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RELEVANCE OF TREES AND FORESTS TO SUSTAINABLE DEVELOPMENT: PERSPECTIVES OF KEY RURAL ACTORS IN SELECTED COMMUNITIES, GHANA

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In consonance with the universal quest for sustainable development, the United Nations (UN) declared 17 global goals in 2015 known as the sustainable development goals (SDGs). Scholarly literature has highlighted the relevance of trees and forests (TFs) to this quest from various perspectives. However, the perspectives appear elitist, as they tend to exclude those of some seemingly ordinary but actually crucial actors whose activities directly affect the growth, health, and population of TFs, namely small-scale farmers, chainsaw operators, and artisanal miners operating particularly in rural areas in developing countries. The study examined the excluded perspectives of the said actors in selected rural comminutes in Ghana on the relevance of TFs to SD. The study was guided by the SDGs in its data collection, analysis, and reporting approach. Focus group discussions were held with the farmers and miners, while in-depth interviews were held with the chainsaw operators. The actors' perspectives generally indicated that TFs were relevant to seven, not relevant to six, and somehow relevant to four of the 17 SDGs. Although the actors saw TFs as important for SD, they (actors) were not favourably disposed to tree-planting for purposes of land restoration because they saw TFs as renewable resources with natural regenerative capacity. Stronger advocacy and more intensive sensitization by the central and local governments, forestry commission, and other pro-environmental organisations, institutions, and agencies on the importance of growing, nurturing, and conserving TFS for SD are recommended. Furthermore, the government should enforce regulations to stop the destruction of TFs by the actors to ensure a sustainable green environment for sustainable development.

Keywords: sustainable development goals, trees, forests, farmers, chainsaw operators, illegal miners, green environment

Introduction

Sustainable development (SD) is defined in the Brundtland Report (WCED, 1987) as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs, In pursuit of SD, the United Nations (UN) adopted a set of 17 sustainable development goals (SDGs) in 2015 to address major challenges that militate against the sustainability of the global environment, economy, and society. The challenges, and for that matter the SDGs, relate to ending poverty and hunger; promoting good health and well-being; providing quality education; promoting gender equality; providing clean water and sanitation; promoting affordable and clean energy; providing decent work and economic growth; providing industry, innovation, and infrastructure; reducing inequalities; and ensuring sustainable cities or communities. The others are responsible consumption and production; containing climate change; promoting life below water and on land; working towards peace, justice, and strong institutions; and creating partnerships to achieve the SDGs.

Subsequent to the declaration of the SDGs, the UN proclaimed the period 2021–2030 as the Decade of Ecosystem Restoration – a universal call for the protection of global ecosystems (Sarre and Davey, 2021), including trees and forests. While it cannot be denied that some progress has been made concerning the achievement of the goals, it is also indisputable that there are challenges, which call for the exploration of opportunities to address them to increase the probability of achieving them (i.e. SDGs). As observed by Prip (2018), one promising opportunity that has the potential to impact many, if not all of the 17 SDGs, is the proper management of trees and forests (TFs). Turner-Scoff and Cavender (2019) have supported this observation, arguing that the benefits that trees provide can help to achieve several of the SDGs.

As an important component of terrestrial biodiversity, TFs provide a number of direct and indirect benefits to humankind and the environment (Muller et al., 2018). They constitute the primary sources of food, timber products, fiber, fuelwood, and medicine, and can also regulate climate, water, and soil erosion (Ojha et al., 2019). TFs can sequester carbon, provide habitat for wildlife, and serve tourism and recreational purposes (DeFries and Nagendra, 2017; Gutrich and Howarth, 2007). Additionally, TFs provide livelihood security to people, particularly to the world's rural poor most of whom reside in developing economies (Muller et al., 2018; FAO, 2020).

Despite the invaluable role of TFs in the SD enterprise, evidence from the 2018 Sustainable Development Report shows that from 2000 to 2015 the Earth's forest areas decreased by millions of hectares (Amoah and Korle, 2020). It has been argued (FAO, 2020; Endreny et al., 2017; Endreny, 2018), that one way to address the challenge is to grow trees and conserve forests. Nonetheless, the need to do this is often overlooked, especially in developing countries, including Ghana where many actors such as peasant farmers, illegal miners, and chainsaw operators continue to destroy TFs (Seymour, 2017) in pursuit of their livelihood activities.

Though they tend to destroy TFs in their operations, TFs have benefits for farmers, chainsaw operators, and miners in Ghana. Fruit-bearing trees generate additional income for the farmers. Trees reduce soil erosion and improve the capacity of soil to hold water to the advantage of farmers. Integrating trees on farms helps to combat the impacts of climate change (Quandt, 2021). The production of chain-sawn timber generates income and employment for some rural dwellers. However, chainsaw activities have attracted public concern in many developing countries due to their effects on TFs and SD. Although chainsaw milling (CSM) has been outlawed in Ghana since 1998, chainsaw operators continue to exploit TFs indiscriminately in rural forest areas. Whiles farming and chainsaw activities are major drivers of forest depletion (Hosonuma et al., 2012; Odoom, 2005; Obeng et al., 2019), degradation caused by mining tends to have long-term adverse effects on flora and fauna (Cristescu et al., 2012). This is because apart from destroying

TFs, mining activities result in the dumping of toxic chemicals and mutilation of the earth's crust (Alvarez-Berríos and Aide, 2015; Lei et al., 2016), which stifle vegetative growth and development for a considerable length of time.

Ghana's 1999 Forestry Commission Act (ACT 571) and the Mineral and Mining Law of 2006 (Act 703), as amended in 2010 and 2015, protect TFs by emphasising sustainable forestry management for SD (Ayee et al., 2011; Bebbington et al., 2018; Insaidoo, Derkyi and Acheampong, 2014; Seymour, 2017; Sourdrie et al., 2012). Yet due to unsustainable TFs management practices, including the operations of farmers, chainsaw operators, and illegal miners, Ghana's pristine primary forest area continues to decrease (Danquah, 2015). The exploited TFs, if not replenished through tree planting, would leave the landscape susceptible to landslides, floods, and other natural disasters (Donovan, 2017; Miller et al., 2020), which could affect the achievement of the SDGs since TFs help to provide clean air, fuel energy, climate protection, and sustainable communities among others.

Against this backdrop, the role of TFs in promoting SD has attracted considerable scholarly interest, leading to an abundance of literature on the subject. However, in Ghana, the literature is predominantly elitist as it largely excludes the perspectives of some seemingly ordinary but actually crucial actors, such as farmers, artisanal miners, and chainsaw operators. The objective of this paper, therefore, is to explore the perspectives of farmers, chainsaw operators, and illegal miners in rural Ghana on the importance of TFs in achieving the SDGs, and by extension, promoting SD. The study is significant as the findings will not only complement the existing knowledge of the relationship between TFs and SD, but also provide an empirical basis for the design of appropriate education, policies, and legislation on the SDGs and forest management for the farmers, chainsaw operators, and illegal miners. Ultimately, it contributes to driving progress toward the sustainability of a green economy and environment for sustainable development.

Materials and methods

The study was carried out at Eguafo in the Komenda-Edina-Eguafo-Abrem Municipality of the Central Region of Ghana and Atobiase in the Wassa East District in the Western Region of the same country (Figure 1). Ghana was used because apart from the literature on the importance of TFs for SD in Ghana being elitist, the country has the necessary laws on mining, chainsaw operations, and forestry but the laws are hardly applied (Mensah et al., 2022b). This negatively affects the growth, health, and population of TFs. Both Eguafo and Atobiase are largely rural farming communities, but in addition to farming being practised in both communities, Eguafo is noted for small-scale illegal gold mining and Atobiase for illegal chainsaw operations.

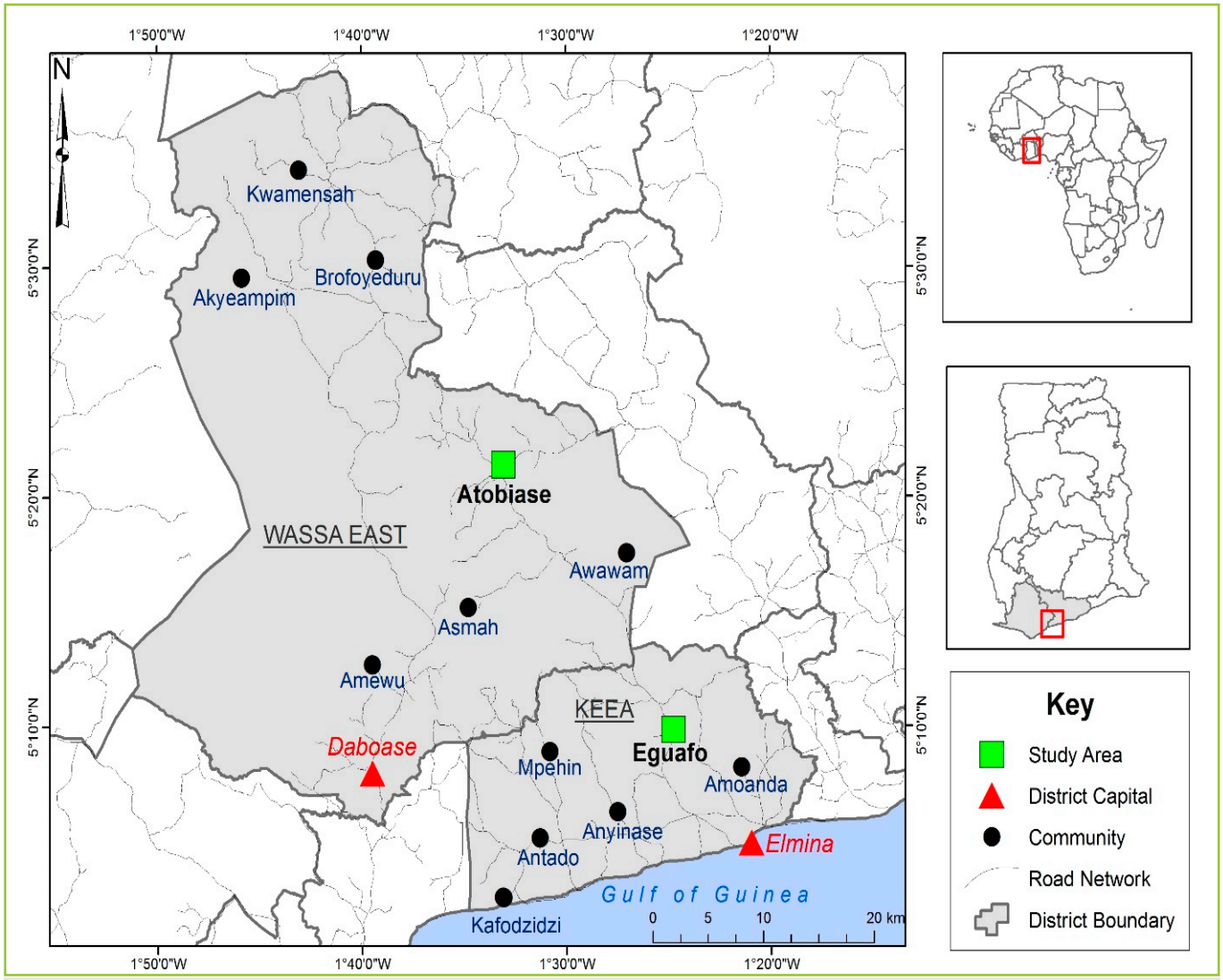

Figure 1 Map showing the location of the study areas
Source: Cartography Uniti, University of Cape Coast: 2021

The study purposively used chainsaw operators, illegal small-scale miners, and peasant farmers as respondents because their operations affect trees and forests directly The rural actors were used because poverty is more prevalent in rural areas. A combination of purposive and snowball techniques was applied to reach the participants.

Focus group discussions were organized with illegal miners and farmers, while interviews were held with the chainsaw operators. The instruments – focus group discussion guide (FGD) and in-depth interview guide (IDI) – contained items on sustainable development, the importance of trees and forests for the SDGs, and willingness to plant trees to promote SD. The instruments were pretested at Efutu, in the Central region of Ghana where relatively similar conditions as the selected sites prevailed. Pre-test results were used to fine-tune the instruments.

The main data collection took place in May and June 2020 by the principal investigator and two trained research assistants. The respondents were assured of anonymity and confidentiality and what the data being collected from them would be used for, as well as how the data would be protected and archived. They were informed that participation was voluntary and they could decide to withdraw at any point in the course of the discussion or interview, Those who gave their consent either verbally or by signing informed consent forms depending on their ability to read and write (sign), were involved in the study.

Three chainsaw operators were identified but two were willing to participate in the study. The instruments were in English but were interpreted in the local language. Three FGDs were held; two with farmers, and one for illegal miners. Two interviews were held with chainsaw operators. Apart from one FGD for farmers which comprised females, all the participants were males. Each FGD consisted of between ten and twelve members. In all thirty-two participants were involved. Two respondents had secondary education, twenty-six had primary education and six had no formal education. All FGDs and interviews were conducted face-to-face in the local languages

Data were transcribed verbatim and analysed manually using the thematic approach. The transcribed data were quickly read through two times to get a general sense of the content. This was followed by a more careful reading at a slower pace for a more meaningful insight into the details of the data. Codes were assigned to words and phrases in each response to help capture what the responses were about, which, in turn, helped to summarise the results of the entire study. Saturation of analysis was reached when no new information on the major themes was any longer obtained. Patterns were then identified based on similarity, difference, frequency, and sequence. Based on the identified patterns, data were regrouped. This helped to make data-driven decisions based on the responses (Mai and Korsgaard, 2019). The next section presents the results and discussion.

Results and discussion

The results and discussions are presented under the 17 SDGs as sub-titles. The central points in the participants' views on the relevance of TFs to each of the SDGs are summarized, examined, and discussed, juxtaposing them with the role of TFs in promoting SD as contained in the existing theoretical and empirical literature. This is followed by an examination of the participants' perspectives on tree planting for SD.

Goal 1: No poverty

Poverty is one of the commonest and bitterest enemies of sustainable development (Mensah, 2020). In view of this, the first of the SDGs is devoted to ending or alleviating poverty in the world. The participants were asked about their views of the role of TFs in achieving this goal. The general view was that TFs are important for reducing poverty as most of the poor people's livelihoods are linked to the extractive industry such as farming and logging, whereby TFs are the main resources. The quotes below illustrate this point:

- We are poor villagers. We do not have meaningful options as means of livelihood. That is why we engage in illegal mining. In the course of our activities, vegetation, including TFs, sometimes gets affected because if the gold is hidden under trees or in the forest we are compelled to destroy it to get our gold (FGD, miners).
- As chainsaw operators, trees constitute our main resource for survival. By felling and sawing trees, we get some money from the sale of timber and wood to support our families. This is how our high level of poverty is somehow alleviated (Chainsaw operator).
- Most of us depend on farming for our livelihoods so TFs are important to us. We get food from them. We use trees as building materials for shelter. If you look around, you can see that tree products form components of our materials for our shelter. As peasant farmers, once our food, shelter, and other basic needs are catered for, we are okay, although we pray, strive, and hope for other things that make us happy (FGD, farmers).

The participants' reports suggest that TFs support (are important for) poverty alleviation, which is the focus of SDG1. In support of this, Neumann and Hirsch (2000) found that the extraction of timber and non-timber products from forests had anti-poor characteristics. Furthermore, Cheng et al. (2017) argued that since the majority of people living in or near forests in developing countries are poor, any efforts to eradicate poverty should include building a solid foundation of forest management. Moreover, trees also support subsistence by providing food, medicinal herbs, fodder, fuel, wood, and timber for construction, all of which help to reduce poverty.

Goal 2: Zero hunger

The second SDG aims to end hunger by 2030 by achieving food security and improved nutrition, and promoting sustainable agriculture. The participants' key viewpoints on this issue are summarized as follows:

- Some trees provide fruits for us to eat. Mango, orange, and guava trees, among many others, are examples of fruit-bearing trees (miners).
- We get food from the forest, and trees constitute the forest. In a sense, all crops can be considered as forms of trees that provide food and nutrition. Without trees and forests hunger will kill all human beings and many animals and birds (farmers).
- The tree is seen as a generic term for all manner of plants or vegetation. this means apart from fish and meat all that we eat comes from trees. Even many animals live in the forests. Therefore, as we hunt them for food, we must remember that trees support them to support us as human beings; The trees themselves are food to humans so eradicating hunger implies maintaining trees and forests all over the world (chainsaw operator).

These perspectives suggest that TFs are the bedrock of food production to feed people, therefore, TFs are relevant to SDG 2. As expressed by the participants, a decline in forest systems will cause food insecurity as there will be less food for humanity. By implication, destroying TFs would be a key driver of hunger. Blanco et al (2020) concluded from their study on how rural farmers feel about trees in France that TFs are critical for the sustainability of agricultural landscapes and food security.

Goal 3: Good health and well-being

Promoting healthy lives and well-being for all at all ages is the third SDG. In the farmers' submissions, they indicated that trees produced food for healthy lives. One chainsaw operator said 'we can only be healthy if we eat good food. Apart from fish and meat products, all food comes from TFs or plants'. Another chainsaw operator reported that herbal medicine is obtained from trees, and the medicine helps to promote health. The miners' and farmers' reports supported those of the chainsaw operators as follows.

- ❒ Trees provide shade and air which make us healthy and comfortable (FGD, miners).
- ❒ We get fruits from trees, and fruits have a salubrious effect on the human body. We also get herbal medicine from trees (FGD, farmers).

It can be argued from the respondents' submissions that they perceive trees as relevant to SDG 3, and by extension, SD. Their perspectives support the theoretical literature on the relevance of trees for SD but the literature has a deeper account of the role of TFs in achieving SDG3. According to the literature, trees provide direct and indirect benefits to human health and wellness (McBride et al., 2013; Donovan, 2017). The green environment provided by TFs is linked to reduced negative thoughts, reduced symptoms of depression, better-reported moods, and increased life satisfaction (Li et al., 2018; Marselle et al., 2020). Even spending time in or near a forest environment has been shown to significantly improve mental health (Bell, Wilson and Liu, 2008; Ulrich, 1984). A view of trees can help patients recover in a hospital and reduce diastolic blood pressure and stress (Li et al., 2018; Turner-Skoff and Cavender, 2019).

Goal 4: Quality education

Education is the main focus of goal four of the SDGs. The goal seeks to ensure inclusive and equitable quality education and promote life-long learning opportunities. The general perspective of the participants was that education and TFs are not directly related, but TFs are somehow relevant for education:

- ❒ We have heard that trees can be used to make paper. Paper is used for writing and printing. This is important in formal education so at least there is some link between trees and education (FGD, miners)

The view suggests that somehow trees have a role to play in quality formal education since the raw materials used for the production of the paper include fibers extracted from trees. Also, it has been found that trees are useful in cognitive development and education. For instance, Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD) can impact a student's success in school (Larsson et al., 2013; Sheffler et al., 2009). Green environments, such as open spaces with big trees, are related to reduced symptoms of ADD and ADHD (Taylor and Kuo, 2009; Yang et al., 2022). Further, Li and Sullivan (2016) found that students who had views of trees and a green environment from their classrooms, as compared to those who were denied that opportunity, scored substantially higher on tests measuring attention.

Goal 5: Gender equality

Achieving gender equality and empowering women and girls is the focus of SDG five. The farmers, miners, and chainsaw operators generally perceived that trees have no direct role to play in this goal. The quotes below illustrate this point:

- ❒ We cannot see how trees can help to achieve gender equality. For gender equality to be achieved men must be talked to so that they respect women. It is not about trees and forests (FGD, miners).
- ❒ Forest cannot empower women and girls except that trees provide firewood for the women for cooking (FGD, farmers).
- ❒ I do not see any linkage between TFs and gender equality or inequality (chainsaw operator).

The evidence suggests no linkage between gender equality and TFs. In other words, the participants saw TFs as having no bearing on SDG 5. Against this backdrop, the literature holds that many people worldwide are dependent on TFs for their food and income and that most of these are marginalised or vulnerable groups, including women (Sheperd, 2012). Thus, forests are not only crucial for sustaining livelihoods, but also for bridging inequality. Degraded landscapes with reduced ecosystem services place severe strain on the ability of women to get water, collect fuelwood, and gather food. TFs improve the lives of both men and women by increasing their access to quality nutrition and improving their overall food security.

Goal 6: Clean water and sanitation

The import of the popular sayings that 'water is life and 'sanitation is health' was considered by world leaders when they were crafting the SDGs. Thus, the sixth SDG seeks to ensure the availability and sustainable management of potable water and sanitation for all. The respondents were asked to express their views regarding the relationship between TFs and this goal. The typical responses are captured below:

- ❒ In our farms, during the dry season, the wells and springs that have no trees around them dry up quickly but those in the forests take a longer time to dry up. Some of the water bodies in the thick forest do not dry up at all. This means the TFs protect the water bodies (FGD, farmers).
- ❒ It rains more in the forest areas than in the savannah area; it implies TFs may induce rain or rainfall (chainsaw operator).
- ❒ TFs can cause rainfall and protect some water sources on land. Since water is needed for sanitation and hygiene purposes, we can say that by extension trees are important for sanitation as well (miners).

The views suggest that trees and forests have bearing on goal seven. Corroborating the relevance of TFs to this goal, DeFries and Nagendra (2017), Cheng et al. (2017), and Wanjira (2019) indicated that TFs supply a high proportion of the water for domestic, agricultural, industrial, and ecological needs, therefore, there is an urgent need for a better understanding of the interactions between TFs and water for policy-making. Sarre and Davey (2021) continued that due to the key role that TFs play in the water cycle, reforestation must be taken seriously to improve the water supply for sustainable development.

Goal 7: Affordable and clean energy

Clean and affordable energy is important because, without access to it, people would spend a great deal of time and physical energy on basic subsistence. In addition, lack of energy correlates closely with many indicators of poverty, such as poor education, inadequate health care, and hardships imposed on women and children (Tong, Xiong and Tan, 2016). A reliable energy supply is essential for economic stability and growth, jobs, and improved living standards (Kaygusuz, 2007). According to all the participants TFs are relevant to goal seven because firewood is a cheaper form of energy in their communities:

- ❒ In this community the main source of energy for cooking is firewood. We get it from trees so trees are relevant to affordable energy supply (FGD, miners).

- ❒ When we make farms we get firewood from the farms which we use for cooking. We also sell some. Even in the case of supply of electric power, trees are used as poles alongside the concrete poles for connection to various places (farmers).
- ❒ We use some of the trees we cut to make charcoal for cooking purposes (chainsaw operator).

The participants' submissions suggest that they perceive TFS as relevant to achieving SDG7. Similarly, Firdaus, Ramly, and Ely (2016) highlight the importance of TFs for SD, arguing that TFs serve as renewable energy sources that can be replenished naturally over time. However, Muller et al. (2018) reported that bioenergy has more deforestation effects than wind, solar, and fossil fuels. By implication, if countries concentrate more on the use of bioenergy to meet the targets under SDG 7, it would have negative effects on SDG 15-life on land- as there would be more pressure on forest ecosystems. Therefore, the prevalence of fuelwood and charcoal, particularly in Africa, must be addressed in the interest of sustainable development.

Goal 8: Decent work and economic growth

Promoting sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all is the focus of SDG 8. Concerning the relevance of trees in achieving this goal, the participants said some people were engaged in productive agriculture, which, not only contributed to economic growth but also served as a means of livelihood for them:

- ❒ Farming is our main occupation and means of livelihood. As farmers, TFs are our bed-fellows. As we till the farmland which is virtually synonymous with forest or trees, we contribute to Ghana's economy, no matter the level of significance of our output or contribution. Therefore if farming is considered decent work then trees and forests have a role to play in providing decent work and contributing to economic growth (farmers).

The miners, on the other hand, indicated that trees and forests do not have a significant role to play as far as this SDG is concerned. According to the miners; for us, our work is 'galamsey'(i.e. illegal small-scale mining) which is not about TFs:

- ❒ We get our gold from the soil or earth, and not from trees and forests (miners).

The chainsaw operators reported a mixed perspective on the relevance of forests and trees for decent work and economic growth. According to one of them:

- ❒ Trees and forests provide an opportunity for farmers, forestry workers, wood industry. However for us as chainsaw operators, since the police and the forestry staff are always looking for us to arrest for prosecution, it means our operations are not only illegal but also indecent in the eye of the government (chainsaw operator).

The perspectives of the respondents on the relevance of trees for SDG 8 are mixed. While some indicated that trees and forests were relevant for the achievement of the Goal, others somehow indicated otherwise, therefore, it can be argued that TFs are somehow relevant to SDG 8. By contrast, the literature indicates that many people, including farmers, woodcarvers, and carpenters, are engaged in forestry and forest-related work for their livelihoods, therefore, to a large extent there is a link between forests and decent work as well as economic growth. According to Endreny (2018), jobs are generated through collecting seeds, planting seedlings, growing food crops, engaging in agroforestry, and reforestation, which has a profound impact on local economies. Shepherd (2012) indicates that trees and forests drive a significant portion of the global economy while also providing a habitat for diverse terrestrial biodiversity.

Goal 9: Industry, innovation, and infrastructure

SDG 9 is about promoting inclusive and sustainable industrialization and building resilient infrastructure for development. The participants' views on the relationship between TFs and this SDG are captured below:

- ❒ Trees and forests are not directly related to the industry, innovation, and infrastructure except when the industry or the infrastructure in question is tree-supported or forest-based, such as furniture building and agriculture (farmers, atobiase).
- ❒ Trees ad forests are not relevant to innovation. For industry and infrastructure, it depends on the type or kind in question. For instance, if the industry would require wood content, then trees would be relevant, otherwise, trees would not be relevant (miners).
- ❒ Trees promote the building of the timber industry. As a chainsaw operator, I produce for the timber industry. the tree products from the timber industry are needed to build other forms of infrastructure such as houses, railways, fishing boats, and canoes.

These perspectives can be described as mixed, suggesting that TFs are somehow relevant to SDG 9. Against this backdrop, Sarre and Davey (2021) argues that the development of most physical infrastructure for several industries requires trees and forest products. Therefore, degrading land puts pressure on infrastructure, shortening its lifespan and minimizing its long-term effectiveness.

Goal 10: Reduced inequalities

Inequality within and among countries is a cause for concern. Despite some positive signs of reducing inequality in its various forms, the phenomenon persists and is deepening for vulnerable populations in developing countries. Refugees and migrants, women and girls, older persons, people with disabilities, and children are particularly at risk of being left behind. Regarding reducing inequality within and among countries as the tenth SDG, the respondents were of the view that trees have no role to play to achieve it.

According to all three categories of participants, trees and forests cannot solve the problems of discrimination, marginalisation, and other forms of inequality among people and nations. To the participant, these are challenges that have to be tackled from the angles of education, health, cultural and political angles to ensure the empowerment of the vulnerable people in society. A chainsaw operator specifically stated as follows:

- ❒ TFs have nothing to do with inequality in society.

This suggests that TFs are not relevant to addressing inequality in society. However, the literature shows inequality is a poverty issue, therefore, afforestation and reforestation can increase incomes, make land more productive, and reduce the need for migration to more fertile lands (Katila et al. 2020)

Goal 11: Sustainable cities and communities

Trees not only make people healthier, but also make communities more livable, as urban forests remove a tremendous amount of air pollution (Nowak et al., 2018). Residents of tree-lined communities feel healthier and have fewer cardio-metabolic conditions than their counterparts in communities without trees (Kardan et al., 2015). Trees create a landscape that is attractive to recreation and residential areas, an environment where people want to live and work. Participants indicated the following:

- ... Trees provide shade in our compound for relaxation. Many of our visitors prefer sitting under the tree to the room (farmers, atobiase).
- Trees make our compound beautiful and children play under the trees. However, they can also make the city and the compound dirty if they are not well-maintained (miners, eguafo).
- Trees can prevent wind from blowing off the roofs of our houses but some of the trees can also break and destroy the roof (chainsaw operator, atobiaser).
- It is airy sitting under the tree on the compound and in any part of the community or town (farmers eguafo).

These show that the participants were of the view that trees have relevance for sustainable cities and communities although they also mentioned some disadvantages associated with trees. Trees are a vital element of the landscape and bring many benefits such as the provision of shade and aesthetic appeal to visitors (Firdaus, Ramly and Ely, 2016). They can provide a feeling of being close to nature in the urban areas and hence constitute an important part of urban life.

Goal 12: Responsible consumption and production

While the planet has provided humankind with an abundance of natural resources, humans have not utilized the resources responsibly and continue to consume beyond what the planet can provide (Lukman et al., 2016). Goal 12 of the SDGs emphasizes responsible consumption and production (RCP), It is about the efficient use of resources such as water, trees, and energy to produce the needs and wants of humankind while maintaining the sustainability of the society, economy, and environment. RCP aims at "doing more and better with fewer resources to increase the welfare gains from economic, environmental, and social activities (Sorrell, 2015).

All the categories of participants said trees and forests have no role to play in ensuring responsible consumption and production. However, the literature demonstrates that achieving SD requires the avoidance of ecological recklessness by changing our consumption and production pattern. Reforestation and forest science have key roles to play in developing more sustainable ways to produce and extract agricultural goods, forest products, energy, and minerals from the land (Lukman et al., 2016).

Goal 13: Climate action

Climate change is considered to be one of the major threats to SD due to its effects on health, infrastructure, settlements, agriculture and food security, and forest ecosystems (IPCC, 2007). Thus, climate change has effects on the well-being of society especially the forest fringe communities whose livelihoods fully or partially depend on forest resources (Insaidoo, Derkyi and Acheampong, 2014). The participants' responses to whether or not trees and forests have relevance for SDG 13 are summarised below:

- It used to rain more in the past than now. The change in the rainfall pattern has been attributed, in part, to the depletion of the forests. As to whether it is true or not, we cannot tell but if it is, then forests have an effect on weather and climate (miners).
- Trees provide shade for us and protect us from the scorching sun. It means the trees absorb the heat from the sun; that is why we feel cool and comfortable in the shade of the trees during the sunshine (chainsaw operator).
- They say trees and forests cause rain to fall. it means that they have an effect on the weather (FGD, farmers, atobiase).
- It is said that trees and forests induce rain so it means they influence or regulate the weather and climate to some extent (farmers, atobiase).

Based on these reports it can be argued that the respondents generally saw trees and forests as relevant to the climate action goal. They indicated that TFs could in a way mitigate the negative effect of climate change Similarly, it has been proven that trees absorb carbon dioxide (CO_2) during photosynthesis (Montagnini and Nair, 2004). Trees cool the planet by absorbing and storing harmful particulate pollutants and increase the resilience of ecosystems.

Goal 14: Life below water

SDG14 requires the global community to conserve and sustainably use the oceans, seas, and marine resources for sustainable development. Oceans, seas, and other marine resources are essential to socioeconomic growth and development worldwide. They provide livelihood benefits through the fisheries sector and also help regulate the global ecosystem by absorbing heat and carbon dioxide (CO_2) from the atmosphere. The respondents were of the view that trees and forests do not have a relationship with Goal 14:

- I cannot imagine how trees and forests are relevant for life below water. Fish and other aquatic biodiversity do not need trees to survive (chainsaw operator).
- Life below water is about fish. There is no relationship between TFS and land below water (farmers).
- If it is about life on land, yes, but life below water, no. Trees and life below water have no relationship (miners).

The respondents' perspectives on the relationship between trees and life below water were at variance with the literature. In the view of Turner-Skoff and Cavender (2019) the ability of trees to reduce the pollution in the waterways is beneficial to the health of aquatic wildlife. Green infrastructure protects life below water and life on land, which promotes sustainability. Donovan (2017) indicated that everything is connected – and that goes for terrestrial and oceanic ecosystems too. To Donovan, everything that happens on land has implications for oceans – including surface run-off, sediment flows, and atmospheric emissions. Land restoration then, reduces pressures on these underwater ecosystems, allowing them to keep providing economic and social benefits for people, especially those in the fishing communities.

Goal 15: Life on land

Goal 15 of the SDGs seeks to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt or reverse land degradation and biodiversity loss. Target 15.2 explicitly underlines the centrality of biodiversity, including trees and forests, in a sustainable future. When asked about the importance of forests and trees in ensuring that this happens, the participants reported that trees and forests have a great role to play in this respect. The participants reported as follows:

- Without trees, life on land would be meaningless. There would be nothing to support the lives of human beings and animals without trees and forests. Animals, birds and human beings feed on trees and plants. The trees provide herbs for our health. We also use them as fuelwood and building materials among other things therefore trees are indispensable with respect to life on land (farmers, eguafo).

A chainsaw operator and the illegal miners reported as follows:

- Trees are useful for the construction of houses for human habitation which makes life on land comfortable (chainsaw operator, atobiase).
- Trees provide fruits and food without which life on land would be impossible (miners, eguafo).

It can be argued that all the respondents perceived trees as relevant in regard to life on land...

Goal 16: Peace, justice, and strong institutions

Goal sixteen is about promoting peace, justice, and strong institutions for SD. This relates to promoting peaceful and inclusive societies, providing access to justice, and ensuring the existence and application of strong institutions to achieve the goals. When asked about the role of trees and forests in achieving this goal, the respondents reported that there was no relationship between trees and this goal.

- ❒ It cannot be imagined how trees help to promote peace, access to justice, or promote strong institutions (FGD, farmers, eguafo).
- ❒ What have trees got to do with peace, justice, and institutions? I think trees and forests have no role to play to achieve this goal. No, not the least (chainsaw operator, atobiase).
- ❒ There is no link between trees and forest on the one hand and peace, justice, and institutions on the other (miners, eguafo).

The respondents' reports suggest trees and forests are not relevant for ensuring peace, justice, and security. From the literature (DeFries and Nagendra, 2017; Teixeira et al., 2019) when land is degraded and food supplies run low, human populations necessarily focus on basic survival, which can lead to resource conflict and competition. This "rush" then drives further degradation and deforestation. Restoring forests can help to reverse these trends and reduce the likelihood of clashing between communities, thus promoting peace. Thus, while the literature tries to paint, at least, a weak link between Goal 16 and TFs, the participants see no connection between the two.

Goal 17: Partnerships for the goals

SDG 17 is about partnership for achieving the goals. It relates to strengthening the means of implementation and revitalizing global partnerships for SD. The respondents did not see the relevance of trees in achieving this goal. All of them said this partnership has nothing to do with trees and forests. One chain operator said:

- ❒ 'partnership is about collaboration and not trees'.
- ❒ Similarly, the farmers said partnership meant working together to achieve the goals while the illegal miners indicated that partnership meant all hands on deck, but not TFs.

It is clear from these that the participants did not see any connection between TFs and the achievement of SDG17. While the literature search did not show any direct link between TFs and this goal, it indicated that afforestation and reforestation could foster partnerships among individuals, organisations, and governments. The relationships that are built by working together to plant trees can provide access to funding and other resources to prosecute the SD agenda (Elmendorf, 2008; Dwyer, Schroeder and Gobster, 1991).

Summary of respondents' perspectives on the relevance of trees for sustainable development goals (SDGs)

The views expressed by the participants regarding the relevance of TFs to the SDGs as captured in the above are summarised in Table 1. They are captured in terms of the general inclination of the general view of participants toward TFs being relevant, not relevant, or somehow relevant to each of the goals. "Relevant" means all three categories of participants viewed TFs as relevant to the SDG under consideration. "Somehow relevant" means the views were mixed or the participants indicated that TFs were somehow relevant to the SDG under consideration. "Not relevant" means all three perceived TFs as not relevant to the SDG in question

It is seen from Table 1 that per the respondents' collective views, trees and forests are relevant for the achievement of 7 (41%) out of 17 SDGs, somehow relevant for 4 (23.5%), and not relevant for 6(35.2%). This finding supports Sileshi et al. (2008) argument that agroforestry practices, when appropriately applied to biophysical and socio-economic conditions, have the potential to address a number of the challenges of SD, including poverty, food insecurity, environmental degradation, and climate change.

Table 1 Respondents' views on the relevance of trees and forests to the SDGs

SDG number	Sustainable development goal (SDG)	View		
		relevant	not relevant	somehow relevant
1	no poverty	√		
2	zero hunger	√		
3	good health and wellbeing	√		
4	quality education			√
5	gender equality		√	
6	clean water and sanitation			√
7	affordable and clean energy	√		
8	decent work and economic growth			√
9	industry, innovation, and infrastructure			√
10	reduced inequality		√	
11	sustainable cities	√		
12	responsible consumption and production		√	
13	climate action	√		
14	life below water		√	
15	life on land	√		
16	peace, justice, and strong institutions		√	
17	partnership for development		√	

Perspectives on tree planting for sustainable development

In response to whether they were prepared to plant trees to restore degraded lands resulting from their farming, chainsawing, and mining activities, the actors demonstrated an unfavourable disposition to tree planting as exemplified in the following quotes:

- We would plant trees for making charcoal, not to beautify nature or restore the degraded environment. The land has the regenerative capacity, so the degraded lands or forests are likely to restore themselves to their original status if given the chance to do so (farmers, eguafo).
- We plant trees that will bear fruits and nuts, such as oranges, mangoes, pears, and guava. and pawpaw. For these ones, we harvest them for food. We also sell some for money so we can buy the things that we need with the money. But if you say we should just plant trees, no. When we slash the vegetation for farms or other purposes, it will grow again when we abandon the farm after harvesting our crops so there is no urgent need to plant trees (farmers, atobiase).
- One can plant one or two trees in front or at the back of his or her house for shade but even if the one allows it to grow so tall, it can break and destroy the house so it is not advisable to always do that (miners, eguafo).
- Trees are natural creations. Just as human beings reproduce their kind, trees also regenerate so there is no compelling need to plant them. The degraded lands, if left alone will grow with trees after some time (miners).
- We plant crops for food, and other trees for economic reasons, Apart from this why should trees be planted when they will grow by themselves (miners, eguafo).
- I am prepared to plant trees when I am hired to do so but not on my own since trees grow naturally (chainsaw operator, atobiase).
- No, I have not thought of planting trees. It is the government's forestry workers who do that for their pay (chainsaw operator).

The quotes show clearly that the participants were generally not favourably disposed to tree planting except for food and economic gain, but not for other important issues of SD such as climate change and environmental restoration. Interestingly, besides food security and economic value, the UN recognises the uniqueness of all types of trees and advises that trees should be valued for what they holistically contribute to a community, rather than being valued for singular or limited benefits (Salmond et al., 2016).

In recognition of the relevance of trees and forests for a green economy, environment, and society, the International Day of Forests was instituted by the UN General Assembly in 2012 to celebrate and raise awareness of the importance of forests every year (Wasonga, 2019). In line with this, Ghana launched the Green Ghana Programme (GGP) on 11th June 2021 with a target of planting five million trees to mark the day. The initiative formed part of the efforts by Ghana's Ministry of Lands and Natural Resources (MLNR) and the Forestry Commission to encourage Ghanaians to plant more trees to preserve and protect the country's forest cover and the environment for SD. To make it a success, the government of Ghana called on all Ghanaians to participate in the day. When asked whether they participated in the day, all the study participants responded in the negative, implying they did not. This confirmed their earlier position that they were only prepared to plant for food and economic gains, but not for any other aspect of SD. It can be argued that this position of theirs was driven by poverty, as their primary concentration was on survival, but not making provision for future generations.

Conclusion

The study examined the relevance of trees and forests for sustainable development from the perspectives of farmers, illegal miners, and chainsaw operators in selected communities in Ghana. It became evident from the actors' perspectives that trees and forests were relevant for the achievement of 7 (41%) out of 17 SDGs. These seven were SDGs 1, 2, 3, 7, 11, 13, and 15 on poverty; hunger; health; energy; sustainable cities; climate action; and life on land respectively. The actors viewed trees and forests as not having a bearing on 6 (35%) of the SDGs, namely SDGs 5, 10, 12,14,16, and 17 on gender equality; reduced inequality; responsible consumption and production, life below water; peace, justice, and strong institution; and partnership for development respectively. They also viewed trees and forests as being somehow relevant to 4 (24 %) of the SDGs. These were SDGs 4, 6, 8, and 9 on quality education; water and sanitation; decent work and economic growth; and industry, innovation, and infrastructure respectively. The evidence supports the argument that properly managed agroforestry practices have the potential to address a number of the challenges of SD, including poverty, food insecurity, environmental degradation, climate change, and health.

The actors demonstrated awareness of the value of trees and forests, at least, in terms of trees' and forests' importance for the provision of food, shade, shelter, fuel energy, and medicine. Nonetheless, they were not favourably disposed to tree planting because they saw trees as self-regenerating natural resources, therefore, it was not so important to plant trees unless the purpose of doing so was for food, sale, fuel (charcoal), and shade. The actors did not demonstrate the principle of sustainability in their interaction with the trees and forest ecology in the pursuit of their livelihoods. That is, they engaged in cultural practices that were inimical to the conservation and restoration of trees and forests. The implication is that awareness or acknowledgment of the value alone cannot guarantee proper tree and forest conservation behavior and practices for sustainable development. Therefore, the Ministry of Lands and Natural Resources, the Municipal Authority, the Forestry Commission of Ghana, and the environment-based Nongoverenmetal Organisations should educate the actors more on the need for tree planting, afforestation, and forest. conservation. The government should also strengthen policies, legislation, advocacy, and monitoring systems to discourage farmers, chainsaw operators, and miners from indiscriminate depletion of TFs to ensure a green and sustainable environment for sustainable development.

Limitations and suggestions for further research

The main limitation of the study was the interpretation or translation of the SDGs from English into the local language. Although the translator did a good job, it cannot be claimed that it was perfect. Therefore, the translation might not have conveyed the exact meaning of the goals as intended by those who set them. Aside from this, the respondents' perspectives could be influenced by their local conditions and their work (farming, illegal mining, and chainsaw operations) more than the universal or world views of SD. Nonetheless, the responses, analyses, and results present, as close to reality as possible, the perspectives of the respondents and their attitudes to trees and forests. Other studies can take the SDGs one by one to do similar studies so the analyses could be more detailed.

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