

## **Issues Affecting the Greening of TVET Programs for Sustainable Development in Kenya: A Case of TVET Institutions in Nairobi County**

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### **Abstract**

*Kenya's Technical Vocational Education and Training (TVET) institutions are adept at developing new skill training and educational programs to meet the changing green labour market. The issues of responding to a green economy, environmental sustainability, climate change and mitigation are different in different sectors of the economy. TVET institutions face the prospect of systemically transforming education and training programs with limited market intelligence and an increasing sense of urgency. This paper explores the issues affecting the greening of TVET programs in Kenya for sustainable development. The study was guided by the implementation evaluation model Jansen (2010), which examined the differences between what are intended, what has happened or other aspects of the program that should be accepted. Descriptive survey design was adopted and a mixed research that incorporated quantitative and qualitative approaches was used. The study employed simple random, stratified and proportionate probability sampling techniques. There were 20 TVET institutions in Nairobi County and the researcher sampled 15 teachers in every institution hence the sample size was 300. Using simple random sampling, the respondents were stratified into departments and questionnaires administered. Data collected was processed, coded and analyzed to facilitate the answering of the research questions using descriptive statistics. The findings show that there was insufficient integrated sustainable development content training, lesser promotion of technical skills for a transition to a greener economy, insufficient enhanced policy coherence and coordinated implementation of training and inadequate curriculum development and implementation strategies. TVET sector should therefore integrate sustainable development into training and enhance policy coherence and coordinated implementation of education and training.*

**Key words:** *TVET programs, sustainable development, green skills*

### **Introduction**

In the past decade many researches and global conferences have focused on the significance of building ecologically sound economies (greening) to address climate change and other pressing environmental issues widely acknowledged by governments around the world (Pavlova, 2016). A notable instance is the 2015 United Nations Climate Change Conference in Paris (France) where 195 countries adopted the first universal climate change agreement (Schröder, Pavlova, Numyoot & Zhiqu, 2016). Although the outcome of the conference, the "Paris Agreement", requires ratification by the various countries, it demonstrates a strong will by the

attending nations to address the pressing issues of climate change, to adopt the Outcomes to their own legal systems and to sign the agreement (Schröder et. al., 2016). The analysis of international reports highlights the importance of education and training in the pursuit of green growth. The strategies provide evidence that the scope and introduction of specific green-related training programs varies across the countries. The government of Kenya for instance has heavily invested on ecofriendly sectors and enacted several laws to simplify the greening of economy in sectors such as agriculture, forestry and energy (World Bank, 2016).

In February 2017, the Republic of Kenya (ROK, 2017), through the cabinet secretary for Environment and Natural Resources in a gazette notice directed that all plastic bags used for commercial and household packaging would be banned from August 28, 2017. The gazette notice in part read “It is notified to the public that the cabinet secretary for environment and natural resource has with effect from 6 months from the date of this notice (February 28, 2017) banned the use, manufacture and importation of all plastic bags used for commercial and household packaging”. This was aimed at promoting a “greener” economy.

Across the globe, countries are facing challenges due to increased environmental degradation and climate change. This requires a systematic approach to changing job opportunities and skill demands as new industries and job profiles emerge (UNESCO, 2013). TVET institutions need to be responsive to these dynamics to produce a workforce at the middle economies that matches the actual market requirements and that are aware of their responsibilities to protect the environment (ROK, 2017). Green Technical Vocational Education and Training (GTVET) encompasses pre- employment education and training, learning in the workplace and further training that address environmental and economic sustainability while meeting the needs of industries and individual learners (UNESCO, 2013). It prepares people for emerging green jobs that contribute to preserving and restoring the quality of environment while improving human well-being and social equity.

It remains unclear why the graduates channeled by the TVET institutions cannot adapt to the evolving newly created green jobs in the industrial, energy and agricultural sectors. Could there be a missing link between the training at TVET institutions and newly created jobs by the greening of economy? Could there be a mismatch between the green skills needed at the job market and what TVET institution offers? Are TVET institutions not “green” enough to channel quality graduates? From time to time, there has been complains that technicians from TVET institution perform poorly or dismally in the job market (UN, 2012).

The escalation of industrial and agricultural production and high consumption levels have resulted in massive degradation of the resources both in terms of quantity and quality that exhausted the carrying capacity of these resources. Upon this recognition, the world is now seeking to achieve sustainable development in realistic manner early enough before all resources are depleted (UNESCO, 2013). The environmental implications are taking their toll on life and achievement of quality life is becoming unmanageable. Therefore, significant interactions amongst the pillars of Sustainable Development Goals (SDGs) in Kenya are of paramount importance if these environmental hiccups are to be addressed. The

interdependence between the economic, political and social pillars of SDGs must be considered holistically.

It is widely agreed by most stakeholders that the environmental conditions must improve and so multiple stakeholders including TVET institutions must contribute to this change (UNESCO, 2013). The educational sectors should have a positive impact on these change process. There can be no development without TVET in Kenya and the world in general. Former UN Secretary-General Ban Ki-Moon on January 2012 observed that environmental, economic and social indicators show that the current model of progress is unsustainable and climate change is destroying the path to sustainability and the world has looming challenges and increasingly limited resources. He noted that sustainable development offers the best solution. It is therefore important to study the issues affecting the greening of TVET in Kenya with a view of giving recommendations to promote sustainable development. This will also go a long way in enabling Kenya to achieve her SDGs. TVET is a critical player in implementing a global greening concept based on national strategies.

UNESCO-UNEVOC promotes TVET education for sustainable development through its activities, publications and as part of the United Nations Decade of Education for Sustainable Development. Despite positive developments in environmental and climatic change policies, the implementations of measures to promote environmentally sustainable economic growth remain a challenge for many countries (UN, 2012). TVET institutions should thus incorporate appropriate policies that promote greening.

When the technical workers do not master new technologies, and cannot operate their job in an environmentally friendly manner, they can contribute to causing environment pollution and climate change (UN, 2012). Therefore, the training of highly skilled workforce with adequate capabilities and perception of protecting environment is necessary. This goal cannot be achieved without eligible TVET curriculum because the quality of TVET curriculum affects the attainment for trainers. The curriculum of TVET programs should therefore include, among others, the green sources of energy.

Greening TVET programs is an essential cross-cutting theme for sustainable development. The professionalization of TVET trainers is widely regarded as one of the most important issues that influence the effectiveness and quality of any TVET system (UNESCO, 2013).

This study explored issues affecting the greening of TVET programs in Kenya for sustainable development and was guided by the following research questions: -

- i. What are the issues affecting the greening of TVET programs at institutional level?
- ii. What are the issues affecting the greening of TVET programs at national level?

- iii. What are the issues affecting the greening of TVET programs at global level?

Green jobs contribute to preserving/restoring environmental quality while ensuring adequate wages and safe working conditions and must be decent jobs and accessible to all (UNESCO- 2013). They include jobs that protect ecosystems and biodiversity by reducing energy consumptions, materials and water consumption, de-carbonize the economy and minimize waste/pollution (Pavlov, 2016). Green skills are specific skills required to adapt products, services or operations due to adjustments, requirements/regulations, for example, water purification, solar panel installation, wind turbines design, green management of urban spaces, carbon capture and storage techniques (Singh, 2013).

The importance of TVET has been well documented in reports and researches. The 3rd world TVET congresses organized by UNESCO in 2012 clearly identified the pivotal role of TVET in the quest of building greener economies and solve unemployment issues. GTVET encompasses pre-employment education and training, learning in the workplace and training that address environmental, economic and social sustainability while meeting the needs of industries and individual learners (Pavlova, 2016). It prepares people for green jobs that contribute to preserving/restoring the quality of the environment while improving human well-being and social equity. It helps production to move to more environmentally conscious practices.

The development of an effective TVET system is at the heart of countries' educational reform efforts. The chosen system establishes a framework which influences important matters as access to and the quality of TVET (UNESCO, 2013). Therefore, the ministry of education must come up with policies that promote the greening of TVET.

## **Methodology**

Data was collected by mixed method research design. It is a procedure for collecting, analyzing, and “mixing” both quantitative and qualitative research in a single study to understand a research problem. Mixed method is an approach to inquiry where the researcher links in some way (merges, integrates, connects) both quantitative and qualitative data to provide a unified understanding of research problem (McMillan, 2007). The design was chosen because of its appropriateness in educational research findings that yield accurate information.

Descriptive survey design was adopted for the study. It encompasses both quantitative and qualitative methods of data collection and analysis. The main instrument used to collect quantitative primary data was questionnaires. This was mainly because it the best instrument available to social scientist interested in collecting original data for describing population (McMillan, 2007). The data collection involved gathering numerical information so that the database represents quantitative information. Secondary data was collected mainly by selective literature review on GTVET globally. Data was analyzed using descriptive

statistics which included the use of frequency counts, percentages and graphs in making deductions and generalizations about the whole population from sampled data.

### Findings

According to McMillan (2007) questionnaire encompasses a variety of instruments in which subjects respond to written questions to obtain reaction, belief and attitude. It is relatively economical, has standardized questions, can ensure anonymity and can be written for specific purpose. Self-administered questionnaires were distributed to a total of 300 teachers in 10 TVET institutions and all responded to the questionnaires. For the study, all the teachers who were selected were expected to provide relevant information. The respondents were assured of confidentiality. A three-tier approach (institutional, national and global) to greening the skills was developed for the study.

**Table 1** Issues Affecting the Greening of TVET Programs at Institutional Level

| STATEMENT   | SA  | %    | A  | %    | D  | %    | SD | %    |
|---|-----|------|----|------|----|------|----|------|
| Inadequate awareness on greening                                | 54  | 18.0 | 62 | 20.7 | 88 | 29.3 | 96 | 32.0 |
| Inadequate transformation in TVET institutions in greening      | 168 | 56.0 | 92 | 30.6 | 23 | 7.7  | 17 | 5.7  |
| Inadequate holistic institutional approach to GTVET             | 136 | 45.3 | 90 | 30.0 | 40 | 13.3 | 34 | 11.4 |
| Inadequate capacity development at institutional level in GTVET | 207 | 69.0 | 53 | 17.7 | 28 | 9.3  | 12 | 4.0  |
| Inadequate greening skills / confidence amongst teachers        | 88  | 29.3 | 82 | 27.3 | 74 | 24.7 | 56 | 18.7 |

Note. SA - Strongly Agree; A - Agree; D - Disagree; SD - Strongly Disagree

**Table 1** shows frequencies and percentages of the responses on issues affecting the greening of TVET programs at the institutional level in Kenya. On inadequate awareness on greening, majority 96 (32%) strongly disagreed while 88 (29.3%) disagreed. On inadequate transformation, most respondents 168 (56%) strongly agreed followed by 92 (30.6%) who agreed. On holistic institutional approach, most respondents 136 (45.3%) strongly agreed followed by 90 (30%) who agreed. On inadequate capacity development, 207 (69%) strongly agreed followed by 53 (17.7%) who agreed. On inadequate greening skills/confidence amongst the teachers, the majority 88 (29.3%) strongly agreed followed by 82 (27.3%) who agreed.

**Table 2** *Issues Affecting the Greening of TVET Programs at the National Level*

| STATEMENT  | SA  | %    | A   | %    | D  | %    | SD | %    |
|--|-----|------|-----|------|----|------|----|------|
| Inadequate GTVET curriculum and green educational objectives   | 94  | 31.3 | 86  | 28.7 | 63 | 21.0 | 57 | 19.0 |
| Inadequate government support on GTVET policies                | 83  | 27.7 | 117 | 39   | 58 | 19.3 | 42 | 14   |
| Incoherent and uncoordinated policies for green growth in TVET | 113 | 37.7 | 97  | 32.3 | 52 | 17.3 | 38 | 12.7 |
| Inadequate partnership between stakeholders on GTVET           | 111 | 37.0 | 99  | 33.0 | 48 | 16.0 | 42 | 14.0 |

Note. SA - Strongly Agree; A - Agree; D: - Disagree; SD - Strongly Disagree

**Table 2** presents frequencies and percentages of the responses on issues affecting the greening of TVET programs at the national level in Kenya. On inadequate GTVET curriculum and educational objectives, most respondents 94 (31.3%) strongly agreed followed by 86 (28.7%) who agreed. On inadequate government support on GTVET policies, most respondents 117 (39%) agreed followed by 83 (27.7%) who strongly agreed. On incoherent and uncoordinated policies, majority 113 (37.7%) strongly agreed followed by 97 (32.3%) who agreed. On inadequate partnership between stakeholders on GTVET, majority 111 (37%) strongly agreed followed by 99 (33%) who agreed.

**Table 3** *Issues Affecting the Greening of TVET Programs at the Global Level*

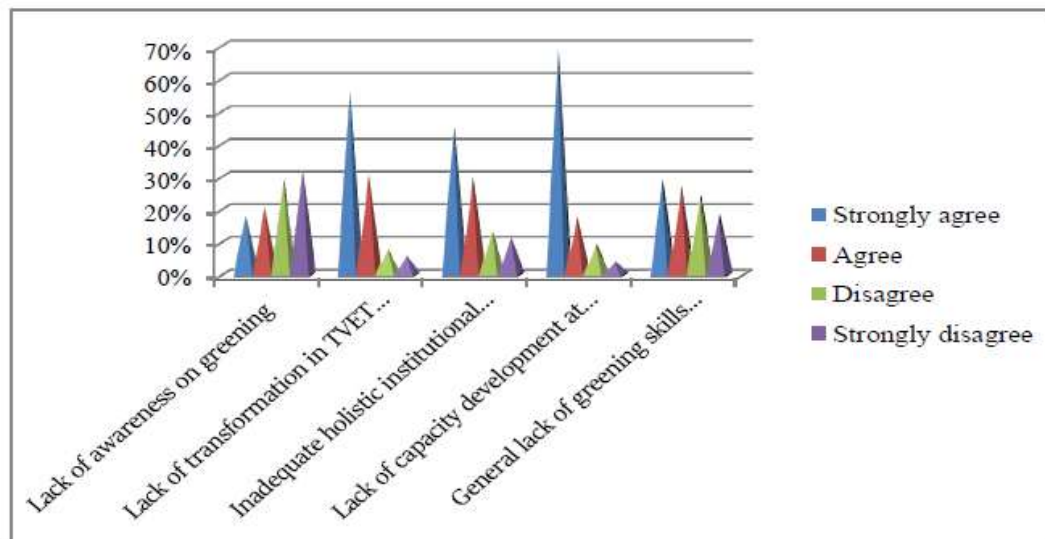
| STATEMENT  | SA  | %    | A   | %    | D  | %    | SD | %    |
|--|-----|------|-----|------|----|------|----|------|
| Inadequate involvement of different stakeholders in GTVET          | 102 | 34.0 | 121 | 40.3 | 50 | 16.7 | 27 | 9.0  |
| Inadequacy of sharing evidence-based policy and practices in GTVET | 111 | 37.0 | 108 | 36.0 | 46 | 15.3 | 35 | 11.7 |
| Inadequate facilitation of interagency cooperation in GTVET        | 124 | 41.3 | 123 | 41.0 | 30 | 10.0 | 23 | 7.7  |
| Inadequate support of capacity building and research in GTVET      | 72  | 24.0 | 71  | 23.7 | 78 | 26.0 | 79 | 26.3 |

Note. SA - Strongly Agree; A - Agree; D: - Disagree; SD - Strongly Disagree

Table 3 displays frequencies and percentages of the responses on issues affecting the greening of TVET programs at the global level. On inadequate involvement of different stakeholders in GTVET, majority 121 (40.3%) agreed after that 102 (34%) who strongly agreed. On insufficient sharing of evidence-based policy and practices, majority 111 (37%) strongly agreed followed by 108 (36%) who agreed. On inadequate facilitation of interagency cooperation, majority 124 (41.3%) strongly agreed while 123(40%) agreed. On inadequate support of capacity building and research in GTVET, there were almost equal responses 72 (24%), 71 (23.7%), 78 (26%) and 79 (26.3%) on strongly agree, agree, disagree and strongly disagree respectively).

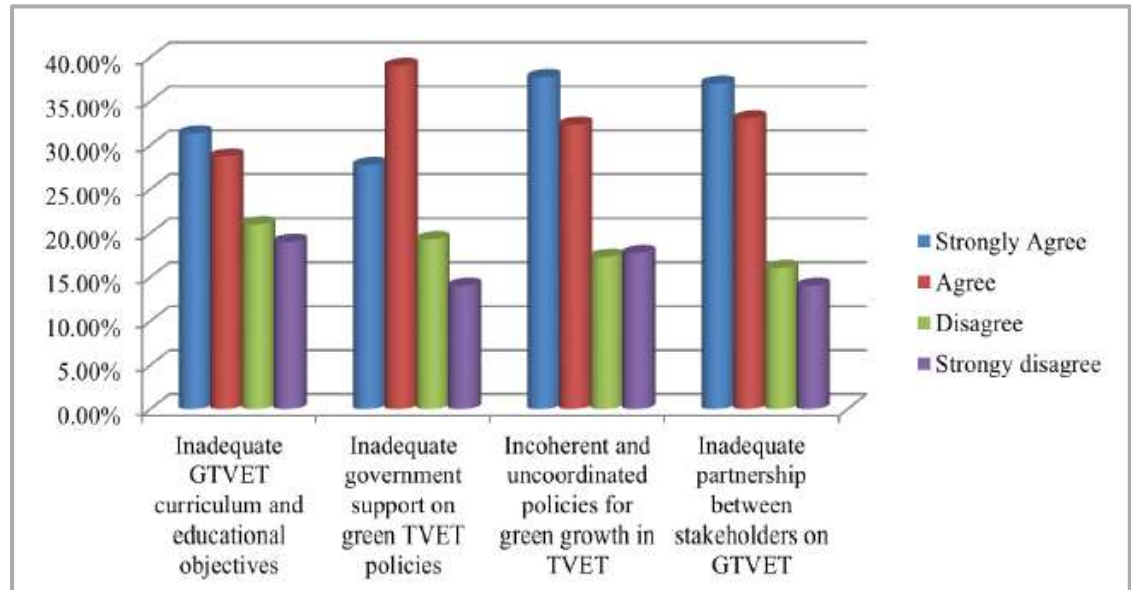
### Discussion

Analysis of figure 1 shows that most teachers were aware of the current trends in greening TVET. On inadequate transformation in TVET institutions in greening, inadequate holistic institutional approach, inadequate strengthening of individual initiatives and inadequate capacity development at institutional level in GTVET the trend responses indicated that lecturers strongly agreed and agreed. These were demonstrations that most TVET institutions in Kenya still lack clear institutional policies on GTVET. Supportive policy environment and framework, developed at the institutional level is critical to the successful integration of GTVET into any education system (Pavlova, 2016). The findings further show that there is general lack of greening skills and confidence amongst the teachers. This agrees with Singh (2013), who argues that attitude, motivation and greening skills are factors affecting teachers’ use of new greening skills in their lessons. While green skills continue to advance in developed countries, Kenya still experiences a lag in its implementation and that continues to enhance the degradation of the environment (Singh, 2013). These findings show that the institutional administrations haven’t fully incorporated the culture of GTVET in their respective institutions



**Figure 1:** Issues affecting the greening of TVET programs at the institutional level





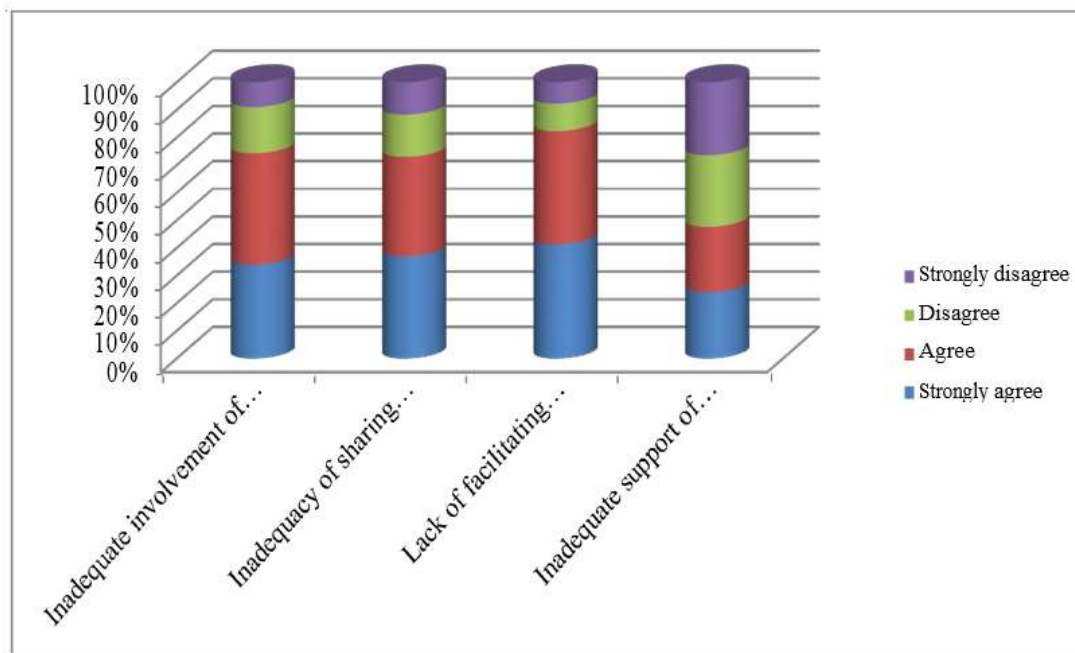
**Figure 2:** Issues affecting the greening of TVET programs at the national level

Investigation of figure 2 shows that there were inadequate GTVET curriculum and educational objectives. It was hence clear that this question needed some serious attention by TVET stakeholders. The GTVET educational objectives should promote basic skills and cross-cutting, generic green skills to enable workers to meet the new and emerging skills needs and promote basic skills as the foundation of flexibility, employability and lifelong learning (UNESCO, 2013). Pavlova (2016) observed that generic green skills can be included in existing modules and courses or as new environmental awareness modules. The UN (2012) report on education states that Kenya has abundant labour force, but the skills do not meet demands of a highly competitive economy because of mismatch between the school curriculum and skills required by employers.

The questions that arose were therefore how well Kenya Institute of Curriculum Development (KICD) could integrate green concepts into the curricula of TVET institutions and work-based training and what specific linkages for the implementation of GTVET would be. The KICD should therefore revise TVET curricula to offer courses in energy-saving and cleaner technologies and sustainable agribusinesses. It should also ensure that updated and new curricula take economic, social, and environmental dimensions of sustainable development. The government needed to promote technical skills for a transition to a greener economy.

Pavlova (2016) noted that the government needed to connect ongoing TVET reform and existing schemes with the greening of skills supply. She also observed that the government should ensure that policies and initiatives in skills development would include greening and greening of education for TVET teacher. The government should further enhance policy coherence and coordinated implementation of education and training for sustainable development. KICD should thus design education and training responses in collaboration with relevant ministries to address national, regional or local demand to address the issue of inadequate partnership between stakeholders on GTVET.





**Figure 3:** Issues affecting the greening of TVET programs at the global level

Analysis of figure 3 shows that all the stakeholders were not adequately involved in GTVET. The KICD should consequently design and implement GTVET policies through inter-ministerial and inter-sectorial approaches that involve the private sector, civil society, local communities and the scientific community (Singh, 2015). Analysis of sharing evidence-based policy and practices and facilitating interagency cooperation in GTVET majority shows that they were inadequate. Singh (2012) noted that students learning green technology in their various fields can showcase their scientific research and benefit from sharing them online and helping others to learn. Collaborations amongst all the international players in GTVET should therefore be enhanced. The responses on support of capacity building and research in GTVET were almost at par and therefore a clear conclusion couldn't be made.

## Conclusion

The findings revealed that there were several issues that haven't adequately been addressed to fully have a functional GTVET. They included insufficient integrated sustainable development into training, lesser promotion of technical skills for a transition to a greener economy, insufficient enhanced policy coherence and coordinated implementation of training and inadequate curriculum development and implementation strategies.

## Recommendations

### Pillar 1: Institutional level

- i. Promote technical skills for a transition to a greener economy.

- ii. Organize workshops and in-service training for TVET teachers in fast-growing green sectors.
- iii. Improve the match between classroom and workplace learning through apprenticeships.

### **Pillar 2: National level**

- i. Integrate sustainable development into education and training at tertiary level of education.
- ii. Integrate skills development into national environmental and development strategies.
- iii. Design education and training responses in collaboration with relevant ministries to address national, regional or local demand.
- iv. Revise TVET curricula to offer courses in energy-saving and cleaner technologies and sustainable agriculture, traditional technologies redefined as green technologies.

### **Pillar 3: Global level**

- i. Increase the reputation and attractiveness of key sectors to be greened such as waste management, recycling and agriculture by improving the working conditions in these sectors.
- ii. Provide retraining for skills upgrading to keep workers' skills up to date with new demands of the green economy.
- iii. Involve the private sector, trade unions and employers' associations in designing GTVET to ensure its relevance to industrial needs.

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