Vocational Education and Training (DGTNET) officials, and relevant stakeholders such as non-governmental organisations (NGOs) and private companies.

The findings provide important insights into how GEDSI considerations are addressed within TVET institutions in relation to green skills integration. With regard to female participation in TVET, the most significant challenge, reported by 64.01% of the respondents, was limited awareness of TVET programs among female students and their parents. This was followed by the limited availability of female-friendly training facilities (51.06%); concerns related to safety, transportation, and cultural norms favoring academic pathways for male students (39.89%); and uncertainty about job placement or apprenticeships after graduation (35.28%). To address these barriers, the participants strongly supported community-based awareness campaigns targeting girls and their parents, the promotion of successful female TVET graduates as role models, strengthened gender-sensitive career guidance, and the provision of financial support such as scholarships or stipends. Analysis of FGDs with TVET teachers and students indicate similar results. The students in the FGDs agreed that increasing female enrollment in TVET requires raising community awareness, providing scholarships and dormitories, offering workshops and internships, and delivering counseling on suitable majors for women. They emphasized that female students should be given priority and support, and that more efforts are needed to introduce TVET programs and explore job opportunities for women. Also, the teachers who participated in the FGDs mentioned similar strategies, noting the importance of scholarships, dormitories, and job opportunities to attract female students.

In terms of inclusion of people with disabilities, respondents highlighted several persistent challenges. A majority (63.48%) indicated a lack of assistive tools or accessible training equipment, while 44.68% reported inaccessible physical infrastructure within TVET institutions. In addition, 41.13% noted the absence of tailored training programs for different types of disabilities, and 30.67% identified limited access to career guidance. Data from the FGDs indicate similar results. The students who joined the FGDs mentioned that students with disabilities reported facing multiple challenges in TVET programmes. They mentioned difficulties in practicing certain tasks, concentrating, accessing materials and equipment, and performing work in workshops. They demonstrated that some students experienced discrimination in verbal interactions and attitudes, had trouble listening to trainers, moving around the campus, or traveling, and required personal assistance from family or friends. Writing and practical exercises were also reported as challenging, and some students described themselves as slow learners. Strategies perceived as most effective for improving accessibility included training staff to use respectful and inclusive language, awareness-raising on disability rights, peer support and inclusive learning practices, improvements in physical accessibility (e.g., ramps, handrails, accessible classrooms, and sanitation facilities), and the provision of accessible information and disability-friendly enrolment support.

Young people also face multiple barriers to accessing green skills training and green employment. Approximately 66.13% of youth reported limited understanding of green skills, while 49.46% lacked awareness of available green programs within TVET institutions. Other challenges included limited green curricula (45.16%), restricted access to training in local areas (35.16%), and a lack of role models in green careers (30.38%). Consistent with the survey results, the teachers indicated during the FGDs that the main barriers to enrollment in green skills training included students' limited understanding of the benefits of green skills, perceived limited job opportunities, and a lack of interest in potential career prospects. To address these constraints, respondents emphasized the importance of private sector partnerships (81.25%), integration of green skills through community learning centers (53.13%), bridging or foundation education programs (45.83%), the incorporation of green skills into existing training programs (42.71%), and the use of flexible or remote training delivery models (35.94%).

At the institutional level, teachers identified several challenges to integrating green skills into TVET programs. The absence of dedicated green skills curricula was identified as the main barrier (62.5%), followed by limited teacher capacity in green technologies (40.63%) and inadequate training equipment or materials (31.77%). Suggested strategies included conducting regular labour market assessments, strengthening teacher capacity through targeted training, expanding public-private partnerships, revising curricula to incorporate green competencies, and providing financial incentives to students. The qualitative findings from the FGDs further reinforced these strategies. The teachers highlighted several key approaches to effectively promote the integration of green skills into TVET including capacity building through Training of Trainers (ToT) programmes to enhance upskilling and reskilling, as well as the provision of adequate training materials, equipment, and teaching facilities.

Despite these challenges, several opportunities and promising practices were identified in Battambang Province. A large majority of teachers (85.94%) reported that partnerships with green-oriented private sector actors could significantly enhance youth employment opportunities. Development partners and NGOs were also perceived as playing an important role (60.94%), alongside access to green technology laboratories or workshops, strengthened career guidance services, and the introduction of pilot courses or modules focused on green skills.

In addition, the study identified a range of national policies and strategies that support green skills development within Cambodia's TVET system, including the Green and Digital Technology TVET Policy Framework (2024), the National TVET Policy (2017-2025), the National Policy on Green Growth (2013-2030), and the Cambodia Climate Change Strategic Plan (2014-2023). Among these, the Green and Digital Technology TVET Policy Framework was perceived by 86.67% of the key informants as the most influential in promoting green skills development. However, despite the existence of these frameworks, significant implementation gaps remain.

Key informants highlighted weak inter-ministerial coordination (80%), low awareness of green-related policies among TVET staff (73.33%), and insufficient funding or incentives for green programs (53.33%) as major constraints for policy implementation. At the same time, there was strong consensus on priority actions to strengthen policy implementation. A majority of the respondents supported embedding clear green skills targets within TVET policies; establishing formal inter-ministerial working groups involving the Ministry of Labour and Vocational Training (MLVT), the Ministry of Education, Youth and Sports (MoEYS), the Ministry of Environment (MoE) and the Ministry of Minerals and Energy (MME) and development partners; increasing budget allocations for green TVET programs, involving employers and the private sector more closely in policy formulation; developing national competency standards for green jobs; and strengthening monitoring and evaluation mechanisms. Together, these findings highlight the need to shift from policy formulation towards coordinated, well-resourced, and accountable implementation. Additional FGD recommendations included establishing partnerships with private sector companies and NGOs to develop policies that encourage small and medium enterprises to adopt green practices, which will expand employment opportunities in renewable energy, sustainable agriculture, and other green sectors.

The findings indicate a positive outlook for green job opportunities over the next five years. Approximately 79.17% of the respondents anticipated a significant increase in green jobs, while 18.75% projected moderate growth and only 1.56% expected no major change. In terms of specific occupations, respondents most frequently identified increased demand for solar system designers (58.85%), solar photovoltaic installers (39.9%), EV electrical engineers (34.67%), and related roles such as solar automation and operation and maintenance engineers (28.72%). Furthermore, teachers in the FGDs noted that green job opportunities in the next five years will continue to increase due to global trends and growing attention to environmental sustainability. They noted the expansion of electric vehicle industries and the overall shift towards a green environment.

The findings have important implications for Cambodia's efforts to promote inclusive and sustainable workforce development. Persistent social barriers and limited institutional readiness constrain equitable participation in green TVET programs, particularly for disadvantaged youth. In addition, gaps in policy coordination and stakeholder engagement weaken the alignment between skills supply and labour market demand. Addressing these issues requires stronger coherence between inclusion strategies, institutional capacity development, and policy implementation to ensure an effective and inclusive green transition.

Based on the findings, there are some applicable recommendations:

- Strengthen awareness of TVET and green skills among disadvantaged groups through targeted community-based outreach and information campaigns.
- Enhance inclusive infrastructure and learning environments within TVET institutions, with a focus on accessibility for people with disabilities.
- Expand financial support mechanisms, including scholarships and stipends, for disadvantaged learners, particularly female students.
- Strengthen and sustain public-private partnerships to improve labour market relevance and graduate employability in green sectors.
- Systematically build the capacity of TVET teachers and trainers in green technologies through national and international training opportunities.
- Strengthen policy implementation by improving coordination, raising institutional awareness of existing policies, and establishing robust monitoring and evaluation frameworks.
- Align policy frameworks more closely with labour market needs to support inclusive, demand-driven green skills development within the TVET system.



# DISCLAIMER

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## List of Abbreviations

3R practices	Reduce, Reuse, and Recycle	MEP	Energy Mechanical, Electrical and Plumbing Engineer
5S in TVET	Sort, Set, Shine, Standardize and Sustain	MIGIP	Mekong Inclusive Growth and Innovation Program
AAC	Australia Awards Cambodia	MLVT	Ministry of Labour and Vocational Training
ADB	Asian Development Bank	MME	Ministry of Minerals and Energy
AI	Artificial Intelligence	MoE	Ministry of Environment
ASEAN	Association of Southeast Asian Nations	MoEYS	Ministry of Education, Youth and Sport
BIT	Battambang Institute of Technology	MtCO <sub>2</sub> e	Megatons of carbon dioxide equivalent
BTB	Battambang province	NDC 3.0	Cambodia's third generation of Nationally Determined Contributions
CA	Conservation Agriculture	NEEP	National Energy Efficiency Policy
CASF	Conservation Agriculture Service with a Fee Project	NGOs	Non-government Organizations
CASIC	Cambodia Conservation Agriculture and Sustainable Intensification Consortium	NSDP	National Strategic Development Plan
CCCSP	Cambodia Climate Change Strategic Plan	NVIB	National Vocation Institute of Battambang
CDRI	Cambodia Development Resource Institute	O&M	Solar Operation and Maintenance Engineer
CMP	Crop Master Plan	PDoE	Provincial Department of Environment
COMPED	Cambodian Education and Waste Management Organization	PDP	Power Development Plan
COP24	United Nations Framework Convention on Climate Change Conference	PhD	Doctor of Philosophy
CQF	Cambodian Qualification Framework	PPPs	Public-private Partnerships
CS	Competency Standards	PV	Solar Photovoltaic
CSR	Corporate Social Responsibilities	RCC	Recognition of Current Competency
DGTVET	Directorate General of Technical, Vocational Education and Training	RE	Renewable Energy
DP	Development Partners	REDD+	Reducing Emissions from Deforestation and Forest Degradation Project
EE	Energy Efficiency	RGC	Royal Governments of Cambodia
EFPC	Economic and Financial Policy Committee	RPITSB	Regional Polytechnic Institute Techo Sen Battambang
ESD	Education for Sustainable Development	RPL	Recognition of Priority Program
EV	Electrical Vehicles	SA	Sustainable Agriculture
FGDs	Focused Group Discussion	SBP	Skill Bridging Program
FOLU	Forestry and Other Land Use	SDGs	Sustainable Development Goals
GDP	Gross Domestic Product	SDP	Skill Development Program
GEDSI	Gender Equality, Disability and Social Inclusion	SI	Sustainable Intensification
GGI4CE	Green Growth Initiative for Circular Economy Project	ToT	Training of Trainers
GWh	Gigawatt-hour	TTIs	Technical Training Institutes
ICLS	International Conference of Labour Statisticians	TVET	Technical, Vocational Education and Training
IEC	Information, Education and Communication materials	UNEP	United Nations Environment Programme
IGES	Institute for Global Environmental Strategies	UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ILO	International Labour Organization	UNESCO	United Nations Educational, Scientific and Cultural Organization
IoT	Internet of Things	UNESCO-UNEVOC	United Nations Educational, Scientific and Cultural Organization-International Centre for Technical and Vocational Education and Training
IT	Information Technology	UNIDO	United Nations Industrial Development Organization
KII	Key Informant Interview	WWF	World Wildlife Foundation
LTS4CN	Long-Term Strategy for Carbon Neutrality		
M&E	Monitoring and Evaluation		
MAFF	Ministry of Agriculture, Forestry and Fishery		
MEL	Monitoring, Evaluation, and Learning		

# 1

## Introduction

### 1.1 Background and Context

Human beings are facing significant challenges from climate change and environmental degradation. The impacts of climate crisis fall disproportionately and profoundly on the most vulnerable populations. Transition to environmental sustainability can potentially create millions of jobs but this will require bold action to invest in people's capabilities to realize their full potential and contribute to the productivity of enterprises. Just transition to environmental sustainability will require reskilling and upskilling of workers to reduce the risk of rising unemployment, poverty and inequality. Equal access to training, raising environmental awareness and climate literacy for current and potential workers will be essential for the implementation of a decent work agenda and greener ways of production and service delivery. At the 2018 Conference of the Parties to the United Nations Framework Convention on Climate Change Conference (COP24), support to a just transition was highlighted as a priority area to support the workforce transitions, and the creation of decent work was declared crucial to effective, inclusive and climate-resilient development. Skills development is a cornerstone of the just transition framework (Strietska, ILO, 2022).

To support the transition to green jobs, Cambodia has developed a new Technical and Vocational Education and Training (TVET) policy to help promote understanding of this policy among a wide range of TVET stakeholders, including ministries, training institutions, employer and employee associations, development partners, civil society organizations, and Cambodian youth. The new policies will guide the formulation and implementation of strategies for skills development and will facilitate better coordination among those involved in skills development in Cambodia. The policy goals are to transform and modernize Cambodia's skills development system to better serve new labor force entrants, existing workers, and Cambodia's future development (ADB, 2016a).

### 1.2 Problem Statement

Cambodia has demonstrated a strong commitment to sustainable development and the transition to a green economy through a range of national policies and strategic frameworks. These include the National TVET Policy 2017 –2025, the Skills Development Roadmap 2023 –2035, the Green and Digital Technology TVET Policy Framework (2024), the Cambodia Climate Change Strategic Plan 2014 –2023, the National Strategic Plan for Green Growth 2013 –2030, Cambodia's Power Development Plan 2022 –2040, and other sectoral green policies implemented across various ministries.

Despite the existence of these policy frameworks, there is limited empirical evidence on their effective implementation at the sub-national level, particularly in Battambang Province. This province has implemented several waste management and green development initiatives, such as scaling up waste recycling, Battambang Smart City, Battambang Province Pioneers Waste Separation, Skill Development Program-III and other related projects. However, policy implementation within the TVET system remains fragmented and inadequately coordinated. Although the Ministry of Labour and Vocational Training (MLVT) has been designated by the RGC to lead and manage the TVET sector under Sub-decree No. 6 and Circular No. 7, implementation has been constrained by insufficient cooperation and compliance among other ministries and training institutions. Consequently, the coordinating role of the National Training Board (NTB) is critical but has not been fully effective in ensuring coherent implementation of national TVET policies across key stakeholders (MLVT, 2017).

Moreover, the TVET system faces multiple structural and operational challenges in delivering training. These include out of dated training curricula, weak linkages between training institutions and the private sector, a shortage of qualified instructors in green technologies, limited provision of soft skills demanded by the labour market, inadequate quality assurance mechanisms for clean energy training, insufficient opportunities for practical and in-company training, and a lack of green training infrastructure and equipment (MLVT, 2017).

In addition, there is limited alignment between training provision and local labour market demands in sectors such as renewable energy, sustainable agriculture, and environmental services (Sevea, 2024). Moreover, fragmented coordination among government ministries, development partners, and the private sector further reduces the efficiency and effectiveness of green skills policy implementation (Naron Veung, 2024). At the individual level, young people encounter significant barriers to accessing green skills training, including financial constraints, limited access to information, career guidance, and education pathways, as well as broader socio-economic challenges (UNESCO-UNEVOC, 2021).

Furthermore, equitable access to TVET remains a persistent concern for female students, persons with disabilities, and rural or vulnerable youth, restricting their participation in green TVET programs and subsequent employment opportunities. Evidence suggests that women are underrepresented in Cambodia's TVET system, particularly in longer-duration and higher-skilled programs, and experience higher dropout rates, often due to household and care responsibilities that discourage enrolment and completion (The World Bank, 2025).

Overall, there is a clear lack of localized and empirical evidence on institutional readiness, inclusivity, and alignment between TVET provision and green job demands in Battambang Province. This knowledge gap underscores the need for systematic research, which this study seeks to address.





## 1.3 Research Objectives

This research is structured around four objectives:

- To examine how gender, disability, and rural youth inclusion (GEDSI) are addressed within TVET institutions in the context of integrating green skills, by identifying key barriers, institutional practices, and strategies that support inclusive participation and success.
- To identify systemic and institutional challenges preventing MLVT and TVET institutions from effectively integrating green skills into training programs, and to explore strategies that strengthen institutional readiness and youth participation in the green job sector.
- To explore the opportunities within the TVET system that can enhance young people's engagement in green skills training and improve their readiness for sustainable employment in the green job sector.
- To review existing green job policies and strategies in Cambodia and evaluate how they support the development of green skills within the TVET system.

## 1.4 Research Questions

To achieve the research objectives, this study is guided by one overarching research question and four sub-questions:

**Main question:** How effectively does Cambodia's TVET system engage diverse groups of youth, including women, persons with disabilities, and rural youth, in green skills development and prepare them for sustainable career opportunities?

**Sub-questions:**

- How are gender, disability, and rural youth inclusion (GEDSI) considered in TVET institutions when integrating green skills, and what are the barriers and strategies for inclusive participation?
- What institutional and systemic challenges hinder the integration of green skills in TVET programs, and what barriers do young people face in accessing green training and employment opportunities?
- What opportunities can be leveraged to enhance young people's engagement in green skills training and improve their employability in the green job sector?
- How do existing green job policies and strategies in Cambodia support the development of green skills in the TVET system?

## 1.5 Study significance

There were some benefits of this study for relevant stakeholders as follows:

- Disadvantaged group engagement: The findings and recommendations of this research will serve as important inputs for equipping disadvantaged groups (GEDSI) with green skills, thereby enhancing their ability to enter and thrive in the growing green economy and access jobs that contribute to environmental sustainability.
- TVET Institutes: The findings and recommendations of the study will be used to inform and improve current and future training programmes and strategies to support TVET institutions and young people in responding to the green job market.
- Policy makers (governments): The findings and recommendations will contribute significantly to policymakers' understanding of the current state of green skills in TVET; therefore, they are able to develop targeted interventions, allocate resources more effectively and establish strategic priorities for sustainable development. Furthermore, the recommendations will help bridge gaps between TVET outputs with needs of the green job market, thereby supporting the creation of employment opportunities in emerging sectors that contribute to economic growth and environmental sustainability.
- Private sectors: The findings and recommendations of this research will contribute significantly to the private sector by supporting the development of a workforce equipped with green competencies. Most importantly, the provision of jobs for individuals with green skills can boost companies' Corporate Social Responsibilities (CSR) initiatives, fulfilling consumer demands for sustainable products and services and opening new market opportunities.

# 2

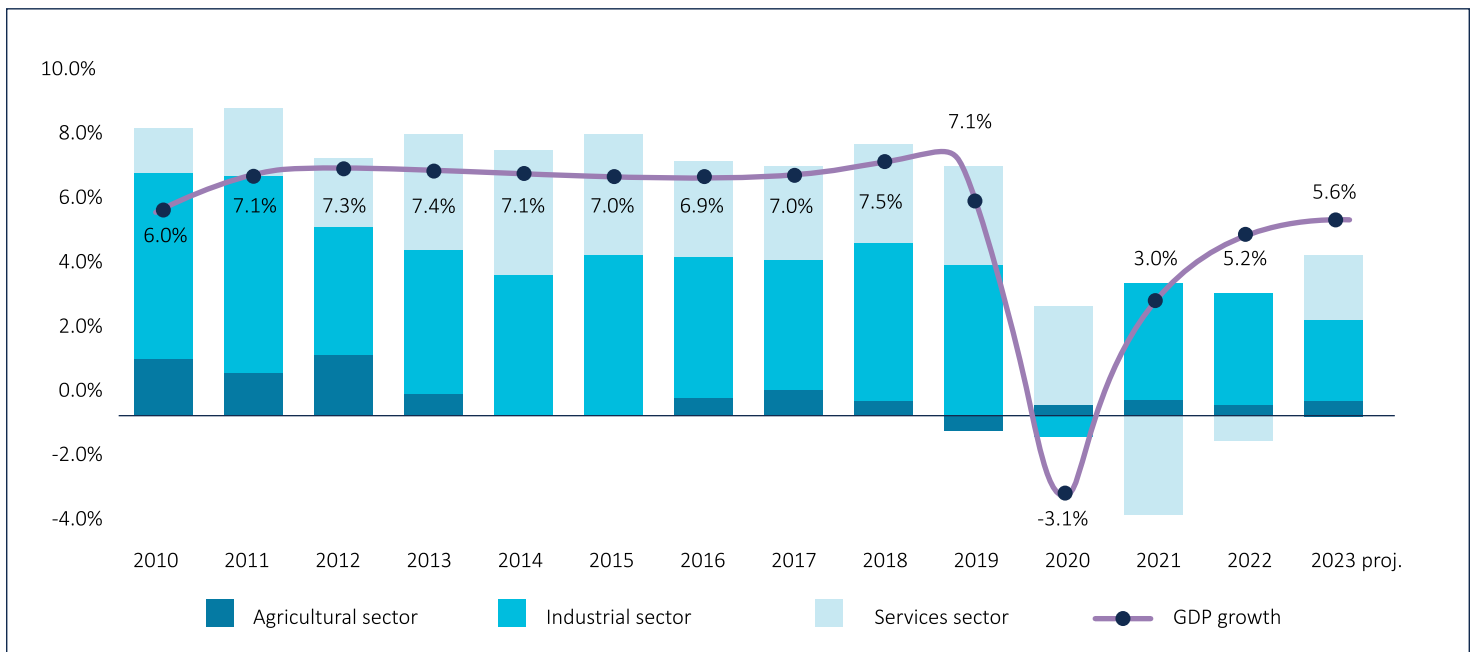
## Literature review

### 2.1 Insights into Cambodia's current growth model

#### 2.1.1 Cambodia's strong macroeconomic performance

According to CDRI (2024), Cambodia's economy has been growing rapidly, with an average annual Gross Domestic Product (GDP) growth rate of around 7% from 2010 to 2019. The country successfully transitioned from a low-income to lower-middle income country in 2015. Moreover, economic growth has strongly generated jobs for millions of people, particularly in the garment and footwear sectors, agriculture, and tourism. The poverty rate failed from 53.2% in 2004 to 17.8% in 2020; however, in 2020, Cambodia's economy declined around -3.1% due to the Covid-19 pandemic. It recovered, returning to 3% growth in 2021 and 5.2% in 2022. Also, it was projected to further increase to 5.6% in 2023. Indeed, Cambodia's economic rebound in 2022 was largely reinforced by three key sectors. The first key factor was industry increased by 8.3% thanks to the strong performance of the garment and other manufacturing sub-sectors. Within that year, the total value of manufacturing goods increased by 82.4%, manufacturing goods for export by 64.3%, and manufacturing products for the domestic market by 88.5%. Secondly, the service sector grew by 4.6%, driven by the recovery of the restaurant and hotel sub-sector, and positive trends in other sub-sectors (transport and communication, and whole-sale and retails). Thirdly, the agricultural sector experienced slight growth of approximately 0.7%, with this lower number attributed to supply chain disruptions and increased production costs compared to 2021 as shown in figure 1. In terms of trade, exports in 2023 increased by 1.8% compared to 2022. Primary export destinations were the United States (39.3% share), Viet Nam (13.1%), China (6.5%), Japan (5.2%) and Canada (3.8%), with imports primarily coming from China (44.6%), Viet Nam (14.9%), Thailand (12.0%), Indonesia (4.1%) and Singapore (3.6%) (CDRI, 2024)

Figure 1: Cambodia's Economic Growth 2010-2023 (Reference: CDRI 2024)



## 2.1.2 The Cambodian government's top priority is achieving a high-income status by 2050

According to Cambodia Vision 2050, RGC envisions to achieve an upper-middle income status by 2030 and a high-income status by 2050. Also, Cambodia is arranging to graduate from a Least Developed Country (LDC) status by 2029. To accomplish these targets, RGC introduced the Pentagonal Strategy Phase 1 (2023-2028) for Growth, Employment, Equity, Efficiency, and Sustainability. The strategy enhances socio-economic development through five Strategic Pentagons: (1) human capital development; (2) economic diversification and competitiveness enhancement; (3) development of the private sector and employment; (4) resilient, sustainable, and inclusive development; and (5) development of the digital economy and society (RGC, 2023a).

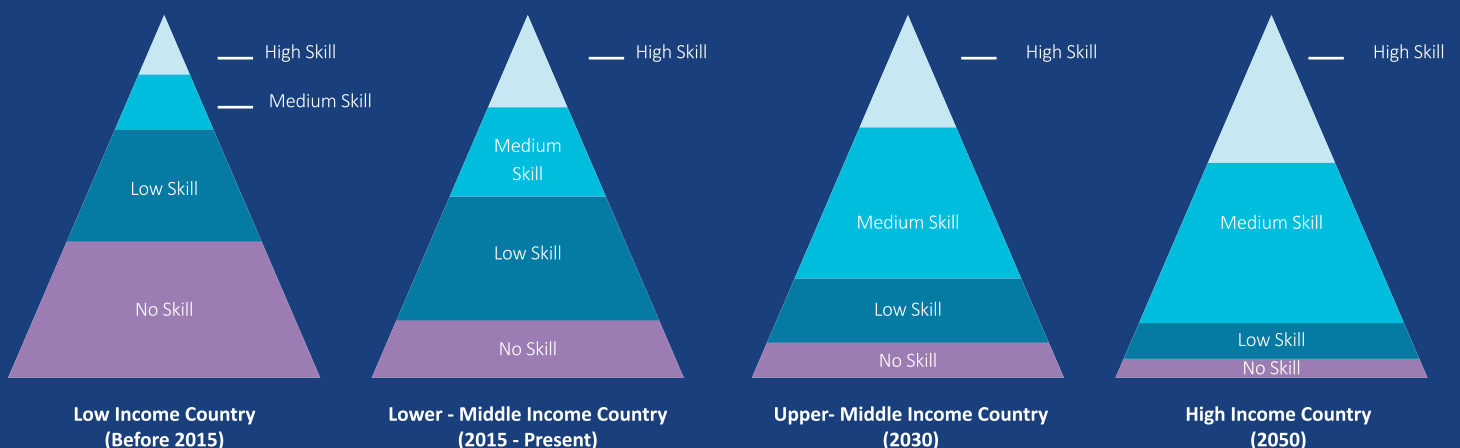
In fact, to attain the socio-economic goals outlined above, Cambodia needs highly skilled and capable human resources as well as a competent labour force. To achieve these characteristics, a skilled workforce is required across various sectors, making human capital development a priority in Pentagon 1. For economic growth and diversification to be resilient and sustainable, investing in human capital is essential. High-quality and healthy human capital plays a crucial role in fostering cultural values, boosting economic development, and driving innovation, all of which contribute to long-term sustainable growth and dynamic socio-economic progress. Furthermore, based on the importance of the TVET system addresses multiple economic and societal demands by helping youth and adults develop the skills they need for employment, decent work, and entrepreneurship. Recognizing the need for and importance of human capital development to promote diversification; strengthen competitiveness; modernize the economy; and promote sustainable, resilient and sustainable economic growth. The Pentagon Strategy continues to prioritize people, roads, water, electricity, and technology as the next priority. In this regard, the second angle is focused on the technical skills training which is a key agenda and one of the main goals in promoting, modifying, and modernizing the industrial structure in Cambodia from labour-intensive to skills-based industries to contribute to national development vision (RGC, 2023a).

On this basis, the Ministry of Labor and Vocational Training (MoLVT) has prepared a strategic plan for the development of employment, social security and vocational training 2024-2028, including the second strategy for transforming TVET to respond the Industrial Revolution 4.0 and Digital Economy and Society and Green Economy. The aim is to produce human capital and develop the workforce to have skills, knowledge, ability, virtue, ethics, attitude, professionalism, responsibility, entrepreneurship, productivity, highly competitiveness, flexibility and ability to respond to the need for rapid development of the economic, industry, digital technology and sustainable environmental protection. It will be in line with the policy orientation of the Royal Government of Cambodia in ensuring that every citizen has at least one skill in life. The Ministry of Labor and Vocational Training has been cooperating with relevant ministries, institutions, development partners, and the private sector to jointly develop human capital in a cellular manner to meet economic and social needs (MoLVT, 2024).

According to NIS (2020), Cambodia is experiencing a significant demographic dividend, with a total population of approximately 16.7 million, of which about 65% are under the age of 30. This youthful population translates into a sizable labor force, with an estimated 9.3 million people economically active. Women constitute a substantial share of the working-age population (15-64), accounting for approximately 49% of the total labor force. Despite this demographic advantage, human capital development remains a major challenge. Secondary school completion rates are low, and only about 7.4% of the labor force has attained any form of postsecondary education. Furthermore, employment in medium- and higher-level technical occupations remains limited, representing just 10.7% of the total labor force. These figures highlight critical gaps in skills development and underscore the need for strengthened TVET to fully harness Cambodia's demographic dividend (NIS, 2020)

Moreover, Pentagons 2 (economic diversification and competitiveness enhancement) and 4 (resilient, sustainable and inclusive development), in particular, can be crucial in driving the country's economic growth towards a greener and more resilient path. The emphasis on economic diversification, resilience, and sustainability as a vehicle for socio-economic development has been carried over from the country's previous Rectangular Strategy 4 2019-2023 (CDRI, 2024).

**Figure 2: The transition from low-income to high-income country (Reference: MVLVT 2024)**



## 2.2 The role of TVET in the green economy

### 2.2.1 Definition of green economy

At the United Nations Conference on Sustainable Development (Rio+20), Green Economy, in the context of sustainable development and eradication of poverty, was recognized as a tool to achieve sustainable social, economic and environmental development. The UN Environment Programme has defined Green Economy as *“one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.”* In its simplest expression, a Green Economy can be considered one that is low in carbon, resource efficient and socially inclusive (UNEP, 2018).

A Green Economy is a market-based economy oriented towards environmental sustainability, economic profitability and social inclusion. Thus, “green” is used as a synonym for ecological (low-carbon, resource-efficient, non-pollutant) and social sustainability in contrast to conventional economic practices. Green practices include sustainable production processes, products and consumption patterns with the circular economy as a general paradigm for resource efficiency (FAKT Consult, 2022).

### 2.2.2 Advancing skills development to promote awareness of sustainable development

TVET systems play a critical role in equipping youth and adults with the skills required for employment, decent work, entrepreneurship, and lifelong learning. In the current development context, TVET supports young people’s entry into the labour market, including self-employment, while enhancing responsiveness to changing skills demand, improving productivity, and contributing to higher wage levels.

TVET also helps reduce barriers to labour market access, particularly for disadvantaged groups. In this regard, integrating Education for Sustainable Development (ESD) into TVET can act as a transformative mechanism by expanding institutional visions of sustainability and strengthening the capacity of learners, communities, and stakeholders. ESD-enhanced TVET provides youth and adults with the knowledge, competencies, and values required to adapt to a changing world of work and to support the transition towards green economies and societies. TVET further contributes to the shift to low-carbon and climate-resilient development through its traditional role of preparing learners for occupational fields and promoting labour market participation, although these roles are increasingly subject to new expectations (UNESCO, 2017).

TVET plays a key role in developing a skilled workforce aligned with labour market regulations and occupational standards. Many employment sectors operate under defined regulatory frameworks that specify required qualifications and competencies, making TVET a primary pathway for meeting these standards. As the transformation toward sustainable socio-economic systems accelerates, the greening of economies must be matched by the greening of jobs, which in turn requires the greening of TVET. Greening TVET supports environmental sustainability while equipping individuals across all stages of working life with the skills, knowledge, and behaviours needed to transform workplaces and communities. It also contributes to a fair and just transition by enabling inclusive access to emerging green employment opportunities. Importantly, greening TVET is a normative and systematic process that goes beyond current green job skills to address long-term environmental and social objectives, requiring holistic and methodical approaches within existing and new TVET structures (ILO, 2022).



## 2.3 Cambodia's commitment to sustainable development

Looking ahead to Cambodia Vision 2050, the country aspires to become “a nation characterized by harmony, resilience, and inclusiveness, where development and environmental conservation are balanced to ensure people’s well-being.” To achieve this vision, the Cambodian government emphasizes energy security, efficient water supply and waste management, modern irrigation systems, climate change mitigation and adaptation, sustainable use of ecosystems, the integration of modern technologies in agriculture, and responsible natural resource management.

Pentagon 4, which focuses on resilient, sustainable, and inclusive development, outlines five strategic priorities: optimizing demographic dividends and promoting gender equality; ensuring sustainable management of natural resources, cultural heritage, and tourism; advancing agriculture and rural development; strengthening urban

management and modernization; and enhancing environmental sustainability and climate resilience through the promotion of a green economy (RGC, 2023b).

The development of Cambodia’s third Nationally Determined Contributions (NDC 3.0) presents an opportunity to align climate action with the Sustainable Development Goals (SDGs), positioning climate policy as a driver of economic and social development. By integrating national development priorities into climate planning, Cambodia aims to address climate vulnerabilities while advancing long-term objectives such as job creation, infrastructure modernization, resilient and inclusive cities, and social equity. Existing alignment between the Pentagonal Strategy–Phase I, the Cambodia SDGs, and NDC 2.0 provides a foundation for greater impact under NDC 3.0.

Cambodia’s approach to SDG 7 prioritizes

increasing renewable energy in the national energy mix, as articulated in the Cambodia Power Development Master Plan 2022–2040 and reaffirmed in the Cambodia Climate Change Strategic Plan 2024–2033. These frameworks emphasize scaling up solar, wind, and hydropower to reduce fossil fuel dependence and greenhouse gas emissions, alongside improving energy efficiency across industry, buildings, and transport. Further priorities include modernizing the energy grid to support renewable integration and climate resilience, expanding renewable energy to 25% of the national mix by 2030 and 35% by 2050, promoting sustainable urban development, and advancing circular economy and energy-efficient technologies (Kidd, 2025).

## 2.4 Local focus: green economy and youth employment in Battambang province

### 2.4.1 Scaling up waste recycling in Battambang city

In the heart of Cambodia's northwest region lies Battambang, a city poised to become one of Southeast Asia's most innovative urban centers. Battambang City, with an estimated population of about 160,000 inhabitants, is subject to several issues, including uncontrolled disposal and waste burning as well as a lack of coordinated waste separation and collection planning. In particular, the large quantity of organic waste produced poses a problem (which constitutes 50–70% of the waste in the city) and presents an opportunity for the development of resource recovery products. Additionally, disposal of plastics (about 10% of waste, with an average Cambodian city resident using an estimated 2,000 plastic bags a year) poses both public health and environmental issues but also provides potential collection and recycling opportunities. Improving solid waste management is a high priority for the city of Battambang, as outlined in the list of priority actions in the draft Sustainable City Strategic Plan for Seven Secondary Cities 2019–2030 (GGGI, 2021).

In recent years, the city has made great improvements in addressing waste management issues and has participated in many initiatives. The city now has several options to manage recyclable materials, such as plastics and organics. Battambang also has a newly constructed Material Recovery Facility that has yet to be operational and it aims to build a new and improved landfill in the coming years. The thriving informal sector also significantly contributes to the recovery of recyclable materials in the city. However, further improvements are required, as littering and the open burning of waste still occurs on a large scale, including at the existing landfill. To build on past work and continue addressing current issues for a more efficient waste management system, the separation of wet and dry waste is critical. This will enable more organic waste to be processed and more recyclables to be separated from the dry waste. Open burning and littering must also be prevented, with the proper implementation of Sub-Decree No. 113. These initiatives would not only improve the environment, public health, and beauty of our city, but they will also create economic opportunities and jobs. Increasing the quantity and quality of compost would also enable farmers to conduct more sustainable practices by using less artificial fertilizers (Michaels et al., 2020)



### 2.4.2 Battambang smart city project

The Battambang Smart City project represents an ambitious vision that combines cutting-edge technology with sustainable development principles, creating a blueprint for modern Cambodian cities. This comprehensive transformation initiative demonstrates how traditional urban areas can evolve into digitally enhanced environments that improve the quality of life for residents while preserving cultural heritage. The Battambang Smart City project is a revolutionary urban development initiative designed to transform Battambang, Cambodia's second-largest city, into a model of technological innovation and sustainable living. This comprehensive program integrates digital infrastructure, intelligent transportation systems, and environmental management solutions to create a more efficient and livable urban environment. At its core, the project focuses on leveraging smart technologies to address the unique challenges facing Battambang while preserving the city's rich cultural identity. The initiative encompasses multiple domains, including transportation, energy, waste management, water systems, and public services, all interconnected through a sophisticated digital network. The project represents a significant step forward in Cambodia's urban development strategy. By implementing smart city solutions, Battambang aims to become a showcase for sustainable urban growth in the region. The initiative demonstrates how smaller cities can successfully adopt modern technologies without losing their distinctive character and heritage. Key components of the Battambang Smart City project include intelligent traffic management systems, smart waste collection and recycling programs, digital governance platforms for citizen services, energy-efficient public lighting systems, water quality monitoring networks, environmental sensors throughout the city and mobile applications for civic engagement. The project also emphasises community participation, ensuring that technological improvements are aligned with residents' actual needs and preferences. This human-centred approach distinguishes Battambang's Smart City initiative from purely technology-driven urban development programs (Visamak, 2022).

### 2.4.3 Battambang province’s pioneering waste separation

Battambang will be the first province to implement the Green Growth Initiative for a Circular Economy (GGI4CE) project, which focuses on waste separation to promote the efficient and sustainable management of solid waste and plastics. The Ministry of Environment and the German Ambassador to Cambodia officially launched the project on June 20, 2025 in Battambang Province. The initiative also reflects 25 years of collaboration between Cambodia and Germany. The Ministry of Environment is offering technical assistance, while the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is providing financial support. According to Cambodianess (2025), the project objectives focus on:

*Encouraging Waste Separation at Home by encouraging waste separation, the project helps reduce the amount of plastic waste dumped in landfills and aligns with the government’s “Clean Cambodia” vision. Environment Minister Eang Sophalleth said the initiative is a significant development that can help improve environmental quality with the participation of citizens and students. He added “The ministry will distribute trash bins to schools and communities so that citizens can properly separate waste and easily recycle it.”*

Turning waste into valuable resources, the Ministry of Environment spokesman, Khavy Atitya, said Battambang was picked to implement this project because it is a model province recognized for its effective landfill management. The project enables residents to benefit from waste by recycling and reusing it, while raising awareness about waste issues and the value of waste, which can be composted or repurposed. It can be used to generate electricity, as many companies are also interested in converting waste into energy. The Ministry is studying the investment opportunities of waste recycling. He added, “We are facing an increasing amount of waste. Between 3,000 and 5,000 tonnes are disposed of in landfills every day. The advantage of this project is having a place to recycle waste so that it can reduce this amount.” The project will implement four key measures: reducing waste production, recycling, reusing, and minimizing food waste. It is hoped that residents and students would actively participate in waste management and refrain from excessive plastic use or improper waste disposal (Cambodianess, 2025).

### 2.4.4 Skills Development Programme

The Skills Development Programme (SDP) is a project of the Swiss Agency for Development and Cooperation (SDC) in cooperation with the Liechtenstein Development Service (LED). Under SDP Phases II and III, significant progress has been made in promoting green skills across 14 partner TVET institutions, including three technical training institutes in Battambang, namely Regional Polytechnic Institute Techo Sen Battambang (RPITSB), the Battambang Institute of Technology (BIT), and the National Vocation Institute of Battambang (NVIB). By August 2025, a total of 6,087 learners (including 1,525 women) and 88 trainers and management staff (20 women) benefited from mainstreamed green lessons and capacity building. Four core modules—covering environmental fundamentals, impacts of non-green practices, benefits of greening, and green jobs—were integrated into training programs. Technical Training Institutes (TTIs) also developed and implemented curricula on solar energy, sensor technology, and waste management from Certificate 1 to higher diploma levels. Green campus initiatives included solar lighting, waste separation systems, tree planting, and green 5Ss and 3R practices. Training institutes actively promoted green awareness through workshops, student-led activities, and infrastructure upgrades. These efforts reflect Cambodia’s commitment to sustainable development, equipping learners and educators with the knowledge and skills to foster environmentally responsible practices in education and the workforce.



## 2.4.5 Other waste management projects relevant to Battambang city

According to Michaels et al (2020), there are other waste management projects implemented in Battambang City. Firstly, United Nations Industrial Development Organization (UNIDO) is providing support to private waste collection companies in Battambang City, called CINTRI, Battambang Plastics Products (BPP), and Cambodian Education and Waste Management Organization (COMPED) to upgrade facilities and improve source separation. Secondly, the Institute for Global Environmental Strategies (IGES), which previously worked with COMPED, has implemented waste separation and collection trials in Battambang. The initial project began in 2011, which led to a community-based waste management initiative with the idea of opening waste management planning, decision making, implementation, and monitoring other key stakeholders in the sector. The initiative was expanded in 2014, which resulted in a study of short-lived climate pollutants and an associated work plan, which was finalized in 2017. Throughout the project, several public workshops were held to seek feedback, and the feedback in the report indicated interest and involvement from the public. Additionally, it was reported that all of the key stakeholders were involved in the work planning and implementation, including the municipality, the Provincial Department of Environment (PDoE), CINTRI, COMPED, and Sangkats (i.e., communes).

Thirdly, In June 2019, the World Bank held a workshop to present and discuss a solid waste management project it plans on implementing. The project consists of a national-level legal, policy, and capacity-building component and piloting implementation in three cities. The World Bank is considering supporting a revision of Sub-Decree No. 113 to adjust the roles of stakeholders, develop a database and reporting system, and set waste sampling and analysis procedures, among others. New policies may address plastics (including possibly banning single-use items) and packaging waste. Other capacity building and guidelines include cost recovery, templates for contracts, support for environmental monitoring and enforcement, and guidance for landfill design and operations.

Fourthly, in 2012, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), in partnership with COMPED, implemented an awareness raising program on source separation as part of a waste-to-resource programme under the Pro-Poor and Sustainable Solid Waste Management in Secondary Cities and Small Towns in Asia-Pacific project, funded by the Bill and Melinda Gates Foundation from 2009 to 2015. The awareness raising program targeted three markets in Battambang City: Nat/Thum, Thmey, and Boeung Chhouk. Market vendors, workers, and association members, as well as some households, were targeted on waste separation at the source.

## 2.5 Understanding of Cambodia's educational system and green jobs

### 2.5.1 Cambodia's education and training system

There are some major challenges to the Cambodian workforce recognized as bottlenecks to the economy and national competitiveness. In fact, Cambodia's education and training system is required to produce more adaptable workforce with professional skills and effective workplace behaviors. First, fulfilling industry demands is considered the biggest challenge due to higher dropout rates in general education, low rate of TVET graduates, curriculum gaps and limited engagement of the private sector in TVET even though the country has had a clear structured education and technical training system. Furthermore, TVET graduates seem to lack basic and life skills even if they are ready for job entry, compared to general education students; therefore, they cannot perform satisfactory work for the industries in which they are employed (MLVT, 2017). In addressing these challenges, there are possible mechanisms to be implemented. The first mechanism is that the government and the private sector should consider skill development by guaranteeing lifelong learning through flexible pathways and gender-inclusiveness. Moreover, relevant ministries should prepare educational planning from bottom-up approaches to improve the quality of teaching and learning. In addition, young people should be attracted to learn via the TVET stream rather than general education. The most important factor is to engage the private sector to improve learning and teaching experience by responding to their demands. Finally, strengthening coordination among all stakeholders at the national level with training institutions should be developed in the short, medium and long-term basis (ADB, 2016a).

There are three streams in the Cambodian education system: general education, TVET, and higher education. General education has 9 years of basic education plus 3 years of upper secondary education, and it includes a technical education stream (ADB, 2016b). The formal educational framework used in Cambodian schools is 6+3+3. For kids ages three to under six, there is also a minimum of one year of pre-school education, kindergarten, before primary school. After that, students must complete nine years of basic education, which are broken down into elementary education, grades 1–6, and three years of lower secondary general education, grades 7–9. And another three years at upper secondary school from grades 10 to 12. Moreover, Technical and vocational education and training which begins after basic education, after the completion of grade 9, and higher education, which begins after grade 12, are examples of post-school formal education (ADB, 2016).

**Figure 2: Cambodia Education and Training System, (ADB, 2016)**

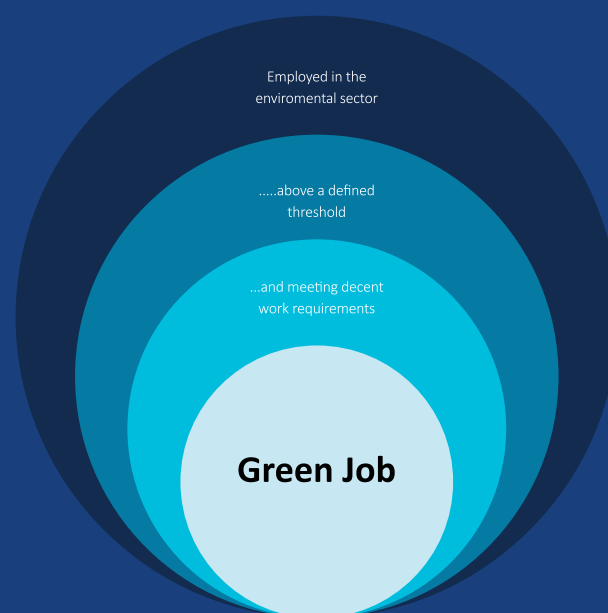
Stream	General Education	TVET	Higher Education
Governance	Ministry of Education, Youth & Sport	Ministry of Labour and Vocational Training	Ministry of Education, Youth & Sport
CQF Level 8	Upper Secondary School (Grades 10-12)	Doctoral Degree	Doctoral Degree
CQF Level 7		Master's Degree (Technology or Business)	Master's Degree
CQF Level 6		Bachelor's Degree (Technology or Business)	Bachelor's Degree
CQF Level 5		Higher Diploma (Technology or Business)	
CQF Level 4		TVET Certificate 3	
CQF Level 3		TVET Certificate 2	
CQF Level 2		TVET Certificate 1	
CQF Level 1	Lower Secondary School (Grades 7-9)	Vocational Certificate	

## 2.5.2 Green jobs

Based on ILO's Handbook on measuring green jobs and skills for green jobs (ILO, 2025, p.8), green jobs involved three main criteria as follows:

- Employment in the environmental sector: Activities and jobs contribute to environmental sustainability. a. employment in environment all goods and services production or known as environmental production; AND/OR b. employment in roles that making production processes more environmentally friendly or more efficient using of natural resources in all other "traditional" industries/sectors-also known as employment in environmental processes.
- Above a defined threshold: For the two categories of employment in the environmental sector, the second criteria above –employment in environmental processes– is expected to meet a defined threshold in order to be counted. The ICLS definition states "where possible, a distinction should be made between those workers that spend less than 50 per cent and those that spend more than 50 per cent of their working time on environmental processes" (para. 12(B)). However, in the context of MEL, it is not always feasible to apply this distinction. Therefore, the handbook explores alternative methods for identifying workers whose roles are primarily focused on environmental processes.
- Meet decent work requirements: According to the ICLS definition, green jobs refer to a subset of employment in the environmental sector above a defined threshold that meets the requirements of decent work. This decent work dimension may be selected according to the context and the type of intervention, and may draw from the ILO Guidelines on Decent Work Indicators.

**Figure 3: Visualization of Green Job's Definition**





### 2.5.3 Skills for green jobs

“Skills for green jobs” was defined as skills that are important to successfully perform tasks for green jobs and to make any job greener. The term accounts for both core and technical skills and covers all types of occupations that contribute to the process of greening products, services and processes, not only in environmental activities but also in other sectors (Gregg, Strietska-Illina & Büdke, 2015).

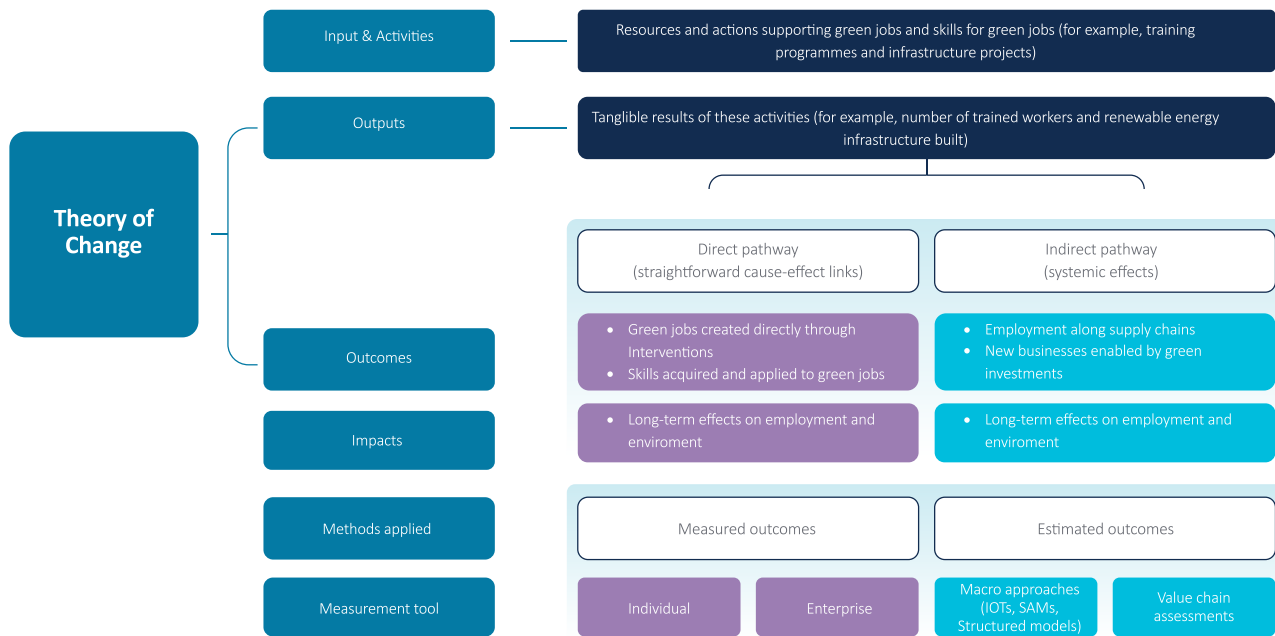
According to ALO (2025), “skills for green jobs” was considered the skills necessary or relevant to different categories of the environmental sector. This definition provided a measurable approach that did not divide between the technical or core nature of the skills but aligned exactly with the same categories used for employment assessment of the environmental sector. At the same time, taxonomies existed regarding the identification of green tasks and activities in different occupations, and these can be applied to measure skills for green jobs. Green tasks and activities could also be used to assess the “greenness” of a job (Vona et al., 2015), particularly in assessing environmental processes (ILO, 2025).

### 2.5.4 Conceptual framework for measuring green jobs and skills for green jobs

The ILO Handbook’s main objective was to offer advice to programme managers, MEL practitioners and policymakers on measuring green jobs and skills for green jobs to be able to provide accurate information on programme outcomes. The basis of selecting a relevant measurement approach was to understand the programme’s objectives, its theory of change (or logical framework) and the impact types.

A conceptual framework, shown in Figure 4, is developed from the inputs and activities of the project/programmes, training programs, policy intervention and green infrastructure investment. These inputs would strongly contribute to producing expected outcomes, such as the number of trained workers and enterprises invested in green infrastructures. At this point, the framework is considered a decision point by two pathways in a direct and indirect manner. In fact, direct pathways depend on the main objective of programme/project design. It will contribute to creating jobs and skills for individuals or enterprises, while an indirect pathway generates jobs along supply chains, which encourages the emergence of new businesses by green investment. Moreover, the direct pathway most likely produces a long-term effect on employment and environment, whereas the indirect pathway contributes to total employment outcomes from green investments (ILO, 2025).

Figure 4: Conceptual Framework for Measuring Green Jobs and Skills for Green Jobs



## 2.5.5 Measuring and estimating green jobs and skills for green jobs

### 2.5.5.1 Indicators of green jobs and skills for green jobs

Indicators of green jobs and skills for green jobs are considered key aspects of the Monitoring, Evaluation and Learning (MEL) system, in which they serve as metrics to evaluate the programs’ results. A list of indicators is shown in Table 1, which measures the green jobs and the skills for green jobs according to specific objectives. These indicators serve as the basis to conduct surveys, data collection and programme evaluation (ILO, 2025). In fact, these indicators are aligned with the conceptual framework of green jobs and skills for green jobs. They include direct and indirect indicators at outcome levels. Direct indicators, for instance, use specific and measurable scales, including a number of people employed in the environmental sector that illustrated the immediate effects of intervention throughout data collection during a survey. Furthermore, indirect indicators normally use tremendous and interferential language, such as a number of jobs created as a result of green intervention to predict the broader effects of systemic employment (ILO, 2025).

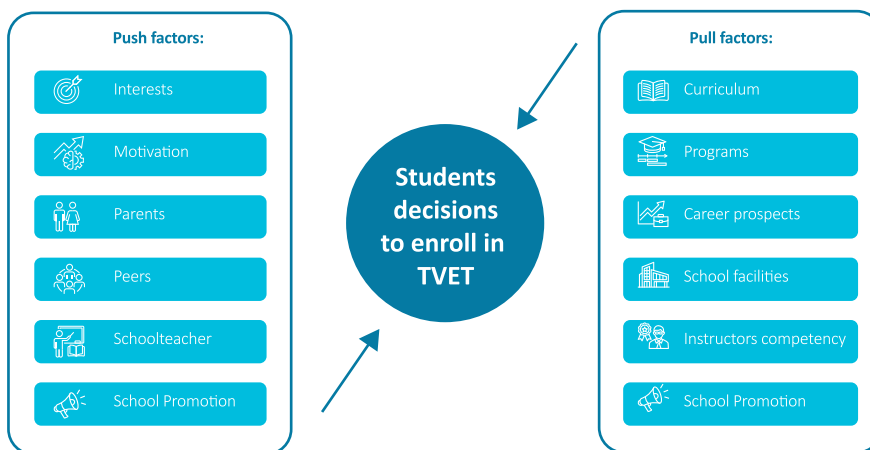
Table 1: Indicators relevant to assessing jobs and skill outcomes in direct and indirect pathways.

Indicator level	Direct indicator	Indirect indicator
Inputs and activities (examples)	Budget allocated for green job training programmes	
	Investment in green infrastructure	
Outputs (examples)	Trained workers with skills for green jobs	
	Infrastructure project completed	
	Policies enabling green investments and entrepreneurship	
Outputs (examples)	Persons employed in the environmental sector	Jobs created as a result of green (intervention)
	Persons employed in green jobs	Green jobs created as a result of (intervention)
	Persons acquiring skills relating to the environmental sector	Jobs created in green sectors as a result of (intervention)
	Persons applying skills relating to the environmental sector	Jobs created in supply chains supporting green sectors
	Enterprises with employees in the environmental sector	Jobs created as a result of green (intervention)
	Enterprises with employees employed in green jobs	Jobs created in supply chains supporting green sectors
	Employees within enterprises in the environmental sector	
	Employees with green jobs within enterprises	
Impacts	Long-term employment that meets decent work and environmental criteria	Total employment outcomes from green investments
	Enhanced workforce resilience in response to climate and environmental transitions	Employment outcomes in green sectors or green occupations

## 2.5.6 Influencing factors for TVET students' enrollment

According to Azie et al, 2020, there were push and pull factors strongly influencing enrollment of students in TVET institutes. Push factors covered student's interest, motivation, parents, peers and schoolteachers while the pull factors included training curriculum, programs, career prospects, school facilities, competency of instructors and school promotion.

Figure 5: Push and Pull factors for TVET students' enrollment by Addul Aziz et al, 2020.



### 2.5.6.1 Push factors

#### Interests

Interests are more likely expressing preferences for a special topic, study subject or activity (Li et al., 2023b). Interests are considered as the main role to identify decisions of students for their professions (Azeem & Omar, 2019). Interests guide learners to select tasks or involve them in their studies. Furthermore, learners who have a higher interest in learning tend to accomplish a comprehensive understanding and a better outcome than those with lower interests (Li et al., 2023b). Interests involve enjoyment and excitement feelings that encourage students to attend regularly in classes, pay more attention, and are keen to learn and engage in their subjects (Harackiewicz et al. 2016). However, Nordin and Omar (2024) and Azeem et al. (2022a, 2022b) recognised that interests of TVET students are demonstrating for their joys of joining TVET classes, satisfying with learning TVET subjects, having active involvement in TVET lessons, higher commitments to completing their TVET schools, and consistent participation in practical work. The primary push factor was the students interest influencing for students' enrollment in TVET training (Abdul Aziz et al, 2020).

#### Motivation

Motivation is combined between beliefs, perceptions, values and actions (Lai, 2011). Students' motivation is a goal of action or commitment to involve in learning (Zin & Yunus, 2020). With this motivation, students perceived that TVET program learnings are able to provide various benefits including self-improvement support, become knowledgeable persons, and improve their technical, vocational and technological skills (Nordin & Omar, 2024; Omar et al., 2020a). In addition, Nordin and Omar (2024) stressed that for learners who are encouraged to have good results for their exams; consequently, they will contribute to society and pursue higher education.

#### Parents

Parents are considered an influential factor for children's development and education (Ceka & Murati, 2016). Parents normally impact their children in terms of students' motivations, advice and financial support (Abdul-Aziz et al., 2020; Safarmamad, 2019). Zhi and Atan (2021) illustrated that parents and friends remarkably encourage students to attend in TVET. Furthermore, Un (2014) recognised that Cambodia students often discuss with their parents about major selection and career paths.

#### Peers

Peers are playing more important role for attitudes of students for subject selection for their further studies (Ayub, 2015; Azeem et al., 2022a; Mohamed, 2022). Moreover, peers influence academic choices and performance (Rubineau et al., 2024). As Zhi and Atan (2021) reflected that some students decided to register in TVET because their peers select to learn in TVET programs. In addition, other students are influenced by their peers' positive perception of vocational and technical education or their careers' prospects in TVET (Zhi & Atan, 2021).

#### Teachers

Teachers play very important roles in participation and motivation of students in academic decisions (Safarmamad, 2019). Regarding Omar et al. (2020b), teachers are important catalyst for promoting inputs and knowledge of students about TVET. In addition, teachers' instructions have been emphasized to play as a very important role in increasing their students' motivations pursuing TVET training. The research by Zhi and Atan (2021) presented that schoolteachers had a major influence on students' registration in TVET such as provision of counselling service about TVET and guaranteeing students have enough knowledge about TVET.

## 2.5.6.2 Pull factors

### **Curriculum**

Referring to Ismail and Mohammed (2015), TVET curriculum has to be generally focused employability such as on core and generic skills. Core skills are technical competency, specific knowledge and capabilities required to perform specific tasks including how to use tools and equipment efficiently. STEM study is a key area to develop core skills in TVETs. Generic skills are soft skills such as problem solving, communication, lifelong learning and collaboration which support students to build good relationships and contribute to the work environment. To guarantee employability of graduates, foreign languages especially, English should be integrated into curriculum (Alam and Sharmin, 2023). Apprenticeship or internship opportunities should be incorporated into the curriculum, allowing students to practice and prepare themselves for workplace (Baraki & Kemenade, 2013). TVET curriculum has to be aligned with job markets by increasing hours of practical skill more than theoretical knowledge (UNESCO, 2020).

### **Programs**

TVET training programs are generally classified into short-term (3 months), medium-term (3-9 months) and long-term period (1-3 years) (Boushib et al., 2023). According to MLVT 2024, there were 8 levels of Cambodia Qualification Frameworks including vocational certificate, technical certificates 1, 2 and 3, high diploma, bachelor, master and Doctor of Technology in Cambodia. Regarding these 8 levels of CQF, the government has paid more attention to technical certificate level 2 (C1) for TVET 1.5 training program. This program aims to provide at least one skill in life to poor, vulnerable, formal and informal economic families, disadvantaged youth and enterprises to obtain employment opportunities and/or create their self-employments with high ownership, quality and productivity for supplying and responding to sustainable, resilient and inclusive labour job markets.

### **Career prospects**

Opportunity for future success in profession is considered as career prospects (Waaiker, 2016). Future success includes different aspects "employment versus unemployment, educational level required for a job, salary, job acceptance for the first choice, a permanent position obtaining...ect"(Waaiker, 2016, p.2). As Zhi and Atan (2021) emphasized that TVET is able to lead students to achieve work they want since people with TVET diploma are attractive in labour markets, and it ensures future employment. In 2022, for example, Cambodian Qualifications Framework skill evaluation study with TVET graduates in engineering, electrical, mechanics, and manufacturing sectors demonstrated that around 17.48% were manager and specialists, about 45% were technicians, 13.18% were mechanics, and 5.1% were entrepreneurs or business owners whereas about 19.22% had jobs in other professions (Khorn, 2023). The results were illustrated that TVET-certificate graduates had a higher demand in diverse job market than other graduates especially in industrial sectors.

### **School facilities**

School facilities are impactor factor for academic performance of students (Olayinka et al., 2021). These facilities included classrooms, libraries, textbooks, tables, laboratories, workshop equipment that have direct impact on enrollment of students in TVET institutes (Abdul-Aziz et al., 2020). In addition, water and electricity are also important school facilities (Kipkemoi et al., 2014). Siswanto and Hidayati (2020) highlighted that internet networking, laptops, and LCD projectors are considered as main facilities in the age of industry 4.0; consequently, school facilities not only improve for students' learning outcomes but also attract them to register more in TVET programs.

### **Instructors' competency**

Omar et al. (2020b) mentioned that competencies of TVET trainers depended on their knowledge, skills and attitudes. They require knowledge and skills to enhance their teaching (Selvi, 2010). Sern et al., 2018 noted that competencies of TVET instructors should engage to manage classrooms, handle teaching aids, assess and evaluate students' performance, apply different teaching methods, recognize students' learning styles, fulfill students' needs in the classrooms, communicate important technical knowledge and vocational skills efficiently and effectively.

### **School promotion**

Promotion is recognized as a communication process between TVET institutes and service users to respond positive behaviours toward service and lead them to obtain service (Mahajan & Golahit, 2017). In order to attract students, TVET institutes have to raise awareness about the institutes (Khan & Qureshi, 2010). Mahajan and Golahit (2017) also highlighted that promotional strategies of school promotion include educational fairs, institute websites, social media (ex: Facebook), brochures/leaflets, F2F counselling, banners/billboards, and visual/air media (ex: radio and TV).

### **Gender disparity in TVET enrollment**

Several studies showed that gender norms also affected enrollment of students in TVET sectors of developing countries (UNESCO-UNEVOC, 2021). In Vietnam, male students appear to have more access to TVET and better career prospects than female in diverse sectors such as automobile mechanics, electronics, chemical technology, information technology, heating and ventilation air conditioning (Eimermacher et al., 2022). In the Philippines, furthermore, Dumadag et al. (2024) mentioned that gender roles, norms, and stereotypes influenced career opportunities of students in TVET since they were strongly believed that TVET programs were designed for men. In Cambodia, despite remarkable development of TVET, around 40% of 72, 412 students were females who registered in TVET from 2020 to 2021 academic year (MLVT, 2022). Women and girls were still facing low employment prospects and wage discrimination while women were put in low position and lower-skilled workers and were not often placed in managerial positions (MoWA, 2014). Regarding Khieng et al. (2025) and Vann (2016) highlighted that TVET was perceived as inappropriate for women.

## 2.6 Cambodia's policy landscape for green jobs

### 2.6.1 Pentagonal strategy phase 1 2023-2028-Pentagon 4 (Side 5): Ensuring environmental sustainability and readiness for responding to climate change, and the promotion of green economy.

- **Relevance:** The policy is highly relevant as it identifies “Environmental Sustainability” and the “Green Economy” as core pillars for Cambodia’s 2050 vision. It directly addresses the need for water security and climate resilience, which are the foundations for green employment in agriculture and infrastructure. Gaps & Green Job Connection: While the policy sets a broad vision for a green economy, there is a relevance gap in defining the specific “Green Skills” required for the workforce. To support green jobs, the strategy needs a more granular roadmap that translates environmental targets into specific vocational training requirements for the youth.

- **Coherence:** The strategy demonstrates strong internal coherence by linking environmental protection with Pentagon 5 (Digital Development), mandating the use of AI and IT for climate monitoring. It also aligns industrial goals by promoting clean energy and waste management. Gaps & Green Job Connection: An institutional coherence gap exists between the environmental mandates of the Ministry of Environment and the training mandates of the Ministry of Labour (TVET). For green jobs to flourish, there must be a unified standard where “Green Work Directions” in this strategy are directly embedded into the National TVET competency standards.

- **Effectiveness:** The policy provides effective, actionable directions such as the “clean and efficient energy policy” and the deployment of agricultural technical officers to communes. These measures create a direct demand for green technicians and climate-smart agricultural specialists. Gaps & Green Job Connection: An effectiveness gap exists in the “skills supply” chain. While the policy creates demand for green practices, the current education and TVET systems are not yet producing graduates with the specific certifications needed to fill these new green roles, particularly in renewable energy and green construction.

- **Efficiency:** Efficiency is pursued through “rationalizing investments” in irrigation and adopting digital automation to lower the operational costs of environmental management. This encourages a transition toward high-productivity green sectors. Gaps & Green Job Connection: A resource efficiency gap is identified in the high cost of “Green Transition.” Implementing clean technology and automation requires significant upfront investment in equipment and specialized trainer training; without clear “Green Financing” for TVET institutions, the transition to green jobs may be slowed by outdated training tools.

- **Impact:** The intended long-term impact is a “vibrant society” with a “good balance between development and conservation.” By shifting toward low-carbon public investments, the policy aims to protect the economy from climate shocks while creating resilient jobs. Gaps & Green Job Connection: An inclusivity gap may arise if the “Green Economy” focus remains primarily on high-tech urban sectors. To ensure a broad impact, the strategy must ensure that green job opportunities are equally accessible to rural youth through decentralized training in sustainable farming and eco-tourism.

- **Sustainability:** To ensure lasting results, the policy promotes innovative funding such as “Green Bonds” and “Payment for Ecosystem Services (PES),” while emphasizing scientific research and technical training. Gaps & Green Job Connection: A capacity sustainability gap exists regarding the “Green Workforce.” Long-term sustainability depends on shifting the mindset of the labor market; unless “environmental morality” and green technical skills are institutionalized as a permanent part of the Cambodian workforce’s identity, the shift may remain dependent on external project-based funding.



### 2.6.2 The National TVET policy 2017-2025

- **Relevance:** The policy aims to transform the labor force into a “skilled and high-capacity” workforce to meet national and international market demands, specifically targeting youth, women, and marginalized groups. It identifies the need for skills that support industrialization and “value-added” economic growth. Gaps & Green Job Connection: A significant gap exists because the 2017 policy does not explicitly define or categorize “Green Jobs.” While it focuses on traditional industrial sectors, it lacks a dedicated framework for the specific technical competencies needed for the green transition, such as renewable energy maintenance, climate-smart agriculture, or circular waste management.
- **Coherence:** The policy seeks to harmonize TVET programs across various ministries and align them with the Industrial Development Policy 2015-2025 and the National Employment Policy. It emphasizes a “unified” TVET system to avoid duplication. Gaps & Green Job Connection: There is a coherence gap between this policy and the newer Pentagonal Strategy—Phase 1 and Cambodia Climate Change Strategic Plan. The TVET system’s current “Competency Standards” are not yet systematically linked to national environmental targets, meaning students may be trained for industrial roles that do not incorporate modern “green” efficiency standards.
- **Effectiveness:** The policy implements the Cambodia Qualifications Framework (CQF) and “Competency-Based Training” (CBT) to ensure training quality. It also introduces the “Skills Development Fund” to incentivize private sector involvement. Gaps & Green Job Connection: An effectiveness gap is found in the current curricula, which remains focused on “brown” industries (traditional construction, fossil-fuel-based electricity). Without updating these standards to include “green modules”—such as energy-efficient building or solar PV installation—the system will fail to produce the “Green Workforce” envisioned in Cambodia’s 2050 goals.
- **Efficiency:** Efficiency is pursued through “Public-Private Partnerships” (PPP) and “Sector Skills Councils” (SSC) to share the costs of training and ensure market alignment. Gaps & Green Job Connection: A resource efficiency gap exists in provincial training centers, such as those in Battambang. Green Job training requires specialized, modern equipment (e.g., hybrid engines, precision agriculture tools). Public TVET institutions currently lack the high-tech infrastructure and the specific budget allocations needed to purchase and maintain this equipment without heavy reliance on external donors.
- **Impact:** The intended long-term impact is to move Cambodia toward “Higher-Middle Income Country” status by increasing the income and productivity of workers. Gaps & Green Job Connection: An impact gap may emerge regarding youth employment. While the policy aims to reduce poverty, if the “Green Jobs” created in Cambodia are limited to high-tech urban areas, rural youth may be left behind. There is a need to ensure that the “Impact” of green vocational training reaches the agricultural and provincial heartlands to prevent a “green skills divide.”
- **Sustainability:** The policy focuses on “Professional Development for TVET Trainers” and institutionalizing the “Quality Assurance” system to maintain standards over time. Gaps & Green Job Connection: A capacity sustainability gap exists because there is a severe shortage of trainers certified in green technologies. For the green transition to be sustainable beyond 2025, Cambodia needs a comprehensive “Train-the-Trainer” program focused on environmental sustainability; otherwise, the system will remain dependent on foreign experts to teach green competencies (MLVT, 2017).

### 2.6.3 Green and digital technology in TVET policy framework 2024-2028

- **Relevance:** This framework is exceptionally relevant as it specifically bridges the gap between traditional vocational training and the “Dual Transformation” (Green and Digital) required by the Pentagonal Strategy. It directly defines Green Skills—such as resource efficiency, low-carbon production, and environmental protection—as essential for the future workforce. Gaps & Green Job Connection: Despite its high relevance, a gap exists in the “granularity of standards.” While the policy identifies the need for green skills, the specific technical competency standards for every trade (e.g., greening the traditional masonry or mechanical curricula) are still in the drafting phase, meaning students may not yet have access to standardized “green” certification across all sectors.
- **Coherence:** The policy shows high coherence with national goals, explicitly aligning with the National Strategic Plan on Green Growth 2013-2030 and the Digital Economy and Society Policy Framework. It creates a unified roadmap for the DGTVET department to synchronize environmental and digital targets. Gaps & Green Job Connection: An institutional coherence gap remains regarding “cross-ministerial data sharing.” For green jobs to be successfully filled, the labor market data from the Ministry of Environment must be seamlessly integrated with the training plans of the Ministry of Labour to ensure that graduates are being trained for the exact types of green infrastructure projects the government is funding.
- **Effectiveness:** The framework sets clear strategies to increase “Green Skills” in line with SDG 2030 commitments and to accelerate the digital transformation of TVET institutions. It mandates the “greening of TVET campuses” and curricula as a way to model sustainable behavior. Gaps & Green Job Connection: An effectiveness gap is identified in the “speed of adoption.” Transforming hundreds of traditional TVET institutions into “Green and Digital” hubs requires a massive overhaul of pedagogy; there is a risk that the transition remains a “pilot project” in urban centers while rural schools struggle to implement the new framework effectively.
- **Efficiency:** Efficiency is pursued by leveraging digital technologies to deliver green training more cost-effectively, such as using “virtual simulations” for high-cost green machinery training. It also emphasizes Public-Private-Partnerships (PPP) to share the costs of modernization. Gaps & Green Job Connection: A resource efficiency gap exists due to the “high cost of digital infrastructure.” While using digital tools to teach green skills is efficient in the long run, the initial investment in high-speed internet and hardware for provincial TVET centers (like those in Battambang) is a significant financial hurdle that may delay the rollout of green job training.
- **Impact:** The intended impact is to ensure that Cambodia’s youth are “future-ready” for Industry 4.0 and a low-carbon economy, thereby increasing their employability and national competitiveness. It aims to reduce the “skills mismatch” that currently hinders green investments. Gaps & Green Job Connection: An “equity impact gap” remains a concern. If the digital requirements for green job training are too high, there is a risk of excluding marginalized groups or rural youth who lack basic digital literacy, potentially widening the wealth gap rather than closing it through green employment.
- **Sustainability:** The policy focuses on “institutionalizing” green and digital technology within the DGTVET department and provincial offices. It prioritizes the “training of trainers” (ToT) in new technologies to ensure the system is self-sustaining. Gaps & Green Job Connection: A capacity sustainability gap exists because of the “trainer shortage.” The framework’s success depends on teachers who are proficient in both green and digital technologies; without a sustained, long-term incentive program to retain these highly-skilled trainers in the public sector, the quality of green job training may decline once external funding or project support ends.

## 2.6.4 National strategic plan on green growth (2013-2030)

- **Relevance:** The policy is a foundational document that establishes “Green Growth” as a fundamental means for sustainable development in Cambodia. It directly targets sectors like green industry, renewable energy, and sustainable natural resource management, which are the primary drivers for green job creation. Gaps & Green Job Connection: A relevance gap exists in its dated 2013 timeline. While it envisions a green economy, the plan does not provide a specific labor market roadmap or detailed vocational profiles for “Green Jobs.” As technologies like electric vehicles and advanced solar energy have evolved rapidly since 2013, the policy’s job-related objectives lack the technical specificity needed for today’s market.

- **Coherence:** The plan seeks to mainstream green growth into national and sectoral policies, aligning with the Rectangular Strategy (the predecessor to the Pentagonal Strategy). It emphasizes cross-ministerial cooperation through the National Council on Green Growth (NCGG). Gaps & Green Job Connection: An institutional coherence gap remains regarding the integration of green growth targets into the National TVET system. While the plan advocates for “Green Technology,” it is not systematically linked with the Ministry of Labour’s training standards, leading to a disconnect where green industry goals are set but the human capital to fulfill them is not explicitly planned.

- **Effectiveness:** The policy outlines nine strategic directions, including “Green Human Resources Development” and “Green Technology.” By promoting clean production and the “3Rs” (Reduce, Reuse, Recycle), it effectively creates a policy demand for specialized roles in waste management and energy efficiency. Gaps & Green Job Connection: An effectiveness gap is found in the “capacity building” pillar. The plan mentions human resource development broadly, but there has been a slow transition into actual specialized training programs. The result is a “skills shortage” where the demand for green techniques in SMEs exists, but the supply of certified green technicians is insufficient.

- **Efficiency:** Efficiency is pursued through the promotion of “Green Micro and Macro Finance” and “Green Taxes” (e.g., pollution reduction taxes). These financial instruments are intended to incentivize businesses to adopt efficient, low-cost green technologies. Gaps & Green Job Connection: A resource efficiency gap exists due to the limited accessibility of “Green Credit” for small-scale entrepreneurs and vocational training centers. Without affordable financing to upgrade to modern green equipment, provincial institutions struggle to provide the high-quality training necessary for the green jobs the policy envisions.

- **Impact:** The intended long-term impact is a balance between economic growth and environmental conservation, ensuring socio-economic prosperity through low-carbon development. It aims to reduce poverty while maintaining national identity and ecosystem safety. Gaps & Green Job Connection: An impact gap may emerge in terms of “equity.” While the plan targets national growth, there is a risk that green job opportunities may be concentrated in well-funded urban sectors. To achieve the intended impact, the policy must ensure that green employment reaches 80% of the population living in rural areas through sustainable agriculture and eco-tourism.

- **Sustainability:** To ensure lasting results, the policy focuses on institutionalizing green growth through “Green Investment” and the “Sustainable Use of Natural Resources.” It seeks to build a culture of environmental responsibility that persists through 2030 and beyond. Gaps & Green Job Connection: A capacity sustainability gap exists regarding the “Technical Workforce.” Since the plan relies heavily on “modernized technology” from international sources, the sustainability of Cambodia’s green transition is at risk unless there is a stronger focus on domestic R&D and a workforce that can maintain and innovate green technologies locally.



### 2.6.5 Circular economy strategy and action plan

- **Relevance:** This strategy is central to Cambodia’s green transition, focusing on the “3Rs” (Reduce, Reuse, Recycle) to transform waste management into a resource-productive sector. It directly targets the creation of sustainable value chains in areas like sustainable consumption, design, and waste collection. Gaps & Green Job Connection: A relevance gap exists regarding the formalization of “Green Jobs” within the informal sector. While the plan aims to train 500 informal waste workers by 2025, there is a lack of a clear regulatory pathway to transition these workers from informal, high-risk labor into formal, certified circular economy professionals with social protections.
- **Coherence:** The policy demonstrates strong coherence with the National Strategic Plan on Green Growth and the Pentagonal Strategy—Phase 1 by promoting resource efficiency as a driver of economic growth. It aligns with global SDG 12 (Sustainable Consumption and Production). Gaps & Green Job Connection: An institutional coherence gap exists in the coordination between the Ministry of Environment (MoE) and the Ministry of Labour (TVET). While the plan calls for integrating circular economy skills into university and TVET curricula by 2035, the current TVET standards for trades like construction or mechanical repair do not yet systematically include circular principles like “Design for Disassembly” or “Material Recovery.”
- **Effectiveness:** The strategy outlines clear, time-bound actions, such as increasing higher education training for circular economy facility services and enhancing SME capacity for sustainable production. It identifies specific “Priority Areas” (PA 5.2) for human resource development. Gaps & Green Job Connection: An effectiveness gap is found in the “scaling of expertise.” While the plan identifies the need for training, the actual number of specialized training centers capable of teaching advanced recycling technologies or “remanufacturing” is currently very low, limiting the ability to produce a workforce that can move Cambodia beyond simple waste collection into high-value green manufacturing.
- **Efficiency:** Efficiency is pursued through “Private Sector Engagement” and the promotion of “Extended Producer Responsibility” (EPR) to shift the financial and operational burden of waste management to producers. This is designed to create a market-driven demand for circular services. Gaps & Green Job Connection: A resource efficiency gap exists due to the lack of “Circular Infrastructure.” Training for green jobs in this sector requires access to modern sorting facilities, composting plants, and recycling laboratories. Without efficient public-private sharing of these facilities, TVET students may graduate with theoretical knowledge but no practical experience with the technologies used in a modern circular economy.
- **Impact:** The intended long-term impact is a decoupling of economic growth from environmental degradation, leading to a “zero-waste” society that creates resilient, local employment. It aims to improve the livelihoods of workers by turning waste into a valuable economic asset. Gaps & Green Job Connection: An impact gap may emerge if the “Circular Economy” remains focused solely on waste management. To maximize impact, the strategy must ensure that “Green Jobs” are created in the design and production phases (upcycling and eco-design), ensuring that Cambodian youth are involved in the high-value start-up ecosystem rather than just low-value waste processing.
- **Sustainability:** To ensure lasting results, the policy focuses on “Institutionalizing” circularity through a dedicated engagement strategy and by embedding circular economy principles into the national education system by 2035. It seeks to foster a permanent shift in consumer and producer behavior. Gaps & Green Job Connection: A capacity sustainability gap remains regarding “Trainer Expertise.” The strategy’s long-term success depends on trainers who can teach complex concepts like “Life Cycle Assessment” (LCA). Without a sustained program to develop a core group of Cambodian “Circular Economy Champions” in the TVET system, the movement toward green jobs may lose momentum once international project funding (like from UNDP or SIDA) concludes.

## 2.6.6 Cambodia's roadmap for sustainable consumption and production (SCP) 2022-2035

- **Relevance:** The roadmap is highly relevant as it provides a comprehensive plan to strengthen the sustainability of Cambodia's consumption and production systems. It focuses on resource efficiency, waste reduction, and sustainable lifestyles, which are the primary drivers for creating "green" roles in manufacturing, tourism, and agriculture. Gaps & Green Job Connection: A relevance gap exists in the explicit mapping of SCP actions to vocational training outputs. While the roadmap envisions a shift in how products are made and consumed, it does not detail the specific "Green Job" profiles (e.g., Sustainable Supply Chain Managers or Eco-design Technicians) required to lead this transition at the firm level.
- **Coherence:** The policy demonstrates strong coherence by aligning with the National Strategic Plan on Green Growth 2013-2030 and the Circular Economy Strategy. It serves as a bridge between environmental protection and economic competitiveness. Gaps & Green Job Connection: An institutional coherence gap remains regarding "Workforce Readiness." While the Ministry of Environment leads the SCP roadmap, there is a lack of integrated planning with the Ministry of Labour (TVET) to ensure that the "Green Skills" identified in the roadmap—such as life-cycle assessment or sustainable procurement—are actually taught in vocational schools.
- **Effectiveness:** The roadmap outlines clear, effective strategies for "Greening the Supply Chain" and promoting "Green Public Procurement" (GPP). By encouraging the government to buy green, it creates a guaranteed market demand for sustainable products and the green technicians needed to produce them. Gaps & Green Job Connection: An effectiveness gap is identified in the "SME Technical Capacity." Most Cambodian SMEs lack the technical know-how to meet the strict "Green Standards" mentioned in the roadmap. Without a massive technical assistance program to train SME employees in green production methods, the policy's effectiveness in transforming the broader economy will be limited.
- **Efficiency:** Efficiency is pursued through the promotion of "Resource Efficient and Cleaner Production" (RECP) techniques, which help businesses reduce costs by using less energy, water, and raw materials. It emphasizes a "win-win" approach where environmental goals improve business profitability. Gaps & Green Job Connection: A resource efficiency gap exists due to the lack of "Green Tech Labs" for testing and validation. Training workers for SCP requires access to specialized equipment for measuring environmental footprints; the current lack of shared technical facilities between industry and TVET institutions makes it difficult to train students efficiently in these modern methods.
- **Impact:** The intended long-term impact is a decoupling of economic growth from environmental degradation, ensuring that Cambodia's development remains within planetary boundaries. It aims to foster a "Green Culture" among consumers and producers alike. Gaps & Green Job Connection: An impact gap may emerge regarding "Behavioral Change." While the roadmap focuses on systems, the ultimate impact depends on individuals. There is a need for a stronger link between the roadmap and "Green Career Guidance" for youth, ensuring they see sustainable production not just as a regulation, but as a viable and prestigious career path.
- **Sustainability:** To ensure lasting results, the policy focuses on institutionalizing SCP through "Legal and Regulatory Frameworks" and by embedding sustainable consumption principles into the national education system. It seeks to build a permanent market for green goods and services. Gaps & Green Job Connection: A capacity sustainability gap remains regarding "Technical Trainers." The long-term success of SCP depends on a steady supply of trainers who can teach "Eco-innovation." Without a dedicated program to "Green the Trainers" in the TVET system, the technical implementation of this roadmap will remain heavily dependent on external international consultants.



Freepik.com, 2016

## 2.6.7 Cambodia power development master plan 2022-2040

- **Relevance:** The PDP is highly relevant as it provides a long-term roadmap for Cambodia’s energy security while prioritizing the integration of renewable energy sources like solar and wind. It directly responds to the increasing energy demand driven by economic growth and the national commitment to carbon neutrality. Gaps & Green Job Connection: A relevance gap exists in the explicit linking of energy infrastructure projects to labor market planning. While the plan details “megawatt” targets, it does not specify the number or type of “Green Jobs” (e.g., solar technicians, grid engineers) needed to build and maintain this new infrastructure, leaving the TVET sector without clear human resource targets.

- **Coherence:** The masterplan demonstrates strong coherence with international climate commitments and the Pentagonal Strategy—Phase 1 by aiming to maximize domestic renewable energy and reduce reliance on fossil fuels. It aligns technical grid expansion with national economic development goals. Gaps & Green Job Connection: An institutional coherence gap exists between the Ministry of Mines and Energy and the Ministry of Labour (TVET). While the PDP plans for massive renewable energy deployment, there is no joint task force to ensure that the TVET system is currently developing the specific competency standards required to operate the advanced high-voltage networks and battery storage systems mentioned in the plan.

- **Effectiveness:** The policy sets clear, measurable targets for energy mix diversification and the expansion of the high-voltage transmission network across all provinces. The plan’s commitment to “No New Coal” (except already committed projects) is an effective step toward a green economy. Gaps & Green Job Connection: An effectiveness gap is found in the “readiness of the local workforce.” The PDP relies heavily on imported technology and technical expertise for large-scale solar and wind projects. Without a parallel strategy to localize these skills, the “Green Jobs” generated by these energy projects may go to foreign consultants rather than Cambodian youth.

- **Efficiency:** Efficiency is pursued through “Least Cost Development Planning,” which utilizes advanced modeling to determine the most economical way to meet energy needs while integrating renewables. It emphasizes reducing electricity costs to enhance national competitiveness. Gaps & Green Job Connection: A resource efficiency gap exists in the training infrastructure. Preparing a workforce for specialized energy roles (like offshore wind or grid stability management) requires high-cost simulation labs. Currently, there is a lack of efficient sharing of technical facilities between the energy industry and TVET schools, leading to underutilized equipment in some areas and severe shortages in others.

- **Impact:** The intended long-term impact is a sustainable, reliable, and affordable energy supply that powers Cambodia’s transition to a high-middle-income country. It aims to reduce the environmental footprint of the energy sector significantly by 2040. Gaps & Green Job Connection: An impact gap may emerge regarding “energy justice.” While the plan improves national grid access, the “Green Job” opportunities created by decentralized energy solutions (like off-grid solar for rural communities) must be intentionally targeted toward local youth to ensure the economic benefits of the energy transition are felt in the provinces.

- **Sustainability:** To ensure lasting results, the PDP focuses on building a resilient “Smart Grid” and promoting “Energy Efficiency” across all sectors. It seeks to institutionalize long-term energy planning through periodic updates and technical capacity building. Gaps & Green Job Connection: A capacity sustainability gap exists due to the “maintenance burden.” The long-term sustainability of Cambodia’s renewable energy assets depends on a domestic workforce capable of sophisticated repairs and upgrades. Without a dedicated “Green Energy TVET” program, the infrastructure built today may face operational decline if international technical support is withdrawn in the future (MME, 2022).

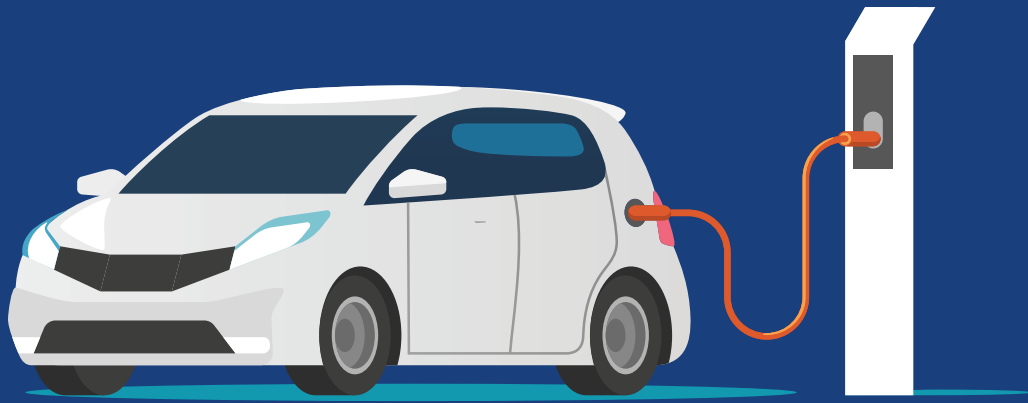


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## 2.6.8 National energy efficiency policy (NEEP) 2022-2030

- Relevance:** The PDP is highly relevant as it provides a long-term roadmap for Cambodia’s energy security while prioritizing the integration of renewable energy sources like solar and wind. It directly responds to the increasing energy demand driven by economic growth and the national commitment to carbon neutrality. Gaps & Green Job Connection: A relevance gap exists in the explicit linking of energy infrastructure projects to labor market planning. While the plan details “megawatt” targets, it does not specify the number or type of “Green Jobs” (e.g., solar technicians, grid engineers) needed to build and maintain this new infrastructure, leaving the TVET sector without clear human resource targets.
- Coherence:** The masterplan demonstrates strong coherence with international climate commitments and the Pentagonal Strategy—Phase 1 by aiming to maximize domestic renewable energy and reduce reliance on fossil fuels. It aligns technical grid expansion with national economic development goals. Gaps & Green Job Connection: An institutional coherence gap exists between the Ministry of Mines and Energy and the Ministry of Labour (TVET). While the PDP plans for massive renewable energy deployment, there is no joint task force to ensure that the TVET system is currently developing the specific competency standards required to operate the advanced high-voltage networks and battery storage systems mentioned in the plan.
- Effectiveness:** The policy sets clear, measurable targets for energy mix diversification and the expansion of the high-voltage transmission network across all provinces. The plan’s commitment to “No New Coal” (except already committed projects) is an effective step toward a green economy. Gaps & Green Job Connection: An effectiveness gap is found in the “readiness of the local workforce.” The PDP relies heavily on imported technology and technical expertise for large-scale solar and wind projects. Without a parallel strategy to localize these skills, the “Green Jobs” generated by these energy projects may go to foreign consultants rather than Cambodian youth.
- Efficiency:** Efficiency is pursued through “Least Cost Development Planning,” which utilizes advanced modeling to determine the most economical way to meet energy needs while integrating renewables. It emphasizes reducing electricity costs to enhance national competitiveness. Gaps & Green Job Connection: A resource efficiency gap exists in the training infrastructure. Preparing a workforce for specialized energy roles (like offshore wind or grid stability management) requires high-cost simulation labs. Currently, there is a lack of efficient sharing of technical facilities between the energy industry and TVET schools, leading to underutilized equipment in some areas and severe shortages in others.
- Impact:** The intended long-term impact is a sustainable, reliable, and affordable energy supply that powers Cambodia’s transition to a high-middle-income country. It aims to reduce the environmental footprint of the energy sector significantly by 2040. Gaps & Green Job Connection: An impact gap may emerge regarding “energy justice.” While the plan improves national grid access, the “Green Job” opportunities created by decentralized energy solutions (like off-grid solar for rural communities) must be intentionally targeted toward local youth to ensure the economic benefits of the energy transition are felt in the provinces.
- Sustainability:** To ensure lasting results, the PDP focuses on building a resilient “Smart Grid” and promoting “Energy Efficiency” across all sectors. It seeks to institutionalize long-term energy planning through periodic updates and technical capacity building. Gaps & Green Job Connection: A capacity sustainability gap exists due to the “maintenance burden.” The long-term sustainability of Cambodia’s renewable energy assets depends on a domestic workforce capable of sophisticated repairs and upgrades. Without a dedicated “Green Energy TVET” program, the infrastructure built today may face operational decline if international technical support is withdrawn in the future.



## 2.6.9 Cambodia automotive and electronics sector development roadmap

- **Relevance:** The roadmap is highly relevant as it identifies the automotive and electronics sectors as key pillars for economic diversification and “moving up the value chain.” It specifically targets high-growth segments like Electric Vehicle (EV) assembly and electronic component manufacturing, which are central to the global green transition. **Gaps & Green Job Connection:** A relevance gap exists regarding the specific “Green Competencies” required for EV maintenance and sustainable electronics manufacturing. While the roadmap focuses on investment and infrastructure, it lacks a detailed breakdown of the vocational standards needed for “Circular Electronics” (repair and recycling) or the specialized safety protocols for high-voltage EV battery handling.
- **Coherence:** The policy demonstrates strong coherence with the Industrial Development Policy (IDP) and the Pentagonal Strategy—Phase 1 by aiming to modernize the industrial base. It aligns with national “Green Growth” goals by encouraging the production of energy-efficient appliances and low-emission vehicles. **Gaps & Green Job Connection:** An institutional coherence gap persists between the Council for the Development of Cambodia (CDC) and the Ministry of Labour (TVET). While the roadmap sets ambitious production targets for 2027 and 2030, there is no synchronized “Green Labour Market Information System” to ensure that TVET institutions are graduating enough technicians with the specific skills required by these new green-tech investors.
- **Effectiveness:** The roadmap outlines clear, effective strategies to improve the investment climate, including the development of “Special Economic Zones” (SEZs) and “Cluster-based” industrial development. The focus on human capital through “sector-specific training” aims to reduce the current skills shortage in technical fields. **Gaps & Green Job Connection:** An effectiveness gap is found in the “Industry-Academia Linkage.” While the policy plans for skilled labor, the current TVET workshops are not yet effectively equipped with the advanced robotics and precision tools used in modern automotive assembly, making it difficult for local graduates to fill high-value green jobs without extensive on-the-job retraining.
- **Efficiency:** Efficiency is pursued through the “One-Stop Service” for investors and the promotion of “Lean Manufacturing” to reduce waste and operational costs. It emphasizes the use of digital trade facilitation to speed up the import-export process for critical components. **Gaps & Green Job Connection:** A resource efficiency gap exists in the high cost of “Green Testing Labs.” To ensure that Cambodian-made electronics meet international energy-efficiency standards, the country needs specialized certification facilities. Currently, the lack of such local infrastructure forces companies to use foreign labs, increasing costs and slowing down the growth of the green manufacturing sector.
- **Impact:** The intended long-term impact is a structural transformation of the economy, creating over 20,000 new jobs in automotive and 10,000 in electronics by 2030. It aims to increase exports and improve the livelihoods of workers through higher-wage technical employment. **Gaps & Green Job Connection:** An impact gap may emerge if the “Green Jobs” created are primarily low-skill assembly roles. To achieve a sustainable socio-economic impact, the roadmap must move beyond assembly and foster “Design and Engineering” jobs, ensuring that Cambodian youth are not just users of green technology but also innovators and maintainers of it.
- **Sustainability:** To ensure lasting results, the policy focuses on institutionalizing the “Roadmap Secretariat” and building long-term partnerships with global lead firms. It seeks to create a “virtuous cycle” of investment and skill development that persists through different economic phases. **Gaps & Green Job Connection:** A capacity sustainability gap exists regarding the “Local Supply Chain.” If the green jobs are only in foreign-owned firms that import all their components, the domestic sustainability of the industry is weak. The roadmap needs a stronger focus on “Green SME Linkages” to ensure that local Cambodian businesses can supply sustainable parts and services to these major manufacturers.



# 3

## Research methodology

### 3.1 Research timeframe

This research started from June 2025 until February 2026 (see Table 2). In this period, there are seven main steps/outputs, including literature review and research framework design, development of research tools, training for a research team and consultants, conducting field data collection, data cleaning and analysis, report drafting and validation, report drafting and validation and validation and report finalization and submission. There are six researchers (2 females) involved in this research, including three researchers and three field data collectors in Battambang province.

Table 2: Research timeframe

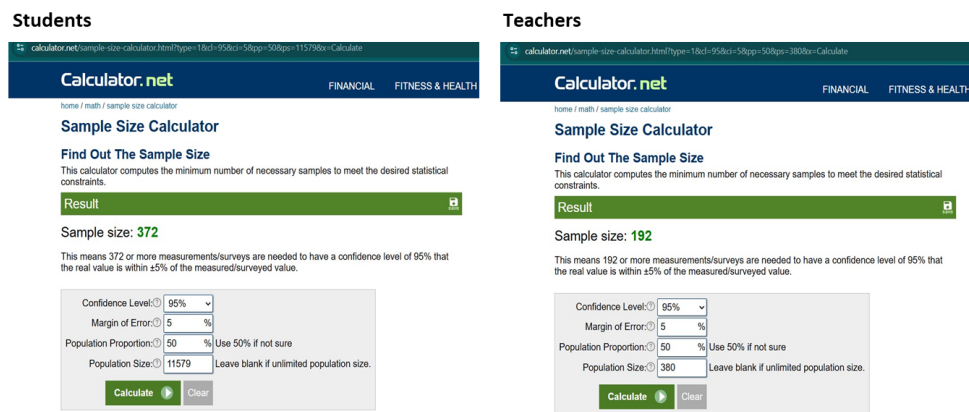
Step	Outputs/activities	Jun 2025	Jul 2025	Aug 2025	Sep 2025	Oct 2025	Nov 2025	Dec 2025	Jan 2026	Feb 2026
<b>Step 1: Literature review and research framework design</b>										
1	Conduct inception meeting with the research team	x								
2	Conduct literature review	x								
3	Draft a research framework	x								
4	Draft the report content	x								
<b>Step 2: Development of research tools</b>										
5	Develop questionnaires with various interviewees	x								
<b>Step 3: Training for a research team and data collectors</b>										
6	Train to the research team and enumerators in Battambang		x							
7	Test developed questionnaires with target interviewees		x							
8	Debriefing and reflect on pre-test results		x							
9	Revise questionnaires after the pre-test		x							
10	Prepare other official administrative letters for a full survey		x							
<b>Step 4: Field data collection-mixed explanatory approach</b>										
11	Collect data with students and teachers (Quantitative)		x	x						
12	Conduct FGDs with students and teachers (BIT, RPITSB and NVIB) (Qualitative)		x	x						
13	Conduct KII with TVET management and leadership (BIT, RPITSB and NVIB) (Qualitative)		x	x						
14	Conduct KII with NGOs working in TVETs (Qualitative)		x	x						
15	Conduct KII with private companies working in TVETs (Qualitative)		x	x						
16	Conduct KII with MLVT/DGTVET working in TVETs (Qualitative)		x	x						
17	Mid/progress report to AAC (financial and narrative reports) (31st Aug 25)									
<b>Step 5: Data cleaning and analysis</b>										
18	Conduct data cleaning		x	x						
19	Conduct data entry in Google/Microsoft Forms		x	x	x					
20	Conduct data analysis in Excel				x	x				
<b>Step 6: Report drafting and validation</b>										
21	Draft a research report						x	x		
22	Complete the report (financial and narrative reports) (31 Dec 25)									
<b>Step 7: Finalisation and submission</b>										
23	Revise the research report and finalise the design								x	
24	Finalise the research report									x

## 3.2 Research methods and sampling

This research applied to a mixed-method explanatory approach, where quantitative research (first) followed by qualitative research (second) to explore and explain key findings in greater depth and insights.

### 3.2.1 Quantitative method

Figure 6: Sample size of the study



• **Surveys:** The study collected data from teachers and students from three TVET institutions in Battambang Province such as Regional Polytechnic Institute Techo Sen Battambang (RPITSB), National Vocational Institute of Battambang (NVIB), and Battambang Institute of Technology (BIT). Sample sizes were determined using a 95% confidence level and a 5% margin of error, based on calculations from an online sample size calculator (<https://www.calculator.net/sample-size-calculator.html>), as illustrated in Figure 6. The final sample included 372 students from a total student population of 11,579 and 192 teachers from a total teacher population of 380 across the three target institutions.

• **GEDSI Considerations:** the study incorporated a Gender Equality, Disability, and Social Inclusion (GEDSI) perspective to ensure that diverse participant characteristics were captured in Table 3. Overall, female respondents comprised 46.10% of the sample, while male respondents represented 53.90%. Participants with any form of disability accounted for 6.85% of the total sample, with the majority (94.15%) reporting no disability. Regarding age, over half of the respondents (52.13%) were youth aged 18–25 years, while the remaining participants were distributed across older age groups. In terms of socio-economic status, the majority of respondents were classified as medium-income (57.80%), with smaller proportions falling into poor, near-poor, and better-off categories. In terms of educational qualifications, participants were distributed across the Cambodian Qualification Framework (CQF) levels, with the majority holding C1 certificates (43.44%), followed by Higher Diplomas (22.34%), Bachelors (21.99%), Masters (7.27%), and smaller proportions in Vocational Certificates (1.60%), C2 (1.60%), and C3 (1.77%). This inclusion of GEDSI and CQF data ensured that the study reflected a diverse and representative sample of TVET students and teachers.

Table 3: Demographic information of research participants (n=564)

GEDSI	Variables	Students (#)	Teachers (#)	Total (#)	Students (%)	Teachers (%)	Overall (%)
Gender	Female	176.00	84.00	260.00	47.31%	43.75%	46.10%
	Male	196.00	108.00	304.00	52.69%	56.25%	53.90%
Disability	Physical	7.00	13.00	20.00	1.88%	6.77%	3.55%
	Hearing	2.00	3.00	5.00	0.54%	1.56%	0.89%
	Visioning	8.00	7.00	15.00	2.15%	3.65%	2.66%
	Intellectual	-	3.00	3.00	0.00%	1.56%	0.53%
	No disability	356.00	175.00	531.00	95.70%	91.15%	94.15%
Age	Under 18 years	53.00	1.00	54.00	14.25%	0.52%	9.57%
	18-25 years	269.00	25.00	294.00	72.31%	13.02%	52.13%
	26-35 years	38.00	56.00	94.00	10.22%	29.17%	16.67%
	36-45 years	8.00	94.00	102.00	2.15%	48.96%	18.09%
	46-55 years	3.00	11.00	14.00	0.81%	5.73%	2.48%
	More than 55 years	1.00	5.00	6.00	0.27%	2.60%	1.06%
Economic status	Poor 1	39.00	5.00	44.00	10.48%	2.60%	7.80%
	Poor 2	94.00	18.00	112.00	25.27%	9.38%	19.86%
	Near-poor	57.00	13.00	70.00	15.32%	6.77%	12.41%
	Medium-income	173.00	153.00	326.00	46.51%	79.69%	57.80%
	Better-off / Not poor	9.00	3.00	12.00	2.42%	1.56%	2.13%
Cambodia Qualification Framework (CQF)	Vocational Certificate	1.00	8.00	9.00	0.27%	4.17%	1.60%
	C1	211.00	34.00	245.00	56.72%	17.71%	43.44%
	C2	9.00	-	9.00	2.42%	0.00%	1.60%
	C3	7.00	3.00	10.00	1.88%	1.56%	1.77%
	Higher Diploma	112.00	14.00	126.00	30.11%	7.29%	22.34%
	Bachelor	32.00	92.00	124.00	8.60%	47.92%	21.99%
	Master	-	41.00	41.00	0.00%	21.35%	7.27%



**Figure 7:** Photos of individual survey with a teacher at RPITSB and student at NVIB.

### 3.2.2 Qualitative method

**Focus Group Discussions (FGDs):** FGDs were conducted separately with TVET students and teachers to understand their aspirations, experiences, and challenges in green job participation, and to gather feedback on TVET curriculum effectiveness in preparing students for green employment. There were six FGDs conducted: three with teachers and three with students (current, graduated and employed). The three FGDs with teachers involved 28 participants (12 females), while the three FGDs with students consisted of 26 people (9 females).



**Figure 8:** Photos of FGDs among teachers at BIT and students at NVIB.



**Figure 9: Photos of KII with TVET management at NVIB and RPITSB.**

**Key Informant Interviews (KIIs):** KIIs were conducted to collect information from TVET management and leadership, policy makers (MLVT/ DGTVET), private sector and NGO representatives (NGOs and private companies). The main topics discussed in KIIs included the role of government policies in promoting green skills development, the effectiveness of public-private partnership in TVET and employer perspectives on green job demand and required skills, among others. The research team was responsible for collecting this data from various stakeholders in skill supply and demand sides in the TVET system. This sample of KIIs included nine participants (1 female) in leadership and management roles in these TVET institutions, six representatives of DGTVET (1 female), and 14 participants (1 female) from the private sector and NGOs. The KIIs were conducted online via Microsoft Forms.

**Consultative workshop:** A consultative workshop was conducted on 23 February 2026 at TRIBE Phnom Penh Post Office Square Hotel to present key research findings, validate results through stakeholder feedback, and identify gaps related to green jobs readiness. The workshop included approximately 18 participants from the Directorate General of Technical and Vocational Education and Training (DGTVET), TVET institutions, NGOs, and private sector stakeholders. The workshop generated targeted feedback aimed at strengthening the overall quality and applicability of the research. This included improving the structure and coherence of the report, enhancing the analytical rigor of the literature and policy review through clearer criteria and use of relevant sources, and ensuring that recommendations are prioritized, actionable, and supported by monitoring and evaluation considerations. Participants also emphasized the importance of integrating demand-side perspectives, particularly in identifying private sector skills needs, embedding green skills within existing occupations, and addressing inclusion dimensions such as disability. All feedback was systematically reviewed and incorporated into this final research report.

**Policy/Document Review:** Relevant government policies and strategies related to green skills and TVET were reviewed to identify alignment with global and national priorities and assessed the effectiveness of existing frameworks in promoting green jobs. There were various policies or strategies endorsed by the Cambodian governments related to enhancement of green skills and jobs. Those policies were fully adopted by the Ministry of Labour and Vocational Training (MLVT), the Ministry of Minerals and Power (MMP), the Ministry of Environment (MoE), and the Ministry of Agriculture, Forestry and Fishery (MAFF). Other documents were research articles collected from NGOs, banks, and other institutions.

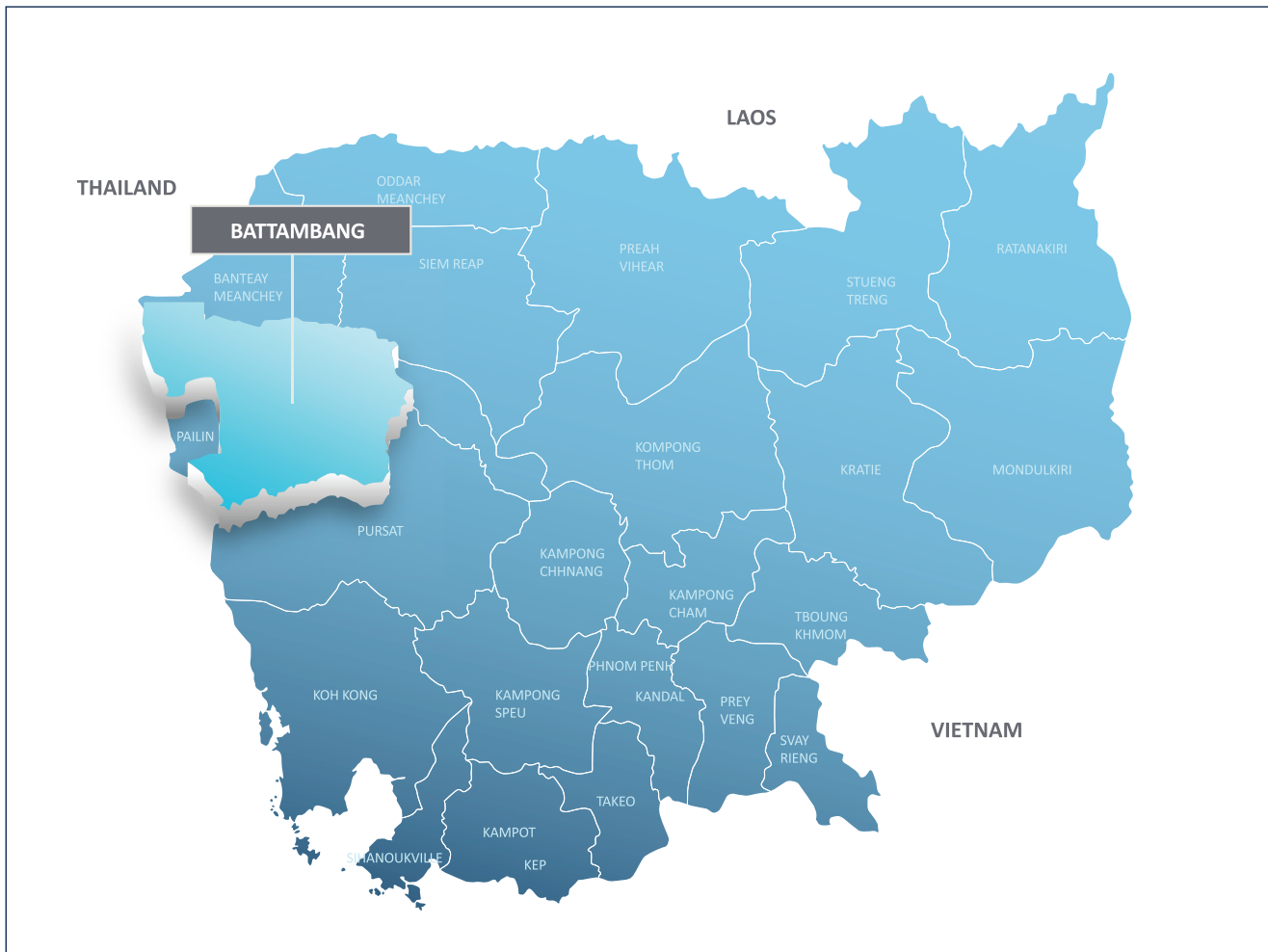


### 3.2.3 Geographic focus: Battambang province

Battambang is located in the northwest of Cambodia, approximately 291 km from Phnom Penh, the capital city. The province shares its western border with Pailin province and Thailand, its eastern border with Pursat province and the Tonle Sap Lake, its northern border with Banteay Meanchey and Siem Reap provinces, and its southern border with Pursat province. Along the western side, it has a 144.8 km border with Chantrea, Trat, and Sra Keo provinces of Thailand (BTB, 2024).

The province covers a total area of 11,748 km<sup>2</sup>. It is administratively divided into 13 districts and one municipality, comprising 92 communes and 10 Sangkats, with a total of 809 villages (2018 data). Battambang has about 258,682 households, equivalent to a population of 1,232,706 people (approximately 616,854 female). Around 56% of the population consists of potential labour forces aged 18-35. Most of the population (about 72.2%) work in the agricultural sector as their main source of income (BTB, 2024). Battambang is considered the leading rice producer of the country. This province alone was able to harvest more than 4.5 million tons of rice in 2023, which strongly contributed to the national rice production. The province consists of fertile plains and many irrigation systems to support both wet and dry season rice (BTB, 2024).

Figure 10: Battambang province's map (source: Google Map)



### 3.3 Data collection and cleaning

- **Data collection:** Data collection was separated into two ways. The first way was to collect physically for a survey and focused groups discussions and KII with TVET management and leadership; however, the second way was to interview representatives of the private sector and policymakers (DGTVET) by using an online Microsoft Forms. Moreover, this research was mainly collected by three data collectors (2 females) in the three target TVETs. These data collectors were well trained, coached and reflected along the way of data collection by the AAS researchers.
- **Data cleaning:** All questionnaires and answers of checklists for FGDs were cleaned daily and supervised by two supervisors of the AAS research team. All unclear information was double checked and confirmed by the interviewees. This ensures that all quality data were properly collected and cleaned before entry and analysis.

### 3.4 Data analysis

- **Quantitative data analysis**

**Descriptive statistics:** It was used to analyze numerical data such as perceptions, choices, trends, and projections. Most of survey data was analyzed by Microsoft Excel.

- **Qualitative data analysis**

**Thematic analysis:** It was used for interviews, focus groups, and policy reviews to identify key themes in research impact and application. Furthermore, some direct quotations from the interviewees were used to emphasize and support the findings.

### 3.5 Limitations and ethical considerations

- The study was commissioned at Battambang Province. While Battambang is an important agricultural and emerging economic hub, the findings may not fully represent conditions in other provinces and areas, such as Phnom Penh city, coastal areas, or industrial zones where green job demands, infrastructure, and private sector engagement differ.
- The involvement of the private sector and policymakers, particularly from green industries (renewable energy, waste management, sustainable construction), may be limited. This can restrict the depth of analysis on labour market demands and employer perspectives on required green skills.



# 4

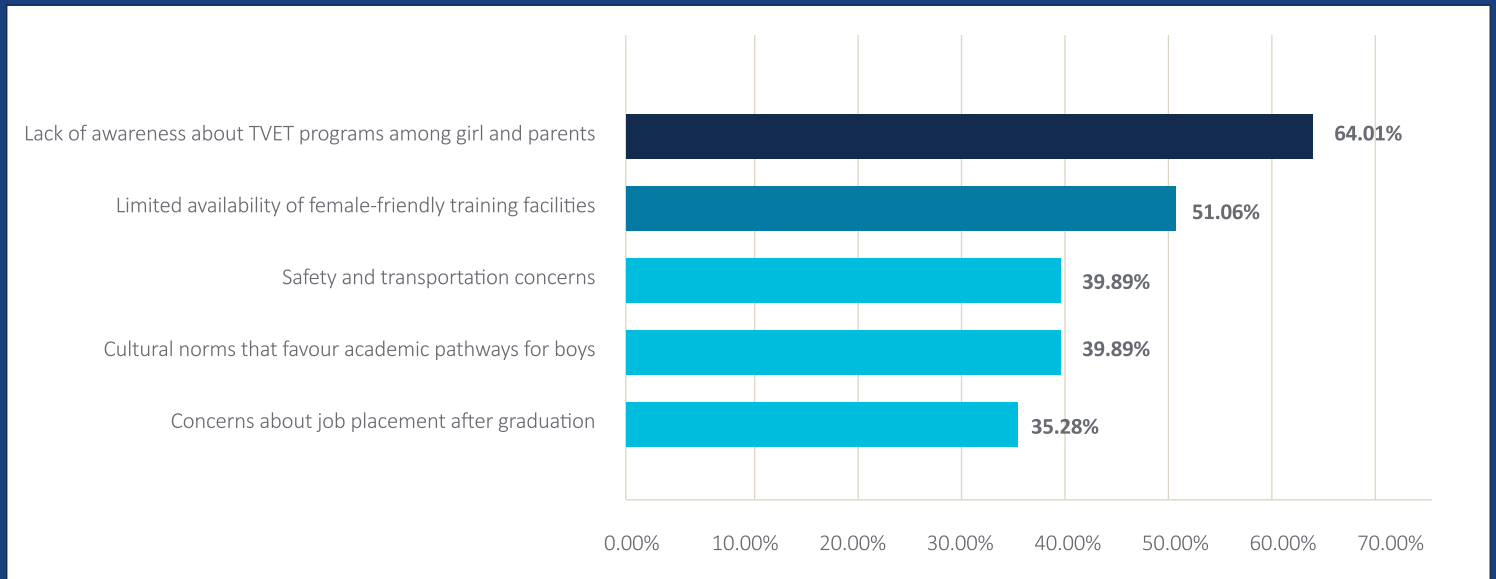
## Results and Discussion

### 4.1 Advancing inclusive green skills in TVET: Gender, Disability, and Social Equity (GEDSI)

#### 4.1.1 Challenges for enrollment of female students in TVET

Figure 11 illustrates the main challenges faced by female students in enrolling in TVET training programs. The primary challenge, reported by 64.01% of the respondents, was a lack of awareness about TVET programmes among female students and their parents. The second most frequently cited challenge, identified by 51.06% of the respondents, was the limited availability of female-friendly training facilities within TVET institutions. In addition, 39.89% of the respondents highlighted concerns related to safety, transportation, and cultural norms that prioritize academic pathways for male students. Finally, approximately 35.28% of the respondents expressed apprehension regarding job placement or apprenticeship opportunities following graduation.

**Figure 11: Main challenges of females for TVET enrollment**



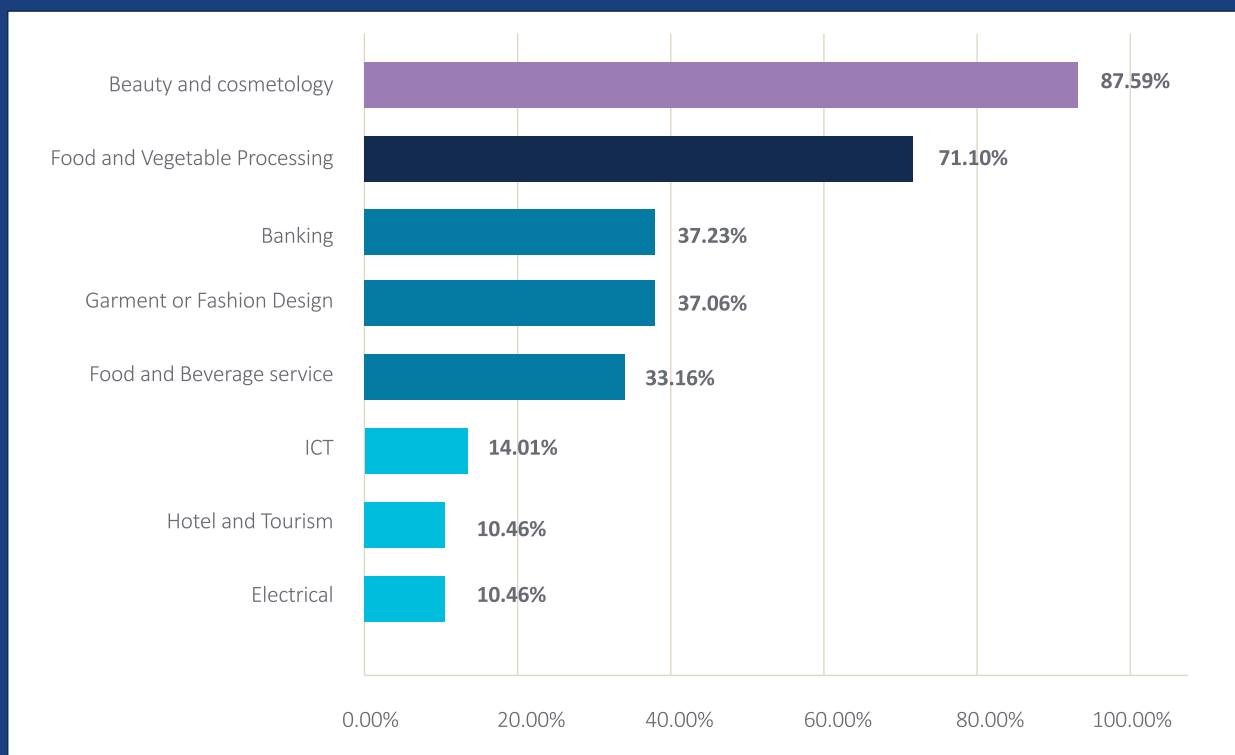
Similar results were noted in the FGDs. For example, the students agreed that girls are less likely to join TVET programmes since most courses are viewed as labor-intensive and designed for men. Some barriers of their access included far distance from home, poor transportation, security and safety issues. Cultural norms and family attitudes also discourage girls from studying technical skills, while limited job opportunities and lack of information from TVET institutions further reduce motivation. One student stated, “The limited educational background of parents and guardians is a major barrier to female student enrollment in TVET programmes.”

In addition, the teachers believed that strong gender norms and community perceptions limit female participation. They said many families considered TVET work to be not fully suitable for girls and prefer them to consider office-based jobs. Moreover, limited awareness, safety concerns, and limited female role models were also recognized as barriers.

## 4.1.2 Female-dominated TVET courses

The survey data from the students and teachers indicate a clear gender-based concentration in certain occupations. Beauty and Cosmetology emerged as the most preferred programme among female students, with 87.59% of the respondents agreed. Food and Vegetable Processing was ranked as the second most popular field, cited by 71.10% of the respondents. Banking and Garment or Fashion Design were identified as the third and fourth most common areas of enrolment, each mentioned by approximately 37% of the respondents. In addition, around 33.16% of the respondents reported that Food and Beverage Services programmes were predominantly attended by female students.

**Figure 12: TVET courses with the highest female enrollment**



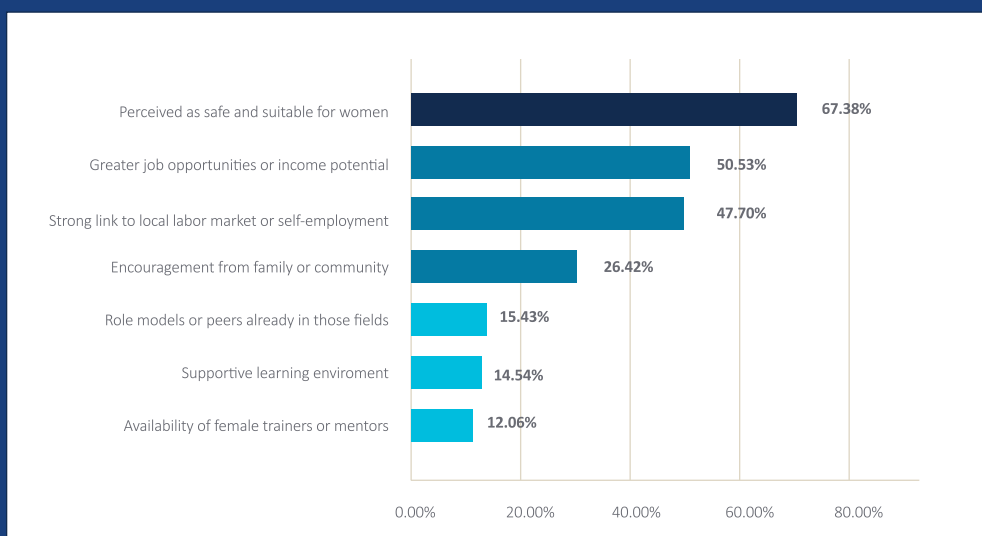
It is important to note that there were no differences between results of the above survey and the FGDs with students and teachers. The students in the FGDs reported that girls most often select and prefer TVET fields such as beauty and cosmetology, tailoring, IT or computer administration (short courses), agro-processing, and salon services. Some also highlighted preferences for graphic design, electricity, and construction, though these are less common. They explained that these fields are more popular among female students because they require less physical labour, are socially acceptable for women, and are supported by parents and communities. In addition, beauty-related and tailoring skills are considered suitable for women and provide good opportunities for self-employment. They also noted that these fields reflect current work trends for women and are seen as areas where women can easily find jobs after graduation.

Moreover, the teachers in the FGDs observed that female students commonly enroll in agro-processing, IT, construction engineering, banking and finance, beauty and salon, electricity, agriculture, and administration. They explained that these programs attract girls because of the available incentives, scholarships, and free dormitories provided by TVET institutions. These teachers added that graduates in these fields have better employment opportunities, can start their own small businesses, and often follow the successful examples of their peers. They also noted that girls consider these occupations easier compared to other technical fields and more aligned with community expectations.

### 4.1.2.1 Reasons for enrollment in TVET courses

According to the survey responses from both students and teachers, several rationales were identified to explain why female students were predominantly enrolled in the above-mentioned TVET courses. The primary reason was the perception that these occupations or programmes were safe and suitable for female students, with 67.38% of the respondent's expressing agreement. The second most frequently cited reason was the expectation of better employment opportunities or income-generating potential, reported by 50.53% of the respondents. In addition, 47.70% of respondents indicated that these courses had strong linkages to the local labour market or opportunities for self-employment. Furthermore, 26.42% of the respondents noted that female students were strongly encouraged by their families or communities to enroll in these training programs.

Figure 13: Reasons to select TVET courses for females.



### 4.1.3 Strategies to increase female enrollment in TVET

Table 4 indicates strong support for strategies promoting female participation in TVET programs. Promoting successful female graduates as ambassadors received 59.9% agreement and 16.7% strong agreement, highlighting the importance of visible role models. Career guidance in schools with gender-sensitive messaging was supported by 57.8% agreement and 13.0% strong agreement, demonstrating the value of guidance and tailored support. Role models of successful females received 55.7% agreement and 24.0% strong agreement. Ensuring safe and inclusive facilities, such as restrooms and dormitories, had 54.2% agreement and 20.3% strong agreement, underscoring the need for a secure learning environment. Awareness campaigns targeted at girls and parents received 52.1% agreement and 13.0% strong agreement, while partnering with women-led businesses and role models had 51.6% agreement and 21.4% strong agreement. Offering non-traditional trades training to females, such as electrical or mechanical skills, received 49.0% agreement and 10.4% strong agreement, suggesting some hesitancy toward these options. Finally, offering scholarships or stipends for female students received 47.9% agreement and 31.8% strong agreement, highlighting the importance of financial incentives.

Table 4: Teacher perceptions on strategies to increase female enrollment in TVET (n=192)

Strategies	Strategies Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Promoting successful female graduates as ambassadors	5.20%	3.60%	14.60%	59.90%	16.70%	100.00%
Career guidance in schools with gender-sensitive messaging	0.50%	1.60%	27.10%	57.80%	13.00%	100.00%
Role model of successful female		3.60%	16.70%	55.70%	24.00%	100.00%
Ensuring safe and inclusive facilities (e.g., restrooms, dorms)	1.50%	5.20%	18.80%	54.20%	20.30%	100.00%
Awareness campaigns targeted at girls and parents	2.10%	1.00%	31.80%	52.10%	13.00%	100.00%
Partnering with women-led businesses and role models	2.00%	1.60%	23.40%	51.60%	21.40%	100.00%
Offering non-traditional trades training to females (e.g., electrical, mechanics)	8.30%	7.30%	25.00%	49.00%	10.40%	100.00%
Offering scholarships or stipends for female students	3.10%	1.60%	15.60%	47.90%	31.80%	100.00%

Analysis of FGDs with TVET teachers and students indicate similar results. The students in the FGDs agreed that increasing female enrollment in TVET requires raising community awareness, providing scholarships and dormitories, offering workshops and internships, and delivering counseling on suitable majors for women. They emphasized that female students should be given priority and support, and that more efforts are needed to introduce TVET programs and explore job opportunities for women. As one student stated, “TVET programmes are not only for men but equally for women; thus, awareness-raising, counseling and ongoing support are crucial strategies to attract more female students to enroll”.

Also, the teachers who participated in the FGDs mentioned similar strategies, noting the importance of scholarships, dormitories, and job opportunities to attract female students. They also recommended community outreach, showcasing successful women graduates, role models among female teachers, and extending trainings and job fairs to women. The teachers also emphasized that demonstrating the potential for self-employment and business opportunities in fields like fruit processing can encourage female participation. One teacher explained, “To attract more female students to TVET, a key strategy is to showcase successful women graduates with decent jobs. Their stories can be used in community awareness and counseling to help women feel more confident and comfortable in choosing and completing TVET programmes successfully.”

## 4.2 Disability inclusion in TVET

### 4.2.1 Barriers for people with disabilities

There were some challenges encountered by people with disabilities in participating in TVET. As shown in Table 5, about 63.48% of the participants agreed that there was a lack of assistive tools or accessible training equipment. Secondly, around 44.68% reported that physical infrastructures in TVET institutions were inaccessible while approximately 41.13% believed that TVET lacked tailored training courses for different types of disabilities. In addition, around 30.67% agreed that there was limited career guidance for people with disabilities during their study.

**Table 5: Main barriers for people with disabilities in participating in TVET (n=564)**

Key challenges	# Student	# Teacher	Total	% Student	% Teacher	% Overall
A lack of assistive tools or accessible training equipment	233	125	<b>358</b>	62.63%	65.10%	<b>63.48%</b>
Inaccessible physical infrastructure (e.g., stairs, narrow pathways)	176	76	<b>252</b>	47.31%	39.58%	<b>44.68%</b>
A lack of tailored training courses for different types of disabilities	155	77	<b>232</b>	41.67%	40.10%	<b>41.13%</b>
Limited career guidance for people with disabilities	129	44	<b>173</b>	34.68%	22.92%	<b>30.67%</b>
Limited policy or institutional support for inclusion	27	19	<b>46</b>	7.26%	9.90%	<b>8.16%</b>
Absence of disability-inclusive communication channels	39	6	<b>45</b>	10.48%	3.13%	<b>7.98%</b>
Negative attitudes or lack of awareness among staff/students	25	17	<b>42</b>	6.72%	8.85%	<b>7.45%</b>

Data from the FGDs indicate similar results. The students who joined the FGDs mentioned that students with disabilities reported facing multiple challenges in TVET programmes. They mentioned difficulties in practicing certain tasks, concentrating, accessing materials and equipment, and performing work in workshops. They mentioned that some students experienced discrimination in verbal interactions and attitudes, had trouble listening to trainers, moving around the campus, or traveling, and required personal assistance from family or friends. Writing and practical exercises were also reported as challenging, and some students described themselves as slow learners.

## 4.2.2 Accessibility/supported mechanisms

Based on results of the survey, there were three main strategies that strongly contributed to improving accessibility for people with disabilities at TVET institutes (Table 6). The first strategy was improvement of staff behavior. In fact, around 56.38% agreed, and 17.91% strongly agreed that staff should be trained to use respectful and inclusive languages. In addition, about 50.53% agreed and 10.82% strongly agreed that staff should use positive and supportive body language. Moreover, 41.31% agreed and 8.16% strongly agreed that awareness campaigns about disability inclusion should be raised in communities. Next, physical accessibility is considered for physical aspects either. For instance, 35.11% of respondents agreed and 10.64% strongly agreed that accessible toilet facilities should be constructed to ensure equal accessibility for people with disabilities. In TVET context, 32.62% agreed and 6.21% strongly agreed that tools or machines should be modified to increase more accessibility for people with disabilities. In terms of information accessibility, around 55.85% agreed and 14.89% strongly agreed that prioritized registration for students with disabilities into TVET training programs should be done. Furthermore, use of accessible Information, Education, and Communication (IEC) materials should be effectively implemented due to agreement (40.07%) and strong agreement (9.57%).

**Table 6: Supported accessibility for people with disabilities in TVET institutes (n =192)**

Accessibilities	Overall(%)					
	Strategies Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
<b>A-Staff Behavior</b>						
Staff trained to use respectful and inclusive language	3.90%	2.84%	18.97%	56.38%	17.91%	100.00%
Use of positive and supportive body language	7.98%	7.98%	22.70%	50.53%	10.82%	100.00%
Awareness campaigns about disability inclusion	5.50%	12.06%	32.98%	41.31%	8.16%	100.00%
Encouragement of peer support and inclusive learning	1.60%	13.30%	46.99%	34.57%	3.55%	100.00%
<b>B-Physical Accessibility</b>						
Accessible toilet facilities	25.53%	14.72%	14.01%	35.11%	10.64%	100.00%
Modified tools or machines for accessibility in workshops	18.44%	17.38%	25.35%	32.62%	6.21%	100.00%
Accessible classroom and dormitory entrances	23.94%	14.72%	19.33%	31.91%	10.11%	100.00%
Handrails added to staircases	25.00%	18.44%	14.36%	30.14%	12.06%	100.00%
Concrete walkways for easy mobility	21.45%	17.38%	19.86%	29.96%	11.35%	100.00%
Wheelchair ramps installed	29.79%	18.44%	10.99%	29.08%	11.70%	100.00%
Safety signs and markers for visually impaired students	40.07%	27.84%	14.01%	14.18%	3.90%	100.00%
Braille signage or buttons in elevators	45.21%	28.01%	10.64%	12.77%	3.37%	100.00%
<b>C-Information Accessibility</b>						
Priority registration for students with disabilities	2.84%	5.67%	20.74%	55.85%	14.89%	100.00%
Disability-friendly enrollment support	1.95%	3.90%	20.39%	53.90%	19.86%	100.00%
Use of accessible Information, Education, and Communication (IEC) materials	7.80%	14.54%	28.37%	40.07%	9.57%	100.00%
Training information shared in inclusive formats (e.g., audio, visual, Braille)	11.70%	18.44%	26.42%	36.70%	6.74%	100.00%

## 4.3 Empowering rural and disadvantaged youth

### 4.3.1 Barriers to green jobs for youth

Table 7 demonstrates key barriers for young people to access green jobs. Firstly, about 66.13% of the respondents agreed that they had limited knowledge of the importance of green skill knowledge. In addition, around 49.46% reported that there was a lack of awareness of available green programmes in TVET. Thirdly, about 45.16% noted that there were limited green curricula in TVET institutes. Furthermore, approximately 35.16% of the respondents had limited access to training in their living areas. More importantly, around 30.38% indicated that there was a lack of role models in green careers.

**Table 7: Key barriers to green jobs for youth (n=372)**

Barriers	# Student	% Student
Limited knowledge of green skills	246	66.13%
Lack of awareness about available programmes	184	49.46%
Limited green curricula in TVET programmes	168	45.16%
Limited access to training in my area	132	35.48%
Lack of role models in green careers	113	30.38%
Cost of training or transportation	101	27.15%
Limited job prospects after training	87	23.39%
Cultural perceptions of technical education	67	18.01%
The community does not value green jobs	47	12.63%
Policy and funding limitations	39	10.48%

Consistent with the survey results, the teachers indicated during the FGDs that the main barriers to enrolling in green skills training included students' limited understanding of the benefits of green skills, perceived limited job opportunities, and a lack of interest in potential career prospects. One teacher explained "Due to limited understanding of green skills, students do not fully realize that activities such as 5S, green 5S, waste management, and saving water, electricity and so on contribute to environmental protection"

### 4.3.2 Strategies for encouraging youth participation in green skills training

Strategies for encouraging youth participation in green skills training have been widely recognized as essential to strengthening engagement in the green economy. The most prominent strategy identified is the establishment and maintenance of partnerships with the private sector, with 89.74% of teachers agreeing and 10.26% strongly agreeing, indicating strong consensus on its importance. In addition, 70.31% of respondents agreed and 8.33% strongly agreed that the delivery of flexible or remote green training formats is necessary to improve accessibility and participation. Similarly, 69.27% of respondents agreed and 17.71% strongly agreed that TVET institutions should develop bridging or foundation programmes tailored to disadvantaged youth, particularly in relation to green initiatives. Furthermore, 63.83% of teachers agreed and 23.4% strongly agreed that integrating green skills training with existing community development projects can serve as an effective motivator for youth participation in green jobs. Lastly, 63.16% of participants agreed and 12.11% strongly agreed that community-based awareness programmes should be strengthened and promoted through both social media platforms and in-person activities.

**Table 8: Strategies for encouraging youth participation in green jobs (n=192)**

Strategies	Strategies Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Partnership with private sectors (NGO and companies)	0.00%	0.00%	0.00%	89.74%	10.26%	100.00%
Deliver flexible or remote training formats	5.73%	5.21%	10.42%	70.31%	8.33%	100.00%
Create bridging/foundation programs for disadvantaged youth	0.00%	11.46%	1.56%	69.27%	17.71%	100.00%
Cooperate with existing community development projects	0.00%	0.00%	12.77%	63.83%	23.40%	100.00%
Community-based awareness programs (social media and physically)	5.79%	12.11%	6.84%	63.16%	12.11%	100.00%
Integrate potential green skills into existing training programs	2.60%	2.08%	3.65%	45.31%	46.35%	100.00%
Offering green skill programs through community learning centers (Greening TVETs in all levels...ect)	0.00%	9.90%	31.25%	40.63%	18.23%	100.00%
Involving local leaders or influencers in promoting green careers	0.00%	3.65%	46.88%	20.83%	28.65%	100.00%
Subsidies for transportation and training costs	5.56%	5.56%	55.56%	25.00%	8.33%	100.00%

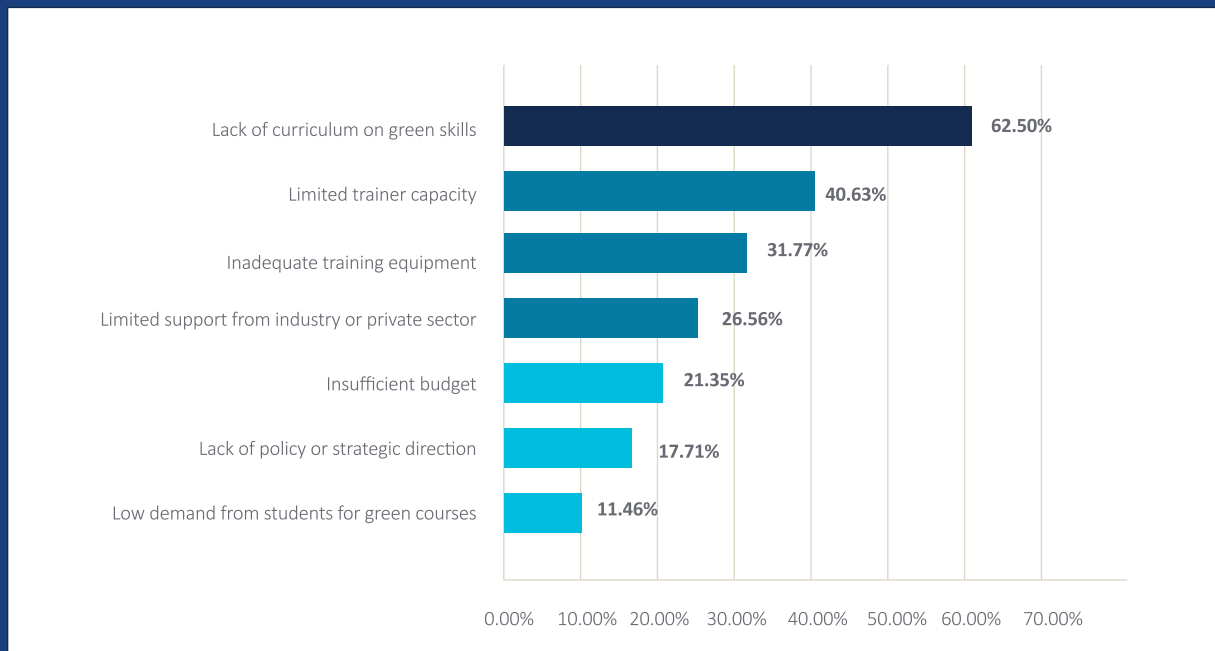
Indeed, there were some similarities of strategies integrating green skills into TVET training programs regarding results of FGDs with teachers and students. Students in the FGDs agreed that TVET institutions should strengthen community outreach and extension activities, using successful graduates as role models, and providing training within local communities. They also recommended offering scholarships, allowances, and volunteering opportunities for rural youth, establishing links with financial institutions, and conducting direct visits to inform young people about TVET programmes and employment opportunities. The teachers also noted the importance of collaboration with local authorities and villagers to promote TVET through community meetings and awareness sessions. Furthermore, they emphasized conducting community-based training, providing career counseling on green jobs, and educating rural youth on solar and green energy opportunities. They also mentioned training of trainers (ToT) on green skills, supporting green facilities, and mainstreaming local scholarships. Additionally, they noted that the 1.5M program extends TVET promotion through radio, social media, and community engagement, using successful student examples to inspire youth participation.

## 4.4 Challenges and strategies for integrating green skills in TVET

### 4.4.1 Institutional challenges

As shown in Figure 14, teachers reported that there were some institutional challenges to integrate green skills into TVET. Firstly, around 62.25% of the teachers mentioned that a lack of curricula on green skills was considered the main barrier for integrating green skills into TVET institutes. In addition, 40.63% of them agreed that TVET teachers had limited capacity related to green skills, and they should be more capacitated. Furthermore, approximately 31.77% of the teachers highlighted inadequate training equipment or materials recognized as another challenge to upgrade TVET for a green job readiness. In addition, about 26.56% of respondents accepted that there was limited support from industry or private sectors. Last but not least, TVET lacked budget to support and sensitize green skill programs.

**Figure 14: Institutional challenges to integrate green skills into TVET**

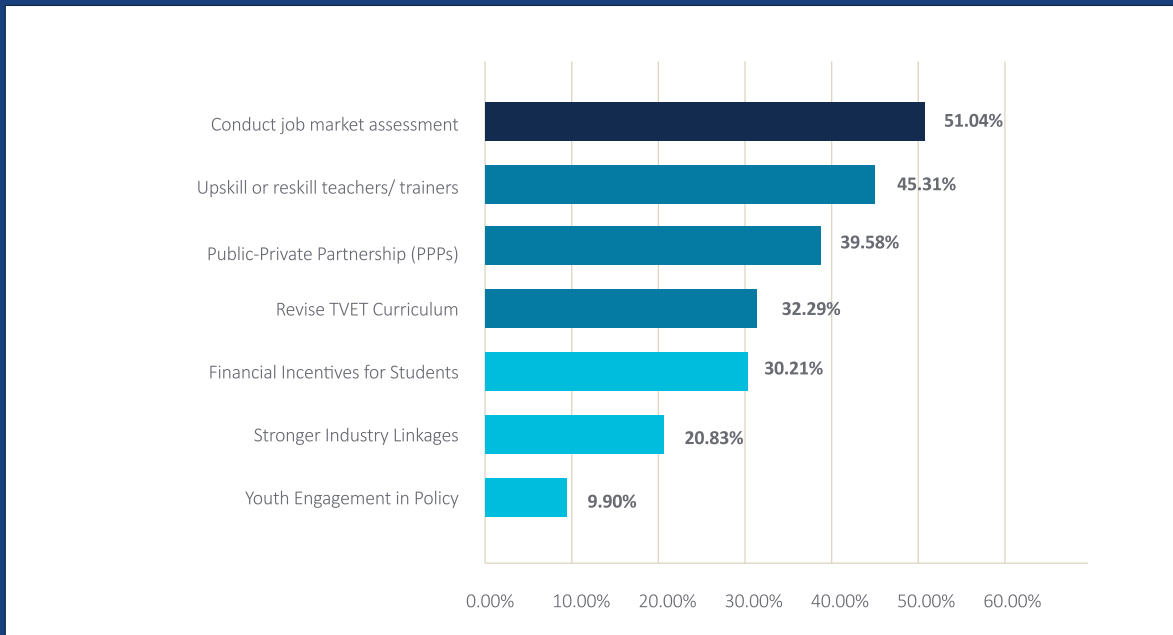


### 4.4.2 Institutional strategies for integrating green skills into TVET

While the strategies presented earlier focus on ensuring that young people are able to access, participate in, and complete green skill programmes, this section highlights strategies to strengthen institutional capacity to integrate green skills into the TVET.

Figure 15 illustrates key strategies for integrating green skills into the TVET system. Approximately 51.04% of the respondents indicated that TVET institutions should conduct regular labor market and job market assessments to ensure alignment with green skills demands. This was followed by 45.31% of the respondents who suggested that capacity building for teachers and trainers should be prioritized through upskilling and reskilling initiatives. In addition, about 39.58% of the respondents emphasized the importance of strengthening public-private partnerships, highlighting the need for collaboration between public and private sector stakeholders. Moreover, around 32.29% of them agreed that TVET curricula should be revised to better incorporate green skills. Furthermore, approximately 30.21% of the teachers reported that financial incentives should be provided to students who are interested in pursuing green occupations during their studies at TVET institutions.

**Figure 15: Strategies to integrate green skills in training programs**

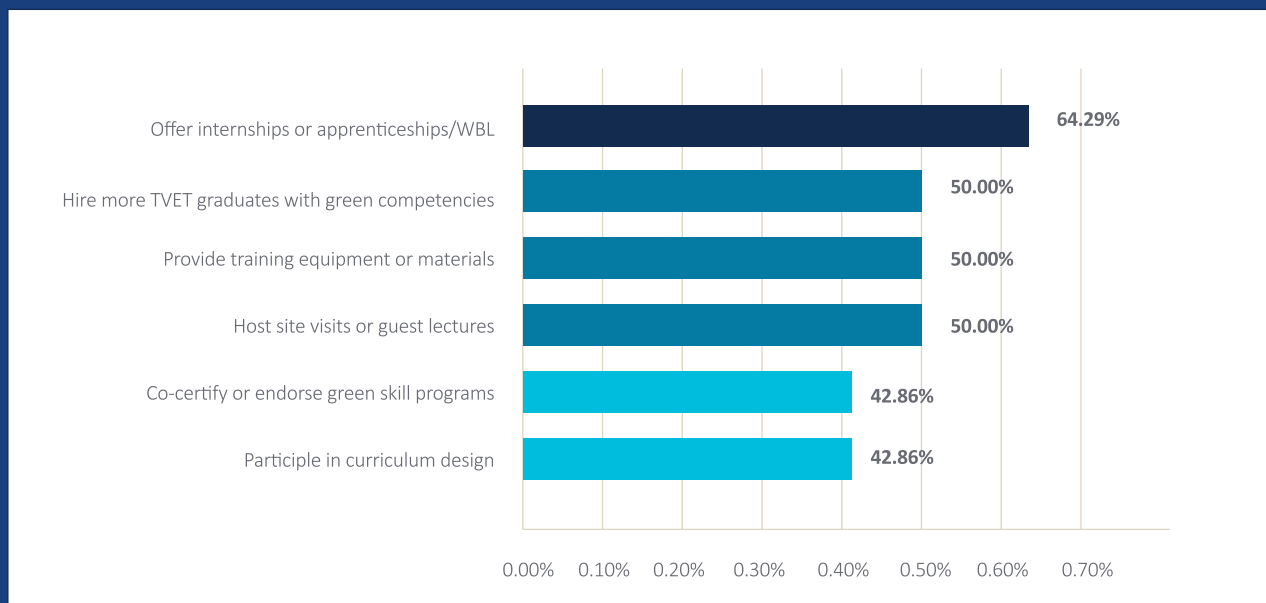


The qualitative findings from the FGDs further reinforced these strategies. The teachers highlighted several key approaches to effectively promote the integration of green skills into TVET including capacity building through Training of Trainers (ToT) programmes to enhance upskilling and reskilling, as well as the provision of adequate training materials, equipment, and teaching facilities. They also emphasized the importance of curriculum development and revision to align with green skills requirements, alongside sufficient budgeting and funding support. As one teacher noted, *“To promote green skills in TVET, the government should enforce coherent policies, provide standardized curricula, train qualified trainers, ensure adequate resources, and collaborate with the private sector for internships and employment.”*

#### 4.4.3 Private sector engagement in supporting green skills supply and youth transition

Figure 16 illustrates the engagement of the private sector or demand sides to support green skill supply and youth transition. The first supporting mechanism was to offer internship or apprenticeship with 64.29% of the respondents agreed with this strategy. The second support would be hosting site visits or guest lectures or provision of training equipment or materials or hiring more TVET graduates who completed green competencies (around 50% of the respondents agreed). Furthermore, they were able to participate in curriculum design for green skill training (about 42.86% of the respondents agreed). Finally, the private sector could co-certify or endorse green skill programmes with the government.

**Figure 16: Private sector engagement in supporting green skills**



## 4.5 Current Opportunities and Promising Practices

Table 9 shows current opportunities and promising practices that support green initiatives in Battambang province. The first opportunity was to invite guest lectures or organize seminars from environmental experts to share good green initiatives (about 80.11% of teachers agreed, and 12.15% strongly agreed). In addition, about 75.52% agreed and 17.71% strongly agreed that partnerships with green private sectors should be observed as a promising practice for green goals. Moreover, TVET institute should pilot courses or modules on green skills (around 75.26% agreed and 11.58% strongly agreed). Last but not least, extra green curricular activities (ex: eco-clubs or green campaign) should be recognized as a promising practices for green initiatives.

**Table 9: Current opportunities and promising practices for green initiatives (n=192).**

Opportunities	Strategies Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Guest lectures or seminars from environmental experts	2.60%	1.66%	6.08%	80.11%	12.15%	100.00%
Partnerships with green private sectors	2.60%	4.17%	0.00%	75.52%	17.71%	100.00%
Pilot courses/modules on green skills	2.60%	2.63%	10.53%	75.26%	11.58%	100.00%
Extra curricular activities (e.g., eco-clubs, green campaigns)	5.08%	7.34%	5.65%	75.71%	6.21%	100.00%
Get supports from NGO/DP	3.13%	5.21%	10.42%	75.52%	5.73%	100.00%
Access to green technology labs or workshops	1.06%	-	4.26%	69.15%	23.94%	100.00%
Career guidance related to green jobs	4.17%	2.08%	11.98%	69.79%	11.98%	100.00%
None available at the moment	91.78%	8.22%	0.00%	0.00%	0.00%	100.00%

The teachers in the FGDs highlighted several opportunities within their institutions to prepare students for green jobs. These included integrating two solar modules into the existing diploma curriculum, establishing networks with Swisscontact and private sector partners such as greenhouses, and cooperating with NGOs and organizations like the Red Cross to enhance practical training and exposure to green skills.

### 4.5.1 Potential green skills training areas within TVET institutes

#### 4.5.1.1 Key green skills training opportunities

As presented in Table 10, approximately 74.47% of teachers and students reported that solar energy installation and maintenance was the primary green training programme attracting learners at TVET institutions. This was followed by waste management and recycling technologies, which were identified by 61.88% of the respondents as the second most attractive training area. In addition, 55.67% of the participants indicated that electric vehicle (EV) maintenance and battery systems were the third most preferred green training programmes. Furthermore, 36.52% of the respondents reported that organic and sustainable agriculture was ranked fourth.

**Table 10: Attractive green courses for youth (n=564)**

Attractive green courses for youths	Total	Overall %
Solar energy installation and maintenance	420	74.47%
Waste management and recycling technologies	349	61.88%
Electric vehicle (EV) maintenance and battery systems	314	55.67%
Organic and sustainable agriculture	206	36.52%
Climate-smart water management	196	34.75%
Energy-efficient construction (e.g., green buildings)	169	29.96%
Eco-tourism and sustainable hospitality	113	20.04%

Consistent with the quantitative results, the FGDs with students and teachers from relevant institutions highlighted solar energy, sustainable agriculture, and EV-related courses as the most attractive programmes. The participants noted that these courses align with emerging trends in renewable energy and environmental sustainability and contribute to climate change mitigation. They further emphasized that these are emerging occupations that offer new employment opportunities for young people.

### 4.5.1.2 Characteristics of green skills training supporting youth employability

As shown in Table 11, several key features of green training programmes were identified as appealing to young people. Accessibility and outreach emerged as the most significant factor, with 85.46% of respondents highlighting the importance of delivering training programmes widely at the community level. Practical and quality learning were also strongly emphasized, as 55.14% of respondents preferred hands-on or experiential learning approaches, while 44.86% indicated that programmes should be delivered by TVET institutions that are recognized and trusted by employers.

In terms of industry relevance, 34.22% of respondents valued mentorship from professionals in the green sector, and 32.27% highlighted the importance of integrating training into real-world projects or incorporating field visits. Additionally, flexibility in training schedules, including daytime, evening, or weekend options, was identified as an important enabling factor for participation. Finally, 21.28% of respondents underscored the role of digital or online learning tools in enhancing both the accessibility and effectiveness of green training programmes.

**Table 11: Features of green skill courses (n=564)**

Features	Total	Overall %
More awareness raising to communities	482	85.46%
Hands-on/practical learning activities	311	55.14
Certification recognized by employers	253	44.86%
Mentoring by professionals in green sectors	193	34.22%
Integration with real-world projects or field visits	182	32.27%
Clear job placement or internship pathways	174	30.85%
Flexible schedules (e.g., evening or weekend classes)	128	22.70%
Use of digital or online learning tools	120	21.28%
Youth-led green innovation competitions	112	19.86%

The above quantitative results were validated by the qualitative findings from the FGDs with TVET teachers. The teachers, for example, suggested that green training programmes would be more attractive if they included practical workshops directly related to the skills being taught, such as hands-on activities. They emphasized the importance of sufficient training equipment, exchange visits, internships, and community-based training and promotion. Moreover, they noted that aligning curricula with labour market needs and selecting convenient training locations would further enhance the attractiveness and relevance of green training programmes.

## 4.6 Policy and Strategy Effectiveness

### 4.6.1 Perceptions from institutional leaders and stakeholders

There were some national policies or strategies across ministries to support green skill development in the TVET system. As shown in Table 12, around 86.67% of the respondents agreed that Pentagon 4 (Side 5): Ensuring environmental sustainability and readiness for responding to climate change, and the promotion of green economy and Green and Digital Technology TVET Policy Framework 2024-2028 contributed to green skill development. In addition, 66.67% of them believed that the National TVET Policy 2017-2025 was in the second rank of policy sharpened for the green initiatives in Cambodia. Moreover, Cambodia Skills Development Roadmap 2014-2023 was perceived by 60% of the participants as the third rank. Moreover, about 53.33% of the respondents agreed that Cambodia Climate Change Strategic Plan 2014-2023 and National Policy on Green Growth 2013-2030 contributed to sharpening the green skill development of the country.

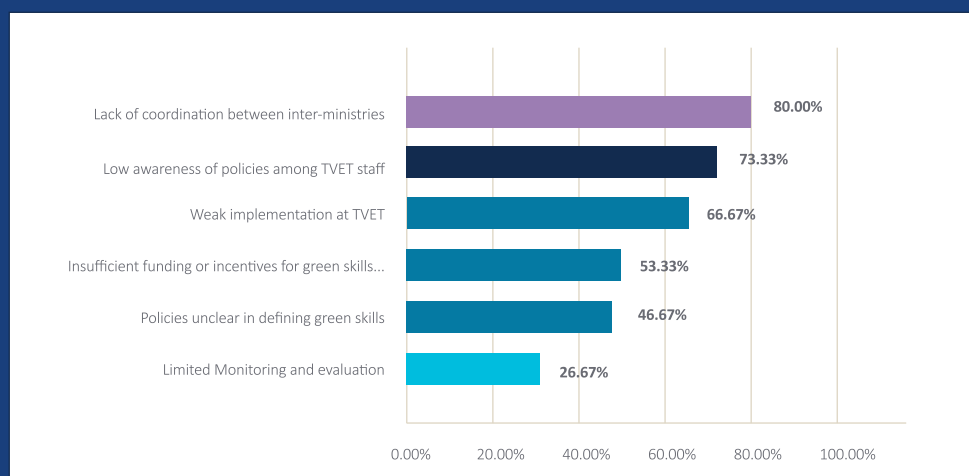
**Table 12: Perceptions of relevant stakeholders on green-relevant policies (n=15)**

National policies/strategies	% TVET Management	% DGTVET	% Overall
Pentagonal strategy phase 1 2023-2028-Pentagon 4 (Side 5): Ensuring environmental sustainability and readiness for responding to climate change, and the promotion of green economy	100.00%	66.67%	86.67%
Green and Digital Technology TVET Policy Framework 2024-2028	88.89%	83.33%	86.67%
The National TVET Policy 2017-2025.	55.56%	83.33%	66.67%
Cambodia Skills Development Roadmap 2023-2035.	33.33%	100.00%	60.00%
Cambodia Climate Change Strategic Plan 2014-2023	66.67%	33.33%	53.33%
National Policy on Green Growth 2013-2030	88.89%	0.00%	53.33%
National Strategic Plan on Green Growth (2013-2030)	0.00%	166.67% <sup>28</sup>	26.67%
National Energy Efficiency Policy 2022-2030 (NEEP)	33.33%	16.67%	26.67%
Cambodia's Power Development Plan 2022-2040 (PDP)	22.22%	16.67%	20.00%

### 4.6.2 Gaps in implementation of policy

Figure 17 demonstrates some gaps in policy implementation in terms of green skill development in Cambodia. About 80% of the respondents agreed that there was a lack of coordination between inter-ministries during the policy or strategy development. Moreover, around 73.33% of TVET management and DGTVET perceived that low awareness of policies among TVET staff was caused by low implementation on the ground. Furthermore, 53.33% assumed that there were insufficient funding or incentives for green development programmes. This phenomenon has influenced green policy implementation.

**Figure 17: Gaps in policy implementation**



### 4.6.3 Coordination between ministries and development partners

Table 13 presents respondents' perceptions of coordination mechanisms to support green initiatives within the TVET system. The establishment of inter-ministerial working groups (involving MLVT, MoE, MoEYS, MME, and other stakeholders) ranked first, with 73.33% agreeing and 20.00% strongly agreeing. This was followed by improving policy monitoring and evaluation, with 66.67% of respondents agreeing and 20.00% strongly agreeing. The development of national competency standards for green jobs and the increase in budget allocations to green TVET programmes were equally ranked in terms of agreement, each with 60.00% of respondents agreeing. However, a higher proportion strongly agreed with the development of competency standards (33.33%) compared to budget allocation (26.67%).

Furthermore, the inclusion of specific targets for green skills in TVET policies and the strengthening of employer involvement in policymaking both recorded 53.33% agreement. Notably, employer involvement received a higher level of strong agreement (33.33%) compared to specific targets (26.67%). Finally, offering incentives to TVET institutions that introduce green skills had the lowest level of agreement at 40.00%, although it received the highest proportion of strong agreement (53.33%). In summary, the findings indicate strong support across all mechanisms, particularly in relation to institutional coordination, policy implementation, and competency development.

**Table 13: Coordination mechanisms for policy implementation (n=15)**

Coordination mechanisms	Overall(%)			
	Neutral	Agree	Strongly Agree	Total
Establish inter-ministerial working groups (MLVT, MoE, MoEYS, MME, etc.)	6.67%	73.33%	20.00%	100.00%
Improve on policy monitoring and evaluation	13.33%	66.67%	20.00%	100.00%
Develop national competency standards for green jobs	6.67%	60.00%	33.33%	100.00%
Increase budget allocations to green TVET programmes	13.33%	60.00%	26.67%	100.00%
Include specific targets for green skills in TVET policies	20.00%	53.33%	26.67%	100.00%
Strengthen employer involvement in policymaking	13.33%	53.33%	33.33%	100.00%
Offer incentives to TVETs that introduce green skills	6.67%	40.00%	53.33%	100.00%

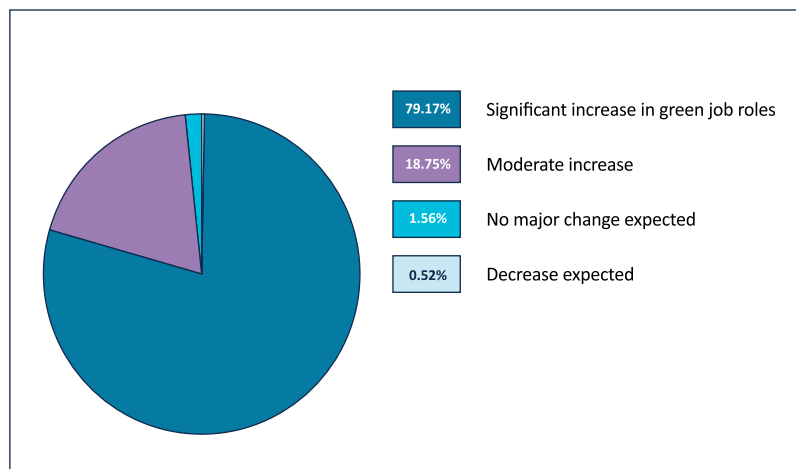
The analysis of FGDs with TVET teachers revealed similar findings. The teachers recommended several strategies for policymakers and institutions to strengthen green job creation and training. Additional recommendations included establishing partnerships with private sector companies and NGOs to develop policies that encourage small and medium enterprises to adopt green practices, which will expand employment opportunities in renewable energy, sustainable agriculture, and other green sectors.

### 4.7 Green job prospects in the next five years

Figure 18 presents the outlook on green job opportunities in next five years (by 2030). Around 79.17% of the teachers noted the prospect of a significant increase of green jobs in the near future. Additionally, about 18.75% who perceived moderate increase in green careers, while only 1.56% expected no major change of the green jobs, and 0.52% expected that green jobs would be decreased.

The analysis of FGDs with teachers indicated that green job opportunities in the next five years will continue to increase due to global trends and growing attention to environmental sustainability. They noted the expansion of electric vehicle industries and the overall shift towards a green environment. These developments are expected to create more job opportunities while contributing to climate change mitigation. One teacher agreed that "Green job opportunities will increase more due to the global trend, everyone turns to a green environment, and with the existing trend of electric vehicles, job opportunities will grow while mitigating climate change."

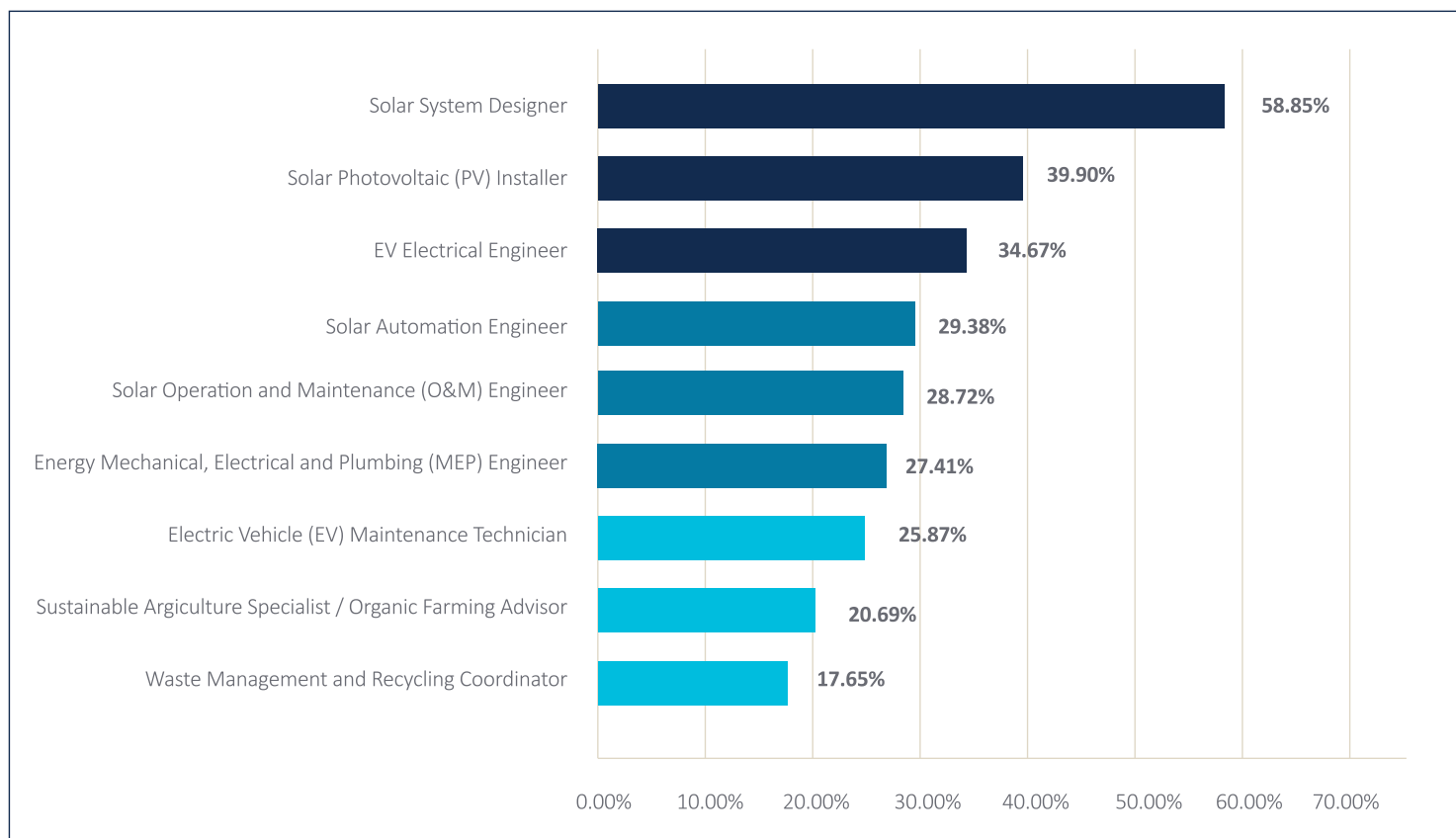
**Figure 18: Perceptions on the prospect of green jobs in the future**



## 4.7.1 Green job prospects

Based on Figure 19, the outlook for green jobs in the next five years indicates that solar-related roles are expected to see the highest demand. The position of Solar System Designer is projected to have the strongest outlook, with 58.85% of respondents anticipating growth. This is followed by Solar Photovoltaic (PV) Installer at 39.90% and EV Electrical Engineer at 34.67%. Other solar-focused roles, including Solar Automation Engineer (29.38%) and Solar Operation and Maintenance (O&M) Engineer (28.72%), also show significant prospects. Additional technical positions such as Energy Mechanical, Electrical, and Plumbing (MEP) Engineer and Electric Vehicle (EV) Maintenance Technician are expected to see moderate growth, with 27.41% and 25.87% respectively. Meanwhile, roles in Sustainable Agriculture, including Organic Farming Advisor (20.69%), and Waste Management and Recycling Coordinator (17.65%) are projected to have comparatively lower demand.

**Figure 19: Outlooks for green jobs in the next five years**



Furthermore, the teachers in the FGDs noted that green job opportunities in the next five years will continue to increase due to global trends and growing attention to environmental sustainability. They noted the expansion of electric vehicle industries and the overall shift towards a green environment. These developments, as discussed earlier, are expected to create more job opportunities while contributing to climate change mitigation.



# 5

## Discussion

### 5.1 Advancing inclusive green skills in TVET: Gender, Disability, and Social Equity (GEDSI)

**Question 1: How are gender, disability, and rural youth inclusion (GEDSI) considered in TVET institutions when integrating green skills, and what are the barriers and strategies for inclusive participation?**

The research indicates that while GEDSI is a core pillar of national policy, such as the National TVET Policy 2017–2025, it remains largely under-operationalized at the institutional level. The data shows a persistent concentration of female students in traditional “soft” vocational fields, reflecting deep-seated socio-cultural norms where technical green trades—such as solar installation or EV maintenance—are perceived as unsuitable for women. Furthermore, learners with disabilities face significant physical and resource barriers, with a critical lack of assistive tools and inaccessible infrastructure.

**Comparative synthesis:** These findings align with the UNESCO-UNEVOC (2020) report, *Boosting Gender Equality in Science and Technology*, which notes that technical fields globally struggle with “gendered stratification.” Locally, this suggests that Cambodia is following a regional pattern where green transitions risk leaving vulnerable groups behind unless “occupational stereotyping” is addressed. As highlighted in UNESCO-UNEVOC (2021), *TVET for Disadvantaged Youth*, moving toward a “whole-institution approach” is essential to ensure that greening efforts include physical and pedagogical accessibility.

### 5.2 Institutional and access barriers to green skills development

**Question 2: What institutional and systemic challenges hinder the integration of green skills in TVET programs, and what barriers do young people face in accessing green training and employment opportunities?**

The transition toward a green workforce in Battambang is currently hindered by structural “bottlenecks.” The primary institutional hurdles are the absence of standardized green competency standards and a shortage of instructors qualified in renewable technologies. Additionally, the high cost of specialized equipment creates a resource gap that provincial centers struggle to bridge without external donor funding.

**Comparative synthesis:** This “capacity gap” is a universal challenge identified in the ILO (2019) study, *Skills for a Greener Future*, which emphasizes that the pace of environmental policy often exceeds the pace of educational reform. Compared to regional neighbors like Vietnam or the Philippines, Cambodia faces a more pronounced “fragmentation” issue where various ministries lead different green initiatives without a unified labor market roadmap. This confirms that the challenge is not just a lack of resources, but a need for better policy coherence across the Ministry of Labour, the Ministry of Environment and other ministries.

## 5.3 Leveraging opportunities for inclusive green employability

### Question 3: What opportunities can be leveraged to enhance young people’s engagement in green skills training and improve their employability in the green job sector?

Despite constraints, there is significant youth interest in high-growth sectors like solar energy and electric vehicle (EV) maintenance. Public-private partnerships (PPPs) are viewed by the majority of stakeholders as the most effective vehicle for ensuring that training remains market-responsive and leads to immediate employment.

Regionally, the ADB (2023) brief, *Preparing the Workforce for the Low-Carbon Economy*, identifies renewable energy as the leading sector for job creation in Southeast Asia. Cambodia’s unique “demographic dividend” (65% of the population under age 30) offers a strategic advantage. By aligning TVET programs with the Cambodia Automotive and Electronics Sector Development Roadmap, the government can turn this youth population into a competitive workforce for the green economy, similar to successful models seen in other emerging ASEAN economies.

Globally, the renewable energy sector employed approximately 16.6 million people in 2024, with solar PV being the largest segment, employing over 7 million workers (IRENA & ILO, 2024). EV-related roles are also expanding worldwide as electrification and battery infrastructure increase, although current job totals remain smaller than in solar. Renewable energy employment has nearly doubled over the past decade and is projected to continue growing, with global renewable jobs potentially exceeding 30 million by 2030 under energy transition scenarios (IRENA & ILO, 2026). Overall, these findings highlight that green energy and renewable technology sectors—particularly solar energy and electric vehicles—are likely to offer the most opportunities for skilled workers in Cambodia, mirroring global trends in green job growth.

## 5.4 Alignment with green job policies with TVET development

### Question 4: How do existing green job policies and strategies in Cambodia support the development of green skills in the TVET system?

Cambodia possesses a supportive policy foundation, including the Pentagonal Strategy—Phase 1 and the Green and Digital Technology TVET Policy Framework 2024–2028. However, there is a clear “implementation gap” where these high-level strategies are not yet fully reflected in local training standards or budget allocations.

Comparative Synthesis: Cambodia’s explicit policy link between “Green” and “Digital” transformation is a modern approach that mirrors international best practices. However, as noted in the World Bank (2025) assessment of Cambodian TVET institutes, the system remains largely supply-driven. To meet international standards, Cambodia must shift from policy formulation to coordinated execution, ensuring that “Green Work Directions” are embedded directly into the National Qualification Framework (NQF) to provide a clear pathway for students and employers alike.

# 6

## Conclusion

This study aimed to assess the readiness and effectiveness of Cambodia's TVET system in engaging disadvantaged groups, particularly youth, female students, and persons with disabilities in green skills development and in preparing them for sustainable employment and career pathways within the green economy.

The findings indicate that disadvantaged groups face multiple barriers in accessing and participating in green-oriented TVET programmes. Female students are constrained by limited awareness of TVET opportunities, insufficient female-friendly facilities, and socio-cultural norms. Students with disabilities encounter accessibility challenges, limited assistive resources, and inadequate career guidance. Youth more broadly face low awareness of green skills, limited availability of green curricula, and weak exposure to green career pathways. At the institutional level, TVET providers face challenges related to curriculum integration, teacher competencies, and training equipment for green job readiness, while policy implementation gaps persist across ministries. These findings suggest that challenges in inclusive green skills development are interconnected across individual, institutional, and policy levels. Limited awareness, accessibility constraints, and institutional capacity gaps collectively reduce the effectiveness of the TVET

system in responding to labour market demands associated with the green economy. The findings also indicate that while policy attention to green development exists, practical integration within TVET delivery remains uneven and insufficiently institutionalized.

The findings have important implications for Cambodia's efforts to promote inclusive and sustainable workforce development. Limited institutional readiness and persistent social barriers affect equitable participation in green TVET programmes, particularly for disadvantaged youth. In addition, policy coordination gaps and limited stakeholder engagement weaken the alignment between skills supply and green labour market demands. These implications highlight the need for greater coherence between inclusion strategies, institutional capacity development, and policy frameworks to support an effective green transition.

In conclusion, Cambodia's TVET system is positioned within a favorable policy environment for green transition; however, enhanced institutional capacity, inclusive strategies, and structured policy implementation are necessary to ensure that women, persons with disabilities, and rural youth are equitably prepared for sustainable career opportunities.

# 7

## Recommendations

Based on the findings of this study, several practical and evidence-based recommendations are proposed to strengthen inclusive green skills development within Cambodia's TVET system as follows:

- Strengthening awareness of TVET and green skills among disadvantaged groups is essential. Targeted awareness-raising mechanisms should be implemented to ensure that vulnerable groups, including female students, persons with disabilities, and rural youth, receive accurate and timely information about TVET and green skills training opportunities. Such mechanisms can improve understanding among communities and local authorities, enhance the public image of TVET institutions, and address existing misconceptions about vocational education and green careers.
- Inclusive infrastructure and learning environments should be further enhanced by all relevant stakeholders. In particular, the Ministry of Labour and Vocational Training (MLVT) and TVET institutions should invest in improving physical accessibility, including wheelchair ramps, handrails, accessible classroom and dormitory entrances, and disability-friendly toilet facilities. Additional measures such as braille signage, tactile safety markers, clearly marked concrete walkways, and modified tools or machinery in workshops are also essential to ensure safe and effective participation of students with disabilities and other disadvantaged groups.
- Financial support mechanisms for disadvantaged learners, particularly female students, should be strengthened. The provision of scholarships, stipends, or other forms of financial assistance is a critical intervention to reduce economic barriers to enrolment and retention in TVET programmes. Such support can enhance participation among vulnerable groups and contribute to more equitable learning outcomes.
- Public-private partnerships should be strengthened and sustained to enhance the relevance and employability outcomes of TVET graduates. Closer collaboration between MLVT, TVET institutions, and private sector employers can support smoother school-to-work transitions, improve graduate absorption into the labour market, and ensure that training programmes remain responsive to rapidly evolving technologies. In particular, green-oriented curricula should be regularly updated and mapped to labour market needs in priority sectors such as renewable energy (especially solar energy), energy efficiency, and electric vehicles (EVs).
- Capacity of TVET teachers and trainers in green technologies should be systematically enhanced to meet emerging labour market demands. Capacity-building initiatives may include in-country training programmes, industry-based learning, and overseas study or exchange opportunities. Strengthening teacher competencies is critical for effective delivery of green skills and for ensuring that training remains aligned with technological advancements.
- While several green-related policies have been developed by relevant government ministries, greater emphasis should be placed on strengthening policy implementation. This includes improving awareness and understanding of existing policies among implementing institutions, enhancing coordination across ministries, and establishing robust monitoring and evaluation frameworks to track progress and outcomes.
- Aligning policy frameworks more closely with labour market needs will further support inclusive green skills development within the TVET system. This alignment can help ensure that training programs are responsive to current and emerging demands for green occupations, thereby reducing skills mismatches and improving graduate employability. Stronger engagement with employers and industry representatives in policy design and implementation can provide timely insights into evolving competency requirements, technological changes, and workplace standards. In addition, labour market-responsive policies can promote inclusive participation by prioritizing support measures for disadvantaged groups and directing resources towards high-growth green sectors. Such alignment is critical for enhancing the relevance, effectiveness, and sustainability of green TVET initiatives in Cambodia.

# 8

## Directions for Future Research

Future research should examine long-term employment and career outcomes of TVET graduates who receive green skills training, particularly among disadvantaged groups. Tracer studies would provide deeper insights into employability and income outcomes. Further research is also needed to explore employer perspectives on green skills demands, while comparative studies across provinces and TVET subsectors are also recommended.



# References

- Abdul Aziz, S. N., Zulkifli, N., Nashir, I. M., & Karim, N. A. (2020). Pull and push factors of students' enrolment in the TVET programme at community college in Malaysia. *Journal of Technical Education and Training*, 12(1), 68–75. <https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/4374>
- Asian Development Bank. (2016a). Policy priorities for a more responsive technical and vocational education and training system in Cambodia. Asian Development Bank. <https://www.adb.org/publications/policy-priorities-responsive-tvet-system-cambodia>
- Asian Development Bank. (2016b). Policy priorities for a more responsive technical and vocational education and training system in Cambodia. Asian Development Bank. <https://www.adb.org/publications/policy-priorities-responsive-tvet-system-cambodia>
- Asian Development Bank. (2023). Preparing the workforce for the low-carbon economy: A closer look at green jobs and green skills (ADB Brief No. 262). Asian Development Bank. <https://www.adb.org/publications/workforce-low-carbon-economy-green-jobs-skills>
- Ayub, H. (2015). Factors affecting students' attitude towards technical education and vocational training. *International Conference on Business, Economics and Management*, 15–16. <https://www.academia.edu/32357907>
- Battambang Administration. (2024). Battambang administration. <https://www.battambang.gov.kh>
- Ceka, A., & Murati, R. (2016). The role of parents in the education of children. *Journal of Education and Practice*, 7(5), 61–64. <https://files.eric.ed.gov/fulltext/EJ1092391.pdf>
- Cambodia Development Resource Institute. (2024). Five priorities for a green and inclusive economic transformation in Cambodia. <https://cdri.org.kh/publication/five-priorities-for-a-green-and-inclusive-economic-transformation-in-cambodia>
- FAKT Consult. (2022). Skills for a just transition to a green future. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- Harackiewicz, J. M., Smith, J. L., & Priniski, S. J. (2016). Interest matters: The importance of promoting interest in education. *Policy Insights from the Behavioral and Brain Sciences*, 3(2), 220–227. <https://doi.org/10.1177/2372732216655542>
- International Labour Organization. (2022). Greening TVET and skills development: A practical guidance tool. International Labour Office. <https://www.ilo.org/skills>
- International Labour Organization. (2025). Handbook on measuring green jobs and skills for green jobs: Monitoring, evaluation and learning. <https://doi.org/10.54394/ZMPJ3373>
- International Renewable Energy Agency (IRENA) & International Labour Organization (ILO). (2024). Renewable energy and jobs: Annual review 2024. Abu Dhabi: IRENA. <https://www.irena.org/Publications/2024/Oct/Renewable-energy-and-jobs-Annual-review-2024>
- International Renewable Energy Agency (IRENA) & International Labour Organization (ILO). (2026). Renewable energy and jobs: Annual review 2025. Abu Dhabi: IRENA. <https://www.irena.org/Publications/2026/Jan/Renewable-energy-and-jobs-Annual-review-2025>
- Kidd, D. (2025). Cambodia's path to sustainability: Accelerating national priorities through climate actions. United Nations Development Programme.
- Lai, E. R. (2011). Motivation: A literature review. Pearson Research Report. [http://www.johnnietfeld.com/uploads/2/2/6/0/22606800/motivation\\_review\\_final.pdf](http://www.johnnietfeld.com/uploads/2/2/6/0/22606800/motivation_review_final.pdf)
- Li, D., Tang, Z., & Zhao, N. (2023). How does users' interest influence their click behavior? Evidence from Chinese online video media. *Frontiers in Psychology*, 14, 1–13. <https://doi.org/10.3389/fpsyg.2023.1101396>
- Li, H., Khattak, S. I., Lu, X., & Khan, A. (2023). Greening the way forward: A qualitative assessment of green technology integration and prospects in a Chinese technical and vocational institute. *Sustainability*, 15(6). <https://doi.org/10.3390/su15065187>
- Michaels, T., Ravaz, J., Sensamras, P., Casaer-Diez, K., Fakhry, J., & Storey, D. (2020). Scaling up waste recycling in Battambang city. Global Green Growth Institute.
- Ministry of Environment. (2022). Cambodia's roadmap for sustainable consumption and production (2022–2035). Royal Government of Cambodia. <https://www.switch-asia.eu/resource/cambodias-roadmap-for-sustainable-consumption-and-production-2022-2035/>
- Ministry of Labour and Vocational Training. (2017). National TVET policy 2017–2025.
- Ministry of Labour and Vocational Training. (2024). Strategic development plan for employment, social security, and technical and vocational training: 2024–2028.

- Ministry of Mines and Energy. (2022). Power development master plan 2022–2040.
- National Institute of Statistics. (2020). Cambodia socio-economic survey 2019–2020. Ministry of Planning. <https://www.nis.gov.kh>
- Nordin, D. N., & Omar, M. K. (2024). Factors influencing TVET readiness among students at public secondary school: Exploring interest, motivation, and self-efficacy. *Asian Journal of Vocational Education and Humanities*, 5(1), 10–19. <https://doi.org/10.53797/ajvah.v5i1.2.20241>
- Royal Government of Cambodia. (2023a). Pentagonal strategy – Phase I: Growth, employment, equity, efficiency and sustainability: Building the foundation towards realizing the Cambodia Vision 2050 (1st ed.).
- Royal Government of Cambodia. (2023b). Pentagonal strategy – Phase I for growth, employment, equity, efficiency and sustainability: Building the foundation towards realizing the Cambodia Vision 2050.
- Royal Government of Cambodia. (2021). Circular economy strategy and action plan. United Nations Development Programme. <https://www.undp.org/cambodia/publications/circular-economy-ce-strategy-and-action-plan>
- Safarmamad, F. (2019). Factors that influence students’ decisions to enroll in initial vocational education and training (IVET) lyceums in Tajikistan (Doctoral dissertation, Old Dominion University). <https://doi.org/10.25777/afbx-ta48>
- Sevea. (2024). Assessment of the need for skill development in the clean energy sector in Cambodia.
- Strietska-Ilina, O. (2022). Skills for a greener future. International Labour Organization.
- United Nations Environment Programme. (2018, October 23). Green economy. <https://www.unep.org>
- UNESCO. (2017). Greening technical and vocational education and training: A practical guide for institutions. UNESCO-UNEVOC International Centre. <https://unevoc.unesco.org>
- UNESCO-UNEVOC. (2021). Technical and vocational education and training for disadvantaged youth. <https://unevoc.unesco.org>
- Un, L. (2014). Upper secondary school curriculum reform in Cambodia: Relevance for employment and tertiary education. <https://www.academia.edu/6180031>
- Visamak. (2022). Battambang smart city project. <https://visamak.com/battambang-smart-city-project/>
- World Bank. (2018). Cambodia education sector: Public expenditure tracking and quality of service delivery survey. World Bank. <https://www.worldbank.org>
- World Bank. (2025). An assessment of technical and vocational education and training institutes under the oversight of the Ministry of Labour and Vocational Training. <https://www.worldbank.org>
- Zhi, W. W., & Atan, S. A. (2021). Factors influencing students’ attitudes towards technical and vocational education and training (TVET). *Research in Management of Technology and Business*, 2(1), 335–348. <https://publisher.uthm.edu.my/periodicals/index.php/rmtb/article/view/1848>
- Zin, M. F. M., & Yunus, M. M. (2020). TVET students’ attitudes and motivation toward learning English. *International Journal of Academic Research in Business and Social Sciences*, 10(11), 717–727. [https://hrmars.com/papers\\_submitted/8134](https://hrmars.com/papers_submitted/8134)

## **ALUMNI RESERACH GRANTS ROUND 5**

### **The Readiness of Cambodia's TVET System for Green Jobs:**

Challenges, Opportunities, and Career Prospects for Young People in Battambang Province

By: MOUK Mao, YATH Yoeuy, KHLEY UI

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31<sup>st</sup> March 2026