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The development of green skills for the informal sector of Ghana: towards sustainable futures

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ABSTRACT

Informed by the capability approach and critical discourse analysis, this article examines how the development of green skills among master craftspersons and apprentices in the informal sector of Ghana could be promoted for cleaner production and sustainable futures. The findings show that inequality and poverty; cyclical policy trap; sectoral green initiatives and the green coordination gap; and limited human resource capacity including uncoordinated informal learning approaches serve to constrain the development of green skills among master craftspersons and apprentices in the informal sector of Ghana. To address these challenges, the current study proposes the development of a framework that (1) harmonises the different sectoral initiatives and strategies on green skills to avoid the cyclical policy trap; (2) expands the current green Technical and Vocational Education and Training (TVET) agenda to include green skills development for individuals in the informal TVET sector; (3) closes the coordination gap in government green initiatives by creating an agency responsible for national green agenda; and (4) creates clear qualification models and strategies for the development of green skills in the informal sector.

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Introduction

The United Nations sustainable development goals (SDGs) were adopted in 2015 as a universal call to action to eradicate poverty, protect the planet, and ensure that by 2030 people enjoy peace and prosperity (UNDP 2022). The SDGs also highlight the importance of ensuring that countries provide their citizens with inclusive and equitable quality education as well as promote lifelong learning opportunities for them. Although SDG4 underscores the importance of the acquisition of Technical and Vocational Education and Training (TVET) skills for employment, decent work and entrepreneurship, there are gaps in literature, policy and practice concerning how green skills for sustainable futures could be developed especially in the informal

economy of Ghana. A review of recent literature on the green economy in Ghana shows that scholarly publications in the field are fragmented and also, dominated by studies in the formal sector (Ali, Anufriev, and Amfo 2021; Ampratwum et al. 2021; Debrah et al. 2022). Another gap is the weak link between skills requirements and the transition to green activities and jobs (ILO 2018). In particular, the current structure of TVET which consist of a policy framework and curriculum do not address issues concerning how TVET could support the transition of Ghana from a high-carbon economy to a green economy.

From an economic perspective, while Ghana has recorded increased economic growth figures over the years, this achievement has come at a cost especially, through increased greenhouse gas emissions (Ali, Anufriev, and Amfo 2021) with consequences for the environment. Notwithstanding the importance of economic growth for improving the living conditions of citizens, poor business practices and human activities have led to environmental pollution, biodiversity loss, and environmental degradation (Mealy and Teytelboym 2022). With the growth in the extractive industry such as the extraction of crude oil, mining of minerals and increasing demand for skilled human capital in these fields (ILO 2018), it has become necessary to explore how master craftspersons and apprentices in the informal sector could develop green skills for cleaner production and sustainable futures. More so, as the TVET sector has become very important to the achievement of the SDGs and a green economy, this study is timely because it examines how sectoral policies and green skills could be developed in the informal sector of Ghana. Whereas informal learning offers opportunities for skills development among individuals in society (Ramsarup and Russon 2023), the process of obtaining skills is intertwined with the aspirations and capabilities of individuals. These aspirations and capabilities are expected to form part of the critical consideration for the development of programmes that are oriented towards decent work (Powell and McGrath 2019), especially in the informal sector.

Using the capability approach as the theoretical underpinning, the current study examines how various forms of inequality, marginalisation and policy gaps continue to affect human development, especially, the acquisition of green skills by master craftspersons and apprentices in the informal sector of Ghana. Secondly, the study examines the policy and legislative context of TVET in Ghana and, the ecology of the informal economy and informal apprenticeship concerning the development of green skills for sustainable futures. Accordingly, the current study was guided by two main research questions (RQ): RQ1) what features shape the development of green skills in the informal sector of Ghana? and; RQ2) how can the different policies, practices, and investments on TVET in the informal sector be harmonised to support the development of green skills for sustainable futures in Ghana? Informed by the capability approach and the critical discourse analysis (CDA), the study concludes by explaining how the

development of green skills among individuals is shaped by different international charters, sectoral policies, strategies, and programmes.

The policy and legislative context of TVET in Ghana

The National Vocational Training ACT, 1970 (ACT 351) was established in 1970 to coordinate all aspects of vocational training including apprenticeship at the national level (Baiden 1996). Consequently, the National Vocational and Technical Institutes (NVTI) were created to coordinate the technical and vocational training programmes across the country. Following structural and systemic challenges within the NVTI setup, the National Coordinating Committee for Technical and Vocational Education and Training (NACVET) was established in the 1990s to accelerate the provision of quality technical and vocational education in the country. The NACVET was also tasked to ensure the evaluation, testing, assessment, and accreditation procedures of technical, and vocational training in Ghana (MOE 2021, 20). These structural changes led to the development of the first National Occupational Standards (NOS) in about 40 trade areas in Ghana and the integration of entrepreneurial education into the curriculum for TVET Institutions (MOE 2021, 20). Currently, the functions of the TVET service include the following: promote further education and training and lifelong learning; keep an up-to-date register of TVET institutions and trainers in the service; facilitate practical workplace experience, learning and apprenticeship and; promote equity and inclusiveness in access and participation in TVET with emphasis on gender and persons with disability (MOE 2021). There are four categories of TVET providers in Ghana: the ministries; private for-profit and non-profit institutes; nongovernmental organisations (NGOs) and; informal apprenticeships (which serve as the largest skills development unit in Ghana) (Darvas and Palmer 2014). Although some efforts have been made to develop policies to promote TVET in the formal and informal sectors, there are still gaps in how sectoral policies especially on green skills could be developed and implemented in the informal sector of Ghana.

Ecology of the informal economy and informal apprenticeship

The term informal economy was coined in 1971 by British anthropologist Keith Hart who argued that the sub-proletariat in urban Southern Ghana who were involved in diverse economic activities were not a passive and exploited group of unemployed and underemployed individuals (Hart 1973). Rather, Keith Hart argued that the sub-proletariat in urban Southern Ghana had the capacity (through their economic activities) to generate growth in the incomes of the urban and rural poor (Dell'anno 2022, 1611). The use of the term informal economy has previously been linked to issues relating to economic opportunity, equity and, social development that are also associated with the dualistic

economic structure of many developing countries (Losby et al. 2002, 2). Likewise, the boundaries of the informal economy are defined by policies that relate to issues concerning trade, labour, environmental sustainability and, regulatory controls (Webb et al. 2013) that are also rooted in cultures, social sanctions, customs, and traditions (ILO 2012). Recent studies in South Africa and Nigeria suggest that conditions that promote the informal sector include income disparity, limited access to education and training, unemployment, disproportionate tax burdens, and institutional bureaucracies (Etim and Daramola 2020). Similarly, the informal sector is characterised by the use of low-return technology, the inefficient use of resources, reduction in the national tax base and revenues, and increasing levels of environmental pollution (Elbahnasawy 2021).

The definition of informal economy vary based on the divergent research goals and discipline of scholars. For example, while the economic perspective of the informal economy is based on synonyms such as underground, unofficial, shadow, hidden and black economy, in national accounting, statisticians perceive informality based on non-observed economy, underground production, and informal productive activities (IPA) (Dell'anno 2022). Attempts to harmonise the definition of the informal economy have led the ILO (2021) to define informal economy based on IPA and informal market economy (IME). In relation to IPA, the informal economy is defined as 'all productive activities carried out by persons and economic units that are in law or in practice not covered by formal arrangements' while under IME, the informal economy is defined as "all productive activities, carried out by workers and economic units for pay or profit that are in law or in practice not covered by formal arrangements (ILO 2021, 7 and 11). While the size of the informal sector cannot be easily estimated (Gewer 2021), recent statistics show that about two billion people representing 61.2% of the world population are employed in the informal sector (ILO 2018). Again, even though informal economic activities in developed economies such as the United States and Japan account for between 5% and 15% of annual GDP, in some developing economies in Latin America, Southeast Asia, and Africa, the informal economy accounts for more than 50% of the annual GDP (Webb, Ireland, and Ketchen 2014). However, the arguments against informal sector are that it worsens social and income inequalities while it also serves as a major challenge to any attempt by governments to use development indicators to measure economic conditions because of its inherent measurement biases and unreliable data (Elbahnasawy 2021).

Within the informal economy is the informal apprenticeship which serves as the main source of developing the technical and vocational skills of individuals in the areas of manufacturing, construction, trading, and service businesses in some countries located in South Asia, sub-Saharan Africa, Latin America and recently, some Central Asian countries (Palmer 2020). In Ghana, the informal economy offers employable skills training to individuals through apprenticeships and on-

the-job skills training which are delivered by registered and unregistered training providers (MOE 2021). However, a major challenge as pertains in many countries is that the delivery approaches used by most Vocational Education and Training (VET) providers in the informal sector are not conducive for training apprentices mainly because the formal VET curricula are designed for formal qualifications (Gewer 2021). Again, the pedagogical approaches and curricula used in formal VET settings are often designed to prepare young individuals for formal workplace settings and thus do not align with the knowledge and skills needs of businesses in the informal sector (Gewer 2021). Although the term informal may suggest a less formal system of operation and standardisation, there could be a high degree of formalisation by informal sector organisations especially through the setting of standards in their professional practice, assessment processes, and certification (Gessler 2019).

Relative to the formal economy, skills development in the informal economy consists of formalised or semi-formalised skills programmes with identifiable objectives (Palmer 2007). For instance, the informal economy accounts for about 90% of all trades training in Benin, Senegal, and Cameroon and also serves as the most dominant form of all trades training in Africa (ILO 2012). Prior study on informal apprenticeship shows that the concept is characterised by minimal state funding, the lack of national TVET policies to guide the training of individuals; and non-legally binding contract between master craftspersons and apprentices which may include the issuance of a certificate to apprentices on completion of their training (Gessler 2019). Also, apprenticeship requires less formal education, training follows a work-based learning approach, it involves a flexible financing arrangement between apprentices and master craftspersons for the payment of fees where applicable and, it is not based on educational qualifications (ILO 2012). Although the government's major interest in the development of technical and vocational education skills consists of social and economic features (Darvas and Palmer 2014), what is yet to be addressed substantially is how the development of green skills especially in the informal sector could lead to cleaner production for sustainable futures. Again, while policies such as Education for All (EFA), the national actions towards the millennium development goals (MDGs) (Palmer 2007), and the SDGs seem laudable, they are yet to fully address the skills development issues confronting individuals in the informal economy and the environment. Another major concern is the seeming low research uptake in the area of green skills development especially in the informal sector.

Sustainability, green skills and green jobs

The third UNESCO international congress on TVET which was held in May 2012 in Shanghai was aimed at transforming TVET from satisfying the labour market needs to contributing to inclusive education and sustainable development

(Kastrup and Winzier 2014). The Shanghai Congress emphasised education for green economies and green societies as important to TVET programmes and qualifications with a focus on ecological, environmental, economic, and social components (Kastrup and Winzier 2014; McGrath 2023). Particularly, the Shanghai Consensus recommended that TVET should be enhanced by incorporating education for green economies, green competencies and green societies in TVET programmes and qualifications which would further lead to low carbon and climate-resilient growth and development (Kastrup and Winzier 2014). However, many years after the Shanghai congress, the VET sectors across countries of the world are still struggling to create a balance between the quadruple components of ecological, environmental, economic, and social features. Particularly, McGrath (2023) has argued that the transformation of the VET sector especially in Africa has focused on satisfying the needs of formal employers and the economy.

The conceptualisation of green skills consists of a broad set of soft skills required for performing general tasks to the narrow technical skills that are needed for specific jobs (Maclean, Jagannathan, and Panth 2018). Globally, the green skills gap between the high and semi-skilled continue to hamper the green economy agenda (ILO 2018). This calls for the development of green skills across different sectors and trade areas that will support the greening process while existing jobs will have to be transformed to ensure that they sustain the environment and reduce pollution and the emission of carbon waste. Also, green skills cannot be discussed in isolation without sustainability competencies and green jobs. Emerging conversations have revealed the importance of sustainability competencies to the concept of sustainable development (Fuertes-Camacho et al. 2019). Sustainability competencies refer to the basic competencies that train people to adopt personal lifestyles thereby, ensuring a balance between economic growth, respect for the environment, and social justice (Fuertes-Camacho et al. 2019). The current study argues that the development of green skills are linked to the concept of sustainability competencies where master craftspersons and apprentices are expected to apply their knowledge and skills in ways that preserve the environment. Undergirding the concept of green skills is that, human activities and occupations at the workplace would be performed using methods that are ecologically friendly and sustainable (UNESCO 2017).

Green jobs “consist of decent work that improves energy and raw materials efficiency, limits greenhouse emissions, minimises waste and pollution, protects and restores ecosystems, and supports adaptation to the effects of climate change (ILO 2018, 15). The concept of green jobs can be explained using two perspectives – the eco-industry perspective which identifies jobs as green based on the different activities and the transformation perspective which identifies all jobs as greening (Maclean, Jagannathan, and Panth 2018). These definitions highlight the need to ensure that jobs are decent and that, activities within the

manufacturing, agriculture, research and development and, service sectors preserve and restore the quality of the environment (Maclean, Jagannathan, and Panth 2018). The current study foregrounds green TVET in the context of Ghana by examining how the development of green skills could be shaped to translate into opportunities for apprentices and workers in the informal sector by way of their capabilities and functioning.

The growing number of unskilled individuals within the informal sector of Ghana has implications for any attempt by policymakers and researchers to work towards the implementation of the green agenda. For instance, 74.3% of mining in Ghana is carried out in the informal sector (ILO 2018) with its attendant challenges such as continuous environmental degradation, pollution of water bodies, destruction of arable lands, and the health risks associated with living in communities within the mining areas. Similarly, urbanisation and industrialisation have led to the degradation and pollution of the environment which include reduced water quality, depletion of urban natural resources, high fuel consumption, and traffic congestion (Debrah et al. 2022). To address the concerns of countries and agencies regarding the unpredictable economic, environmental and social forces, the MDGs and the 17 global goals for sustainable development were modelled for implementation (Ramísio et al. 2019; United Nations 2015). Furthermore, population growth, consumption of natural resources and the changing social norms continue to affect the economic, environmental and social gains that could be made concerning sustainability (Ramísio et al. 2019).

Critical discourse analysis (CDA)

Critical discourse analysis (CDA) consists of a set of theories and methods that are used for examining discourse and social life (Rogers et al. 2016) as well as exploring the link between educational practices and social contexts (Mullet 2018). Although concepts such as discourse, power and, ideology had been used in various studies, the term CDA was coined by Fairclough in his book, *Language and Power* which was published in 1989 (Rogers et al. 2016). Discourse analysis has been explained as ‘the analysis of “texts” in a broad sense – written texts, spoken interaction, the multi-media texts of television and the internet, etc.’ (Fairclough 2005, 920). For the current study, we examined how various forms of inequality, marginalisation, and policy gaps continue to affect human development especially, the acquisition of green skills by master craftspersons and apprentices in the informal sector of Ghana. Also, by highlighting and challenging taken-for-granted assumptions concerning language and social elements that could serve as strong agents of change, CDA could be applied through a process of systematically analysing texts, identifying patterns in a text, and connecting the patterns in a context (Ofori-Parku and Koomson 2023). Other

formulations suggest that CDA is a qualitative analytical approach that is used for critically describing, interpreting and explaining how discourses serve to construct, maintain, and legitimise social inequalities (Mullet 2018; Wodak and Meyer 2009).

Data analysis

To conceptualise the development of green skills as a social phenomenon in the informal sector of Ghana, the General Analytical Framework for CDA (Mullet 2018) was followed. First, we selected and discussed green skills as a discourse that relates to social inequalities and persistent neglect of the skills development of individuals in the informal sector. Our discussions were underpinned by the capability approach (Sen 1999) which is rooted in critical theory. Ingrid Robeyns (2005, 95) explains that 'the capability approach is a theory within the liberal school of thought in political philosophy, albeit arguably of a critical strand'. The second step was to locate and prepare the data sources which consisted of books, book chapters, articles, and policy documents drawn from different databases including Web of Science, Elsevier Scopus, EBSCOhost, and the government of Ghana websites. Although under the CDA approach, there is no one way of gathering data, it is important for researchers to recognise the prominence of analysing existing texts (Mullet 2018; Wodak and Meyer 2009). We further examined how the development of green skills is connected to the context of TVET in Ghana, the informal economy, the context of sustainability, green skills, and green jobs. Consequently, we generated themes based on deductive and inductive coding approaches. We were also interested in examining how conversations both locally and internationally around policy issues on TVET, green TVET, inequality, and poverty affect the development of green skills especially among master craftspersons and apprentices in the informal sector. This also includes examining how government policies over the years have shaped skills development and how the concept of green skills has been incorporated into TVET policies.

The analysis further led us to identify the challenges associated with implementing policies on skills development in the informal sector. For instance, the 2021 Ghana TVET report acknowledges the importance of green TVET by emphasising the need to integrate greening philosophies into the curricula of TVET Institutions, workplace practices, and communities (MOE 2021, 26). However, there are still no defined policies that govern the development of green skills in the TVET sector and also in the informal sector. We also analysed the different issues that affect the development of green skills among individuals in the informal sector of Ghana. Lastly, we interpreted the four major themes of the data and showed how they are linked to the development of green skills in the informal sector of Ghana. The four themes developed are inequality and poverty; cyclical policy trap; sectoral green initiatives and the

green coordination gap and; limited human resource capacity and uncoordinated informal learning modes.

The findings of the current study should be interpreted in the light of some limitations. First, we could not include in our study, all the different Sectoral initiatives on the green economy. What this means is that there could be some very important initiatives that could inform our framework but were left out. Secondly, we did not provide a detailed structure of the green skills development needs of the over 40 different trade areas in Ghana. While we consider this as outside the scope of our study, we believe that a detailed structure of the green skills development needs of the different trade areas in Ghana would inform the government and researchers of how to support the development of green skills in Ghana. Lastly, we must indicate that there are very few literature on the development of green skills within the informal sector of Ghana and internationally.

The capability approach

Originally developed by Amartya Sen (1980, 1984), the capability approach explains how evaluation and policies should emphasise what individuals *'are able to do and be, on the quality of their life, and on removing obstacles in their lives so that they have more freedom to live the kind of life that, upon reflection, they have reason to value'* (Robeyns 2005, 94). Therefore, *'while the notion of capabilities refers to a very broad range, basic capabilities refer to the real opportunity to avoid poverty'* (Robeyns 2005, 101), it could be explained based on two important features: freedom and valuable beings and doings (functioning). Similarly, a capability represents a potential functioning with an endless list that consists of doings and beings such as having access to clean water, paid job, good education, safety, and being respected (Walker 2005). Although it is widely used in the fields of welfare economics, development studies, social policy, and political philosophy (Robeyns 2005), recent literature has also highlighted how the capability approach could be used to explain the effect of inequalities and exclusion in the TVET sector (McGrath et al. 2019, 2022; Tikly 2013). However, in the field of green TVET, very little is known about how capabilities could be theorised and conceptualised, especially in the informal sector.

Sen identified freedom as essential to the capability approach (Sen 1999). What this means is that the capability approach focuses on what individuals are able to effectively do by way of the freedoms they have, the valuable opportunities available to them and, to lead the kind of lives they aspire to have in terms of their capabilities (Robeyns 2005; Sen 1999). However, we emphasise that in the context of green TVET, these freedoms could in part be guaranteed by the state through international charters that bind the actions of a state and the internal policies that support the development of green skills. A major question

in relation to green TVET is, how do individuals achieve their desired goals and objectives with very minimal education, technical knowledge, technical skills, and financial support? Prior study has shown that:

A capability approach allows for an expanded view of the purpose of TVET as supporting the development of human capabilities and functionings that individuals, communities and society at large have reason to value ... The idea of capabilities adds to existing conceptions of TVET by drawing attention to the opportunities and freedoms (capabilities) that lead to the development of these functionings. (Tikly 2013, 22)

Another important feature of the capability approach is that it highlights how *'evaluations should look at the condition of being educated, the negative and positive freedoms that sustain this condition, and the ways in which being educated supports what each and every person has reason to value'* (Unterhalter 2007, 75). Without the opportunities (financial and other resources) available to master craftspersons and apprentices, they would not be able to develop the requisite green skills to engage in activities that protect the environment from degradation and pollution. Furthermore, there could be social constraints that restrict individual well-being and evaluative exercises (Robeyns 2005). Second is valuable beings and doings (functionings) which consist of activities such as participating in political discussions, being confident, and enrolling in educational programmes (Alkire 2005). In the context of green skills and the informal sector, functionings could represent the inclusion of master craftspersons and apprentices in the design and implementation of training activities. This is because the notion of functioning includes 'the various things a person may value doing or being' (Sen 1999, 75) or the multiple diverse features of life that individuals value (Alkire 2005, 118). However, there is no one set of basic functioning especially in the development of green skills among individuals in the informal sector. While the capability approach is not a theory that can be used to explain features, such as well-being, inequality, and poverty (Robeyns 2005), it has been used to advance the human development paradigm (Fukuda-Parr and Kumar 2003). For example, the ends of well-being, justice, and development could serve as the basis for conceptualising the capabilities of individuals to function by means of real opportunities and to take on activities they plan and, work towards, and becoming who they desire to be (Robeyns 2005). In essence, functionings include the ends of wellbeing, justice, and development that all serve to enable individuals to undertake actions and to work towards achieving their aims and making life valuable. This includes the development of green skills for the preservation of the climate and environment and for sustainable futures and individual well-being.

Consistent with prior studies (McGrath et al. 2020, 2022), the current study argues that contemporary theoretical approaches to VET do not adequately address the challenges associated with skills development in the sector. Particularly, there are still gaps concerning how these theories including the

capability approach could adequately address issues concerning not only the development of green skills for sustainable futures but also how individuals in the informal sector could transform their livelihoods and thoughts concerning the effect of ecologically unfriendly business practices to the environment. Again, the concept of green skills in the informal sector presents new challenges that call for a new capability approach that does not only address issues regarding inequalities and exclusion in the informal sector but also, focuses on the preservation of the environment through good business practices and concern for the environment. Therefore, while we think about what we are able to do and be concerning the quality of life and obtaining more freedom to live the kind of life that we value (Robeyns 2005), we must also be mindful of our environment, by considering green jobs in place of traditional jobs that are ecologically unfriendly and, green competencies sustainable futures.

Inequality and poverty

One of the fundamental strengths of the capability approach is the clarity about objectives such as proposing alternative spaces to conceptualise poverty reduction and justice (Alkire 2005, 117). In the context of TVET, barriers such as poor educational background, low socio-economic background, and gender inequalities could affect individual capabilities and what they choose to value (Tikly 2013). Concerning the development of green skills, inequality, and poverty which are common among individuals from low socio-economic backgrounds and the rural poor could limit their opportunities to acquire skills for sustainable futures. While about 71% of children complete primary education, 47% complete lower secondary, and 35% complete upper secondary in Ghana (UNICEF 2020). The reasons for school dropout in Ghana include the inability of some learners to mobilise resources to pay their school fees (Osei et al. 2021). Again, children from poor family backgrounds and those living in rural areas have low completion rates below the national average while children from rich family backgrounds and children in urban areas have completion rates above the national average (UNICEF 2020). In terms of headcount, 526,500 pupils at the primary school level, 920,700 at the lower secondary level, and 1,104,800 at the upper secondary level did not complete school (UNICEF 2020). What these statistics mean is that while a lot more pupils drop out of school, they do not develop skills that could provide them with jobs for their livelihoods and sustainable futures. A corollary is that the majority of these individuals who drop out of school would find their way to the informal economy.

There are limitations to the effective distribution and utilisation of resources in democratic countries (Drèze and Sen 2002). Resources include financial means, economic production, social or cultural practices, social institutions, public goods, social norms, protection of freedom of thought, traditions, habits, and all dimensions of human well-being (Robeyns 2005, 96). However, social

relations of power and inequality that create the disadvantaged in society can be explained by the capability approach (Tikly 2013, 21). As highlighted by Darvas and Palmer (2014, 85):

[t]he poor have considerably lower access to skills training in Ghana be it institute based or enterprise based; fees and other contributions by private households constitute obstacles to participation. Much public spending on TVET is not targeted at the poor and is captured by those who are less in need, thus widening inequalities.

The antecedents of social inequalities are important to examine how individuals make use of the resources available to them including the development of green skills. For instance, a study conducted by Tabiri, Adusah-Poku, and Novignon (2022) revealed that socioeconomic-related inequalities in the use of clean cooking fuels continue to affect Ghana's goal to achieve SDG 7 which seeks to ensure universal access to affordable and sustainable energy. Again, while the lack of clean cooking fuels contributes to energy poverty, the continuous use of traditional fuel poses health challenges (Tabiri, Adusah-Poku, and Novignon 2022). Therefore, it is important for the government and different stakeholders including researchers in academia to relook at: 1) the promotion of green jobs and skills across different levels, professions, and trades; 2) the transformation of the rural economy through green jobs and sustainable livelihoods and; 3) the development of green skills in rural areas through apprenticeship training.

Cyclical policy trap

The cyclical policy trap represent a major challenge to the implementation of policies on green skills in Ghana and other developing countries. In the current study, we refer to the cyclical policy trap as a process of reframing old policies and presenting them as new ideas to address existing problems. For instance, to address the underemployment and unemployment issues in Ghana, the government has put in place several policies with most recently, the Coordinated Programme of Economic and Social Development Policies (2017–24): An Agenda for Jobs-Creating Prosperity and Equal Opportunity for All (Dadzie, Fumey, and Namara 2020) and; the COVID-19 Alleviation and Revitalisation of Enterprises Support (CARES) programme (Government of Ghana GoG 2022). Likewise, other policies such as the national employment policy, Labor-Intensive Public Works Policy, National Social Protection Policy, and the National Youth Policy have all been developed to support youth employment and the employment of citizens (Dadzie, Fumey, and Namara 2020). However, the implementation of these policies as well as previous policies are challenged by the lack of coordination of the various government programmes, the fragmented approach to addressing the different issues, and differences in the

policy direction of the various governments (Dadzie, Fumey, and Namara 2020; Darvas and Palmer 2014).

Previous study has shown that inadequate use of functional democratic institutions by individuals or groups could lead to low appreciation of issues, limited technical know-how, or low motivation to perform specific tasks (Drèze and Sen 2002). A corollary is that first, while agencies and institutions may be set up by the government to support the implementation of policies on the development of green skills, a lack of resources, skilled personnel, and conflicting political interests could affect the implementation processes. Furthermore, while most of the public TVET institutions can be found in almost all the regions of Ghana, they are mostly located in the urban areas while the majority of those located in rural areas are the publicly funded ICCESs and the Youth Leadership and Skills Training Centers (Darvas and Palmer 2014).

Secondly, although homegrown solutions and local intervention strategies may be appropriate for resolving issues regarding the implementation of policies on skills development, the tendency for government to rely on policies and practices from Western countries could render some of these policies ineffective. Resultantly, there has been a continuous development of policies on employment and skills development with very minimal effect on the livelihoods of rural dwellers and those with minimal or no skills. The capability approach emphasises the plurality of functionings and capabilities as the evaluative space where the activities of individuals and groups could be examined (Robeyns 2005, 99). Therefore, institutional or country evaluation and policies on the development of green skills must be centred on what individuals are able to do and be regarding the quality of life they desire to live, to have the freedom to live the life they decide to value and, to engage in activities that preserve the environment from degradation.

Sectoral green initiatives and the green coordination gap

As part of efforts by the government to achieve sustainable development through equitable low-carbon economic growth and also to ensure a climate-resilient and climate-compatible economy, the 2013 National Climate Change Policy (NCCP) was developed. The NCCP focuses on five priority areas: energy, industrial and infrastructural development; agriculture and food security; national resource management; disaster preparedness and response; and equitable social development (ILO 2018). Additionally, programmes such as community resilience through early warning, low-emission capacity-building programme, adaptation learning programmes and, Climate Change Education in Schools Programme (CCES, EPA) (ILO 2018) have all been organised to support the government's agenda on the green economy. However, while stakeholder engagement and the development of the NCCP are necessary, there is a need to coordinate and harmonise the various green initiatives in

the country. Particularly, what the current study terms as the green coordination gap has implications for the development of green skills for craftspersons and apprentices in the informal sector. The following section examines what could be referred to as green practices in three dominant fields in Ghana.

First, in the construction industry, the term green has been used to represent environment-friendly and resource-efficient practices that are used in building designs as well as landscaping options (Agyekum et al. 2019; Ampratwum et al. 2021). Changes to the traditional construction practices through a sustainable approach would require modifications to existing policies, professional norms, national standards, regulatory processes, technologies, consumption behaviour (Agyekum et al. 2019), and the development of green construction skills. This includes the adoption of green buildings in rural and urban communities. The benefits of green buildings include maintaining the health of occupants, the efficient use of resources, providing a healthier environment for users, the reduction of the adverse effects of building structures on the environment, and the conservation of energy and water (Agyekum et al. 2019). Even though the demand for skills in the construction sector has only been partially met (Darvas and Palmer 2014), one of the challenges in the promotion of green building is the shortage of personnel with green skills in the construction industry. This is also the result of gaps in the training and education of individuals to fill green jobs in the country (Agyekum et al. 2019) as well as training skilled individuals to support the implementation of green building certification (Ampratwum et al. 2021). The introduction of green certification of buildings in Ghana (Agyekum et al. 2019; Ampratwum et al. 2021) means that a lot more skilled artisans especially in the construction industry would be needed. The complexities of green buildings which include the establishment of an industrial chain consisting of planning, architecture design, material manufacturing, and operation management (Agyekum et al. 2019) make it imperative for extensive green skills training to be provided to artisans in the informal sector of Ghana. Particularly, when artisans in the informal sector are provided with green building skills, they would be able to design buildings that are resource-efficient, environmentally friendly and, energy efficient. This also calls for partnerships, between trades association in the informal construction sector and academia to find ways of developing the green building skills of artisans in the construction industry.

In the energy sector, Ghana's economic growth has led to increasing demand for electricity (Ibrahim et al. 2021). Again, the insufficient production of energy from hydro and thermal plants has led to demand for renewable sources of energy as well as the training of skilled personnel to develop, install and service renewable energy such as solar, wind, solid biomass, landfill gas, mini-hydro, geothermal, tidal and, sewage gas (Amo-Aidoo et al. 2022). To increase the production of renewable energy in Ghana, various policies such as Renewable Energy Service Program

(RESPRO 1999), Ghana Energy Development Access Project (2007), and recently, the Renewable Energy Master Plan (REMP) have been developed. These policies are backed by the Renewable Energy ACT (ACT 832, 2011) (Gyamfi, Modjinou, and Djordjevic 2015). The REMP has also been developed to achieve an estimated installed capacity of 2567 MW in renewable energy plants, carbon dioxide savings of about 20.6 million tonnes, and the provision of about 225,000 jobs by 2030. To achieve the goals of REMP, there is a need to build capacity in different areas of renewable energy development such as solar, wind, solid biomass, and landfill gas, especially for individuals in the informal sector. Prior study has also shown that the benefits of installing renewable energy in rural and off-grid communities in Ghana would be to provide households and businesses with continuous sources of energy while also contributing to the attainment of SDG 7 and 13 (Amo-Aidoo et al. 2022). However, the implementation of all the policies on renewable energy would require the training of personnel including apprentices in the informal sector to develop green skills to support the government agenda on renewable energy production. This is consistent with McGrath and DeJaeghere (2020) who have argued that the idea of decent work, green jobs, cleaner production, and sustainable livelihoods should be linked to the expansive goal of human development.

Currently, the agricultural sector in Ghana employs more than 50% of the population (Dadzie, Fumey, and Namara 2020). Therefore, it is important to enhance the green skills of individuals in rural areas and those in urban areas who desire to go into agriculture to support their livelihoods and to adopt environmentally friendly agricultural practices. The promotion of green skills especially in the agricultural sector includes advisory services, training, and extension activities that have clear objectives including the sustainable management of natural resources and the adoption of farm practices that are beneficial to the environment and farmers (OECD 2015). Practices that affect the sustainable production of crops in the agricultural sector of Ghana include misuse of pesticides and their residual effect on the environment including the destruction of farms, deforestation for cultivation purposes, and high usage of inorganic fertiliser (Yamoah et al. 2020). However, the training of individuals especially in rural communities on sustainable agricultural practices could lead to an increase in ecological practices and green skills. Although the CARES 'Obaatan pa' programme highlights the importance of supporting commercial farming and attracting educated youth into agriculture (Government of Ghana GoG 2022), emphasis must also be placed on the development of green skills among individuals in rural communities. Specifically, activities such as agricultural waste conversion storage (warehousing); sustainable water use; organic farming; cultural practice services in areas such as disease, pest, and weed control and; agro-processing (Dadzie, Fumey, and Namara 2020) could provide the rural youth with additional green job opportunities in agriculture.

Limited human resource capacity and uncoordinated informal learning activities

The transition to a green economy requires a change from low-skilled to high-skilled occupations, the training of professionals, and the nurturing of training and development professionals (ILO 2018) including those in the informal sector. Previous study has shown that TVET equips individuals with vocational skills, enriches human knowledge and skills required for meaningful participation in work and life, further learning and living, and promote economic, social, and environmental aspects of development (Galguera 2018, 53). Similarly, the development of green skills in the informal sector across different trades could enable individuals to acquire knowledge and skills that are not only relevant for today's jobs but also, jobs for sustainable futures. While the government continues to develop policies aimed at building a climate-resilient and climate-compatible economy, occupations for green jobs especially in the informal economy remain a major challenge because of limited human resource capacity. In particular, limited human resource capacity and uncoordinated learning activities in the informal learning sector serve to (1) constrain the ability of individuals to transform the characteristics of a commodity into a functioning and (2) constrain the development of green skills that are relevant to sustainable futures. Different economic, cultural, and political barriers may prevent individuals and groups from converting the resources available to them into capabilities and functionings (Sen 2009). Therefore, whereas government and other agencies attempt to transition from traditional ways of doing jobs to green jobs and cleaner production, it must also support individuals in the informal sector to acquire green skills without deepening existing inequalities and other forms of marginalisation (McGrath and DeJaeghere 2020).

A recent study by Alla-Mensah and McGrath (2021) has shown that apprentices in the informal sector indicated their desire to acquire further knowledge, especially in the area of health and safety at the workplace, diagnostics, and the theories concerning their trade. What this suggest is that individuals in the informal sector if given the opportunity could develop green skills that would help them to keep their jobs, contribute to the preservation of the environment and sustain their livelihoods. Likewise, the importance of creating sustainable livelihoods for individuals (Afreh et al. 2019; Osei et al. 2021) includes the need to explore how the acquisition of green skills could lead to employment and a reduction in the poverty rate. Another issue worth highlighting in relation to the development of human resources capacity is the element of cost. The green economy agenda is associated with cost, especially in the area of monitoring and evaluation of work activities in the green space. Consistent with the findings of a prior study, the high cost of green technologies among other features

continues to threaten Ghana's drive at meeting its green economy targets (Ali, Anufriev, and Amfo 2021). Summarily, although the cost of developing green skills and maintaining green jobs especially in the informal sector has implications for the government's green economy agenda, there is a need for more funding opportunities to be explored.

Conclusion

Using the capability approach as the theoretical underpinning, the current study examined how the development of green skills among master craftspersons and apprentices in the informal sector of Ghana could be promoted for cleaner production for sustainable futures. This is also against the backdrop that the transition from TVET to green TVET requires the training of master craftspersons and apprentices on issues concerning the environment, green technologies, and the preservation of the environment through sustainable practices. When master craftspersons and apprentices acquire green skills, they would be able to operate their businesses using sustainable practices that also help to address issues concerning climate change, environmental degradation, and scarcity of resources. Prior study has shown that the notion of decent work, green jobs, cleaner production, and sustainable livelihoods should be linked to the broad goal of human development (McGrath and DeJaeghere 2020). The findings of the current study show that the development of green skills in the informal sector of Ghana is characterised by four distinctive features: inequality and poverty; cyclical policy trap; sectoral green initiatives and the green coordination gap and; limited human resource capacity and uncoordinated informal learning modes.

First, inequality and poverty serve as two dominant features that constrain human development, especially individuals from low socio-economic backgrounds and the rural poor in Ghana and, could limit the opportunities of artisans to acquire green skills for sustainable futures. However, when artisans operate their businesses using sustainable approaches and enjoy the freedoms they have as well as the valuable opportunities available to them, they could lead the kind of lives they aspire to have in terms of their capabilities. Again, we argue that the opportunities (financial and other resources) and freedoms that master craftspersons and apprentices could have in the informal sector can be guaranteed by the state through policies and practices that enhance the development of green skills for sustainable futures. Similarly, the functionings which represent valuable beings and doings (Alkire 2005) could be enhanced when artisans are trained to acquire green skills that are relevant for sustaining business practices that serve to preserve the environment from degradation and pollution. Therefore, it is only when individuals are able to develop their capabilities and functionings that society can have cause to value these gains (Tikly 2013).

Secondly, insufficient use of functional democratic institutions by individuals or groups within the society could lead to a low understanding of

issues and limited technical know-how (Drèze and Sen 2002), especially concerning how homegrown solutions and local intervention strategies could enhance the development of green skills among artisans in the informal sector. To avoid what we term the cyclical policy trap that has affected the implementation of TVET policies in Ghana and other developing countries over the years, support (WTO 2001) for the development of green skills in the informal sector should be provided by integrating the different sectoral initiatives and strategies into one broad framework. Our review of the sectoral green initiatives in Ghana points to a coordination gap in the different initiatives, strategies, and goals. The framework should also aim at reducing inequality and poverty, promoting the adoption of ecologically friendly business practices, and increasing food security and sustainable livelihoods, especially for individuals in the informal sector.

To close the coordination gap in government green initiatives, the current study proposes that the green TVET concept should be integrated into the informal sector of Ghana to ensure the development of green skills among apprentices and master craftspersons for sustainable futures. This of course requires the development of an all-inclusive set of evaluation criteria (Tikly 2013) and the allocation of resources for different apprentices and craftspersons who would be trained. While there may be financial constraints across different sectors, there is the need for government to allocate resources to the most significant programmes such as those in the construction, energy, and agriculture sectors. The integrated framework should include the development of training manuals for green skills in the different trade areas such as renewable energy, automotive repair, building construction, furniture making, agriculture, cosmetology and, catering and hospitality. Additionally, there should be increased awareness in society concerning the need for the development of green skills for sustainable futures in the informal sector and the certification of artisans who have green skills.

The current study also argues for the creation of clear qualification models and strategies for the development of green skills in the informal sector. For instance, green building certification in the construction industry (Agyekum et al. 2019; Ampratwum et al. 2021) could be further developed to ensure that artisans and contractors who design and build structures have the requisite green skills and certification. This also means that educational institutions must focus on training facilitators to train artisans to develop their green skills in their trade areas. Furthermore, there should be a curriculum for green TVET in the different trade areas with adequate information concerning the expected knowledge and skills, a clear pedagogical approach, and practical learning approaches. This further calls for TVET providers to explore ways of developing the green competencies of apprentices to ensure that human activities and occupations at the informal workspaces are carried out using ecologically friendly methods. Also, the various trade associations should be encouraged and supported to develop needs assessments based on their skills for the green

economy. A recent study has shown that within the TVET settings, human resource development is important to enhancing green entrepreneurship training and innovation capacity (Askerud 2024).

By supporting the development of green skills in the informal sector across different trades, the government could ensure that standards are maintained within and across different professions while green jobs are also promoted in the informal sector. In relation to green jobs, the implications for policymakers and researchers are that: 1) increased effort at creating alternative pathways for craftspersons and apprentices to transform traditional jobs into green jobs would enhance cleaner production and ecologically friendly business activities; 2) the use of pedagogical approaches suitable for training apprentices in the informal sector would lead to the development of knowledge and skills that are relevant to business needs and; 3) improved collaboration between research institutions and businesses in the informal sector could lead to innovative and environmentally friendly ways of working. A prior study by Gewer (2021) has revealed the importance of using context-specific pedagogical approaches for training apprentices in the informal sector.

The current study argues that universities and research institutions have a major role to play by increasing studies in the field of green skills development in the informal sector and also ensuring that the findings of these studies are disseminated to a large audience. While challenges such as inadequate funding for green technologies and innovations, and the high cost of green technologies affect the objective of the government to build a green economy (Ali, Anufriev, and Amfo 2021), there is a need for greater involvement of researchers in promoting green skills in the informal sector. Also, the prioritisation of the development of green skills among individuals in the informal sector has become a necessity. One way of addressing this issue is for institutions at the district levels to advance strategies on the development of green skills with clear aims that include poverty alleviation, reducing social inequalities, and creating employment opportunities for individuals in the informal sectors.

Lastly, the current study argues that there is a need for researchers, government, and other agencies in the TVET and educational sector to rethink transforming the old ways of developing the skills of individuals in the informal sector to include the development of green skills. This also has implications for policies on lifelong learning, recognition of prior learning, the national qualifications framework, and budget allocations. Particularly, further research could be conducted into how green skills could be developed across the life span, different forms of learning (formal, informal, and non-formal), and along different trade associations. Consistent with a prior study (McGrath and DeJaeghere 2020), the delivery approaches used by TVET providers should be reviewed to ensure that appren-

tices obtain relevant knowledge and skills concerning green and cleaner production that would serve the business needs of the informal sector. Although Ghana has implemented different policies and strategies that are linked to skills development (Ali, Anufriev, and Amfo 2021), there are gaps in the informal sector concerning the development of green skills. Current government programmes such as planting for food and jobs (PFJ) and rearing for food and jobs (RFJ) initiatives could serve as the foundation for promoting research and the adoption of green skills among individuals in the agricultural sector. We also recommend that there should be further studies on how sectoral initiatives on green skills development could be improved to enhance green competencies in Ghana.

Disclosure statement

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