

**Georgia Green Jobs and Skills Assessment:
Preliminary Report**

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ABBREVIATIONS AND ACRONYMS

AA: Association Agreement

Agri-tech: Agricultural technology

BTU: Business and Technology University

CEEBN: CEE Bankwatch Network

CENN: Caucasus Environmental NGO Network

CU: Caucasus University

DTDA: Danish Trade Union Development Agency

EBRD: European Bank for Reconstruction and Development

EEC: Energy Efficiency Centre

EIEC: Environmental Information and Education Centre

ESG: Environmental, Social and Governance

GGEI: Global Green Economy Index

GGGI: Green Growth Index

GIPA: Georgian Institute of Public Affairs

GRUNI: Grigol Robakidze University

GTU: Georgian Technical University

IBRD: International Bank for Reconstruction and Development

ILO: International Labour Organization

ISSA: Institute of Social Studies and Analysis

MoESD: Ministry of Economy and Sustainable Development

NGO: non-governmental organization

OECD: Organisation for Economic Co-operation and Development

PRME: Principle of Responsible Management Education

R&D: research and development

RES: renewable energy sources

SDGs: Sustainable Development Goals

SDSN: Sustainable Development Solutions Network

SMEs: Small and medium enterprises

SOU: Sokhumi State University

UNCT: United Nations Country Team

UNDP: United Nations Development Programme

UNEP: United Nations Environment Programme

UNESCAP: United Nations Economic and Social Commission for Asia and the Pacific

WFD: Westminster Foundation for Democracy

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EXECUTIVE SUMMARY

1. Scope and methodology

In the contemporary global economic landscape, the imperative for nations to embrace a shift towards low-carbon, circular, and sustainable economies is echoing across the world. The rise of green jobs - jobs in any economic sector that contribute to preserving, restoring, and enhancing environmental quality and/or supporting the development of sustainable practices - is recognized as pivotal for environmental preservation and economic prosperity. However, comprehensive social and labor market policies must address challenges such as job displacement, skill gaps, and social inequality. Moreover, despite remarkable progress in recent years, Georgia continues to fall behind in implementing plans and strategies to train the workforce for 'green employment' and ensure competent and certified staff. Thus, there is a need to modernize the educational system to satisfy the impending demand from the green employment market.

This report examines the state of the green transition in Georgia, focusing on the rise of green jobs and developing green skills through education and training programs. It emphasizes the challenges and opportunities in the green transition process and provides insights for policymakers, educators, and other stakeholders on how to encourage the development of green jobs and skills. This study employs a mixed-methods approach, combining a thorough literature review, semi-structured interviews with key stakeholders from academia, public institutions, and NGOs, and a critical analysis of a recruitment platform like LinkedIn. The data from these sources were triangulated to ensure a comprehensive understanding of contemporary Georgia's green jobs and skills scenario.

2. The green transition framework in Georgia

The state of green transition in Georgia reflects a growing commitment to establishing a comprehensive green economy aimed at integrating economic, ecological, and social benefits. While still in its initial stages, Georgia's journey towards a green economy is closely tied to its alignment with European Union legislation, particularly since the inception of the Association Agreement in 2016. Over the past few years, there have been notable advancements in policies and initiatives aimed at fostering a more eco-friendly and sustainable approach to development, exemplified by a series of environmental laws and regulations that replace outdated Soviet-era legislature. On the whole, such documents built a robust foundation for environmental policy and legislation supporting various aspects of the green transition such as environmental protection, renewable energy promotion, and sustainable waste management. As a result, a series of green trends are already observable in areas like green banking/financing, green NGOs, green tourism, renewable energy, sustainable bio-production, sustainable manufacturing, sustainable urban planning, and sustainable waste management.

Despite these advancements, some difficulties persist, including financial barriers hindering private investment in green projects, fundamental gaps in the legal and policy framework for green finance, diverse environmental problems such as pollution and illegal logging compounded by obstacles related to policy execution and interagency coordination, obstacles in the utilization of renewable energy resources, stagnation in the agricultural sector due to limited support for sustainable technologies and practices, and socio-cultural and educational barriers. To overcome these challenges, Georgia must adopt innovative financial mechanisms, develop partnerships with international organizations, create clear regulatory frameworks, strengthen mechanisms for compliance monitoring, promote sustainable agricultural approaches, and raise awareness through education and capacity-building initiatives, all while enforcing stringent rules to ensure adherence

to environmental standards and responsibility for ecological footprint. Although challenging, several promising indicators provide optimism for the upcoming future.

3. Green job market analysis of Georgia

As of the end of 2023, Georgia's labour force comprised 1,618,000 individuals, with 1,366,000 employed and 252,000 unemployed (15.6%). The largest employment sectors included agriculture, forestry, and fishing; wholesale and retail trade; industry; and education. There is, however, a lack of specific data on green employment, indicating the urgent need for comprehensive statistical research and analysis. Notwithstanding such a gap, some indicators suggest that the green job market might get an increased relevance in the country: the territorial covering of protected areas in the country is significantly growing year by year; in the agricultural sector, diverse unsustainable practices are still commonly used in the country and require reactive interventions; and the share of renewable energy in electricity production is already over 80% and it might further increase in the next future.

Moreover, a preliminary analysis of LinkedIn postings revealed emerging green occupations and evolving skill requirements in the country. These include roles in renewable energy, energy efficiency, green policy-making, consultancy, and sustainable resource management. Insights from interviews with experts corroborate the findings from LinkedIn analysis, further validating the demand for green occupations and associated skill sets. Expert opinions provide nuanced perspectives on the needs of Georgia's green job market, guiding efforts to address skill gaps and promote workforce readiness in the sustainability sector. Alongside the emergence of these green occupations, there is a growing demand for specific skill sets that align with sustainability objectives. Key skills sought after in the green job market include renewable energy competency, green policy development, green tech, sustainability reporting, analytical thinking, environmental awareness, and systemic thinking. Overall, Georgia needs to implement integrative interventions in the education and professional training sector to develop a workforce with the required green abilities and prevent a potential skill gap.

To date, challenges in assessing Georgia's green job market include the absence of a clear definition of green jobs and a statistic monitoring system to collect data. To address these gaps, recommendations include:

- Introducing a “Strategic Concept for the Transition to a Green Economy” to define green jobs, develop policies, and establish regulatory measures.
- Implementing a public communication campaign to raise awareness of the value of green jobs and emphasize economic and environmental benefits.
- Measuring and classifying green jobs employment using data collection mechanisms aligned with international standards, and establishing a feedback mechanism involving key stakeholders.

4. Educational environment and green skills in Georgia

The analysis of the educational framework in Georgia reveals a mixed landscape, showcasing both commendable levels of awareness among the populace and significant gaps in environmental engagement. While certain segments of the population demonstrate active involvement in green initiatives, a notable proportion remains disconnected, with a quarter of respondents admitting to never contributing to raising environmental awareness. This lack of engagement is compounded by a deficit in formal and informal environmental education, despite widespread recognition of its

importance. Likewise, sustainability and green skills tend to remain on the periphery of both higher education and vocational learning, necessitating a more integrated approach.

In examining educational initiatives at various levels, it becomes apparent that while numerous programs promote environmental awareness and sustainability principles, they often suffer from fragmentation and lack cohesive promotion and organization. At the school level, initiatives such as the Eco-Schools program and efforts by organizations like the Caucasus Environmental NGO Network (CENN) and the Environmental Information and Education Centre (EIEC) provide valuable opportunities for students to engage with environmental issues through multidisciplinary learning and practical activities. Similarly, at the higher education level, universities like Grigol Robakidze University (GRUNI), Business and Technology University (BTU), and Caucasus University (CU) offer courses and programs focused on sustainability, albeit on a limited scale. Furthermore, specialized master's programs and scholarship initiatives such as the "Green Scholarship" program demonstrate efforts to incentivize students to pursue environmental studies and careers. At the vocational level, various organizations, NGOs, universities, and international entities provide specialized training programs in green skills, including climate change mitigation, circular economy, and energy efficiency. However, despite these efforts, challenges persist, including limited awareness of green issues, resistance to change, lack of foundational knowledge, and constrained availability and doubtful quality of green educational programs.

To address these challenges and foster the development of green skills in Georgia, a multifaceted action plan is proposed. This plan includes launching public awareness campaigns targeting different demographics, showcasing successful case studies of green practices, offering workshops and seminars to enhance public understanding of green concepts, integrating green skills into educational curricula, providing financial support for green education and training, updating academic programs to align with industry needs, establishing green campuses, and creating a multi-stakeholder platform for coordination and collaboration. Georgia may empower its population by adopting these measures, providing them with the necessary information and skills to promote sustainable growth and transition to a green economy

1. INTRODUCTION

1.1 The purpose of the “green jobs and skills assessment project”

In the complex economic landscapes of the 21st century, the pressure for states to embrace a transition towards low-carbon, circular, and sustainable economies is a resounding call for immediate action echoing from every corner of the globe. This urgency is grounded in the sobering reality that climate change knows no borders. The global catastrophic events, ranging from extreme weather phenomena to escalating biodiversity loss, serve as stark reminders of the consequences of inaction. Therefore, the call for sustainability is an urge for countries to reassess their economic paradigms while progressively reducing their dependence on fossil fuels.

With the approval of the 2015 Paris Agreement and the Sustainable Development Goals (SDGs), the international community has set forth the need to incorporate environmental and social responsibility into economic strategies through a green transition process. Each state must take action against global warming and create a sustainable economic system. As defined in the World Commission on Environment and Development's 1987 Brundtland report ‘Our Common Future’, the ultimate goal is to ‘meet the needs of the present without compromising the ability of future generations to meet their own needs’. (World Commission on Environment and Development 1987, section 27)

Turning such a vision into reality entails a systemic process of transformation. From a political-legal perspective, governments need to adopt laws and implement regulations aimed at encouraging sustainable business practices and the transition to a circular economy. From a corporate profile, it is important to deal with the issues of eco-business development by monitoring the rising green jobs market and the related opportunities for investments. From an educational perspective, schools and universities must enhance their academic programs to cultivate the attitudes, expertise, and skills of tomorrow’s responsible leaders.

As a result, there is growing attention toward the rise of green jobs and their related skills. The International Labour Organization (ILO 2016) defines green jobs as ‘decent jobs in any economic sector (e.g. agriculture, industry, services, administration) that contribute to preserving, restoring, and enhancing environmental quality’ by:

- improving the efficiency of energy, raw materials, and water;
- de-carbonizing the economy and bringing down emissions of greenhouse gases;
- minimizing or avoiding all forms of waste and pollution;
- protecting or restoring ecosystems and biodiversity;
- and supporting adaptation to the effects of climate change.

Within such a general definition, it is possible to distinguish between two categories of green jobs: on one side, dedicated green jobs, which are fully directed toward the realization of green goals and environmental protection; on the other side, integrated green jobs, in which green skills and sustainability practices are incorporated into existing professions. (UNDP 2018) For example, solar panel installers and environmental scientists are two professions belonging to the list of dedicated green jobs, while a sustainable finance professional or a green supply chain manager tends to be associated with the list of integrated green jobs. Of course, such a distinction is a social construction, thus entailing a certain flexibility and ambiguity. Likewise, up to now, specific statistical parameters to identify and distinguish “green jobs” from other occupations have not

been identified yet. Nevertheless, such a categorization is a valuable analytical tool, serving as a lens through which it is possible to understand the complex and evolving landscape of green employment and provide insights crucial for strategic planning, policy formulation, and sustainable development initiatives.

On the whole, green jobs not only contribute to fighting climate change and environmental degradation, but they can also boost states' economies and create new job opportunities. According to the World Employment and Social Outlook (ILO 2018), achieving the Paris Agreement will result in 18 million more jobs, the transition to a circular economy will generate 6 million new jobs, and 1.2 billion jobs will only be preserved by supporting a stable and healthy environment. However, such a process of transformation entails also some risks such as job displacement, supply chain disruptions, and an exacerbation of social inequality. To mitigate such adversities, social and labour market policies need to complement economic and environmental measures because there cannot be a sustainable green transition path without simultaneously thriving social equity, inclusivity, and justice.

Another challenge is represented by the risk of significant skill gaps. Green jobs are open to diverse backgrounds and they require a diverse set of both hard and soft skills. At the same time, their execution entails the acquisition of certain technical “green skills” (e.g. corporate sustainability, ESG foundations, environmental advocacy, etc.), which are here defined as those knowledge, abilities, and values that enable the environmental sustainability of economic activities and support the integration of green technologies and processes in diverse professional settings. (Pavlova 2017) Retraining workers, upgrading their skills, and/or providing the right green skills to new workers is, therefore, a fundamental condition to sustain the green transition process in the long term. So, a green talent pool needs to be cultivated by adequately retraining the current workforce and adapting the curricula of educational institutions to the evolving job market. At present, however, the demand for green talent is outpacing the available supply. (LinkedIn 2023) Indeed, much remains to be done.

Considering such a framework, this project aims to conduct a preliminary assessment of the rise of green jobs and skills in Georgia. Through a combined analysis of top-down (e.g. policy frameworks, regulatory measures, and economic trends) and bottom-up initiatives (e.g. business climate, university curricula, and professional training) the goal is to provide a holistic understanding of the landscape for green employment and propose recommendations for fostering green jobs and skills in the country. In the specific, this study intends to:

- Offer an overview of the state of green transition in Georgia.
- Define the state of the green jobs landscape in the country by considering aspects such as demanded employment figures, job types, and required competencies.
- Assess the alignment of existing educational and training programs with the needs of the green jobs market.
- Propose cohesive and effective strategies for improving the education and skills development required for green employment.

Ensuring the green transition and developing a green employment market in Georgia is of the utmost importance for encompassing environmental preservation, social welfare, and economic stability. Moreover, Georgia has a responsibility under the Association Agreement with the EU to actively participate in the promotion of sustainable development and the transition towards a more environmentally friendly economy. Under the auspices of the EU4Environment Program and the support of the United Nations, noteworthy progress has been made within the legislative and policy

framework in the last decade. And yet, Georgia's green transition is currently at a critical stage. Enduring obstacles such as high unemployment rates, a prioritization of consumption rather than production, and longstanding economic difficulties constrain the advancement in the green transition process. Moreover, insufficient attention has been given to the establishment of environmentally friendly employment opportunities and the acquisition of the necessary expertise. Therefore, to fully succeed, the existing legal and policy framework must be supported by effective enforcement mechanisms and a strong focus on education and skill development.

Structurally, this report is organized to ensure a comprehensive and systematic exploration of the green transition in Georgia, from legal frameworks and business trends to the job market and educational landscape. Section 1 establishes the purpose, scope, and methodological approach of the project. Section 2 delves into the green transition framework, examining legal reforms, policy measures, and green business trends, and outlining the main challenges and recommendations in the green transition process. Section 3 conducts a thorough analysis of the green job market, exploring the current state of green employment, specific job types in demand along with related green skills, and presenting challenges and recommendations for the development of a systemic assessment of the green job market. Section 4 focuses on the educational environment, assessing the state of green educational and training programs, identifying gaps and barriers hindering the development of green skills, and proposing an action plan to foster green skills in Georgia. Finally, the report concludes in Section 5, summarizing key findings and insights. The bibliographical resources (Section 6) provide transparency by listing academic literature, official public documents, reports, and websites used for the research.

1.2 Methodological framework

This report is the result of research activities conducted in the period between mid-January to mid-February 2024. Figure 1 schematically represents the methodological approach of this study in its different phases.

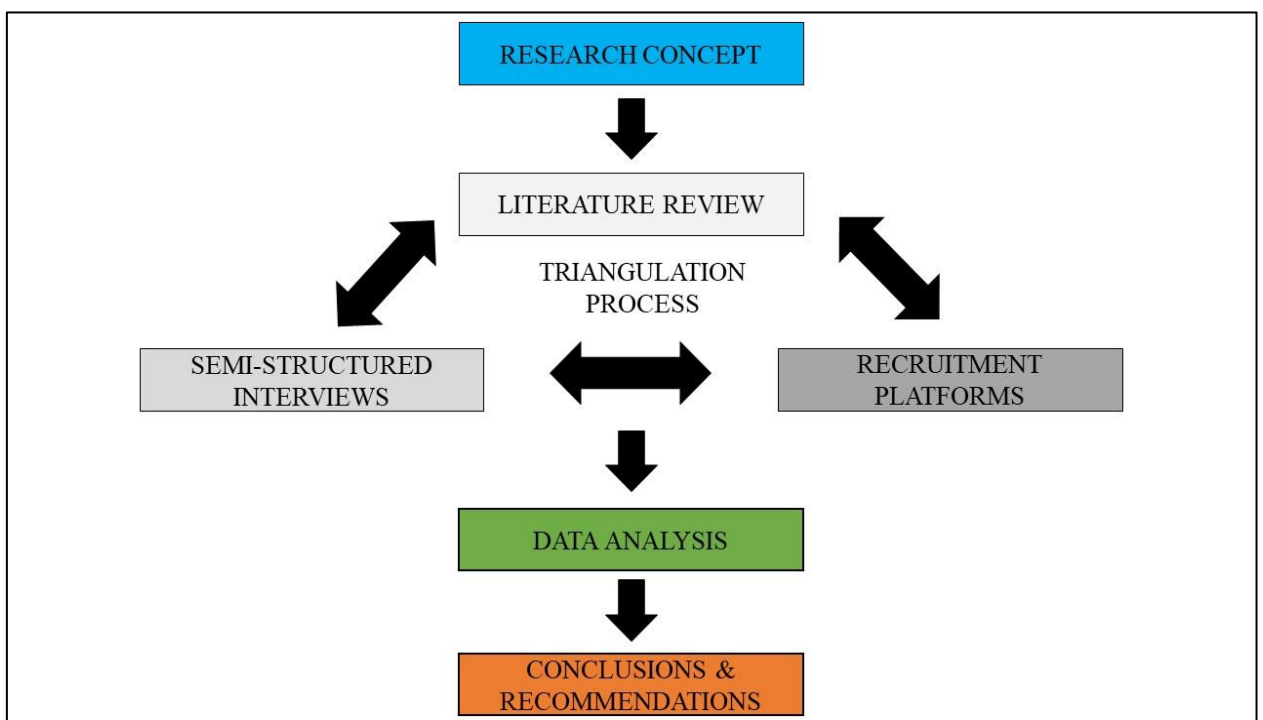


Figure 1. Methodological approach and triangulation process. Source: author.

Three distinct yet complementary sets of sources have been used to collect wide-ranging data on the green transition processes in Georgia:

- **A comprehensive literature review and official document analysis:** The initial phase of data collection involves a meticulous review of the published academic literature and released official documents on the green transition processes in Georgia. This comprehensive assessment serves as the foundational knowledge base, allowing for an in-depth understanding of the historical context, policy frameworks, and key milestones in the green transition journey.
- **Semi-structured interviews with key stakeholders:** To supplement and enrich the insights obtained from the literature review, seven semi-structured interviews have been conducted with representatives from academia, non-governmental organizations (NGOs), and public institutions in Georgia (see Annex 1 for details). This qualitative approach aims to capture the perspectives, experiences, and opinions of key stakeholders directly involved in or affected by the green transition. Each interview lasted approximately 30 minutes. Diverse sets of questions have been prepared for academicians, people working in NGOs, and representatives of public institutions.
- **Analysis of recruitment platform for assessing green job demand and skills:** In recognition of the pivotal role that employment and skill development play in sustainable transitions, this research has scrutinized one of the most popular recruitment portals in Georgia – LinkedIn – to specify the skill set required for newly created green occupations and redesigned conventional professions. This approach provides a real-time snapshot of the evolving job market, thus offering valuable data on the practical implications of the green transition for employment and skill requirements.

By combining the information gathered from these different sources through a triangulation process, it has been possible to improve the accuracy, credibility, and comprehensiveness of the findings, thus leading to a deeper understanding of the intricate factors involved in the emergence of green jobs and the growth of green skills in Georgia.

The material that had been collected was subsequently coded methodically and organized logically so that it could be evaluated and presented through the application of extensive content analysis. Based on the identified insights, this report offers an indicative evaluation of the green transition in Georgia and provides a series of actionable recommendations aimed at cultivating a workforce knowledgeable in sustainable practices and proficient in green skills.

2. THE STATE OF GREEN TRANSITION

2.1 Legal and policy framework

“Green economy” is commonly viewed in Georgia as a comprehensive system aiming to establish economic, ecological, and social guarantees for society (Adeishvili, Tchiotashvili, and Berdzenishvili 2023). This is a relatively new concept for Georgia and its implementation is at a very initial stage (Jishkariani, Ghosh, and Didbaridze 2021). However, the legislative framework that supports the circular economy is evolving rapidly in the country.

Georgia's journey towards a green economy is a testament to its internal aspirations and deeply intertwined with its alignment with European Union (EU) legislation. Since the inception of the Association Agreement (AA) with the EU in 2016, Georgia has actively sought to harmonize its legal and policy frameworks with EU standards and priorities. The AA has played a pivotal role in shaping Georgia's development agenda, emphasizing energy security, environmental protection, and sustainable development. To date, Georgia's journey towards a sustainable and inclusive green economy involves a dynamic interplay of legal frameworks, policy initiatives, and multi-institutional collaborations as shown in Table 1.

LEGISLATION	POLICY	SUPPORTING INSTITUTIONS
Law of Georgia on Environmental Protection (1996)	Socio-Economic Development Strategy ‘Georgia 2020’ (2014)	EU (EU4Environment)
Law of Georgia on Water (1997)	National Action Plan for the Georgian Forest Sector in a Green Economy (2015)	OECD
Waste Management Code of Georgia (2014)	Strategy for Agricultural Development in Georgia (2015)	UN (UNCT, UNDP, UNEP, and the World Bank)
Law of Georgia on Promoting the Generation and Consumption of Energy from Renewable Sources (2019)	Rural Development Strategy of Georgia (2017)	EBRD
Forest Code of Georgia (2020)	SME Development Strategy of Georgia (2016; 2021)	Westminster Foundation for Democracy
-	National Strategy for Waste Management 2016-2030 and its Action Plan (2016; 2022)	Ecovision
-	Third and Fourth National Environmental Action Program of Georgia (2017; 2022)	CENN
-	Freedom, Rapid Development and Welfare (2018)	-
-	Georgia’s 2030 Climate Change Strategy and its Action Plan (2021) and Georgia’s Long-Term Low Emission Development Strategy 2050” (2023)	-

Overall, Georgia has undergone a transformative path of reforms, exemplified by a series of environmental laws and regulations, replacing Soviet-era legislation and establishing a robust foundation for environmental policy and legislation (Martus 2023). The legal foundation for the green transition in Georgia is anchored in several key legislative acts, such as:

- The Law of Georgia on Environmental Protection (1996): this foundational law establishes the basis for environmental protection, emphasizing the importance of sustainable practices and resource conservation.
- The Law of Georgia on Water (1997): this law addresses water resource management, emphasizing the need for sustainable and responsible water use.
- The Waste Management Code of Georgia (2014): this legislation provides a comprehensive legal framework for waste management, focusing on waste prevention, environmentally safe treatment, and establishing guidelines for waste reduction.
- The Law of Georgia on Promoting the Generation and Consumption of Energy from Renewable Sources (2019): this law promotes renewable energy use and contributes to the reduction of the environmental impact of energy production. In addition, it sets the obligatory national standard indicators for the proportion of energy derived from renewable sources in the final energy consumption.
- The Forest Code of Georgia (2020): this law regulated all those aspects associated with the management of the country's natural environment.

These laws are additionally reinforced by a set of subsidiary regulations on specific domains. Moreover, Georgia's commitment to a green economy is further substantiated by its policy initiatives. Although Georgia has officially joined the OECD Green Growth Declaration, a national green growth strategy has not been adopted yet (but its elaboration is planned for 2025). Indeed, while key aspects of such a document are still under discussion, a series of strategic policies and national-specific-sector programs have been developed in Georgia to guide the country during its ongoing green transition. They include:

- The “Socio-Economic Development Strategy ‘Georgia 2020’” (2014): this strategy identifies obstacles to inclusive economic growth and sets priorities for their elimination, aligning with green economy principles.
- The “National Action Plan for the Georgian Forest Sector in a Green Economy” (2015): the plan outlines the potential of the forest sector in Georgia to support the growth of a sustainable economy and effectively conveys this message to policymakers, the general public, and decision-makers in various sectors.
- The “Strategy for Agricultural Development in Georgia 2015-2020” (2015) and the “Rural Development Strategy of Georgia 2017-2020” (2017): the primary objective of the first strategy is to provide a conducive environment that will enhance the competitiveness of the agricultural sector, foster consistent growth in the production of high-quality agricultural goods, guarantee the safety and security of food, and eradicate poverty in rural areas by promoting sustainable development practices. The second strategy is a comprehensive plan whose goal is to enhance the quality of life for the rural population through a combination of economic opportunities, social benefits, a vibrant cultural scene, environmental protection, and sustainable management of natural resources.
- The “SME Development Strategy of Georgia 2016–2020” (2016) and the “SME Development Strategy of Georgia 2021-2025” (2021): these strategies support private sector development, emphasizing the importance of fostering green initiatives within small and medium enterprises.

- The “National Strategy for Waste Management 2016-2030 and National Waste Management Action Plan for 2022-2026” (2016; 2022): these documents offer specific actions to support waste minimization and the development of an extended recycling system while making agriculture, forestry, and fisheries more productive and sustainable.
- The “Third National Environmental Action Program of Georgia for 2017–2021” (2017) and “Fourth National Environmental Action Programme of Georgia for 2022-2026” (2022): the first program prioritizes the green economy, focusing on resource efficiency, waste minimization, sustainable water use, and environmentally conscious consumption. The second one is an extension of the first program, with a focus on various environmental aspects, including water resources, air quality, land management, waste, and biodiversity protection.
- The Governmental Program “Freedom, Rapid Development and Welfare” (2018): this program outlines the government's vision for development, incorporating green economy priorities and recognizing the necessity to draw a green growth national strategy.
- The “Georgia’s 2030 Climate Change Strategy” (2021) and “Georgia's Long-Term Low Emission Development Strategy 2050” (2023): Georgia’s 2030 Climate Change Strategy aims to reduce greenhouse gas emissions in the energy generation, transmission, and transportation sector to 15% below the reference scenario projections by 2030, and to support the development of low-carbon approaches in the construction, industrial, agricultural, and water sector by promoting climate-smart and energy-efficient technologies and services. A further long-term strategy for the country's carbon-neutral future has been adopted in 2023.

Such an extensive and comprehensive regulatory framework has been achieved thanks to proactive cooperation with multiple institutions. The EU4Environment program, for instance, has promoted greener decision-making, circular economy, and environmental protection in six partner countries in Eastern Europe including Georgia. Likewise, various UN programs, such as UNCT, UNDP, UNEP, and the World Bank, have also contributed significantly to transforming the legal and policy agenda, promoting a sustainable and inclusive economy in Georgia. (OECD 2019; EU4Environment 2022b, UNCT 2022; World Bank 2023) In addition, they have offered financial support for the green transition process: the EBRD alone has thus far allocated nearly €5 billion to Georgia across 286 initiatives. (EBRD 2023) However, the EBRD “Georgia Country Strategy for 2021-2026” (2021) emphasizes the urgency of accelerating the transition by focusing on a systemic shift towards a low-carbon economy and providing support for climate-related action plans. Other institutions like the Westminster Foundation for Democracy, the Caucasus Environmental NGO Network (CENN), and Ecovision are also directly supporting the green transition in Georgia by regularly collecting, analyzing, and spreading data on central themes like environmental protection, climate change, and democratic resilience as well as directly participating in the effectuation of practical-oriented projects and educational/training activities. More information about the educational activities of these institutions will be presented in section 4.

Even if the green transition is in its beginning phases, noteworthy results have already been achieved in the country. For instance, efforts to incorporate circular economy principles into the SME sector are evident in the SME Policy Index, evaluating Georgia's performance with a score of 2.8 out of 5. (Jishkariani, Ghosh, and Didbaridze 2021) Georgia's commitment to a green transition is also reflected in its ranking of 44th in the Global Green Economy Index (GGEI 2023) and its 4th place in the Green Growth Index (GGI 2023) among Asian countries. Some initiatives have also started to be taken at the municipal level. For instance, Tbilisi City Hall contributes to

the "green economy" through the development of an "Environmental Strategy 2015-2020" and a "Green City Action Plan 2017-2030", two important initiatives that have generated positive responses. (Abesadze 2019) Actions and advancement have been demonstrated. Still, challenges persist in legislative regulation and enforcement, institutional stability, and the nascent stages of circular economy adoption. Indeed, Georgia's objective of a resilient and green economy will require continued efforts, both locally and via international collaboration.

2.2 Business trends

As an effect of the ongoing green transition, Georgia is progressively embracing the principles of the circular economy. According to Pavliashvili and Prasek (2020), key trends shaping this transition include a shift from product-based to service-based revenue models, designing products for durability and reusability, and adopting business models that prioritize the value, use, and lifespan of materials. This transformation is crucial for businesses to align with circular principles, rethink traditional approaches to production, increase revenue generation, and improve resource utilization. In such a framework, Georgia appears to be already enjoying different green business trends, which are briefly summarized here below.

Green banking/financing: Surmanidze *et al.* (2023) highlight Georgia's progress in developing a legal and policy framework for green financing, including adherence to the Paris Agreement through a National Climate Change Adaptation Strategy. The National Bank of Georgia is a key player in this area. It is progressively introducing and promoting green finance through actions aimed at avoiding greenwashing, creating collaborative working groups, and spreading the practice of ESG reporting and green certifications. In addition, the EBRD is introducing a Green Economy Financing Facility (GEFF) in the nation to reduce the cost of green loans and enhance borrowing conditions for SMEs.

Greening the industry: in the framework of the EU4Environment, the Resource Efficiency and Cleaner Production (RECP) specialists conducted systematic inspections and assessments at the manufacturing sites of twenty Georgian SMEs operating in diverse sectors (e.g. food, plastic, chemicals, steel, asphalt, wood, and poultry). After completing their analytical assessment of resource efficiency, they merged personalized evaluation reports with RECP action plans to help organizations implement new methods aimed at increasing productivity while reducing resource consumption, emissions, and waste pollution. (EU4Environment 2022a) To further support such a process of transformation in the business area, a World Bank study (2023) has examined the green transition of Georgian firms and how energy efficiency might help them cut emissions. The added value was the creation of a storyline for effective actions aimed at embracing sustainability principles.

The driving role played by non-state actors: in Georgia, non-state actors such as NGOs and international organizations are playing a crucial role in supporting environmental capacity. Institutions like the Caucasus Environmental NGO Network (CENN), CEE Bankwatch Network (CEEBN), the Centre for Biodiversity Conservation and Research – NACRES, and many others have a leading role in raising public awareness and supporting the green transition in their sector of competencies. Examples of Georgia's green transition efforts include incentivizing resource efficiency in rural development, organizing competitions for youths in the area of environmental protection, and adopting sustainable finance initiatives by the National Bank. Such a direct involvement of non-state actors signifies a decentralized approach to sustainability, fostering broader engagement and innovative solutions beyond governmental efforts alone.

Opportunities in the area of bio-production: Natsvlishvili (2020) underscores the potential for bio-production to stimulate agro and eco-tourism, providing new avenues for economic development in Georgia. The transition to a green economy presents opportunities such as stimulating exports, attracting investments, fostering sustainable development, developing the bio-economy, reducing reliance on imports, and protecting the environment. However, according to Kharashvili (2020), the risks in agri-food production are high, the revenues are relatively low, and the interest rates on agro-loans are still high. Therefore, there are currently few opportunities to implement innovations in the agriculture industry regardless of the long-term benefits at stake.

Green policy and institutional framework: even if challenges persist in policy implementation and enforcement, Georgia boasts well-developed environmental institutions and policies, with financial commitments comparable to the EU. (Martus 2023). While the legal and policy framework is still evolving, recent initiatives underscore Georgia's commitment to reform. The country's proactive stance on policy reforms, bolstered by institutional support and international collaboration, sets a promising trajectory toward a sustainable and resilient future. By prioritizing environmental concerns and actively engaging with international partners, Georgia demonstrates its recognition of the interconnectedness of global environmental issues and its willingness to address them. This approach not only benefits the environment but also contributes to the country's long-term development and prosperity.

Renewable energy: the country recognizes the pivotal role of transitioning to cleaner and more sustainable energy sources to reduce its carbon footprint and enhance its energy security. (Patarkalashvili and Mirianashvili 2022) The government has set ambitious targets for further increasing the share of renewable energy in its energy mix, aligning with global efforts to combat climate change. Georgia owns abundant natural resources, including hydroelectric potential, which the country has been harnessing for decades. There is also a growing emphasis on diversifying the renewable energy portfolio to include more solar, wind, and bioenergy projects. Nevertheless, initiatives to attract investments in renewable energy infrastructure, coupled with favorable regulatory frameworks, are pivotal in driving this transition. (Giguashvili 2022)

Sustainable tourism: green tourism, if invested wisely, can create jobs, support the local economy, and contribute to poverty reduction. Seturi and Urotadze (2020) identify important sustainable tourism patterns in Georgia that align well with bio-production and eco-tourism. However, the same authors argue that effective measures, responsible guest conduct, knowledge within the local business community, international collaboration, and political stability are required for Georgia's tourism to flourish sustainably. One possibility to be explored is the implementation of such interventions within the framework of community-based tourism aimed at endorsing cooperation between the various stakeholders associated with the tourism business and local people. (Khartishvili *et al.* 2020)

Sustainable waste management: addressing waste management, Georgia is focusing on prevention, reuse, recycling, and recovery, along with public-private partnerships. Ongoing legislative developments include the introduction of a separate waste collection system, incineration methodologies, and energy recovery plants. Even though some noteworthy improvements have been made thanks to a renewed legislative and regulatory framework, there is room for improvement in recycling, waste reduction, pollution control, and climate-friendly initiatives. But, if all the planned measures are effectively implemented, then Georgia will have the capacity to reduce its mixed waste by 25% in 2030 and decrease GHG emissions by 4.1%. (Dvalishvili 2019)

Testing of circular practices within the capital: research by Zhghenti *et al.* (2023) reveals that Tbilisi leads in the adoption of circular practices, with a higher percentage of firms implementing such measures compared to other regions. Large enterprises seem to show higher adoption rates, thus the necessity to support and develop further backing mechanisms for medium and small enterprises. Likewise, there is also a pressing need to create an enabling environment for circular practices outside the capital. Creating an enabling environment for circular practices outside the capital is crucial to decentralizing sustainable development efforts, promoting regional economic growth, and mitigating environmental degradation on a broader scale.

Summing up, Georgia's transition to a green economy is still in its infancy and several challenges persist. Nevertheless, it has already made substantial progress in recent years. Overall, nine main green business areas are progressively growing in Georgia, as schematically represented by Figure 2. They are green banking/financing; green NGOs; green tourism; renewable energy; sustainable bio-production; sustainable manufacturing; sustainable urban planning; and sustainable waste management. As Georgia navigates these green trends, it stands at the forefront of sustainable development in the Caucasian region.

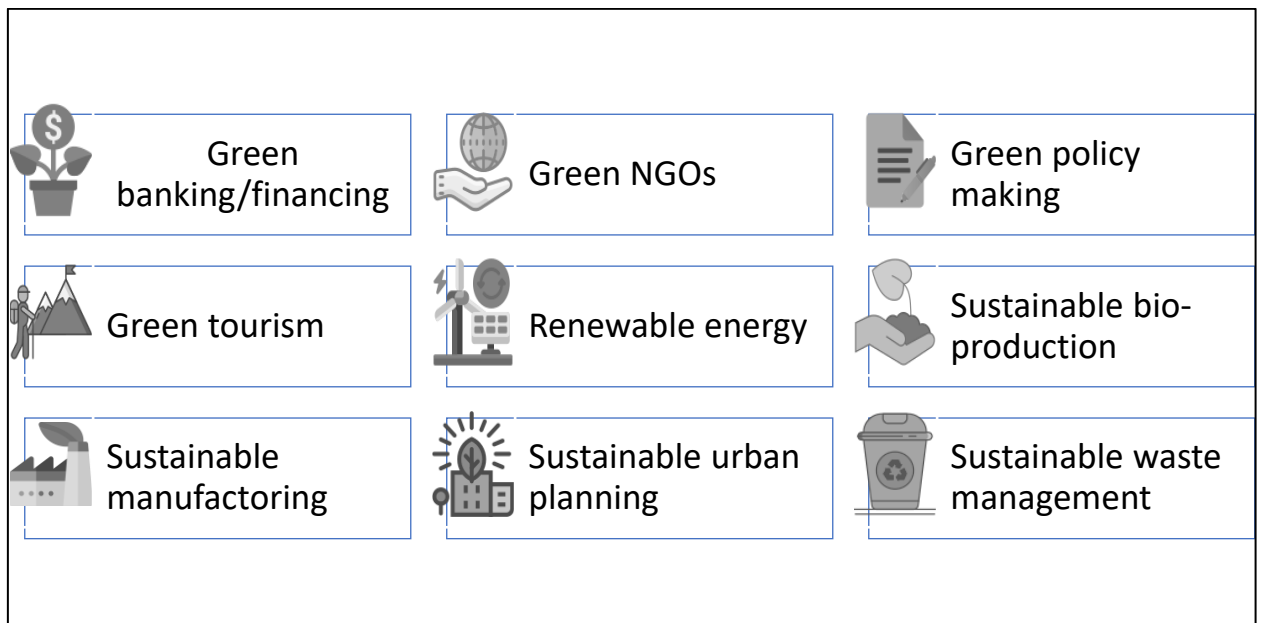


Figure 2. Emerging green business areas in Georgia. Source: author.

2.3 Main challenges and recommendations for the green transition process

In its endeavor to shift towards a sustainable and inclusive green economy, Georgia is confronted with multifaceted challenges that span legal, economic, environmental, and social dimensions. This section briefly delves into these barriers, structurally organizing them into six main areas, and proposes a series of recommendations to successfully address them. Table 2 summarizes the identified challenges and the related recommendations.

Georgia faces significant financial barriers hindering its transition to a green economy (Adeishvili, Tchiotashvili, and Berdzenishvili 2023). Limited financial resources impede the execution of environmentally friendly efforts, hindering the adoption of cleaner technology and practices in various industries. Mobilizing private finance is essential to overcoming this challenge. However, encouraging private investment in green projects requires the adoption of innovative financial mechanisms (such as incentives, subsidies, or grants for investors), the development of further

partnerships with international organizations to co-finance green infrastructural projects, and the creation of a clear, transparent, and consistent regulatory framework, including standards for project eligibility, reporting requirements, and certification criteria.

Fundamental gaps exist in Georgia's legal and policy framework for green finance (Surmanidze *et al.* 2023). The absence of a clear definition of green finance, for example, leads to confusion and uncertainty for investors, while the lack of specific regulations for financial products such as green bonds and carbon insurance complicates the issuance and assessment process. Additionally, the still-evolving regulatory framework for the green economy poses challenges to effective implementation (Adeishvili, Tchiotashvili, and Berdzenishvili 2023). Developing a clear definition of green finance and specific regulations for green bonds and carbon insurance is recommended to provide clarity and transparency. In addition, Georgia could also benefit from strengthening the mechanisms to monitor and enforce compliance with these regulations by reducing bureaucratic hurdles, improving coordination between government agencies, and establishing clear mandates for implementation responsibilities.

Georgia confronts diverse environmental problems, including pollution in rivers and soil, illegal logging, air contamination, and concerns regarding biodiversity conservation (Abesadze 2019). Obstacles related to policy execution and interagency coordination additionally compound the complexities within Georgia's environmental governance framework (Martus 2023). Addressing these challenges requires complex interventions supported by innovative approaches and the institution of a circular economy. Setting strict standards, monitoring systems, and penalties for non-compliance while empowering regulatory agencies with adequate resources, personnel, and authority to ensure compliance can lead to significant progress in addressing such environmental challenges. Supporting initiatives such as Extended Producer Responsibility (EPR) schemes, product stewardship programs, and circular supply chain management practices would also encourage the adoption of sustainable practices across industries.

Notwithstanding the remarkable results already achieved in the hydropower sector, Georgia still encounters obstacles in the utilization of other renewable energy resources due to insufficient technology and funding (Zhakupova *et al.* 2020). Optimizing the utilization of water, solar, wind, and other sustainable resources entails the need for policy enhancements and technological investments in the energy industry. Measures such as tax credits and subsidies, carbon pricing mechanisms, and setting emission reduction targets are samples of actions that might contribute to the advancement of clean energy utilization. At the same time, meticulous measures are necessary to prevent and minimize the projects' socioeconomic and environmental repercussions. This is particularly relevant for those projects connected with large hydroelectric plants that raised diffused social and environmental concerns in the past among Georgian local communities. In this regard, 'public awareness regarding development and promotion of renewable energy should be raised as it's crucial for future actions.' (Chomakhidze and Melikidze 2018, p. 105)

The stagnation in Georgia's agricultural sector is to a large extent attributed to inadequate addressing of challenges related to food self-provisioning, export production, and integration into the international market. (Verulidze and Miceikiene 2021) The lack of effective analysis, minimal promotion of bioproducts, and undeveloped agricultural infrastructure further contribute to the sector's inertia. Additionally, factors such as regional disparities and limited support for small and medium enterprises (SMEs) hinder progress in adopting circular practices. (Zhghenti *et al.* 2023) However, the potential for sustainable agricultural development in Georgia is substantial, particularly in the direction of bio-economy. Moreover, in 2023 a loan agreement was signed between Georgia and the International Bank for Reconstruction and Development (IBRD) for

supporting the development of sustainable agriculture, irrigation, and land projects for a total amount of €69.3 million. Several actions can be taken to support sustainable agricultural approaches, accelerate the development of agricultural infrastructure, and stimulate the production and export of bioproducts. Providing training to farmers on agroecological innovative practices such as organic crop raising, agro-voltaic farming, and integrated pest management seems a feasible and desirable solution.

Finally, some socioeconomic and educational barriers also impede Georgia's transition to a green economy. The lack of awareness and education about green practices is a significant challenge (Adeishvili, Tchiotashvili, and Berdzenishvili 2023). The knowledge gap impedes the broad adoption of green technologies and the execution of environmentally friendly approaches. Initiatives such as awareness-raising campaigns and capacity-building programs are recommended to address these barriers and promote sustainable practices, especially in key areas like energy management and renewable energy technologies (Ministry of Economy and Sustainable Development of Georgia and UNESCAP 2022). In addition, stringent rules are crucial for directing enterprises and individuals toward sustainable practices, guaranteeing adherence to environmental standards, and enforcing responsibility for their ecological footprint.

TABLE 2. CHALLENGES AND RECOMMENDATIONS FOR THE GREEN TRANSITION PROCESS IN GEORGIA	
Type of challenge	Recommendations
Financial Barriers	Mobilize private finance through innovative financial mechanisms. Develop partnerships with international organizations to co-finance and implement green infrastructural projects. Create a clear, transparent, and consistent regulatory framework.
Legal and Policy Framework Gaps	Establish a clear definition of green finance. Develop specific regulations for green bonds. Strengthen mechanisms to monitor and enforce compliance with regulations.
Environmental Issues	Set strict standards, monitoring systems, and penalties for non-compliance. Empower regulatory agencies. Support diverse initiatives to encourage the adoption of sustainable practices across industries.
Renewable Energy Utilization Obstacles	Increase investment and technological advancement. Enhance policies in the energy industry and mechanisms related to carbon emissions. Raise public awareness and engage local communities regarding plans for the development of renewable energy.
Agricultural Sector Stagnation	Accelerate the development of agricultural infrastructure. Stimulate the production and export of bioproducts. Provide training to farmers on agroecological innovative practices and promote soil conservation measures.
Socioeconomic and Educational Challenges	Implement awareness-raising campaigns. Develop capacity-building programs. Enforce stringent rules to direct enterprises and individuals toward sustainable practices.

3. GREEN JOB MARKET ANALYSIS

3.1 Current state of green employment

According to the data from the National Statistics Office of Georgia (2024), at the end of 2023, the labour force in the country counted 1,618,000 people of which 1,366,000 were employed and 252,000 were unemployed (15.6%). Figure 3 shows the employment distribution by sector for the year 2022. Interestingly, “agriculture, forestry and fishing” is the driving sector (18% of total occupation) with around 229.000 employees, followed by “wholesale and retail trade” (15%; 193.000 people), “industry” (12%; 152.000 people), and “education” (12%; 150.000 people).

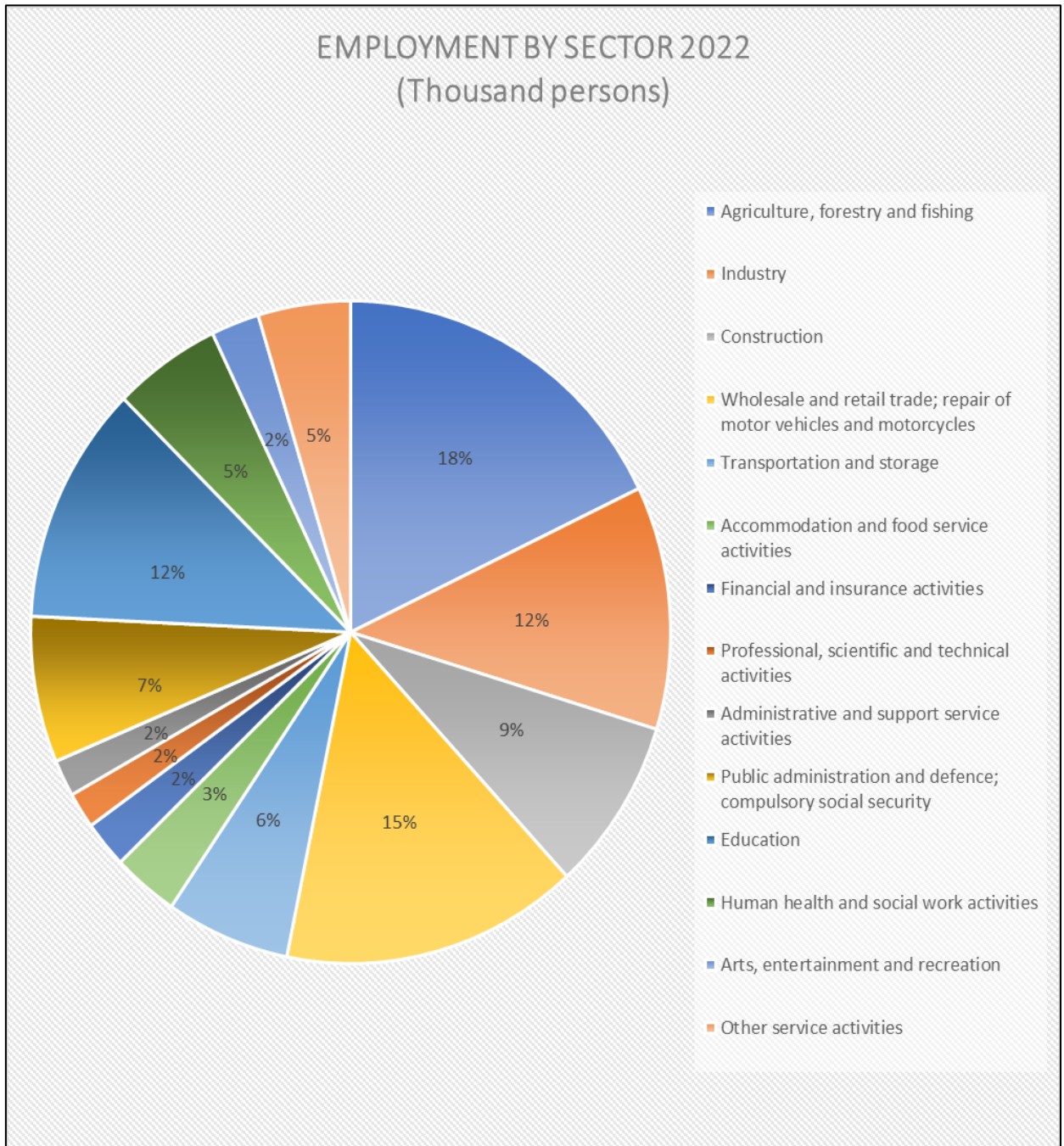


Figure 3. Employment by sector in Georgia in 2022. Source: author, data from the National Statistics Office of Georgia.

The common perception is that the transition to a circular economy in Georgia will likely create demand for jobs related to sustainable management, innovation, and investments. (Pavliashvili and Prasek 2020) Nevertheless, ‘Georgia is behind in dealing with plans and policies to prepare the workforce for ‘green jobs’ and ensure skilled and qualified workers.’ (DTDA 2022) Moreover, the available academic literature and national statistical reports do not provide any detailed information on the current rate of employment in green jobs. Therefore, advanced research and comprehensive data analysis are urgently needed in this area.

Some observations, nonetheless, suggest the necessity of raising attention toward green job areas. For example, the territorial covering of protected areas in the country is significantly growing as shown in Figure 4. Today, 709 people are working in the administration of protected areas in Georgia. (National Statistics Office of Georgia 2022) A higher number of people with forestry and natural resource management skills could, nonetheless, be demanded in the upcoming years if the share of total protected areas in the country keeps growing.

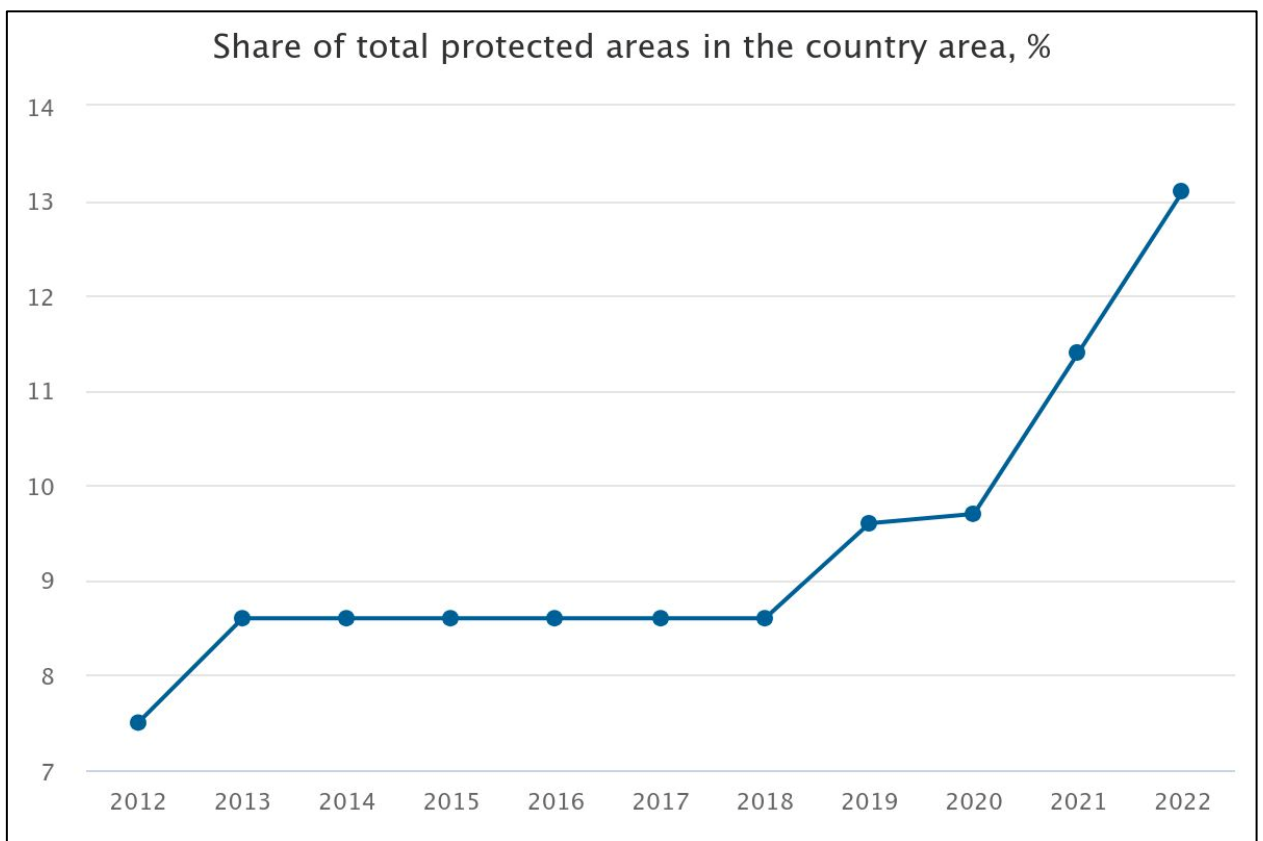


Figure 4. Share of total protected areas in Georgia. Source: National Statistics Office of Georgia.

Moreover, as depicted in Figure 5, the agricultural sector in Georgia continues to rely on various unsustainable practices, highlighting a pressing need for the development of new sustainable methodologies and the adoption of innovative agri-technologies. This condition implies the necessity to move towards more environmentally friendly and resource-efficient farming practices. To achieve this transition, there is a critical requirement to not only hire individuals with specific green skills but also to focus on retraining existing workforce members in the agricultural sector. By equipping individuals with the necessary knowledge and expertise in sustainable agriculture, such as organic farming techniques, water-efficient irrigation methods, and integrated pest management strategies, the sector can reduce its environmental footprint while enhancing productivity and resilience to climate change. Moreover, fostering a culture of sustainability within

the agricultural industry will be vital in ensuring the long-term viability and prosperity of Georgia's agricultural sector amidst evolving environmental challenges.

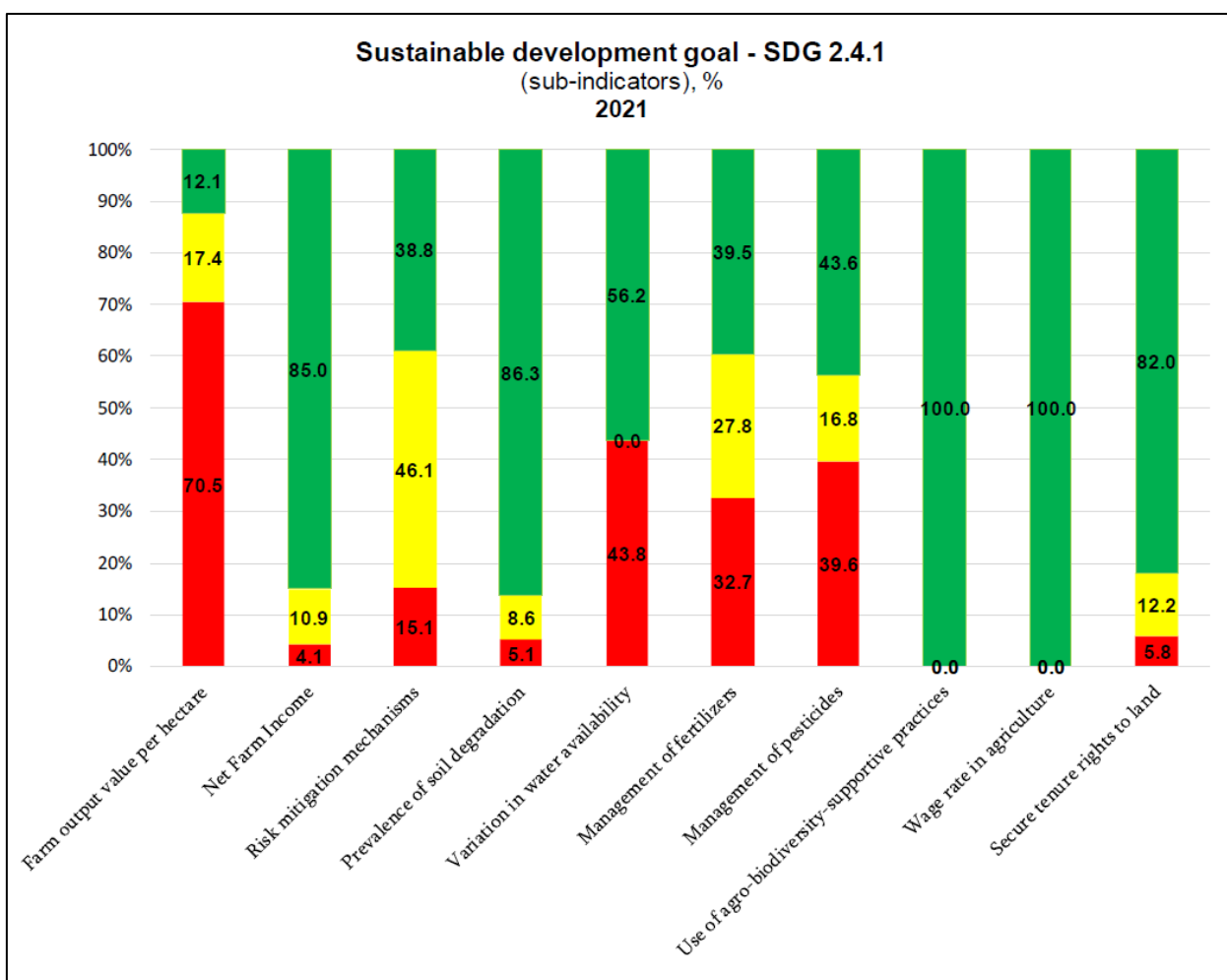


Figure 5. Sustainable and unsustainable agriculture practices in the country. Source: National Statistics Office of Georgia (2021).

Likewise, from an energetic perspective, the share of renewable energy in electricity production provided by hydropower and one wind farm was 81% in 2021 (IEA 2023). And yet, the water resources are so abundant that they still have untapped potential. Approximately 20% of rivers are currently utilized for hydropower, while there is an unutilized total potential capacity of 15,000 MW. (IEA 2023) Other renewable sources like wind and solar power are also unutilized. The government of Georgia has plans for further progressive integration of hydro, solar, and wind energy in the next decade. Therefore, the number of experts working in the renewable energy sector is most plausibly going to grow in the future.

These three findings appear to imply that there will likely be an increase in the number of individuals working in green areas in the upcoming years. However, the lack of detailed statistical data on green engagement and total investments in environmental projects in Georgia makes it challenging to reflect on the current state of green employment in the country as well as to provide specific recommendations on how to foster the green sector. Indeed, a top priority should be to develop a statistical definition of green jobs and to organize regular data collection at the national level.

3.2 Job types demand and green skills

Diverse authors in academia have speculated about the upcoming circulation of new job opportunities as a direct result of the green transition process. Still, there are no studies focused on the current state of green job demand in Georgia and their related green skills. This section analyses emerging green occupations and the evolving requirements of conventional professions in Georgia by critically scrutinizing for two weeks in February a prominent recruitment platform like LinkedIn to find job open calls related to green functions. The research has been conducted by using the “green jobs” filter on LinkedIn and trying diverse keyword search combinations like “sustainable development”, “green”, “sustainability”, “natural resources management”, and so on. The job description and the skills associated with the job post have been then further examined to address if such a required working position could be considered a dedicated green job, integrated green job, or none of them. The purpose is to offer an outline of the skills required for new green employment as well as the green transformation of traditional ones. Table 3 provides a sum up of the main findings.

A total of 14 job postings related to “green jobs” – professions directly or indirectly associated with environmental sustainability and green practices – have been identified in the course of the analysis. The majority of them (12) belong to the "dedicated green jobs" category, as they are professions explicitly designed to address environmental challenges, such as carbon offsets, sustainable energy, water management, biodiversity finance, and forestry. There are, nevertheless, also a few (2) “integrated green jobs”, here referring to those positions where individuals incorporate green skills and sustainability practices into existing professions, making these roles more environmentally conscious without being the primary focus. For example, a business development professional with expertise in decarbonization. The preponderance of dedicated green jobs could be associated with the rising demand for green specialists in the Georgia market, but also with the greater technical difficulties in identifying integrated green jobs in the considered portal.

Even though these data are limited (e.g. short duration, limited platforms consulted, and difficulty in identifying green job postings), they provide a partial but significant insight into Georgia's current need for green jobs and skills. Overall, the reported job types are quite diversified. Nevertheless, most of them tend to be related to two main business areas:

- the management and development of energetic sources (in the framework of renewable energy, energy efficiency, and carbon emissions);
- the decision-making and problem-solving practices in diverse areas (such as green policy-making for public institutions, engagement in green NGOs, and consultancy for food production).

Assessing the skill requirements, there is a demand for a rather diversified set of skills and knowledge. The only “green skills” that are mentioned more than once are the following:

- renewable energy (3 mentions);
- consultancy, business development, climate finance, ICT, social inclusion, energy saving (2 mentions).

Overall, these findings underscore that even if the reported job types predominantly fall into a few business areas, the green economy in Georgia has a multifaceted nature. This fact highlights the importance of cultivating a broad spectrum of skills to meet the evolving needs of the green job market in the country.

TABLE 3. JOB TYPES DEMAND AND ASSOCIATED GREEN SKILLS IN GEORGIA		
Job type	Business area	Required green skills
Apple Orchard Management	Food Production Consulting	Irrigation Intercultural communication Consultancy
Business Development Professional*	Carbon Emissions	Business development Decarbonization
Chief of Party*	Scientific Research Green NGO	Civil society Environmental performance Quality reporting
Control Room Operator (Biomass Power Plant)	Renewable Energy	Power engineering Steam
Economic/Climate Professional	Green NGO Green Policy Making	Green growth Private sector sustainability Circular economy Climate finance Solid waste management ICT Social inclusion
Electricity Engineer	Renewable Energy Energy Efficiency	Renewable energy integration Grid optimization Safety and environmental compliance
Experts in Green Economy	Green Policy Making	Analytical skills Critical thinking ICT Social inclusion
Junior Policy Specialist	Consulting Food Production	Food safety policy and legislation Consultancy Knowledge sharing
Project Development Engineer	Energetic Saving Energy Efficiency	Energy audit Energy saving Conservation issues
Senior Climate Impact Specialist	Climate Change Carbon Emissions Renewable Energy Green Policy Making	Energy saving Greenhouse gas emission reductions Renewable energy Energy efficiency ESG assessment and reporting Climate finance Climate change mitigation
Solar Power Expert	Renewable Energy	Solar energy Feasibility study Energy industry Project development Renewable energy
Sustainable Natural Resource Management	Natural Resource Management	Biodiversity Natural resources management Community engagement Sustainable Development
Tree Climber	Forestry	Pruning practices Tree care skills
Water Market Sector Director	Water Management	Business development Strategic development Health economics Quality review

* Careers considered as “integrated green jobs”

To improve the study's comprehensiveness and reliability, the author also examined the experts' responses to two specific inquiries, "What types of green job positions are currently experiencing high demand in Georgia?" and "In the next five years, what green skills are projected to be most in demand in Georgia?" Tables 4 and 5 sum up the results of this inquiry with local respondents, reporting the most mentioned green jobs and skills.

Green job areas	Number of mentions
Renewable energy installer/engineer	5
Renewable energy manager	4
Energy auditor	3
Energy efficiency specialist	3
Sustainable waste manager	3
Sustainable water manager	3
Environmental manager	3
ESG consultant	3
Green policy maker	2
Research experts	2
Sustainable development planner	2

There is a clear correspondence between the green job areas identified in the assessment of the LinkedIn posts and the rising green jobs identified by the interviewed experts. The energetic sector is at the top, especially in the framework of renewable energy, energy efficiency, and energy audit. Likewise, diverse respondents emphasized decision-making roles such as green policymakers and sustainable development planners as well as those functions required for a conscious process as ESG consultants and (green) research experts. The added factor is the importance of managers able to apply sustainable approaches in dealing with waste, water, and environmental resources.

Green skills	Number of mentions
Renewable energy	6
Green policy development	4
Green-tech	4
Sustainability reporting	4
Analytical thinking	3
Environmental awareness	3
Systemic thinking	3
Critical thinking	2
Energy efficiency audit	2
Environmental law and regulations	2
Environmental management	2
ESG foundations	2
Green business models	2
Green finance	2
Hydropower energy	2

Concerning the skills, almost all respondents mentioned renewable energy competency among the green skills that are going to be in major demand in Georgia. This is an expected result considering that the Georgian government has defined renewable energy as a priority direction in the sector of

electricity production. Following, green policy development, green tech, and sustainability reporting have been mentioned by four respondents. On the whole, these results are in line with the skills identified in the LinkedIn green job posts. Continuing, half of the respondents mentioned three soft skills: analytical thinking, environmental awareness, and systemic thinking. According to one interviewee, these skills represent the basic background for whoever would like to contribute to the green transition. In conclusion, there are a series of skills that have been mentioned at least two times: critical thinking, energy efficiency audit, environmental law and regulation, environmental management, ESG foundations, green business models, green finance, and hydropower energy. Most of these abilities are directly associated with the raising green business areas of Figure 2. Curiously, competencies like bio-production, sustainable agriculture, and eco-tourism have been mentioned only once as if the green transition in the agricultural and tourism industry would take a longer time to raise in the country.

From the data collected, it's evident that there's a significant demand for renewable energy expertise in Georgia, aligning with the government's focus on sustainable energy sources. Additionally, emphasis on green policy development, technology, and sustainability reporting underscores the need for professionals who can navigate regulatory frameworks and promote environmental transparency. Soft skills such as analytical thinking, environmental awareness, and systemic thinking are deemed essential for addressing environmental challenges effectively. The repeated mention of critical thinking, energy efficiency, and environmental management highlights the high demand for these skills, reflecting the growing importance of sustainability across various sectors.

3.3 Challenges and recommendations for the green job market

The richness of natural resources and Georgia's strategic position are two factors that contribute to the widespread belief that the state has the potential to become a regional leader in the field of green technology and renewable energy. Although the lack of data does not allow the provision of detailed information, the common perception – in literature and among the interviewees – is that green occupations would become increasingly important in the country.

To successfully achieve such a goal it is, nevertheless, essential to nurture competencies and expertise. In this regard, the influence of green skills on the green transition process extends significantly, encompassing workforce readiness, the promotion of innovation and technology integration, and the enhancement of sustainable competitiveness. It is also important to keep in mind that, as revealed by Consoli *et al.* (2015, p. 23), ‘green jobs are characterized by higher levels of nonroutine cognitive skills and higher dependence on formal education, work experience and on-the-job training.’ All these aspects will be considered deeper in the next chapter, which is focused on education and professional training. Still, a few reflections on the risk of a green skills gap can be introduced here. According to the LinkedIn Global Green Skills Report (2023), only one in every eight workers has one or more green skills. This is relevant data considering that:

- From 2022 to 2023, the proportion of green talent in the workforce increased by a median of 12.3%, but the proportion of job advertising that needed at least one green skill expanded twice as fast, with a median increase of 22.4%.
- The number of job postings mandating at least one green skill has increased by a median of 15.2% within the same time frame.
- Workers with at least one green talent have a median LinkedIn hiring rate that is 29% greater than the average hiring rate.

Although a total of 48 countries were analyzed in this study, the results can be generally extended to the whole world. Arguably, the Georgian setting has not reached a degree of green transition to face such a phenomenon yet. In other terms, the demand for green skills and the request for green jobs is still constrained. However, the green transition is slowly, but constantly moving on and, unless certain key actions will be implemented in the educational and professional training fields, the country will face a significant talent gap. According to interviewees, the main risk is a lack of renewable energy engineers, energy efficiency consultants, green tech specialists, and sustainability advisors (dedicated green jobs) as well as attorneys specializing in environmental and energetic law, financial professionals with a focus on green finance, and policymakers with the capacity to conduct systemic analysis in the framework of the green transition (integrated green jobs). Section 4 will examine the state of educational and training programs in Georgia to provide recommendations on how the country could be prepared to address the risk of a green skills gap and box 4.1 will be specifically dedicated to a preliminary assessment of such a gap.

Beyond the risk of a green skills gap, there are two factors negatively affecting the assessment of the green job framework in Georgia. First, there is not a clear, well-articulated, and publicly recognized definition of “green jobs” in Georgia. Without a clear definition of "green jobs," there is ambiguity about which occupations and industries contribute directly to environmental sustainability. A precise definition is, therefore, crucial for identifying and categorizing jobs that have a positive impact on the environment. This clarity helps guide policy initiatives, training programs, and investment strategies towards sectors that actively support the green transition. Moreover, a well-defined concept of green jobs provides a foundation for understanding the skills and competencies necessary for these roles, emphasizing their significance in the workforce. In this regard, recognizing the existence of dedicated green jobs and integrated green jobs is essential for informed decision-making, targeted skill development, and effective policy implementation in the overall transition toward a more sustainable and environmentally conscious economy.

Second, there is no “green jobs” monitoring system. A monitoring system for green jobs is essential to track the growth and impact of environmentally sustainable employment. Without such a system, it becomes challenging to assess the success of green initiatives, measure the effectiveness of policies, and identify areas that require additional support. Monitoring helps policymakers maintain updated statistical information, make informed decisions, and allocate resources efficiently in support of the green economy. Furthermore, a monitoring system for green jobs enables the identification of trends in the demand for specific skills within the green sector. This information is valuable as it facilitates the alignment of education and training programs with the evolving needs of the green job market, ensuring that individuals are equipped with the right skills for employment in environmentally sustainable sectors.

On the whole, three structured actions might be implemented to enhance the green job market in Georgia and address the above-mentioned gaps.

1. Introduce a “Strategic Concept for the Transition to Green Economy in Georgia” aimed at:

- Providing a clear definition of green jobs and differentiating between dedicated green jobs and integrated green jobs;
- Developing a comprehensive, transparent, and renewed policy framework – grounded on specific goals, targets, and timeframes – to outline the government's commitment to a green economy;
- Establishing regulatory measures and incentives to encourage businesses and industries to adopt green practices.

2. Support an impactful public communication campaign on the meaning and value of green jobs by:

- Utilizing a mix of communication channels (e.g. traditional media, online platforms, community events, etc.) to reach different stakeholders (e.g. general public, businesses, educational institutions, etc.);
- Emphasizing tangible economic benefits and environmental gains that can positively impact people, communities, and industries;
- Placing the notion in context through a series of case studies and narratives that highlight local success stories (like those of the RECP), thus making the idea more approachable and compelling.

3. Measure and classify green jobs employment and their related skills according to specific methodologies and tools by:

- Establishing data collection mechanisms that leverage advanced analytics and tracking systems. Diverse sources such as labor market data, industry reports, and surveys can be used to gather information. However, the data collection methods must be standardized and consistent over time for accurate trend analysis.
- Aligning measurement methodologies with international standards and frameworks, such as those established by the International Labour Organization (ILO) and the United Nations Environment Programme (UNEP). Adhering to globally recognized standards facilitates cross-border comparisons, benchmarking, and the exchange of best practices.
- Creating a feedback mechanism involving key stakeholders to gather input on the effectiveness of the measurement methodologies and tools. Likewise, conducting periodic reviews of the methodologies and tools to incorporate emerging trends, technologies, and industry developments.

4. EDUCATIONAL ENVIRONMENT AND GREEN JOBS SKILLS

4.1 The state of green educational and training programs

A research study assessing the level of environmental education and awareness in Georgia (ISSA 2022) indicates a generally adequate level of environmental awareness among the population, but it also reveals significant gaps and areas for improvement. The findings suggest that a considerable portion of the population lacks active engagement with environmental issues. Shockingly, every fourth respondent admitted to never having actively contributed to raising environmental awareness, and an additional 40% reported doing so rarely, indicating a substantial portion of the population remains disconnected from environmental initiatives. Moreover, despite recognizing the importance of environmental education, many respondents have not received formal or informal education on environmental issues.

The Unified National Strategy for Education and Science of Georgia (2022-2030) outlines a comprehensive approach to enhance the quality of education and science in the country. The strategy acknowledges the importance of vocational education in addressing social inequality and unemployment. Key initiatives include aligning vocational education with labor market demands, harmonizing it with European standards, developing a new national qualifications framework, and fostering collaboration between the private sector and vocational education institutions. From an institutional perspective, a Skills Agency was established in 2021 by the Ministry of Education and Science of Georgia and the Chamber of Commerce and Industry to facilitate the widespread of vocational programs in the labour market, support innovative training, and provide better employment opportunities. Positively, 32% of Georgian firms offered formal training in 2019, thus showing a supportive approach toward professional skills development. (DTDA 2022) Moreover, the number of individuals enrolled in vocational education programs grew by 30% compared to the 2021 data, reaching a total of 24,449 registered participants. (Ministry of Education and Science of Georgia 2023) However, despite the comprehensive nature of the strategy, the implemented institutional changes, and the constructive attitude of a certain portion of businesses and individuals in Georgia, at present sustainability and green skills still tend to remain at the margins in the context of vocational education and knowledge development.

These oversights underscore the need to integrate sustainability principles into conventional education and vocational training programs to equip individuals with the necessary competencies for a green economy. As recognized by Gagnidze (2014), education serves as a powerful tool for promoting the green transition by raising awareness, promoting sustainable values and behaviors, developing green skills and knowledge, adopting an interdisciplinary approach, facilitating lifelong learning, and building civil capacity for sustainable development. A comprehensive analysis of educational and training institutions in Georgia shows that there are, actually, diverse opportunities for green skills development in the country. However, they tend to be highly fragmented, weakly promoted (at times), and organized by diverse actors that do not cooperate cohesively. As a result, the impact of these valuable initiatives remains constrained as they lack a systemic organization and mechanisms of mutual support and endorsement. The section below offers an overview of the educational initiatives promoted at school, higher education, and vocational levels.

At the school level, the most relevant initiative in Georgia is the Eco-Schools program. The Eco-Schools program is an international educational program that was launched by the Foundation for Environmental Education (FEE) in 1994 and, since then, it has been successfully implemented in more than 80 countries around the world, including Georgia (from 2021). The program has been

implemented in Georgia under the auspices of the organization NNLE ‘Keep Georgia Tidy’ (KGT), which is an Associate Member of the Foundation for Environmental Education (FEE). Overall, this action-oriented program is based on a 7-step methodology related to Sustainable Development Goals (SDG) and Education for Sustainable Development (ESD). It starts with multidisciplinary learning lectures in classrooms (e.g. formation of environmental awareness, values, and skills) and proceeds out-of-class with practical activities focused on the environmental preservation and improvement of local communities. The program aims to raise students' awareness of global issues, helping them to become more eco-friendly and responsible citizens. Currently, more than 300 schools – located in 10 diverse regions and 62 municipalities – are involved in the Eco-Schools program in Georgia. Moreover, through the FEE Academy training programs under GAIA 20:30, school teachers can deepen their professional and environmental knowledge by learning how to use diverse innovative practices and materials.

The Caucasus Environmental NGO Network (CENN) is another NGO that is involved in the development of both formal and informal educational programs for youths in the area of environmental protection and human rights. Overall, the CENN team works in cooperation with ministries, schools, and universities to strengthen the education systems, for instance, by introducing cutting-edge methodologies, distributing new learning materials, and supporting the updating of educational curricula. Likewise, CENN regularly organizes green camps for youths living in Georgia and Armenia. Participants in the green camp receive training in diverse fields including social entrepreneurship, environmental protection, sustainable development, circular economy, and green growth. In 2022, CENN conducted a total of 6 green camps with the engagement of over 150 participants.

The Environmental Information and Education Centre (EIEC) has developed materials and organized training for teachers of both kindergartens and early school grades (1st-6th grade). The training course “Pre-school Environmental Education”, includes the following issues: biodiversity around us, waste management, water and energy saving, and climate change. Differently, the training course “Environmental Protection and Agricultural Education at School” is grounded on 8 topics, including sustainable development; protection of biodiversity; protection and sustainable management of water resources; air protection from pollution; waste management; climate change and reduction of natural hazards; land management and fight against desertification; agriculture, food safety, and quality. The Centre is currently working on textbooks and training for school teachers with students in the 7th-12th grade. The Centre also runs the annual "Green Award" competition, which is a principal contest for teachers and kindergarten practitioners from all over Georgia. Likewise, the Centre regularly announces different types of competitions for students, in which any interested young person can participate. Furthermore, the Centre implements special programs for school students, such as:

- The “School of Ecoleaders”, where students are introduced to several environmental issues for 2 months, and after the program they have thematic field trips to various protected areas, waste processing plants, zoos, botanical gardens, etc.
- The “Forestry School”, which is a 2-month program aimed to promote the forestry profession for young people. During the organized field trips, students go into the forest to learn about forest accounting and the main species that live there.
- The “Green Camp - Climate Ambassadors”, a 5-day intensive camp where students learn about disasters caused by climate change.

Therefore, there are already multiple initiatives in Georgia aimed at introducing environmental awareness and sustainability principles from an early stage of school that are valuable and

impactful. Still, some of them would need better public promotion to achieve even higher results, and reaching national coverage would be desirable.

Concerning the higher education level, there are around 60 universities in Georgia, but only approximately 10-12 universities have research centers on sustainable development and/or teach students about sustainable business models. Even less are those that specifically mention green skills among their expected learning outcomes (a simple Google search of the term “green skills” both in English and Georgian does not reveal any valuable reference from the official websites of local universities). Nevertheless, some valuable initiatives can already be identified.

The Grigol Robakidze University (GRUNI) has introduced a few courses related to sustainability in its bachelor's program in “Public Administration and Politics” and its master’s programs in “Business Administration” and “Public Governance and Policy”. Some examples are lectures on “Sustainable Development of Business”, “The Political Economy of Sustainable Energy”, “Energy and Ecological Law”, “Introduction to Environmental Law”, and “Global Environmental Policy”. Moreover, in cooperation with “Libra Alliance”, GRUNI has launched in 2022 a Center for Sustainability with the purpose to increase awareness and implementation of the 17 SDGs, the PRME principles, and the Global Compact.

Other universities of Georgia have followed a similar practice to integrate sustainability courses into their educational programs. For example, the Business and Technology University (BTU) has introduced in its curricula one course on “Sustainable Development” and one on “Circular Economy”. Likewise, Caucasus University (CU) has introduced a course on “Circular Economy” for bachelor’s alumni studying economic disciplines, courses on “The Economy of Climate Change” and “Transition Economy” for master’s programs, and a series of diverse courses and seminars related to “Green Economy”, “Green Finance”, and “Environmental Economics” for those studying at a Ph.D. level. The same institute has also organized diverse short-term events in the area of sustainability such as, for example, the workshop on “Education for sustainable development – architecture, engineering technologies, green construction” organized in 2021 by Caucasus University in cooperation with the company “Esco-ES”.

In recent years, some institutions have also started to provide entire educational programs related to environmental management and sustainable development. Among them, it is possible to mention the “Master in Water Supply, Water Discharge and Rational Use and Protection of Water Resources” and the “Master in Water Engineering” at Georgian Technical University (GTU); the “Master of Constructive (applied) Geography and Protection of the Environment” offered by Sokhumi State University (SOU); and the “Master’s program in Environmental Management and Policy” provided by the Georgian Institute of Public Affairs (GIPA). Unfortunately, these programs still represent exceptional cases within the Georgian higher education system.

Another important project is the “Green Scholarship” program, a joint initiative of the Environmental Information and Education Centre of the Ministry of Environmental Protection and Agriculture of Georgia, the Green Climate Fund (GCF), the governments of Sweden and Switzerland, and the United Nations Development Program (UNDP). The program was launched in 2022 to increase the number of students enrolled in environmental programs. A total of 32 scholarships were awarded to the following master's programs: physical geography and sustainable development of the environment, integrated management of water resources (hydrology), geology, management of energy and mineral resources, and sustainable development, ecology, constructive (applied) geography and environmental protection, environmental management, and policy. Eight universities participated in the scholarship program: Ivane Javakhishvili Tbilisi State University;

Ilia State University; Technical University of Georgia; Sokhumi State University; Georgian Institute of Public Affairs (GIPA); Shota Rustaveli State University of Batumi; Jacob Gogebashvili Telavi State University; Akaki Tsereteli State University. In 2023, the same initiative was extended to include both “Green Scholarships” and “Agro Scholarships”. Nine universities (the former eight plus Samtskhe-Javakheti State University) and twelve vocational colleges (College “Opizari”; College “Horizon”; College “Gantiadi”; College “Aisi”; Kaspi College; College “Iberia”; College “Modus”; College “Tetnuli”; Ilia Tsinamdzghvishvili College; College “Phazisi”; College “Prestige”; College “Lacada”) participated in the project. (UNDP 2023)

After reviewing the whole range of educational possibilities available within Georgia's higher education system, it appears that development is promising and heading in the correct direction. However, the number of institutes offering courses in sustainability and green skill development remains limited, as does the number of specialized educational programs in the field. Similarly, local models of green development in higher education are just beginning to emerge, and they will require time to provide systematic and long-term results.

BOX 4.1 – THE GAP BETWEEN GREEN JOBS AND HIGHER EDUCATION IN GEORGIA

This box section seeks to study the availability of specialized educational programs (master’s degrees) related to some of the most demanded green jobs identified in the previous chapter. This preliminary assessment reveals that, notwithstanding some relevant improvements reached in recent years, there is still a notable gap between the burgeoning demand for green jobs and the current landscape of higher education offerings in Georgia. Even if part of this gap is covered by vocational education and special training, there is still a great deal of work to be done to “green” the higher education system.

THE GAP BETWEEN GREEN JOBS AND HIGHER EDUCATION IN GEORGIA		
Green Jobs in Demand	Available Education in the Area	Missing Educational Aspects
Green energy specialists	Master in “Water Engineering” at Georgian Technical University.	Master in Renewable Energy Engineering.
Green policymakers	Master in “Public Governance and Policy” and “Business Administration” at GRUNI. Master in “Environmental Management and Policy” at GIPA.	Courses in: Climate change policy analysis. Carbon literacy.
ESG consultants/auditors	-	Courses in: ESG/Sustainability reporting. Energy auditing.
Sustainable development planners	Master of “Urban Planning” at Tbilisi State Academy of Art.	Courses in: Sustainable land use planning. Sustainable transportation planning and design.
Sustainable environmental, waste, and water managers	Master in “Protection of water resources” at Georgian Technical University. Master in “Protection of the Environment” at SOU. Master in “Environmental Management and Policy” at GIPA.	Courses in: Waste management and recycling technologies. Hazardous waste handling. Environmental impact assessment.
Financial experts with a focus on green finance	Master in “Economics” at Caucasus University.	Courses in: Green bonds and climate finance. Environmental economics.
Lawyers specialized in environmental/energy area	Master in “Environmental Management and Policy” at GIPA.	Master in environmental and energy law

Beyond traditional higher education, within the state of Georgia, there are a variety of green training that are accessible at the vocational level. They are organized by a wide variety of organizations, such as local institutions, non-governmental organizations (NGOs), and international organizations. A selection of the most valuable opportunities is provided here below.

Beyond its projects directed at the youth, CENN is also engaged in activities aimed at developing human capital and promoting sustainable leadership skills. For example, CENN has organized a grant competition for innovative ideas for climate change mitigation and adaptation, specialized training in the field of circular economy, and a study tour to the European Environmental Bureau in Brussels (Belgium) for fourteen representatives of civil society organizations. Since December 2023, CENN is also responsible for the implementation of the “Green Agenda project”, a three years initiative aimed at undertaking a comprehensive assessment of Georgia’s green transition.

Other organizations provide well-developed training initiatives. The NGO ECOVISION, for example, offers certified training programs in areas like climate change, energy efficiency, biodiversity conservation, waste management, and water management. Differently, the Westminster Foundation for Democracy in Georgia organized in recent years professional development training on climate and environmental challenges for journalists, civil society organizations, and other interested groups. In 2021, the New Technology Center ATC – an architecture and construction company in Tbilisi – launched the “Bazaleti Green Architecture and Engineering Technologies Training and Demonstration Center” where guests will have the opportunity to become familiar with the most recent environmentally friendly ideas, solutions, and technology in this sector. (Georgia Today 2020)

Some initiatives are promoted by local universities. The Georgia Institute of Public Affairs (GIPA) in collaboration with its global partner, RRC International, and with the financial backing of the Millennium Challenge Account - Georgia (MCA-Georgia) provides a vocational program in “Occupational Health and Environmental Technologies”. In 2022, the Georgian Technical University (GTU) in cooperation with the Ministry of Economy and Sustainable Development of Georgia launched four vocational programs related to renewable energy: installer of small-scale biomass boilers and ovens; installer of solar photoelectric systems; installer of solar thermal systems; installer of surface geothermal systems and heat pumps. Construct2 is a college established in 2017 as a PPP between the Ministry of Education and Science of Georgia and the construction company BK Construction. The college has 11 short-term certified programs in field construction plus 5 long-term educational programs including one in “Occupational Safety and Environmental Protection Technologies”. In 2023, one of its projects on aerated concrete bricks reached the finals of the ETF Green Skills Awards.

Some chances are also given by governmental institutions and international organizations. The Environmental Information and Education Centre (EIEC) provides professional education to those who are interested in topics such as environmental management, forest inventory, and climate-wise planning of agricultural operations. Likewise, the Ministry of Economy and Sustainable Development (MoESD) is preparing vocational programs to train individuals to become energy efficiency auditors in the fields of industry, buildings, and transportation, as well as inspectors of heating and cooling systems in construction. Furthermore, in 2021, the United Nations Environment Programme (UNEP) in partnership with the United Nations International Training and Research Agency (UNITAR), introduced a free online course called "Introduction to the Green Economy" as part of the EU4Environment program.

A priceless opportunity for training/retraining is made available to the people of Georgia through the above-mentioned vocational programs. The foundations for the development of green talents in occupational fields seem, therefore, already established in the country. There are, nevertheless, some drawbacks, the most notable of which are associated with its large fragmentation, inadequate promotion (at times), and relatively low effect in terms of the number of participants.

Table 6 sums up the main green educational and training programs available in Georgia to date.

TABLE 6. GREEN EDUCATIONAL AND TRAINING PROGRAMS		
Level of Education	Organization	Description
School	“Keep Georgia Tidy” under FEE	Implemented the "Eco-school" project, which accomplished the participation of over 300 schools.
	Caucasus Environmental NGO Network (CENN)	This NGO is involved in green camps organization and educational materials distribution.
	Environmental Information and Education Centre (EIEC)	Provides training for teachers and runs programs like “School of Ecoleaders”, “Forestry School”, and “Green Camp - Climate Ambassadors”.
Higher Education	Grigol Robakidze University (GRUNI)	Offers sustainability-related courses in various programs and launched the Center for Sustainability.
	Business and Technology University (BTU)	Introduced courses on "Sustainable Development" and "Circular Economy".
	Caucasus University (CU)	Offers courses on “Circular Economy”, "Economy of Climate Change", "Green Economy", and others.
	Georgian Technical University (GTU)	Offers a master's in “Water Supply, Water Discharge and Rational Use and Protection of Water Resources”
	Sokhumi State University (SOU)	Offers a master’s program in “Constructive (applied) Geography and Protection of the Environment”
	Georgian Institute of Public Affairs (GIPA)	Offers a master’s program in “Environmental Management and Policy”
	Green Scholarship program	A joint initiative aimed to increase enrollment in environmental study programs.
Vocational	Caucasus Environmental NGO Network (CENN)	Provides grant competitions, training in the circular economy, and study tours.
	ECOVISION	Offers certified training programs in climate change, energy efficiency, and others.
	Westminster Foundation for Democracy	Organizes training in climate and environmental challenges.
	Georgia Institute of Public Affairs (GIPA)	Offers a vocational program in “Occupational Health and Environmental Technologies”.
	Georgian Technical University (GTU)	Offers 4 vocational (technical) programs related to green energy installments.
	Construct2	Offers diverse programs in the construction sphere including one in “Occupational Safety and Environmental Protection Technologies”.
	Public institutions (e.g. EIEC; MoESD)	Offers/supports diverse green professional training/retraining programs.
	International organizations (e.g. UNEP; UNITAR)	Offered a free e-learning course in "Introduction to the Green Economy".

4.2 Gaps and barriers hindering the development of green skills

Georgia is gradually introducing a variety of green education and training programs. Having such a trend seems to be a promising development as it allows green skills to spread throughout the population and helps to support the process of making a smooth transition to a green economy. Notwithstanding the remarkable value of the existing programs, there is still much room for enhancing the development of green skills and competencies in Georgia. (DTDA 2022; World Bank 2023) A schematic representation of the obstacles hindering the spread of green skills in Georgia is presented in Table 7, which divides them into three different categories: willingness to learn, accessibility to learning, and quality of available learning opportunities.

Category	Challenge	Description
Willingness to learn	Limited Awareness of Green Issues	Climate change and environmental protection are not actively discussed in daily conversations. This lack of public awareness translates into limited motivation to pursue education and training in green skills.
	Resistance to Change	Focus on the economic impact of the green transition more than the environmental one. Limited willingness to invest time and resources into acquiring green skills.
	Lack of Foundational Knowledge	Lack of foundational knowledge constrains the capacity of citizens to participate in professional training regardless of their availability.
Accessibility to learning	A limited number of educational programs	There is a limited availability of educational programs tailored to environmental sustainability and green skills development.
	A limited number of green experts	The scarcity of green experts can limit the availability of mentorship and practical hands-on experiences, hindering the accessibility and quality of learning opportunities in green skills.
	Lack of incentives to promote vocational education	The absence of mechanisms to promote and value vocational education further exacerbates the accessibility challenge.
Quality of the available programs	A necessity to update academic curricula and professional training	Academic curricula and professional training need to be updated to incorporate relevant environmental and sustainability concepts to meet the demands of the modern workforce.
	A limited role played by universities in driving the green transition process	The limited involvement of academic institutions in research, analysis, and advocacy diminishes the quality and depth of available learning opportunities in green skills development.
	Need to better coordinate diverse stakeholders	Limited coordination among stakeholders contributes to the lack of comprehensive and effective educational programs.

In Georgia, there exists a significant lack of awareness and understanding regarding the importance of environmental sustainability and green initiatives among the public. Research indicates that topics related to climate change and environmental protection are not actively discussed in daily conversations, with a notable proportion of respondents expressing minimal concern or engagement with these issues (WFD, 2023). This lack of public awareness translates into limited motivation to pursue education and training in green skills.

Furthermore, there is resistance to change, which poses a considerable obstacle to fostering a culture of environmental responsibility and sustainability (World Bank, 2023). The perception of the economic value of transitioning to green practices is often not fully grasped by individuals and businesses alike, hindering their willingness to invest time and resources into acquiring green skills. This seems associated with aspects such as low levels of civil responsibility, lack of motivation, and low activity in the state and civil sphere. (Mghebrishvili, Mghebrishvili, and Atoshvili 2020)

A lack of foundational knowledge serves as a barrier to further engagement with green skills training and development. As a result, some people might not have the capacity to attend green professional development courses, notwithstanding their potential availability. This reflection entails that essential adjustments must be planned and implemented at all levels of education, including schools, universities, and lifelong learning. (Gagnidze 2020)

One of the primary barriers to accessing green skills education in Georgia is the limited availability of educational programs tailored to environmental sustainability. A significant portion of the population, across various levels of education, has not received adequate environmental education, as evidenced by the lack of exposure to environmental topics in university, technical education, and informal learning settings (UNDP, 2022). To date, the number of higher education programs offering green skills development remains relatively constricted.

A related problem is the limited number of specialists in green areas. A limited number of green experts poses a problem for accessibility to learning green skills because it creates a bottleneck in the availability of qualified instructors and mentors who can effectively teach and guide individuals seeking to acquire green skills. Without an adequate number of experts, educational programs may be constrained in their capacity to offer diverse and comprehensive training opportunities, leading to gaps in learning and skill development.

The absence of mechanisms to promote vocational education, coupled with outdated curricula that do not align with the needs of employers, further exacerbates the accessibility challenge. Vocational education often faces a lack of recognition and support compared to traditional academic pathways. Without mechanisms in place to promote vocational education, such as awareness campaigns or government incentives, Georgian citizens may not be encouraged to pursue these paths, leading to a limited pool of skilled workers in crucial sectors.

The quality of available learning opportunities in green skills education is hindered by several factors. Firstly, academic curricula need to be updated to incorporate relevant environmental and sustainability concepts to meet the demands of the modern workforce (World Bank, 2023). Moreover, despite ongoing reforms in vocational education since 2007, there remains a mismatch between educational programs and the demands of the labor market, particularly in the realm of green skills (Tavartkiladze, 2020).

Additionally, there is a dearth of green specialists and constrained scientific research, with universities playing a limited role in driving environmental change compared to non-governmental organizations (NGOs) (World Bank, 2023). This limited involvement of academic institutions in research, analysis, and advocacy diminishes the quality and depth of available learning opportunities in green skills development.

Finally, limited attention from the government in terms of policy development and coordination among stakeholders contributes to the lack of comprehensive and effective educational programs (World Bank, 2023). Without clear policies and coordination mechanisms, there may be a lack of

direction and consistency in educational initiatives aimed at addressing important issues such as sustainability and environmental awareness. This can result in fragmented efforts and missed opportunities to equip students with the necessary skills and knowledge to address environmental challenges. Likewise, there is a need for more industry-academic collaborations.

Therefore, addressing the gaps and barriers hindering the development of green skills in Georgia requires a multifaceted approach. Efforts should focus on raising public awareness, updating educational curricula, enhancing accessibility to learning opportunities, and improving the quality of education and training programs. Collaboration between government entities, educational institutions, NGOs, and industry stakeholders is essential to overcome these challenges and foster a skilled workforce capable of driving sustainable development in Georgia.

4.3 Action plan to foster green skills in Georgia

Taking into account the information collected in this report and the recommendations offered by the interviewees, the following action plan – schematically represented in Table 8 – has been developed to foster the spread of green skills in Georgia and prepare the country to address the rising demand for green jobs.

Launching public awareness campaigns targeting different demographics and incorporating environmental education into school curricula can effectively address limited awareness of green issues. These campaigns should use tailored messaging and utilize various media channels to engage audiences of all ages and backgrounds. Content should be interactive and appealing, highlighting both local and global environmental challenges while encouraging active participation through hands-on activities and community involvement. Adding environmental education into school curricula would empower individuals to become advocates for environmental protection and drive positive change in their communities and beyond. Therefore, continuing and further enhancing the constructive process already started by “Keep Georgia Tidy”, the Caucasus Environmental NGO Network (CENN), and the Environmental Information and Education Centre (EIEC) is a priority.

Showcasing successful case studies and examples of how adopting green practices can benefit individuals and communities is crucial in overcoming resistance to change. By highlighting tangible benefits such as cost savings, improved health outcomes, and enhanced quality of life, individuals are more likely to see the value in transitioning to sustainable practices. Furthermore, increasing access and awareness to career planning consultations for representatives of green professions can provide guidance and support for those seeking to pursue careers in the green sector, thereby addressing concerns about job security and economic stability. These efforts collectively empower individuals and communities to embrace change and contribute to a more sustainable future.

Offering workshops and seminar sessions to enhance understanding of green concepts and practices among the general public is key to addressing the problem of lack of foundational knowledge. By providing accessible and interactive learning opportunities, individuals can gain the necessary skills and knowledge to make informed decisions and take part in more advanced training. In addition, encouraging participation in online courses and resources related to environmental sustainability further expands access to educational materials, allowing individuals to learn at their own pace and deepen their understanding of green principles and practices. Translating already available online programs would be a cost-effective solution.

By offering specialized courses and programs dedicated to green skills and sustainability, as well as integrating green principles and skills into traditional courses across various disciplines, educational institutions can better equip students with the knowledge and expertise needed to address environmental challenges. This comprehensive approach ensures that individuals from diverse backgrounds and fields of study have access to green education, thereby fostering a skilled workforce capable of driving sustainable development across sectors. Indeed, the government should advocate for the incorporation of Sustainable Development Goal (SDG) references into the strategic documents of university administrations, as well as for the support of interdisciplinary and transdisciplinary research. (Keryan *et al.* 2020)

Providing financial support to encourage the participation in and completion of internationally recognized green training and certification programs, such as Certified Renewable Energy Professional (REP), GRI Professional Certification, and International Society of Sustainability Professionals (ISSP) would allow increasing the number of green specialists in Georgia. Moreover, fostering collaboration with international partners allows for the exchange of best practices, expertise, and resources, thus contributing to innovation and capacity-building efforts in the field of sustainability. These initiatives collectively contribute to the development of a larger pool of qualified green experts.

Financial incentives, grants, and subsidies for organizations and people who engage in green education might boost awareness of vocational education by lowering financial obstacles and balancing expenses. Moreover, by upgrading facilities and providing modern equipment and technology, vocational schools could create more attractive learning environments for those who seek hands-on learning experiences and tangible skill development opportunities. In turn, investing in infrastructure signals a commitment to the value of vocational education, boosting its reputation and recognition as a viable pathway to rewarding careers.

Reviewing and updating academic curricula to incorporate the latest developments in green technologies, practices, and policies is essential in staying current with advancements in the field. Additionally, establishing partnerships with industry experts and practitioners enables academic curricula to be aligned with industry needs and standards, providing students with practical insights and real-world experiences that enhance the quality and applicability of their education. This collaborative approach bridges the gap between academia and industry, ensuring that graduates are equipped with the skills and knowledge needed to succeed in the green workforce.

By providing financial support, universities are incentivized to prioritize sustainability efforts and incorporate environmental considerations across their academic and operational activities. The development of green campuses is, for instance, an idea that should be taken into account as they demonstrate a commitment to sustainability, foster a culture of environmental stewardship, and inspire positive change in the broader community. Moreover, establishing a consortium among universities and research centers to integrate environmental initiatives into research, teaching, and campus operations would amplify the impact of individual initiatives and foster collective action toward sustainability goals.

Establishing a multi-stakeholder platform comprising government agencies, educational institutions, businesses, NGOs, and community representatives to coordinate efforts related to green skills development can address the need to better coordinate diverse stakeholders for higher green quality education. By bringing together key stakeholders from various sectors, this platform would facilitate collaboration, information sharing, and resource pooling, ensuring a cohesive and coordinated approach to green skills development. In such a regard, it would also be useful to

develop a comprehensive strategy or action plan with clear goals, timelines, and responsibilities for all stakeholders involved. This coordinated approach fosters synergy, effectiveness, and sustainability in addressing the challenges and opportunities related to green skills development.

**TABLE 8.
ACTION PLAN TO FOSTER GREEN SKILLS IN GEORGIA**

Category	Challenge	Recommendations
Willingness to learn	Limited awareness of “green issues”	Launch public awareness campaigns targeting to educate people about environmental issues and the importance of green skills.
		Include environmental education and awareness programs in school curricula from an early age.
	Resistance to change	Showcase successful case studies and examples of how adopting green practices can benefit individuals and communities.
		Increasing access and awareness to career planning consultations for representatives of green professions.
	Lack of foundational knowledge	Offer workshops and seminars to enhance understanding of green concepts and practices among the general public.
		Encourage participation in online courses and resources related to environmental sustainability.
Accessibility to learning	A limited number of educational programs	Expand the range of educational programs focused on green skills and sustainability across vocational training centers, universities, and other educational institutions.
		Integrating green principles and skills into traditional courses.
	A limited number of green experts	Support the completion of internationally recognized green training and certification programs.
		Collaborate with international partners and organizations to introduce new educational cooperative initiatives and exchange best practices.
	Lack of incentives	Provide financial incentives, grants, and subsidies for businesses and individuals who invest in green education.
		Invest in infrastructure and facilities for vocational education institutions to ensure the best modern equipment, technology, and learning environments.
Quality of the available programs	A necessity to update academic curricula and professional training	Regularly review and update academic curricula to ensure they incorporate the latest developments in green technologies, practices, and policies.
		Establish partnerships with industry experts and practitioners to ensure that academic curricula are aligned with industry needs and standards.
	A limited role played by universities in driving the green transition process	Offer grants and other financial incentives to encourage the development of a “green campus”.
		Establish a consortium among the universities and research centers that are leading the green transition to generate a greater impact.
	Need to better coordinate diverse stakeholders	Establish a multi-stakeholder platform comprising government agencies, educational institutions, businesses, NGOs, and community representatives to coordinate efforts related to green skills development.
		Develop a comprehensive strategy or action plan with clear goals, timelines, and responsibilities for all stakeholders involved in green skills development.

Table 9 provides a risk assessment framework – with references for mitigating or preventing these risks – for the recommendations provided in the action plan for fostering the spread of green skills in Georgia.

TABLE 9. RISK ASSESSMENT FRAMEWORK		
Recommendation	Risk Description	Mitigation/Prevention
Public awareness campaigns and environmental education in school curricula	Lack of funding or resources	Secure funding through public-private partnerships or government grants. Collaborate with NGOs for support in campaign development and implementation.
Career planning consultations for green professions	Resistance from individuals or industries	Provide evidence-based data on the benefits of green business practices and careers.
Workshops, seminars, and online courses to provide basic green knowledge	Lack of funding or resources	Focus on the translation of already available courses offered by NGOs and international institutions.
Integration of green skills into academic curricula	Resistance from academic institutions or faculty to update curricula	Provide faculty training and resources on green concepts. Cooperate with international partners with a successful experience in such a process.
Support for participation in internationally recognized green training and certification programs	Lack of awareness or accessibility to international certification programs	Provide information and guidance on available certification programs. Offer scholarships or grants for program participation.
Incentives for businesses and individuals investing in green education	Insufficient uptake of financial incentives due to bureaucratic hurdles or lack of awareness	Simplify application processes and provide clear guidelines for accessing incentives. Launch awareness campaigns about available incentives.
Development of green campuses	High costs associated with infrastructure upgrades and green campus development	Seek public-private partnerships for funding. Prioritize infrastructure investments based on feasibility studies.
Establishment of a multi-stakeholder platform for green skills development	Lack of commitment or participation from key stakeholders in the platform	Engage stakeholders through targeted outreach and communication. Clearly define roles and responsibilities to foster accountability.

5. CONCLUSIONS

Although the state of green transition in Georgia is at an early stage, it exhibits a promising trajectory towards establishing a comprehensive green economy, underpinned by legislative measures, policy frameworks, and economic mechanisms. Georgia's commitment to aligning with European Union legislation, particularly through the Association Agreement initiated in 2016, has laid a robust foundation for environmental policy and legislation, marking significant advancements in various sectors such as environmental protection, renewable energy promotion, waste management, and sustainable agriculture. Despite these advancements, several challenges persist. To address them effectively, Georgia must mobilize private finance, strengthen awareness and education, enhance regulatory frameworks, promote circular economy principles, accelerate sustainable agricultural development, and focus on renewable energy utilization and energy efficiency promotion.

Notwithstanding the lack of statistical data, the analysis of Georgia's green job market underscores the emerging demand for green occupations and associated skill sets. Preliminary findings suggest a growing demand for roles in renewable energy, energy efficiency, green policy-making, consultancy, and sustainable resource management. In such a framework, soft and hard skills like renewable energy, green policy development, green tech, sustainability reporting, analytical thinking, environmental awareness, and systemic thinking are going to be in high demand. And yet, despite some relevant improvements reached in recent years, there is still a concerning gap between, on one side, the potential demand for green jobs and their related skills and, on the other, the current landscape of higher education offerings in Georgia. Addressing challenges such as the absence of a clear definition of “green jobs” and the lack of a statistic monitoring system will also be essential to bridging skill gaps and promoting workforce readiness in the sustainability sector.

The analysis of Georgia's educational environment and green skills landscape reveals commendable initiatives at various levels aimed at promoting environmental awareness and sustainability principles. Nevertheless, impediments such as fragmented educational programs, insufficient knowledge of environmental issues, and restricted access to and excellence of green educational programs are still present. A multifaceted action plan is proposed to address these challenges, encompassing public awareness campaigns, integration of green skills into educational curricula, financial support for green education and training, and collaboration among stakeholders. By implementing these initiatives cohesively, Georgia can bridge the green skills gap, align education with workforce demands, and propel its green transition toward a sustainable and prosperous future. With continued commitment and concerted efforts from government, private sector, academia, and civil society, Georgia can realize its vision of a resilient and inclusive green economy, ensuring environmental sustainability and socio-economic prosperity for future generations.

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7. ANNEXES

ANNEX 1.		
RESPONDENTS TO THE SEMI-STRUCTURED INTERVIEWS		
ACADEMIA		
NAME AND SURNAME	UNIVERSITY	FOCUS AREA
Giva Tvauri	Grigol Robakidze University	<ul style="list-style-type: none"> • Sustainable Development • Business Administration • Renewable Energy
Ioseb Berikashvili	Caucasus University	<ul style="list-style-type: none"> • Green transition • Circular economy • Education
Kakha Artsivadze	Georgian Institute of Public Affairs (GIPA) & Centre for Biodiversity Conservation and Research – NACRES	<ul style="list-style-type: none"> • Biodiversity conservation • Climate change • Natural resources
PUBLIC INSTITUTIONS		
NAME AND SURNAME	INSTITUTION	FOCUS AREA
Konstantin Barjadize and Liana Garibashvili	Energy Efficiency Centre (EEC)	<ul style="list-style-type: none"> • Energy efficiency • Renewable energy • Sustainability
Tamar Aldashvili	LEPL Environmental Information and Education Centre	<ul style="list-style-type: none"> • Environment • Education • Sustainability
NON-GOVERNMENTAL ORGANIZATIONS		
Levan Gagoshvili	Caucasus Environmental NGO Network (CENN)	<ul style="list-style-type: none"> • Agriculture • Forestry • Sustainability
Manana Kochladze	CEE Bankwatch Network (CEEBN)	<ul style="list-style-type: none"> • Democracy • Environment • Human Rights