United Nations
Convention to Combat
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G20 GLOBAL
LAND INITIATIVE

Gender Issues in Post-Mining Land Restoration

Case Study on Ghana

UNITED NATIONS DECADE ON
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The United Nations Convention to Combat Desertification (UNCCD) through its G20 sponsored Global Initiative for Reducing Land Degradation and Enhancing Conservation of Terrestrial Habitats, has the ambition to restore up to 50% of degraded lands by the year 2040. The G20 Global Land Initiative (G20 GLI) is building capacity for land restoration amongst various stakeholders including women, youth, and smallholders.

Working with, and through women-led organizations and professional women in land related professions including civil society organizations, the GLI is developing their capacity to enable them advocate confidently for land restoration. By empowering women and youth groups through various outlets such as presentation at global conferences, webinars, online courses, and roundtable discussions, the GLI is developing alliances and strategic partnerships to influence local, national, and global policy development and programs in support of land restoration.

As part of the G20 GLI's women's engagement strategy, a three-day Roundtable discussion on Gender Issues in Post-Mining Land Restoration using Ghana as a case study, was organized by the G20 GLI. The Roundtable was organized in collaboration with the University of Mines and Technology (UMaT), Tarkwa – Ghana, the Women in Mining Association, Ghana; COLANDEF and Commissions 7 and 8 of the International Federation of Surveyors (FIG), The event took place in Takoradi, Ghana from the 16th to the 18th of May 2024.

The Case studies presented in this report provided the context for the discussions and deliberations at the roundtable event: https://g20land.org/reports/roundtable-on-gender-issues-in-post-mining-land-restoration-may-2024-takoradi-ghana/.

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1 Introduction

The mining industry contributes significantly to economic development. In Ghana, the industry is currently the largest foreign exchange earner, contributing about 41% of the country's foreign exchange earnings (Akabzaa and Darimani, 2001). The economy of Ghana grew from USD 4.98 billion in 2000 to USD 72.35 billion in 2020, with the mining sector being one of the major (Trading Economics, 2024). While gold is the main mineral produced, accounting for 45% of total export value in 2020, other minerals mined include bauxite, manganese, diamonds, brown clay, silica sand, kaolin, and mica (Datawheel, 2024).The mining industry is foreign owned, with the Government of Ghana holding up to a 10% free carried interest share in most of the large-scale mining. Although the mining sector is traditionally not a major employer, Ghana has done well in maximizing the employment of nationals, who account for 98.5% of the mining labour force (GHEITI, 2019). Although mining has inevitably changed many economies, it presents significant disturbances to biodiversity, ecosystems, pollution, land degradation, with a risk of residual materials propagating outside designated exploitation areas and affecting the external society (Adekunle et al., 2019). The loss of vegetative cover, extensive soil damage, and alteration of microbial communities has led to the destruction of vast amounts of land (Abdel Rahman 2023; Gomiero 2016). Toxicity preventing vegetation growth, widespread destruction of water bodies, changes in land use, food insecurity, an increase in social vices and conflicts, air pollution, and high living expenses are some of the adverse consequences arising from mining (Ros-Tonen 2021; Webrah Kazapoe 2023; Mencho 2022).

Furthermore, intensive mining activity can induce profound environmental complications, which in turn can render land unsuitable for several other important industrial applications such as farming and forestry after reclamation. It is important to restate that mining activities have profound impacts on the environment, ecosystems, and communities, often resulting in significant land degradation and disruption of socio-economic systems (Worlanyo and Jiangfeng, 2021). Reclamation, on the other hand, has shown to be a practical means of guaranteeing the effective and productive use of mine

wastelands while lessening the adverse effects of abandoned mine lands (Cao 2007; Guo et al., 2007; Peco et al., 2021). It has emerged as a method of countering the negative after-effects of mineral extraction. Mining activities can cause significant disruption and consequences to the environment, such as land degradation, contamination of water sources, loss of biodiversity, and disruption of ecosystems, as well as social impacts such as mass migration, displacement of people and property, and the spread of diseases such as HIV/AIDS (Mitchell and O'Neill, 2017; Haddaway et al., 2019). The Scale, frequency, intensity, and mode of execution are more important indicators of a disturbance's severity than its type. For instance, the operations of one small artisanal miner may be seen as a minor disruption, but when multiple small miners or large industrial mines are involved, the effects can be more widespread and significant (Hernandez-Santin et al., 2020). Therefore, it is crucial to employ effective restoration methods to mitigate these impacts and restore the land to a functional and sustainable state (Obeng et al., 2019; Favas et al., 2018; Worlanyo and Jianfeng 2020). It is therefore imperative that mined sites be returned to its original landscape or a higher level of use following the closure of the mine.

1.1 Post-Mining Land Restoration

Post-mining land restoration is a comprehensive interdisciplinary subject that covers the problems of landscape redevelopment and the restoration of its productivity, ecological integrity, promoting ecological recovery, and economic and aesthetic value of degraded landscapes and disturbed mine land areas (Rahmonov et al., 2022; Beer et al., 2021; Kivinen 2017; Sphiwe 2023; Muñoz-Rojas, 2018). Post-mining land restoration is the act of repairing and restoring land that has been disrupted by mining or other activities. In Ghana, reclamation is a frequently used method for recovering land after mining activities. It includes redesigning the ground, replacing the top layer of soil, growing plants, and restoring water bodies (Shah et al., 2022; Priya et al., 2023). Post-mine land restoration seeks to establish a self-sufficient ecosystem that supports animal habitats and offers various ecological services. Additional methods used in the restoration of land after mining include soil stabilisation, erosion mitigation, revegetation, and water management. Effective restoration of post-mining land requires meticulous planning, monitoring, and adaptive management to guarantee the ecological functionality and resilience of the restored landscape (Wang et al., 2022; Sutrisno et al., 2023; Basu and Mishra 2023).

It may also include cooperation among mining corporations, government entities, nearby communities, and environmental groups to create and execute restoration strategies that achieve ecological objectives while considering social and economic considerations (Botchway et al., 2023). The goal of reclamation is to return the site to a condition that most resembles the pre-mining condition; to prevent or minimize in perpetuity, the release of contaminants from various mine sites (i.e., heavy metals released from tailings, open pits, and impoundments); and how funds would be made available to ensure that the costs of reclamation and closure will be paid. Post-mining land restoration can in principle be used to transform such lands to allow for safe productive reuse (Bing-Yuan and Li-Xun, 2014; Yu et al., 2024). However, this is not the case in most countries, especially third-world countries (Feng et al., 2013). There is an urgent need for proper land restoration programs or green mining to curb adverse environmental impacts emanating from mining. Only when this is done can the land be put back to its original use or more efficient use (Worden et al., 2024; Worlanyo and Jiangfeng, 2021).

1.2 Post-Mining Restoration and Gender

Unfortunately, most post-mining restoration studies are conducted without the consideration of gender perspectives in these restoration efforts which eliminates inclusivity and effectiveness. Gender plays a significant role in shaping people's relationships with the environment, access to resources, decision-making processes, and participation in restoration initiatives (Ota et al., 2024; Elias et al., 2021). Ignoring gender considerations can lead to unequal distribution of benefits and burdens from restoration projects, as well as overlooking valuable knowledge and perspectives that different genders may bring to the table. As a result of the paucity of knowledge about the inclusion of gender in post-mine rehabilitation, this working paper explores the intersection of gender issues and post-mining land restoration, highlighting key challenges, opportunities, and strategies for integrating gender equality into restoration initiatives.

Within the realm of post-mining restoration research, the integration of gender perspectives entails acknowledging the varied responsibilities, requirements, and objectives of males and females regarding land utilisation, management of natural resources, and the advancement of the community (Tuokuu et al., 2019). Additionally, it involves advocating for the inclusion of women in decision-making processes concerning restoration planning and execution. It also involves addressing gender-specific obstacles and possibilities that may develop throughout the restoration process. By including gender issues in studies on restoring post-mining areas, researchers and practitioners may improve fairness, environmental sustainability, and overall effectiveness of restoration efforts. Implementing gender-sensitive strategies for postmining restoration may contribute to the development of fair and equal results for local populations impacted by mining operations. Recognizing the distinct experiences and contributions of various genders regarding environmental stewardship and land rehabilitation allows restoration efforts to meet the varying demands and goals of all concerned parties more effectively. Furthermore, the inclusion of gender views in research on restoring post-mining areas is consistent with the larger objectives of advocating for social equality, strengthening disadvantaged groups, and supporting sustainable development methods in regions impacted by mining.

"Mining drives Ghana's economy but causes environmental and social harm. Effective restoration, with gender-inclusive approaches, ensures sustainable recovery and equity."

2 Overview of Post Mining Land Restoration

Post mining landscape restoration involves the reconstruction of ecosystems and land disturbed by mining activities. This practice aims to restore ecological functionality and enhance the aesthetic value of landscapes after mining operations have ceased.

2.1 Key aspects of post mining landscape restoration

The key aspects of post mining landscape restoration can be outlined as follows:

1. Commencing with soil reclamation, which involves restoring soil quality and structure to support vegetation growth and may require treating or replacing contaminated soil and replenishing nutrients.
2. There are hydrological issues, where the disruption of natural water flows leads to problems with water retention and erosion. Restoring water quality and hydrology is crucial, especially if water sources have been contaminated or altered by mining activities. This includes cleaning polluted water, reshaping land to manage runoff, and restoring natural waterways.
3. Soil degradation which is the loss of topsoil and nutrients makes it difficult to establish plant life. Reintroducing plant life is essential for rebuilding habitats and stabilizing soil which often involves planting native species to promote biodiversity and ecological balance.
4. Landscape shaping is another critical aspect, where the physical contour of mined land is reshaped to more natural forms which is done to help reduce erosion risks and integrates the land back into the surrounding environment.
5. Biodiversity recovery where local flora and fauna recover at slower-than-expected rates therefore, continuous monitoring and maintenance are necessary after restoration efforts to ensure the success of ecological recovery and allows for adjustments as needed.
6. Community involvement in the restoration process helps to ensure that the restored land meets local needs and supports sustainable use. Post mine land restoration process is not only about environmental recovery but also about creating usable land for future generations for conservation, recreation, or new development purposes.
7. The general technical challenges involved in post mine land include the utilisation of native vegetation for ecological restoration, the application of soil amendments to improve fertility and structure, and the implementation of continuous monitoring and adaptive management strategies.

The presence of toxic residues, such as heavy metals and other pollutants which pose risks of leaching into the environment as well as financial constraints further complicate restoration efforts, as the prohibitive costs associated with these projects often exceed initial mining profits. Although significant technical challenges in post-mining landscape restoration, there are innovative approaches which offer promising solutions to improve ecological outcomes and sustainability such as the use of biochar and other novel soil amendments to bind contaminants and improve soil health. While phytoremediation techniques should be deployed to extract or immobilise pollutants and the development of artificial soils and substrates made from mine waste materials as well as geomorphic reclamation techniques and are being implemented to achieve more natural landscape recovery.

2.2 Post-Mining Restoration and Livelihoods

There are different level of activities and livelihood opportunities within the restoration agenda of post-mined lands. These levels include reclamation activities, restoration activities and post-restoration activities. During the roundtable one of the groups in the break-out sessions identified livelihoods opportunities at every phase of the post-mining restoration process. They identified and categorized these opportunities in which women can explore. The six (6) categories of women in the mining value chain namely, Women in Industrial Mining, Women in Artisanal Small-Scale Mining (ASM), Women in Civil Society and Global Advocacy Groups, Women the Public Sector (regulatory bodies, research institutions and academia), Women in Mining Communities and Interest Groups who could find livelihood opportunities in post-mining restoration activities. The discussions fostered consensus on the activities involved in post-mining land restoration stating that this cannot be done in isolation without engagement with community leaders, appropriate institutions, and agencies to deliberate on customary tenancy and land rights and use for women. There were suggestions that

Gender-based tenure assessment should be done with community folks, and they should be educated on land redistribution before embarking on land restoration in localities. This is to safeguard the rights of women who have interest in exploring livelihoods in the land restoration agenda.

"Post-mining land restoration is key to rebuilding ecosystems, improving livelihoods, and ensuring sustainable land use. Engaging communities—especially women—in restoration efforts enhances both environmental recovery and economic resilience."

3 Gender Issues Mining and Post-Mining Contexts

Gender roles and responsibilities refer to the specific challenges and opportunities faced by women in restoring mined land to a productive or more sustainable state after mining activities have ceased. It influences how individuals experience and respond to the impacts of mining and subsequent restoration efforts (Abera et al., 2023). Subsequently, these culminate in challenges that hinder the integration of gender considerations into post-mining land restoration. A few issues brainstormed upon during the roundtable are presented:

3.1 Disproportionate Burden on Women

In many mining-affected communities, women often bear disproportionate burdens due to changes in household dynamics caused by male migration to mine areas (Kilu, 2017). The absence of male partners can lead to an unequal distribution of household responsibilities for women (Walters et al., 2021; Arthur Holmes and Abrefa-Busia, 2020), requiring them to take on additional tasks and roles that were previously shared with their spouses. This may include heightened responsibilities in overseeing domestic affairs, tending to offspring, and maintaining social connections within the community. Furthermore, women may face challenges related to financial independence and overall well-being. Additionally, lack of support from male partners can strain women's mental and emotional well-being, leading to feelings of loneliness, isolation, and being overwhelmed by increased responsibilities, particularly regarding work, income, women's rights, promotion, and lifestyle matters.

3.2 Limited participation of Women in Decision-Making

Limited participation of women in decision-making processes and restoration planning refers to the situation when women are underrepresented in important positions where decisions are made on environmental restoration efforts. This problem is widespread across several industries, including government institutions, and non-profit organizations. The low involvement of women might impede the efficacy of restoration endeavours, since a wide range of viewpoints and experiences are crucial for inclusive decision-making. Multiple reasons contribute to the restricted involvement of women in decision-making processes about restoration planning. These factors include cultural conventions and prejudices that prescribe conventional gender roles, limited availability of educational and training prospects, subconscious prejudice in recruiting and promotion procedures, and systematic obstacles that impede women from progressing into leadership positions. Suggestions on the efforts to tackle this problem include the promotion of gender equality and diversity in decision-making entities, the establishment of training and mentorship initiatives for women interested in environmental management and restoration fields, the implementation of policies that facilitate work-life balance, and the dissemination of information to highlight the significance of women's involvement in environmental decision-making. Organizations, and community groups. The low involvement of women might impede the efficacy of restoration endeavours, since a wide range of viewpoints and experiences are crucial for

inclusive decision-making. Social arrangements in indigenous societies that are patriarchal also restrict women's participation in decision-making. Attempts to lessen gender discrepancies in decision-making engagement can be made, as well as the acknowledgment and protection of indigenous women's customary rights in post-mining reclamation decision-making (Sri et al., 2023). The absence of Women Participation in Decision Making: Explaining this challenge the panellist stated that the involvement of women in the local government structures would be needed in the advocacy for restoration and any other issues on livelihoods for women in the value chain. She stated that the negative impacts of mining on the livelihoods of women is extensive, and we cannot afford to neglect consideration of gender in decision making.

3.3 Women's traditional knowledge and ecological restoration:

Traditional knowledge held by women regarding land use, agriculture, and resource management is often overlooked in restoration planning (Meinzen-Dick and Doss 2020; Mehra 1995). Women possess a wealth of traditional knowledge, and skills developed over generations through direct interaction with the land, encompassing not only agricultural techniques but also social and cultural dimensions of land use (Mwaura et al., 2022; Ugboma 2014). Throughout history, women have played crucial roles in implementing sustainable land management practices and transmitting their expertise across generations (Mehra, 1991). Their proficiency in areas such as soil fertility, crop diversification, water conservation, and biodiversity preservation can contribute to the effectiveness of restoration efforts. However, due to gender biases and unequal power relations, women's traditional knowledge is often marginalized or disregarded in decision-making processes concerning land restoration and natural resource management (Soita 2007; Bryan et al., 2025; Duguma et al., 2022). Women's role as custodians of land is deeply enshrined in many cultures globally, making their perspectives essential for sustainable restoration efforts. Integrating women's indigenous knowledge into restoration planning can result in more effective and culturally sensitive strategies that benefit both the environment and local communities.

Women possess a vast array of traditions and skills that have been honed over many ages via their direct interaction with the earth. This knowledge is often comprehensive and interrelated, including not just agricultural techniques but also the social and cultural dimensions of land use. By acknowledging and appreciating the knowledge and skills that women possess in the areas of land use and resource management, restoration initiatives may attain higher levels of success and ensure their long-term viability. Women's efforts in ecological restoration are often disregarded or underestimated, despite their vital significance. Women possess a profound comprehension of local ecosystems, plant species, soil health, water management skills, and sustainable agriculture practices, which together constitute their traditional wisdom. This information is often obtained via individual experiences, observation, experimentation, and cultural customs. Women have played a crucial role in safeguarding biodiversity and natural resources in many communities across the globe. They have implemented sustainable methods that enhance the ability to withstand and adjust to environmental changes.

Land restoration and remediation initiatives typically concentrate on the technical components of clean-up and as such, they run the risk of omitting socio-environmental injustices linked to previous development and hiding government and industry blame or responsibility for environmental degradation and social bias (Beckett and Keeling, 2019). Access to resources, land tenure rights, and decision-making processes related to restoration are frequently unequal, disadvantaging women.

3.4 Lack of Access to Resources

Women have obstacles while attempting to access resources like as financial capital, technology, and knowledge that are essential for participating in restoration operations. In addition, women may face constraints on their land tenure rights, which limit their capacity to engage in decision-making processes on land restoration. The absence of opportunities to access and manage resources might exacerbate the marginalization of women and impede their involvement in restoration initiatives. Moreover, discrepancies in access to resources based on gender might sustain and prolong existing gaps in income and possibilities for living between males and females. It is essential to tackle these disparities to achieve lasting restoration results that provide fair benefits to all members of society. To advance gender equality in restoration programs, it is crucial to tackle the fundamental societal attitudes, regulations, and institutional structures that sustain these discrepancies. Enhancing women's empowerment by providing them with greater access to resources, secure land tenure rights, and meaningful involvement in decision-making processes may contribute to more comprehensive and efficient restoration initiatives. By granting women the authority to function as caretakers of the environment and recognizing their distinct contributions to the process of restoring ecological balance, society may attain conservation achievements that are both comprehensive and enduring.

3.5 Gender Policy Issues

Gender-blind/neutral policies that fail to address the specific needs and vulnerabilities of women in mining-affected communities were reviewed and discussed. These policies could be classified as gender-blind and gender-aware (Kabeer, 1992; 1995). Gender-blind policies do not recognize any distinction between the sexes and make assumptions which often lead to a bias in favour of existing gender relations, while gender-aware policies, further classified as gender-neutral, gender-sensitive, gender-responsive, and gender-transformative policies, recognize that both men and women are development actors (Kabeer, 1992; 1995; Greaves et. al, 2014). The nature of their involvement in a policy is determined by gender relations, which differ for men and women based on their needs, interests, and priorities and are often unequal (Kabeer, 1992). In many countries where mining takes place, mining policies, including post-mining transitions either fail to consider the distinct effects of mining on both men and women (gender-blind) or at best ensure that interventions target and benefit both sexes (neutral).

However, women residing in areas impacted by mining operations may encounter heightened vulnerabilities to sexual harassment, gender-based violence, forced relocation, livelihood deprivation, and exposure to hazardous substances used in mining procedures. Policies that do not take gender into account are ineffective in addressing the specific issues faced by mining-affected communities

and may contribute to the continuation of gender inequality. Furthermore, such policies overlook the opportunity to empower women economically, socially, and politically by not acknowledging and addressing their special needs. Implementing inclusive policies - gender-responsive and gender-transformative policies - that consider the complexities of gender dynamics may result in fairer outcomes for both men and women in communities impacted by mining.

To successfully tackle these problems, it is crucial to develop laws and regulations that are at least responsive to gender and consider the varied experiences and requirements of women in communities impacted by mining. This requires a thorough understanding of the gender-specific effects of mining operations and active participation in local women's clubs and organizations. By integrating a gender perspective into the processes of policy formation, governments, firms, and other stakeholders can strive to provide more comprehensive and enduring solutions for communities impacted by mining. Persistent socio-economic disparities affect women's access to livelihood opportunities and resources post-mining. This includes the loss of livelihoods, limited access to economic opportunities, and wage disparities.

3.6 Women's Lack of Access to Land Resources

Referring to social cultural practices and the inheritance system as a major cause of women's apparent exclusion, Ghana's inheritance system does not only affect uneducated women but that this was the general difficulty for female access to land for socio-economic activities. Referring to the 4% statistics on female ownership of mining concession in Ghana, the panellist suggested that in the quest to promote the restoration agenda the women with mining concession in Ghana should be targeted and supported to champion the agenda. Understanding these gender dynamics is crucial for designing effective and socially equitable post-mining restoration strategies and addressing these challenges requires a comprehensive approach to prioritizing gender equality and women's empowerment issues in post-mining restoration initiatives.

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"Gender disparities in post-mining restoration limit women's participation, access to resources, and decision-making power. Recognizing and integrating women's traditional knowledge, rights, and leadership is crucial for achieving sustainable and equitable restoration outcomes."

4 Gender Analysis of Ghana's Mining Policies

Shifting our focus to examining the gender implications embedded within the framework of Ghana's mining policies, this working paper adopted the Gender Transformative Continuum Approach (Figure 1) alongside the associated checklist for policy assessment (Figure 2) to ascertain the extent to which these policies address the fundamental roots of gender inequality within the mining sector. Gender Analysis of Mining/Post-Mining Laws, Policies, and Regulation in Ghana: Using the IUCN (International Union for Conservation of Nature) GGO gender keyword dictionary, 5 key Mining sector laws and policies in Ghana were assessed. These include the Minerals Commission Act, 1993 (Act 450); the Minerals and Mining Act, 2006 (Act 703); and its amendments (Act 900 & Act 995); the Mineral and Mining Policy of Ghana (2016); Environmental Protection Agency Act, 1994 (Act 490); and the Environmental Assessment Regulations, 1999 (L.I. 1652) to identify keywords such as – gender, sex, female, woman, women, girl, gender equity and gender equality, etc.

4.1 Analysis of Keywords

The keywords were analysed for context, to identify how gender and women have been integrated into these frameworks.

Figure 1: The Gender Transformative Continuum Approach for Assessing Policies

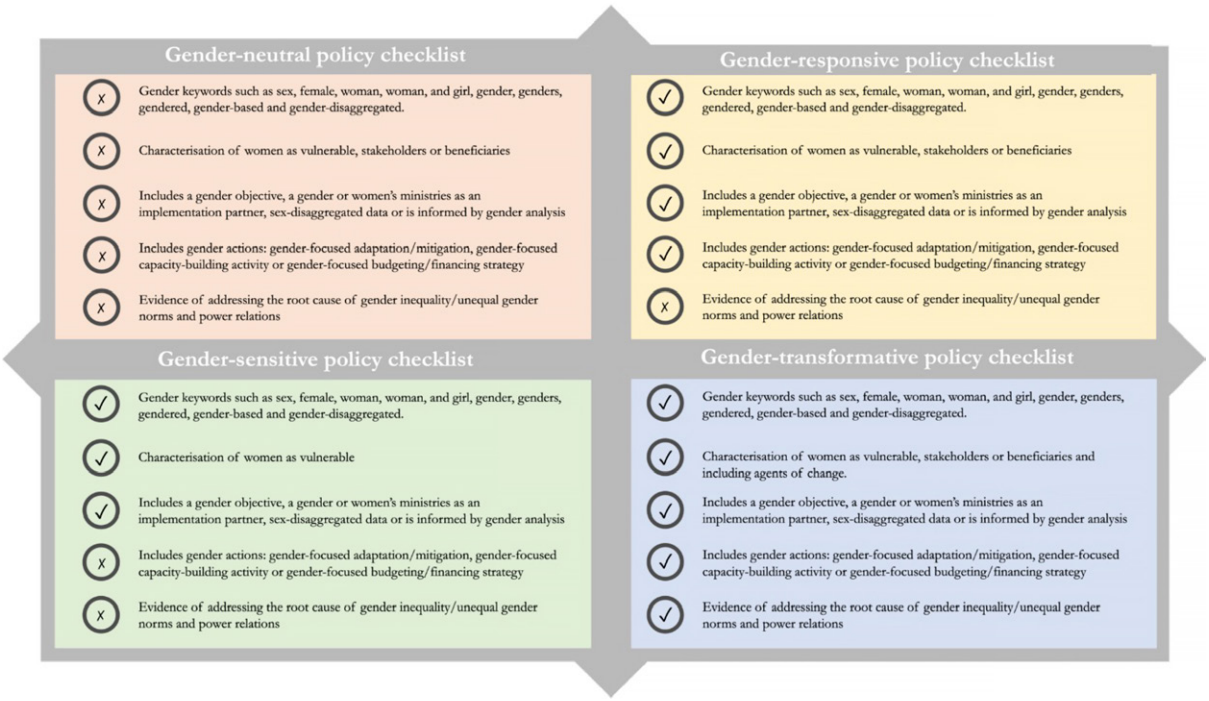
Challenge: Gender inequality

Policy Assessment – A Gender Transformative Continuum Approach						
Policy Approach	Gender Discriminatory	Gender Blind	Gender Aware			
			Gender Neutral	Gender Sensitive	Gender Responsive	Gender Transformative
Policy Level	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
Policy Characteristics	These policies are discriminatory, reinforcing gender-based discrimination. They recognise the distinction between the sexes but tend to favour one over the other.	These policies maintain the status quo by ignoring or not including a gendered perspective. They recognise no distinction between the sexes. They make assumptions, which lead to a bias in favour of existing gender relations. Therefore, gender-blind policies tend to exclude women.	These policies use the knowledge of gender differences in a given society to overcome biases in development interventions, to ensure that interventions target and benefit both sexes effectively to meet their practical gender needs. They work within the existing gender division of resources and responsibilities.	These policies take into consideration and acknowledge social gender norms, different gender roles and gender inequalities, however without taking any actions to address them throughout the policies.	These policies reflect an understanding of gender norms, gender roles and gender inequalities as central. They strive to establish equality, inclusiveness, and fair distribution of benefits. They aim at challenging inequalities. Gender-responsive is moreover based on knowledge and awareness of the culture in which the policy is carried out.	These policies acknowledge differences in gender roles, gender norms and gender equalities in the cultural context, and actively try to transform underlying social structures, policies and social norms that reproduce and reinforce gender inequalities. They do this by engaging women, men, girls and boys in critical thinking; examining and changing social norms and institutions that reinforce asymmetrical power relations.
Recognition of gender/women characterisation	No recognition of gender/women characterisation			Women characterised, stakeholders or beneficiaries	Women characterised as vulnerable, stakeholders, beneficiaries or agents of change	Women characterised as vulnerable, as stakeholders, beneficiaries or agents of change and as agents of change

Goal: Enhanced Gender equality and transformed gender norms and power relations

Section 3 of the Minerals Commission Act which deals with the Composition of the Commission, mandates that the Commission shall consist of '(a) a Chairman; (b) the Chief Executive of the Commission; and (c) seven other persons at least two of whom shall be women. (2) The members of the Commission shall be appointed by the President.

Figure 2- Checklist for Assessing Policies - Gender Transformative Continuum



Under the Mineral and Mining Policy of Ghana (2016) which establishes a framework for environmental regulation of mining activities, including land restoration, the study identified that one of the twenty (20) guiding principles under Section 3 of the policy underpins the minerals and mining sector policy to 'Respect employee, gender, children's rights and other human rights in mining, and the removal of obstacles to participation in the mining sector on the basis of gender, marital status or disability' Incorporating gender considerations into post-mining land restoration is crucial for achieving sustainable and socially inclusive outcomes since it aids in addressing gender disparities, such as the increased domestic responsibilities and limited resource access that women face, can enhance both empowerment and restoration effectiveness; maximise the potential of restoration initiatives through prioritising women's needs and participation and promotes gender equality and economic empowerment. Subsequently, there is the need for partnerships with local women's organisations to empower women as agents of change in restoration efforts to enhance decision-making processes and economic conditions. Implementation of gender-sensitive monitoring frameworks to ensure equitable outcomes, which can contribute to building resilient ecosystems, biodiversity conservation, and inclusive economic growth in mining-affected communities.

Laws, Policies and Regulations	**Inclusion of Gender Keywords**
Minerals Commission Act, 1993 (Act 450)	Yes
Law/Regulation Minerals and Mining Act, 2006 (Act 703) and its amendments (Act 900 & Act 995)	No
The Mineral and Mining Policy of Ghana (2016)	Yes
Environmental Protection Agency Act, 1994 (Act 490)	No
Environmental Assessment Regulations, 1999 (L.I. 1652)	No

Gender-responsive post-mining restoration ensures equitable resource distribution, enhances women's participation in ecological recovery, and promotes sustainable development through inclusive decision-making, capacity-building, and policy advocacy.

5 Post-Mining Restoration Strategies with a Gender Perspective Lens

5.1 Gender-Responsive Needs Assessment and Planning

Gender-disaggregated evaluations are essential instruments for comprehending the separate effects of mining and restoration efforts on males and females. Through the implementation of these evaluations, researchers can recognize and tackle the distinct obstacles, prospects, and requirements encountered by both males and females within the realm of mining operations and environmental restoration endeavours. Gender-disaggregated evaluations in the mining industry reveal discrepancies in the allocation of resources, job prospects, authority in decision-making, and advantages between males and females. Women often have a disproportionate impact on mining operations because of variables such as land displacement, water contamination, loss of means of subsistence, and social upheaval.

Gaining insight into these distinct effects is crucial for formulating precise solutions that advance gender parity, societal integration, and enduring progress in areas impacted by mining. Moreover, when it comes to environmental restoration programs after mining operations, conducting gender-disaggregated evaluations may provide insights into the distinct experiences and contributions of men and women in these restoration efforts (Turner et al., 2021; Mponlea et al., 2023). It is crucial to consider women's understanding of local ecosystems, their responsibilities as carers and managers of resources, and their involvement in community-based conservation projects when planning and conducting restoration efforts. It is important to engage women's groups and community stakeholders, service providers, policymakers, and advocates in participatory planning processes to ensure their perspectives and priorities are integrated. Including these heterogeneous groups in the planning process, facilitates the development of more comprehensive and fair policies and programs that cater to the requirements of all community members. This participatory method promotes cooperation, openness, and accountability in decision-making processes.

Women's organizations are crucial in promoting gender equality and tackling problems that have a greater impact on women (Bayeh 2016). By including people in participatory planning processes, their distinct viewpoints, and first-hand encounters may be considered when formulating policies and programs. Community stakeholders possess invaluable local expertise and perspectives that may be used to customize solutions according to the unique requirements of the community (Zikaragae et al.,

2022). Service providers give their specialized knowledge and experience at the operational level, offering significant insights into the practicality and efficiency of suggested interventions. Policymakers can guarantee that the produced plans are under wider policy goals and legal frameworks. Advocates function as advocates for marginalized populations, ensuring that their perspectives are acknowledged and considered throughout the planning process.

5.2 Capacity Building and Training

Provide training and skill-building opportunities to enhance women's participation in restoration activities, including ecological restoration techniques, sustainable agriculture, and land management. Training and skill development opportunities are essential for increasing women's involvement in restoration activities, such as ecological restoration methods, sustainable agriculture, and land management. Historically, women have been inadequately represented in these sectors because of several social, economic, and cultural obstacles. Offering specialized training programs may empower women by equipping them with the necessary information and skills to actively participate in restoration initiatives and make valuable contributions to environmental sustainability. An essential component of teaching women in restoration operations is providing them with a comprehensive understanding of ecological restoration procedures. This includes comprehending the fundamental concepts of ecosystem dynamics, the preservation of biodiversity, the restoration of habitats, and the management of natural resources. By acquiring proficiency in these domains, women may actively contribute to the restoration of deteriorated ecosystems, the preservation of biodiversity, and the enhancement of ecosystem resilience. Moreover, providing instruction in sustainable agricultural techniques is crucial for encouraging women to participate in ecologically conscious farming approaches. This may include instructing individuals on the procedures of organic farming, principles of agroecology, strategies for integrated pest management, practices for soil conservation, and ways for water-efficient irrigation. Using sustainable agricultural methods, women can improve food security, support soil vitality, preserve natural resources, and lessen the effects of climate change. Education on land management methods is essential for empowering women to actively engage in restoration operations, alongside ecological restoration, and sustainable agricultural training. This includes expertise in land-use planning, watershed management, forest conservation methods, wildlife habitat protection measures, and community-based natural resource management initiatives. Through the acquisition of land management skills, women may actively contribute to the preservation of ecosystems, the improvement of landscape resilience, and the promotion of sustainable development.

5.3 Promotion of Women's Land Tenure Rights

Advocate for policies and legal reforms that secure women's land tenure rights and promote equitable access to restored lands and resources. It is essential to support policies and legislative changes that ensure women's rights to own property and encourage fair access to restored lands and resources (Dugasseh et al., 2021). This is vital for attaining gender equality, economic empowerment, and sustainable development. Women globally have substantial obstacles in obtaining and possessing land because of discriminatory legislation, cultural customs, insufficient knowledge of their entitlements, and restricted participation in decision-making procedures (Doss and Meinzen-Dick 2020). Ensuring

women's land tenure rights not only advantages women individually but also aid in alleviating poverty, enhancing food security, promoting environmental sustainability, and fostering social stability. An essential factor in advancing equal access to restored lands and resources for women is guaranteeing that legislative frameworks acknowledge and safeguard women's land rights. This includes the resolution of discriminatory inheritance laws, guaranteeing equitable participation in land titling and registration procedures, offering legal assistance to women involved in land disputes, and advocating for land governance methods that are sensitive to gender issues. Furthermore, it is important to exert endeavours to enhance the involvement of women in decision-making procedures about land management, conservation, and restoration endeavours. By promoting policies and legal changes that prioritize women's rights to own land and provide fair access to restored lands and resources, countries may make progress towards attaining gender equality, empowering women economically, and promoting sustainable development for everyone.

5.4 Inclusive Livelihood Development

Design livelihood programs that cater to the needs and aspirations of women, incorporating alternative income-generating activities such as agroforestry, eco-tourism, and value-added processing. Land restoration efforts must be tailored to the unique needs and characteristics of mining communities to account for inter-community variation. This means that interventions aimed at enhancing human well-being, securing infrastructure, and fostering stakeholder collaboration should be included in addition to simple landscape reclamation to facilitate the affected local communities transition to sustainability (Antwi et al., 2017).

5.5 Community Engagement and Empowerment

Foster partnerships with local women's organizations and civil society groups to empower women as agents of change in restoration efforts. Establishing collaborations with local women's organizations and civil society groups to empower women as catalysts for change in restoration efforts is a vital approach to advancing sustainable development and environmental protection. Women have a substantial impact on the management of natural resources, the protection of biodiversity, and the adaptation to climate change. By including women in restoration projects, their distinct viewpoints, expertise, and abilities may enhance decision-making processes, making them more efficient and inclusive. Collaborating with local organizations to empower women may result in more engagement in restoration efforts, better economic conditions for women and their communities, and a greater ability to withstand environmental difficulties. Empowering women in restoration efforts may simultaneously tackle gender inequities, advance social fairness, and cultivate long-term sustainability. Moreover, including women as active participants in restoration activities may lead to comprehensive and fair solutions that are advantageous for both individuals and the natural surroundings. By acknowledging and endorsing the significant contribution of women in the fields of conservation and restoration, we can foster the development of more robust ecosystems and communities that will endure for future generations.

5.6 Monitoring and Evaluation

Establish gender-sensitive monitoring frameworks to track the impacts of restoration interventions on men and women. It is essential to create monitoring frameworks that consider gender differences to effectively measure the effects of restoration interventions on both men and women. The general objective of a M&E framework is to provide a mechanism for the continuous and systematic assessment of progress towards the achievement of a project's objectives. This framework helps identify potential issues, track progress, and measure outcomes. Through Monitoring and Evaluation, organisations can; Assess the effectiveness of their strategies; Identify areas for improvement and ensure they meet their goals and objectives. Benchmarking within an M&E framework provides data to build systemic and unbiased benchmarks for future land programs. This clarity he said is crucial in multi-dimensional and complex situations, guiding what is feasible. By integrating gender views into monitoring frameworks, it becomes feasible to detect and tackle any discrepancies in the results of restoration initiatives. Gender-sensitive monitoring facilitates a more thorough comprehension of the impact of restoration initiatives on various genders, enabling policymakers and practitioners to develop more inclusive and efficient policies. Gender-sensitive monitoring frameworks often include the collection of data that is separated by sex, the performance of gender analyses, and the inclusion of both men and women in decision-making processes for restorative measures. These frameworks facilitate the identification of gender-specific obstacles and possibilities that may emerge from restoration efforts, such as alterations in resource accessibility, changes in family duties, or variances in economic prospects. Furthermore, the implementation of gender-sensitive monitoring may also aid in the advancement of gender equality and the empowerment of women. This is achieved by emphasizing the valuable contributions made by women to restoration efforts and ensuring that their specific needs and objectives are duly considered.

Gender-sensitive monitoring frameworks may contribute to more sustainable and equitable results for all stakeholders participating in environmental conservation and restoration by acknowledging the separate roles that men and women play in these efforts. Use monitoring data to adapt strategies and address gender disparities in access, participation, and outcomes. Monitoring data is essential for detecting and correcting gender discrepancies in access, participation, and results in roles associated to the restoration of post-mined land. Organisations may enhance gender equality and inclusion in restoration projects by gathering and examining data on gender representation, participation, and achievement rates, allowing them to customise their approaches accordingly. Monitoring data may be used to track the gender distribution in post-mined land restoration initiatives, specifically by comparing the participation of women and men. By analysing this data, potential inequalities in access to opportunities may be identified depending on gender. This information can assist organisations in implementing focused recruiting strategies to enhance female involvement. Furthermore, the analysis of monitoring data may be used to evaluate the influence of gender on the results of restoration initiatives. Organisations may discover impediments or biases that may be impeding equal chances for both genders by comparing the success percentages of men and women in various jobs within these initiatives. In addition, the analysis of monitoring data may provide valuable insights for the creation of training programs and support systems that are specifically designed to meet the unique issues encountered by women in post-mined land restoration positions.

Through the analysis of data about the requirements and encounters of female participants, organizations may develop interventions that foster gender equality and enable women to thrive in

this domain. key objectives of M&E frameworks in post-mining restoration projects objectives, enable projects to monitor and track progress and the results of implementation to achieve the project's objectives; Promote learning and knowledge sharing by providing systematic linkages between the project and key stakeholders; Bring about accountability and transparency in project implementation; Provide a platform for identifying and sharing challenges for corrective action, as well as success stories and best practices in project implementation; Support evidence-based and informed decision-making in planning, budgeting, and overall resource allocation and management at different levels; Provide key stakeholders with relevant information for program planning, management, and evaluation at project and country levels, and Assess the outcomes and impact of the intervention. The general objective of an M&E framework is to provide a mechanism for the continuous and systematic assessment of progress towards the achievement of a project's objectives. This framework helps identify potential issues, track progress, and measure outcomes. Through Monitoring and Evaluation, organisations can; assess the effectiveness of their strategies, identify areas for improvement and ensure they meet their goals and objectives.
A comprehensive picture of the project's impact on different genders involving a wide range of stakeholders, including local communities, government agencies, and non-governmental organisations, ensures that the M&E process is inclusive and considers diverse perspectives. Gender balance in stakeholder involvement is critical.

5.7 Policy and Institutional Considerations

Issues of gender and land revolve around several concepts and can vary depending on the socio-cultural and socioeconomic contexts. It must be highlighted that some gender and land related issues include gender equality, gender equity, gender inclusion, gender, land and livelihoods, gender perspectives and gender gap. Policy formulation and institutional considerations processes may begin with the responsible government agencies who would include community land custodians. Decision making would usually be based on policies or a set of ideas that are usually subjected to institutional frameworks involving established laws, regulatory guidelines, cultural norms, and gender stereotypes.

The design and planning for land restoration projects involves several decision-making by large groups of stakeholders, with power and political structures determining the levels of engagement. Landowners also play critical roles in the restoration process. Even though there is a wide gap between the number of women who own land compared with men across different age groups, women who use land for agriculture without ownership rights, lose their livelihoods through land degradation. Empowering women through land ownership can promote gender balance in land restoration decisions. The need to promote gender responsive policies that recognises the fundamental equality of women and men; promotion of policies that affirm and guarantee women's right to own land and to have full representation on decision-making for its restoration; promotion of policies that guarantee equal representation in advisory decision making capacities; promotion of policies that guide the development of health standards for the land restoration industry; and ensure the inclusion of livelihoods of women empowerment initiatives in restoration projects.
Post mine land restoration is an opportunity for land redistribution. It is therefore important to take it seriously to reap the associated benefits.

Investing in research and knowledge-sharing on gender-responsive restoration is key to addressing social aspects of mine closure and ensuring inclusive, sustainable post-mining recovery.

6 Conclusion

By recognizing and addressing gender disparities, restoration efforts can contribute to enhanced resilience, biodiversity conservation, and improved livelihoods in mining-affected communities. This working paper examined the importance of mainstreaming gender equality in restoration policies, practices, and partnerships to maximize the ecological and socio-economic benefits of post-mining land restoration. In mining-affected communities, women often bear disproportionate burdens, facing challenges such as increased domestic responsibilities, limited access to resources, and exclusion from decision-making processes. These gender disparities not only hinder women's empowerment but also undermine the effectiveness and sustainability of restoration initiatives. However, by prioritizing gender-responsive approaches, we can unlock the full potential of post-mining restoration efforts.

Through gender-responsive needs assessments and inclusive planning processes, we can ensure that restoration strategies address the unique challenges and opportunities faced by women. Engaging women's groups and community stakeholders in participatory planning facilitates the development of more comprehensive and equitable policies and programs. Moreover, providing training and skill-building opportunities for women in restoration activities empowers them to actively contribute to ecological restoration, sustainable agriculture, and land management efforts.

Advocating for women's land tenure rights and designing inclusive livelihood development programs are crucial steps towards promoting gender equality and economic empowerment in mining-affected communities. By securing women's rights to own land and providing access to restored lands and resources, we can create opportunities for women to thrive and contribute to the sustainable development of their communities. Partnerships with local women's organizations and civil society groups play a vital role in empowering women as agents of change in restoration efforts. By harnessing the expertise and perspectives of women, we can enhance decision-making processes, improve economic conditions, and build resilience in mining-affected communities.

Additionally, gender-sensitive monitoring frameworks are essential for tracking the impacts of restoration interventions on men and women and addressing gender disparities in access, participation, and outcomes. By integrating gender perspectives into monitoring and evaluation processes, we can ensure that restoration initiatives benefit all members of society equitably. In conclusion, mainstreaming gender equality in post-mining land restoration is not only a matter of social justice but also a pathway to sustainable development. By recognizing and addressing gender disparities, we can create more resilient ecosystems, conserve biodiversity, and promote inclusive economic growth in mining-affected communities. Through collaborative efforts to prioritize gender equality, we can unlock the full potential of post-mining restoration initiatives and create a brighter future for all.

7 Future Research Potentials

Invest in research and knowledge-sharing initiatives that highlight best practices for gender-responsive restoration strategies. Future research agenda concerning post-mining restoration should cover (Bainton and Holcombe, 2018).

1. The knowledge base on the physical aspects of mine closure is significantly deeper and more developed than the social aspects. Unlike environmental closure processes, the standards, guidelines, regulatory frameworks, knowledge, and tools for managing the social aspects of mine closure are at an early stage of development, while implementation is inconsistent (Bainton and Holcombe, 2018).

2. There is limited technical literature on the social aspects of mine closure. The paucity of innovative case studies and policy guidelines indicate a dearth of expertise in this field. Mine closure experts typically focus on issues such as mined land rehabilitation, mine water management, topsoil replacement, groundcover monitoring, vegetation management, post closure land use, and physical decommissioning (Bainton and Holcombe, 2018).

3. There are multiple barriers preventing mining companies from optimising the social aspects of mine closure. These barriers can be grouped in terms of those that are external to the company, those that exist at the interface between the company and other parties, and those that exist within the company. “They are, however, mutually reinforcing in a variety of ways.”

4. Active industry, and government, engagement with the social aspects of mine closure is required to address the impacts and legacies associated with mine closure. This will also help to ensure that opportunities for asset regeneration, re-purposing, and transfer are not missed (Bainton and Holcombe, 2018).

8 Recommendations

By addressing gender issues in post-mining land restoration, we can ensure more resilient and sustainable landscapes that benefit all members of mining-affected communities. Land degradation stems from agriculture, mining, deforestation, urbanization, climate change and among others, with mining being the major culprit. Effect of land degradation according to UNCCD Report on Global Land Outlook 2 indicates that 40% of the planet is degraded, 50% of humanity is affected and 50% of GDP is threatened. This calls for pragmatic action in restoration in accordance with the UN SDG15. Finding workable solutions towards post-mining land restoration centred on four themes: strategies for integrating gender issues; financing; capacity building; and job creation and employment.

Recommendations

1. Foster multi-stakeholder collaborations that prioritize gender equality in post-mining restoration agenda.
2. Integrate gender-sensitive indicators into monitoring and evaluation frameworks for restoration projects.
3. A network of stakeholders in land restoration be created for universities to collaborate and create courses on land restoration.
4. Universities and research institutes are to develop a comprehensive curriculum dedicated to the training of women in alignment with the restoration agenda via the development of certificate programmes in Gender, Leadership and Restoration, as well as undergraduate programmes in Land Restoration and Forestry.
5. The National House of Chiefs must receive targeted education on the importance of integrating gender considerations in the restoration of post-mine lands and emphasise the critical role that gender-inclusive strategies play in achieving sustainable and equitable land restoration outcomes. By understanding the unique contributions and perspectives of women, male chiefs can foster more inclusive decision-making processes, ensuring that restoration efforts benefit all community members and promote gender equity.
6. It is imperative to conduct a comprehensive technological survey of post-mined lands prior to reclamation. Using advanced surveying techniques and digital tools will enable a thorough assessment of the land's current condition, identifying key environmental, geological, and hydrological factors that must be addressed. This data-driven approach will inform the development of effective reclamation strategies, ensuring that restoration efforts are scientifically sound, environmentally sustainable, and tailored to the specific needs of the land. By prioritising such technological surveys, stakeholders can optimise resource allocation, mitigate potential risks, and enhance the overall success of reclamation projects.
7. A comprehensive blueprint for restoration approaches and methods should be developed to guide stakeholders in the reclamation efforts. This blueprint should outline standardised procedures, best practices, and innovative techniques tailored to the specific conditions of the post-mined lands. By establishing a clear and detailed restoration framework.

8. Stakeholders can ensure consistency, efficiency, and effectiveness in their efforts. This approach will also facilitate better planning, coordination, and monitoring of restoration activities, leading to more sustainable and resilient outcomes for rehabilitated lands.
9. A pilot restoration project should be initiated on an abandoned small-scale mining site to assess the feasibility and effectiveness of proposed reclamation methods. The pilot project will serve as a crucial testing ground, providing valuable insights into the practical challenges and potential successes of the restoration techniques. By conducting a controlled trial on a smaller scale, stakeholders can refine their strategies, identify best practices, and gather empirical data that can inform larger-scale restoration efforts. The lessons learned from this pilot initiative will be instrumental in developing scalable, efficient, and sustainable restoration approaches for comparable sites.
10. Universities and research institutes should be supported to secure funding for an initiative to implement advanced water treatment technologies, conduct thorough environmental assessments, and execute comprehensive clean-up efforts to depollute water bodies that have been contaminated by illegal mining operations. Adequate funding will facilitate ongoing research, capacity building, and community engagement activities necessary to sustain the depollution efforts. By investing in this initiative, stakeholders can help restore vital water resources, protect public health, and promote environmental sustainability, thereby contributing to the broader goal of responsible natural resource management.
11. Climate change targeted finances should be developed by incorporating digital tools which will make it attractive for the youth.
12. Since women involved in artisanal small-scale mining are powerful agents, it is important to incorporate them in all aspects of land restoration by taking into consideration the various categories of women in mining as the effect on each of them is different. There are women in industries, women in artisanal and small-scale mining, women in local communities, and women in public sector agencies. Since branding is key to the success of every activity, it was also recommended that pictures of women in artisanal small-scale mining need to be looked at. It is critical to use good pictures of women involved in ASM to make it attractive for the youth.

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