ADDRESSING SOCIO-ECONOMIC INEQUALITY: DECENT WORK IN CAREC'S GREEN AND DIGITAL TRANSITIONS

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Executive Summary

Countries in the Central Asia Regional Economic Cooperation (CAREC) region are navigating twin transitions–the shift to greener economies and the rapid digitalization of markets and societies. While these transitions offer opportunities to enhance productivity, sustainability, and connectivity, they also risk exacerbating structural inequalities unless accompanied by deliberate, inclusive policy measures. Socio-economic disparities are likely to widen due to uneven infrastructure development, with rural and less developed areas often falling behind in accessing new technologies and green energy solutions. In addition, limited availability of quality education and digital skills training restricts vulnerable groups—including women, youth, informal workers, and rural populations—from fully engaging in emerging labor markets. Financial constraints further impede investments in necessary upskilling and adaptation, disproportionately excluding marginalized communities. Regional dependence on traditional economic sectors can slow the pace of transition or concentrate benefits unevenly, compounding labor market inequalities. Moreover, entrenched gender inequalities, rural-urban divides, and high levels of informal employment exacerbate these challenges, making it essential to implement targeted, inclusive strategies to ensure these transitions foster equitable and sustainable development.

This report investigates how socio-economic inequality, decent work, and the twin transitions intersect across six CAREC countries: Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan. The concept of decent work is grounded in the International Labour Organization (ILO) framework, encompassing employment that is productive and provides fair income, workplace security, social protection for families, opportunities for personal growth and social integration, freedom of expression and collective organization, and equality of opportunity and treatment for all workers. The study emphasizes ILO standards—including fair pay, safe working conditions, labor rights, and social protection—while also addressing broader social and economic factors such as the inclusion of vulnerable groups (youth, women, migrants, informal workers), the formalization of informal employment, and the alignment of labor markets with green and digital transitions to foster equitable outcomes. Consequently, decent work is understood not only as adherence to fundamental labor standards but also as encompassing employment quality, social inclusion, and sustainable economic development. The report assesses trends in inequality, labor market dynamics, and the implications of green and digital transformations, drawing on quantitative data alongside over 50 key informant interviews and focus groups to offer evidence-based policy recommendations and guidance for regional cooperation.

This report contains several key findings. Firstly, there are persistent socio-economic inequalities that need to be addressed. Economic inequalities remain entrenched despite overall GDP and income growth. Wealth is highly concentrated, with elite control of assets rooted in post-Soviet reforms. Rural-urban gaps, weak capital markets, and rentier structures reinforce divides. Social inequalities manifest as uneven access to education, healthcare, and civic freedoms. While basic infrastructure delivery is strong, disparities in quality of education, environmental health, and opportunity hinder upward mobility. Labor market inequalities are pronounced. Informality is widespread, limiting access to social protections. Migration remains central to livelihoods but exposes workers to vulnerability. Women and youth face particularly high barriers to decent work.

Second, there are labor challenges across the region, exacerbated by limited data availability. CAREC countries have improved labor participation rates, especially among women, with rates in Azerbaijan and Kazakhstan rivaling those in Western economies. Yet gaps in social dialogue, occupational safety, and social protection persist. Youth unemployment is a growing issue (up to 30% in Georgia and 24% in Tajikistan), while NEET rates highlight systemic weaknesses in education-to-work transitions. Migration flows from less developed to richer CAREC economies (and beyond) help households but entrench structural dependency and labor insecurity.

Third, the region remains heavily reliant on fossil fuels. The political economy, often shaped by subsidy regimes and vested interests, slows the transition to renewables and other green energy sources. Opportunities exist in hydropower (Tajikistan, Kyrgyz Republic), solar and wind (Uzbekistan, Kazakhstan), and green agriculture (Georgia). However, investments often fail to reach rural and informal workers. The absence of a just transition framework risks leaving vulnerable groups behind in emerging green sectors.

Fourth, the dynamics of the digital transition add a layer of complexity. While digital infrastructure has expanded, digital divides in skills, access, and affordability persist, particularly for people in rural areas, women, and youth. Education systems emphasize theory over applied digital competencies, creating skill mismatches and graduate unemployment. Platform and gig economies are expanding, offering flexibility but with high precarity and limited protections. Gender wage gaps remain stark. Concerns grow that technology-driven concentration of wealth could entrench digital rentier economies.

The implications of these findings are significant. The green and digital transitions are mutually reinforcing. Digital tools can accelerate climate action (e.g., smart grids, precision agriculture), while renewable industries can anchor new employment pathways. Without intentional design, both transitions may deepen existing inequalities, widening rural-urban, gender, and generational divides. Decent work must be a foundation as the region navigates these transitions. Promoting fair, safe, and inclusive labor markets is central to ensuring that transitions create shared prosperity rather than division.

This report presents a discussion of policy directions to address the unique challenges faced by CAREC countries in managing their twin-track transition, through national-level priorities and regional cooperation, ensuring that no worker is left behind in the pursuit of sustainable development. CAREC countries face a generational opportunity to harness the green and digital transitions as engines of inclusive, sustainable development that will address and mitigate socio-economic inequality in the region. Success will depend on embedding equity and decent work at the center of transition strategies. Failure to do so risks entrenching inequality, undermining cohesion, and missing the potential of a more connected, climate-resilient, and prosperous region.

Introduction

Countries in the Central Asia Regional Economic Cooperation (CAREC) are at a pivotal juncture as they navigate the dual transitions toward greener and more digitalized economies and societies. Despite shared histories among some of these countries, such as transition economies emerging from the post-Soviet era, CAREC countries today are highly diverse and dynamic in socio-economic terms. This is largely driven by varying resource endowments and governance and institutional contexts, leading to different levels of economic and social development over the last three decades. In the post-Soviet countries in the CAREC region, this emerged from the acquisition and control of assets and resources by a few actors as they transitioned to market-based economies. This legacy of asset concentration has produced persistent structural inequalities that continue to influence present-day income distribution and labor market outcomes, limiting inclusive economic participation and perpetuating disparities throughout the region.

While incomes and wealth have grown across CAREC countries during this time, the region–much like other parts of the world–continues to grapple with significant socio-economic inequalities rooted in historical patterns. However, the ongoing digital and green transitions present a unique opportunity for CAREC countries to break these entrenched cycles of inequality by fostering more inclusive economic growth and expanding access to new forms of employment. Digitalization is opening new avenues for flexible employment and simplifying business operations–but the widespread adoption of artificial intelligence (AI) and other emerging technologies poses significant challenges for regulators and societies. Likewise, the green transition offers opportunities to leverage renewable energy and cleaner technologies, but it also presents the complex task of reducing national and global reliance on fossil fuels and diversifying economies and supply chains. Central to these transitions are the labor market dynamics that emerge, bringing new risks and opportunities for decent work across the region.

In response to these changes, the CAREC Strategy 2030 aims to promote regional economic cooperation by emphasizing sustainable infrastructure, trade, and investment, while also tackling income inequality. The region strives to lower carbon emissions, enhance resource efficiency, and utilize digital technologies to foster innovation and improve governance. Nevertheless, achieving these ambitions requires substantial investments in education, vocational training, and social protections to equip the workforce for emerging sectors such as renewable energy and Information and Communication Technology (ICT). CAREC countries need to implement inclusive policies that address job displacement, support decent work, and ensure fair access to economic opportunities, especially for vulnerable groups.

To this end, this research aims to address two primary aims:

I. To examine the extent of socio-economic inequality in a selected group of countries in the CAREC region, analyzing both the structural factors and the distributional patterns that contribute to economic disparities among countries. This investigation will shed light on the underlying causes of rising inequality within these countries.
II. To explore the dynamics of the labor market in the CAREC region, including digital and green transitions, and to suggest policies supporting the future of work. This includes examining issues such as job creation, skill development, and how these factors influence the distribution of income across population segments. The research aims to provide insights into the evolving landscape of work and its implications for economic equality, ensuring a just green and digital transition across the region.

Throughout this report, the terms CAREC region/countries, Central Asia and the Caucasus, and Central Asia (CCA)[1] are used intentionally. The study does not aim to generalize about the entire CAREC region but offers recommendations for regional cooperation within CAREC. The definitions of Central Asia might be broader than the countries included here and may or may not encompass the Caucasus. CCA might not cover all CCA countries geographically, but only those that are CAREC members. Clarifications are provided when possible about which countries are referenced by these terms. Readers should exercise caution regarding when and how these terms are used deployed.

Report's conceptual framework explores the nexus of digital and green transitions with decent work and socio-economic inequality. Some approaches frame broader sustainability goals within existing economic frameworks. For example, the Triple Bottom Line Framework evaluates sustainability through three pillars: People (social), Planet (environmental), and Profit (economic). It shifts business and policy focus beyond economic growth to long-term environmental and social value creation (Miller, 2020).

Others are more comprehensive, such as the SDGs Framework, which is based on the 17 Sustainable Development Goals (SDGs). This framework provides a holistic approach to sustainability, integrating economic, social, and environmental goals. It serves as a blueprint for sustainable development, guiding policymaking and investment (United Nations, n.d.). The Capability Approach Framework is also a human-centered approach that assesses development by measuring people's real freedoms and opportunities (capabilities) rather than just economic resources. It informs policies on education, digital inclusion, and social justice (Sen, 1999).

Structural conceptual approaches focus more on broader social and economic systems and governance change. The Transition Management Framework offers a governance approach for managing long-term, complex transitions, such as the energy shift. It emphasizes experimentation, multi-level governance, and adaptive policy cycles to guide sustainability transitions (Loorbach, 2007). The Social-Ecological Systems Framework examines interactions between human societies and ecosystems, emphasizing resilience, feedback loops, and sustainability. It is widely used in climate adaptation and resource management studies (Partelow, 2018).

Some frameworks specifically examine the green or digital transition and its impact on inequality. However, they do not comprehensively integrate both transitions to offer a framework for understanding the inequality or decent-work outcomes of both. For example, the Digital Transformation and Inequality Framework analyzes how technological advancements affect economic and social inequalities. It focuses on people, connectivity, government, regulation, and the economy to ensure inclusive digitalization (UNDP, 2023b). The Green Jobs and Equity Framework examines how green jobs contribute to economic equity and workforce development, ensuring that new opportunities in the renewable energy, circular economy, and sustainability sectors are accessible to all, especially marginalized groups. The Just Transition Framework focuses on ensuring that the shift to a green economy is equitable and inclusive, protecting workers, communities, and industries affected by climate policies. It emphasizes social dialogue, reskilling, and support for displaced workers in sectors such as fossil fuels.

Building on these existing frameworks, this study proposes an integrated, CAREC-specific framework that simultaneously addresses the twin-track green and digital transitions alongside the dual

[1] Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan. Turkmenistan was not included in this study due to research limitations. This is addressed later in the methodology section.

dimensions of decent work and socio-economic inequality. This framework delineates key transitions, interventions, and intended outcomes relevant to the region.

Socio-economic inequality refers to systemic disparities in income distribution, wealth accumulation, and access to essential resources, including education, healthcare, technology, and employment opportunities. Structural economic transformations and policy failures often exacerbate these inequalities (Cecchini et al., 2021). In the CAREC region, socio-economic disparities are particularly evident in the unequal distribution of resources between urban and rural populations and across income groups (Hasanova & Mambetova, 2020). Addressing these disparities requires targeted policies that promote inclusive economic growth, equitable access to opportunities, and social mobility.

Decent work is defined as productive employment that ensures equitable remuneration, safe and secure working environments, access to social protection, representation and adherence to labor rights. It is a cornerstone of inclusive and sustainable economic development (ILO, 2024b). In the CAREC region, where informal labor dominates the economy, decent work is integral to mitigating potential labor market disruptions (UNDP, 2024a). Policies that foster vocational skill development, labor market inclusivity, and social protection are vital to equitable employment opportunities.

The green transition refers to the shift toward environmentally sustainable economic and social systems. It involves gradually adopting low-carbon technologies, renewable energy sources, and sustainable practices across sectors such as agriculture, mining, transport, and energy. This transition is a vital element for mitigating climate change-related risks, reducing environmental degradation, and ensuring the long-term sustainability of socio-economic systems (ETF, 2022). In the CAREC region, where environmental challenges such as resource depletion and climate vulnerabilities hinder long-term development, the green transition is a strategic imperative for fostering resilience and socio-economic stability (CAREC Program, 2024a). CAREC countries could reap a "triple dividend" from investing in climate change adaptation, including avoided losses (first dividend), induced economic benefits (second dividend), and additional social and environmental benefits (third dividend).

The digital transition refers to the systematic integration of digital technologies into socio-economic and governance systems. It encompasses advancements in artificial intelligence, automation, cloud computing, digital public infrastructure, and digital connectivity, which foster efficiency, innovation, and progress (European Commission, n.d.). Within the CAREC region, the digital transition offers opportunities to modernize industries, build e-governance, and enhance regional integration. Leveraging digital infrastructure can help bridge digital divides and expand economic opportunities (ADB, 2022).

Integrating these insights into the analysis enables a comprehensive understanding that goes beyond economic growth or technological adoption alone, focusing instead on inclusive, sustainable development pathways for the CAREC region. Despite the significant socio-economic transformations underway in the CAREC region, there remains a notable gap in comprehensive, integrated analysis that specifically addresses the intersection of socio-economic inequality, labor market dynamics, and the ongoing green and digital transitions. Existing studies often treat these issues in isolation or rely on broader regional data that do not fully capture the unique challenges and opportunities faced by CAREC countries. This fragmentation limits the ability of policymakers and stakeholders to design inclusive, evidence-based strategies that effectively promote decent work and equitable growth in the context of rapid technological and environmental change. This report aims to fill this critical void by providing CAREC-specific insights that synthesize these interconnected dimensions, thereby informing more coordinated and actionable policy responses and fostering enhanced regional cooperation to navigate the future of work inclusively and sustainably.

Through a mixed-methods approach combining quantitative data with over 50 key informant interviews and focus groups, the report assesses trends in inequality, labor market dynamics, and the implications of ongoing green and digital transformations. It seeks to generate evidence-based recommendations to inform national policies and regional cooperation mechanisms aimed at future-proofing the workforce, reducing disparities, and ensuring that the benefits of these transitions are broadly shared.

The report is organized as follows. First, it presents a review of the key literature to contextualize socio-economic inequality, decent work, and the green and digital transitions in CAREC countries and the region more broadly. Second, it outlines the research methodology. Third, there are three sections presenting key findings and analysis from our research on socio-economic inequality, decent work, and green and digital transitions. Finally, it presents national-level recommendations and a strategic framework for the CAREC region.

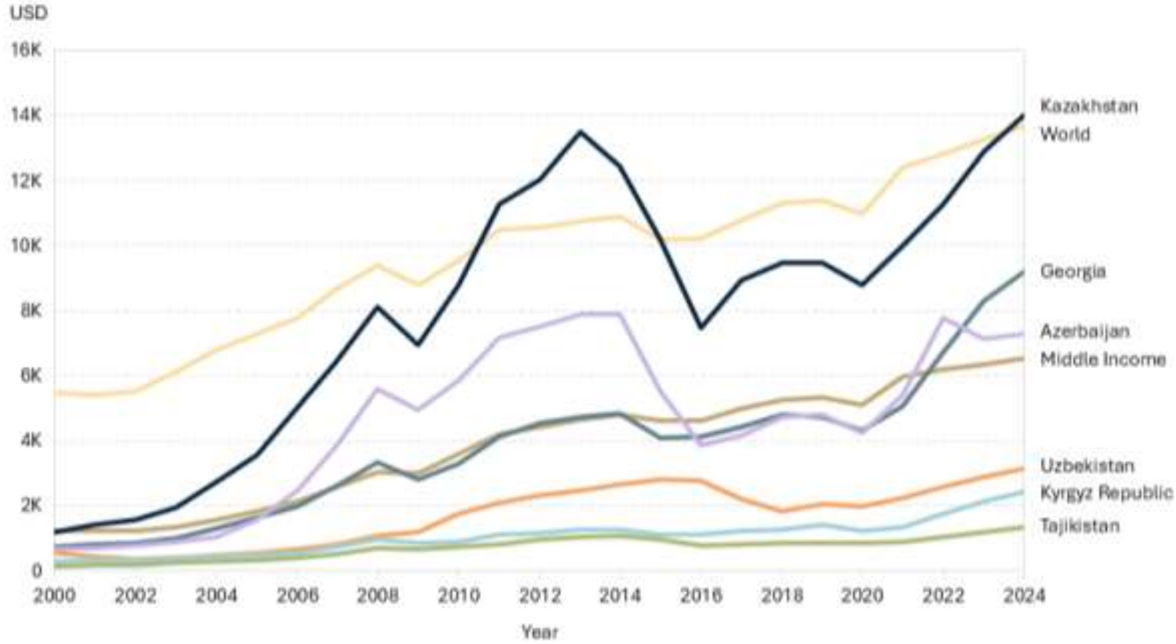
Understanding Socio-Economic Inequality, Decent Work, and the Green and Digital Transitions in CAREC Countries

Like many countries worldwide, CAREC nations in the CCA regions grapple with persistent inter- and intra-regional socio-economic disparities. While many low- and middle-income countries face similar challenges, the region has seen significant changes in its political, economic, and social institutions since gaining independence from the Soviet Union (Anderson & Pomfret, 2004). For nations transitioning from the Soviet system, some level of inequality is an inherent aspect of market economies, driven by differences in talent, effort, and access to opportunities. Nonetheless, extreme inequality can threaten social cohesion, exacerbate political divisions, and slow long-term economic growth (Berg & Ostry, 2011; Rodrik, 1999; IMF, n.d.). This section of the report discusses key developments in understanding social and economic inequality within CAREC, decent work, and the influence of green and digital initiatives transitions.

Economic Inequalities in CAREC

The CAREC countries included in this study are economically diverse, including upper-middle-income countries (Azerbaijan, Georgia, and Kazakhstan) and lower-middle-income countries (Kyrgyz Republic, Tajikistan, and Uzbekistan). Energy-exporting countries such as Kazakhstan and Azerbaijan tend to be wealthier, while more agriculturally dependent countries such as Tajikistan and Uzbekistan tend to be less so (World Bank, 2025a). Kazakhstan is the wealthiest country, with a per capita GDP of US$14,155, while Tajikistan is the least wealthy, with a per capita GDP of US$1,341 (World Bank, 2025b) (Figure 1).

Figure 1: GDP Per Capita Across Selected CAREC Countries with Middle Income and World Comparators, 2000-2024



Source: World Bank (2025b).

While there are vast differences in economic size, per capita GDP has grown across the region over the last 25 years, and the working poverty rates have declined dramatically.[2] In Kazakhstan alone, individuals are accumulating substantial wealth, with the number of millionaires (US$) expected to increase by 36% from 2023 to 2028 (UBS, 2024). Despite this being a positive story in traditional economic terms, it masks a broader trend - economic inequality.

Economic inequality has increased worldwide in recent decades. The richest 10% of people earn 52% of the world's income, while the bottom 50% earn just 8.5%. Wealth inequality is even more extreme; the bottom 50% own just 2% of the world's wealth, and the top 10% own 76% (Qureshi, 2023).

Similarly, such trends can also be observed across CAREC countries. According to the World Inequality Report 2022, Russia and Central Asian countries as a region have average incomes compared to other regions worldwide; however, their inequality levels are classified as extreme (Chancel et al., 2022). This is despite income inequality being relatively better than the world average.

Some have linked the extreme inequality in post-Soviet countries to assets accumulated by a small group of 'self-made billionaires" (Mihályi & Szelényi, 2016, p. 1238). A substantial body of research supports the view that economic reforms allowed elites to extract income from owning and controlling scarce assets (Mihályi & Szelényi, 2017; Sayer, 2015). It is also argued that global financial institutions with the neoliberal agenda such as IMF, provided financial and political backing within countries like Kazakhstan and the Kyrgyz Republic to legitimize and expand rent-based income sources (Sanghera & Satybaldieva, 2020). These "rentier capitalism" reforms not only increased social and economic inequality but also morally normalized and justified these disparities (Sanghera, 2016; Sanghera & Satybaldieva, 2020).

Social Inequalities in CAREC

Much like economic inequality is pervasive across the studied CAREC countries, social inequalities are also widespread. Health and education are inextricably linked and key indicators of socio-economic outcomes (The Lancet Public Health, 2020). While they are not the only indicators of social inequality (as explored further in this research), they are a helpful starting point for understanding the broader situation in CAREC countries. While progress has been made in both education and health across Central Asia, significant gaps remain, further exacerbating existing inequalities (WHO, 2022).

Health challenges across CAREC countries vary, in part because of different approaches and the success of policy development from the 1990s onward. For example, in Kazakhstan, a systematic approach to health policy was adopted in 2004; in Tajikistan, reforms were delayed due to the civil war; and in Uzbekistan, health reform was delayed until 2016 due to two decades of unchallenged power (Adambekov et al., 2016; Peyrouse, 2020). Coordination across the region has also been limited; in 2022, the WHO reported that there was no sub-regional organization in Central Asia focused primarily on public health and well-being (WHO, 2022). This is evident in empirical research from Kazakhstan, which identified disparities in health status across population segments. Poor

[2] https://pip.worldbank.org/

health outcomes were strongly linked to income levels and living conditions (Spankulova et al., 2020), creating an inextricable link between economic and social inequality.

Education policy and outcomes also vary across CAREC countries, but some research suggests that inequalities can be broadly linked to investment, resourcing, and the broader political economy. Analysis of the OECD Programme for International Student Assessment (PISA) identified improving, but unequal and inequitable, progress across Central Asian countries, including Azerbaijan, Georgia, and Kazakhstan.[3] Having said that, while GDP expenditure on education is low compared with OECD member countries, these countries perform as predicted based on levels of economic development.

A key concern from the OECD analysis is how students from disadvantaged backgrounds perform relative to their more advantaged peers, affecting their potential for upward socio-economic mobility. It also highlights how existing policies may unintentionally reinforce inequalities rather than reduce them. The report identifies resource gaps, educators' digital pedagogy skills, and education segregation based on academic performance—which often correlates with socio-economic background—as major challenges in the region (OECD/UNICEF, 2021).

The political economy of education in Central Asia, particularly in Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan, offers vital insights into the structural and institutional factors driving inequality, revealing its roots and persistence. Some research indicates that post-Soviet reforms aimed at "de-Russification and adopting Western educational values" (Ozawa et al., 2024, p.6) have led these countries to promote democratic ideals in education while adopting market-oriented policies that have widened gaps in access and quality (Niyozov & Dastambuev, 2013). Additionally, some scholars argue that educational narratives have perpetuated inequalities, especially among vulnerable groups (Durrani & Thibault, 2023).

Concept of Decent Work

The concept of Decent Work was first introduced to the wider public as the ILO's main goal for the next century in June 1999 by ILO Director-General Juan Somavía in the ILO's report for the International Labour Conference.[4] It is defined as much more than just having a job—it involves productive work that provides a fair income, workplace security, and access to social protection. More importantly, it also includes freedom of association, the right to participate in decisions affecting workers, and demands equal opportunity and treatment for all, without discrimination.

This concept differs from other definitions of work in its relevance during periods of economic transition. For instance, some economists prefer the term "good jobs," which has multiple interpretations. The 2019 Asian Development Bank (ADB) report "Good Jobs for Inclusive Growth in Central Asia and the South Caucasus" provides the following definition: "Jobs are 'good' when they are well-paid and secure due to their high productivity, thereby contributing to inclusive growth" (ADB, 2019, p. 1). While Good Jobs are important for economic growth, this concept has a narrower focus, focusing only on economic aspects such as well-paid, secure jobs linked to high productivity and inclusive growth.

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[3] This analysis did not include more recent PISA results when Uzbekistan participated in 2022, nor does it include Kyrgyzstan in 2006 or 2009.
[4] https://www.ilo.org/resource/brief-history-6

In contrast, the concept of decent work is broader and more holistic. While it incorporates key aspects of "good jobs" such as fair income and job security, it goes significantly beyond that by including fundamental labor rights, social protections, and the inherent dignity all workers deserve. Therefore, decent work is important for achieving fair globalization, poverty reduction, and sustainable and inclusive economic growth, and it has been recognized globally in the 2030 Agenda as the UN's Sustainable Development Goal 8, "Promote inclusive and sustainable economic growth, employment and decent work for all."[5,6]

Decent work is important for addressing the critical challenges and opportunities of our time—green and digital transitions—faced by the CAREC region, because it can ensure these transitions are fair and inclusive, without leaving any worker behind.

The most important attribute of the concept of decent work is that it can ensure fairness in jobs. The rise of digital jobs, such as platform or gig work (ETF, 2024b), in the CAREC region is often associated with a lack of stability, social protection, paid annual leave, and fair pay (Zhou, 2023). In this regard, decent work provides the framework to ensure the necessary protections for workers are in place. Similarly, while green jobs in emerging sectors are vital to green growth, they should be inclusive and safe, not just highly paid. In this regard, decent work ensures that these jobs not only offer good wages but also provide the necessary training to meet the new sector's skill demands and comprehensive worker welfare programs that protect their well-being.

Furthermore, decent work actively reduces socio-economic inequalities by protecting the most vulnerable workers, including women, youth, rural and informal workers, and people with disabilities. While "good jobs" may primarily benefit those with advanced digital and green skills, thereby creating wage premiums for these groups, this approach risks widening disparities during green and digital transitions. In contrast, decent work guarantees that marginalized workers receive equal pay, access to upskilling and reskilling training programs, and essential social protection, ensuring no worker is left behind during these two transitions.

As outlined above, decent work supports sustainable development that extends beyond mere economic productivity. Decent work requires balancing sustainable and inclusive economic growth by pursuing profitability while upholding dignity, fairness, and workplace rights. Such a decent work approach lays a more stable foundation for societies as they transition toward green and digital economies.

The green and digital transitions will face challenges in societies if the input and interests of affected workers are overlooked. Decent work promotes social dialogue and worker participation in decision-making that impacts them, ensuring workers can influence employment and labor market policies—particularly in automation and decarbonization. This approach helps mitigate job losses, lessen workplace harm, and promote a fair transition.

Political Economy of Decent Work

In the CAREC region, the decent work agenda plays a vital role in addressing the political and economic issues that arise from rapid shifts in structure, especially those related to digitalization and the move toward low-carbon economies. The political economy of decent work is influenced by

[5] https://www.ilo.org/topics-and-sectors/decent-work
[6] https://globalgoals.org/goals/8-decent-work-and-economic-growth/

post-socialist legacies, state-market dynamics, and integration into global value chains. Since the early 2000s, the region's economic changes have led to growth but also increased inequality, with ongoing informality, labor migration, and unequal access to social protection. As CAREC countries focus on green and digital transitions, these systemic issues present specific challenges in ensuring that new work opportunities are inclusive and socially sustainable.

Azerbaijan's political economy is heavily shaped by its reliance on hydrocarbons, influencing its labor market and the relationship between the state and society. The rentier economic model has enabled strong government control over resource distribution but has also led to a segmented labor market. The formal public sector, especially in energy and administration, provides relative stability, while the private and informal sectors suffer from weak enforcement of labor standards and limited union presence. Although the Azerbaijan Decent Work Country Program (DWCP) with the ILO highlights reforms in labor inspection and promotes social dialogue, implementation faces barriers due to limited institutional independence and a corporatist approach to labor relations. Initiatives to diversify the economy through digital advancements and renewable energy projects, such as offshore wind in the Caspian Sea, create opportunities for green, high-skilled employment. Nevertheless, achieving decent work in these areas depends on establishing robust social protection and ensuring transparent labor governance mechanisms.

Georgia's trajectory aligns with that of many post-socialist countries—such as Kazakhstan, Kyrgyz Republic, and Russia—that implemented radical neoliberal reforms, pursuing extensive market liberalization and reduced state intervention since the early 2000s. While these reforms improved business conditions, they weakened labor protections and collective bargaining institutions. The resulting labor market is marked by high informality, underemployment, and limited social dialogue. The ILO's engagement in Georgia has focused on re-establishing social partnership mechanisms and strengthening labor inspection systems, which were largely dismantled during the liberalization period. The digital economy and green energy development (in the hydropower and IT sectors) have attracted foreign investment but also raised concerns about labor rights, environmental justice, and gender disparities. The political economy of decent work in Georgia thus reflects the tension between economic competitiveness and the need to institutionalize social protections.

Kazakhstan has the largest and most diverse economy in the CAREC region, with significant government involvement in key sectors like oil, gas, and mining. The country's developmental strategy, highlighted by initiatives such as Kazakhstan-2050, emphasizes economic diversification, digital advancement, and green modernization. Nonetheless, the limited independence of trade unions restricts the development of authentic social dialogue. Labor protests in extractive sectors, notably the 2011 Zhanaozen strike, reveal ongoing tensions between economic reforms and decent work principles. Although the government has established social partnership frameworks and national employment initiatives, labor standards enforcement varies. The ongoing industry digitalization and green infrastructure expansion could promote more inclusive employment, but this will depend on strengthening institutions related to occupational safety and labor rights representation.

The Kyrgyz Republic's political economy is marked by significant informality and labor migration, which deeply influence decent work conditions. More than half of the workforce is employed in informal sectors such as trade, agriculture, and small-scale manufacturing. Remittances from migrants, mainly from Kazakhstan and Russia, represent a substantial part of the GDP, connecting domestic employment to international labor markets. Although informal workers can earn higher wages than public-sector employees, they are often excluded from social protection and occupational safety programs. The ILO's DWCP for the Kyrgyz Republic prioritizes expanding social insurance and formalizing informal jobs, but political instability and limited government capacity have challenged consistent progress. Emerging green initiatives and digital entrepreneurship efforts have the potential to foster inclusive employment if paired with specialized vocational training and social dialogue mechanisms.

Tajikistan is actively engaging with its economic realities, where labor migration plays a key role in providing income for many families and significantly contributes to the national economy through remittances, which serve as a vital tool for poverty reduction. At home, the government is focused on transforming the labor market by moving beyond its traditional base in agriculture and public employment. Strategic efforts are underway to create more diverse and skilled opportunities within the formal sector. Recognizing the challenges of informal work and the need for stronger worker protections, Tajikistan in partnership with the ILO is implementing forward-thinking national employment strategies. These initiatives are designed to formalize the economy and unlock new potential in emerging green sectors like hydropower and sustainable agriculture. By proactively addressing foundational issues such as increasing industrialization and managing the dynamics of migration, Tajikistan is building a resilient economy and laying the essential groundwork for the widespread adoption of decent work standards.

Since 2016, Uzbekistan has been implementing economic reforms that promote market liberalization, openness, and international cooperation. The government has made progress in eliminating systemic forced and child labor in the cotton industry, a crucial step for decent work. Recent ILO reports confirm notable advancements, demonstrating how political commitment can enhance labor governance. Nevertheless, the labor market still struggles with informality, youth unemployment, and skills gaps. Initiatives like the Strategy for Transition to a Green Economy 2019-2030 and Digital Uzbekistan-2030 have spurred growth in sectors such as solar power, green construction, and ICT. Overall, Uzbekistan's approach to decent work involves a transformation that balances state-led reforms, foreign investment, and new social partnership institutions to promote fair and inclusive labor conditions standards.

Across CAREC economies, the political economy of decent work is shaped by shared structural characteristics: post-socialist institutional legacies, widespread informality, dependence on migration, and uneven state capacity. These features intersect with global imperatives for green and digital transformation, creating both risks and opportunities. A just and inclusive transition requires integrating decent work principles into national development strategies through social dialogue, expanded social protection, and gender-sensitive labor market reforms. In this sense, decent work functions not merely as a social objective but as a cornerstone of sustainable political economy in CAREC countries, anchoring economic modernization in fairness, dignity, and rights at work.

Decent work is crucial for economic growth and reducing inequality (United Nations, 2023a). Although CAREC countries have experienced strong economic growth since the early 2000s, achieving more sustainable and inclusive growth remains necessary to address inequalities. Efforts have been made across these countries to improve outcomes related to decent work. The Governments of Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan all have current or former programs with the ILO focused on decent work. Although these programs differ in specific areas, they share common elements of labor market issues, such as labor migration, informality, limited social protection, occupational health and safety (OHS) concerns, weak social dialogue with trade unions and employers' organizations, and difficulties faced by women and young people in the labor market (ILO, 2020; ILO, 2021). While these challenges are core components of decent work, understanding local complexities—especially around informality and migration—is crucial.

Informality across CAREC countries and Central Asia more broadly is not seen as a shadow economy or as illegal activity. Rather, research tells us that informal work (and trade) cannot be disaggregated from formality and is an essential component of the movement of people and consumption (Fehlings & Karrar, 2020). Informality generally leaves workers vulnerable to social protection, OHS, and related issues. However, the impact of informality varies across contexts; for example, research from the Kyrgyz Republic has found that informal workers often earn higher wages than formal workers. This is because formality is often associated with the public sector, which hires workers with higher education but pays lower salaries than the private sector, which is associated with informality (Tilekeyev, 2021). Another key challenge to this normalization of informality is that, despite differences in social protection systems–which vary greatly across the region–access to social protection is associated with formality, limiting benefits for workers who are often the most vulnerable (ILO, 2021; Gugushvili & Meuleman, 2022).

Given that many migrants engage in informal work, the challenges of achieving decent work are amplified in the context of cross-border labor movements. Workers often migrate from less developed CAREC nations like Tajikistan, the Kyrgyz Republic, and Uzbekistan to more developed economies such as Kazakhstan and Russia. Additionally, there has been a significant rise in Central Asian migration to countries including Germany, South Korea, and Europe (Rozyyeva, 2024). While this migration has helped many escape poverty, it also highlights the need for economic diversification to lessen reliance on external shocks and enhance labor protections (OECD, 2018).

Because some migrant workers work informally, they face long hours, low wages, and minimal legal protections (Ryazantsev et al., 2021; Tiwari, 2024). Given the key role of migrant labor in CAREC regional dynamics, coordinated approaches to decent work are essential.

Green and Digital Transitions in CAREC Countries

Green transitions present enormous opportunities and challenges to the global economy. During the green transition, the chance to utilize renewable energy and sustainable technologies is contrasted with the difficulty of diversifying economies and global supply chains that have long relied on fossil fuels (Arnold et al., 2023; Giannini, 2024). Likewise, in the digital transition, smartphone access to jobs and consumption opens up new opportunities for flexible work and simplified business operations. However, the ubiquity of artificial intelligence and other frontier technologies presents enormous challenges to regulators and society alike.

These green and digital transitions are not occurring in isolation and should be viewed as interdependent drivers of economic development. We know that digitalization can play a key role in accelerating sustainable development by enabling innovation and driving research and development. For example, digitalization supports smart grid technologies, enhances climate monitoring systems, and automates resource-efficient industries (Kassenova & Duprey, 2021). Harmonizing these two transitions is essential to maximize benefits and is increasingly the subject of high-level policy levers, particularly in Europe (Kovacic et al., 2024; Arnold et al., 2023). CAREC countries face unique macro challenges in these twin transitions.

In the green transition, research indicates that the region is relatively late in phasing out fossil fuels and promoting clean energy (Overland, Juraev & Vakulchuk, 2022), and the political economy of fossil fuel subsidies presents other key challenges to serious investment in renewables and to effective renewable energy policies. (Sabyrbekov, 2024). It is estimated that 95% of the total energy supply in the five Central Asian countries that are members of the United Nations Economic Commission for Europe (UNECE) comes from fossil fuels (UNECE, 2023). Actual reliance on fossil fuels varies across this group; Tajikistan and the Kyrgyz Republic, to an extent, rely more on hydropower (IEA, 2025).

Investing in sectors like green energy and ICT can boost local jobs, decrease dependence on migration, and support sustainable growth (Mogilevskii, 2020; United Nations, 2023b, 2024; Pazylov et al., 2023). The region has some encouraging diversification examples; for instance, Georgia's green transition has created jobs in sustainable agriculture and green infrastructure, although vocational training still needs development challenge (Bassi et al., 2019; World Bank, 2023a).

Historically, during the digital transition, technological development and investment have been relatively low, though levels vary across the region (Erokhin, 2020). There are also concerns that technology companies may reinforce rentier economies, thereby increasing inequality through further concentration of wealth and power (Sanghera & Satybaldieva, 2020).

The lack of digital skills is a major impediment to economic inclusion and to reducing inequality. In the Kyrgyz Republic, research suggests that 98% of adults have only basic or below-basic proficiency in problem-solving using technology (Hou et al., 2021). This deficiency in digital competencies limits employment opportunities in high-growth sectors such as information technology and digital finance.

Furthermore, there is a clear mismatch between education systems and labor market demands. Higher education institutions in Central Asian countries often emphasize theoretical learning over industry-relevant digital skills, leading to high unemployment among graduates despite growing demand for IT and computer skills across sectors. This is especially true in urban areas, where there is demand for intellectual work (Tilekeyev et al., 2019).

Rural communities in many CAREC countries also face persistent digital infrastructure deficits, limiting access to online education, job markets, and skill development programs. These disparities reinforce economic divides, restricting entry into emerging sectors and deepening labor market inequalities (Semenov & Semenov, 2024).

Structural gender gaps also persist in digital employment sectors. Women remain underrepresented in IT and digital finance, with barriers including cultural norms, limited access to training, and gender-biased hiring practices (Roland-Holst et al., 2022).

Studies suggest that while the expansion of digital financial services and online work platforms could create new employment pathways, the benefits of these advancements are not evenly distributed due to gaps in digital infrastructure and policy limitations (Zhghenti, 2021).The gig economy is growing in CAREC, offering flexible work opportunities, particularly for women with caregiving responsibilities and young people facing high unemployment (Insebayeva & Beyssembayev, 2023). Platform work offers income and access to the labor market but comes with risks like job insecurity, income fluctuations, and limited social protections (Jansova, 2024). Women generally earn less than men and tend to be in lower-paid roles, while young workers often have fewer legal protections (Zhghenti, 2021). Despite these issues, the gig economy is still an important source of employment and needs regulatory reforms to improve its sustainability.

Against this backdrop, these twin transitions offer a vital opportunity for policy actions that can address labor market dynamics and help lessen regional inequalities. Although the region experiences economic growth, income and wealth gaps continue to be a major issue, worsened by historical and structural factors. External economic changes, along with the uneven effects of climate change and rapid technological advances, add to these difficulties. Focused policies in education, healthcare, and social welfare—along with efforts to formalize informal jobs and support vulnerable workers—are crucial for fostering inclusive growth. By aligning labor market policies with green and digital economy needs, CAREC countries can reduce inequality, mitigate labor market disruptions, and build a sustainable and fair future.

Methodology

This study used a three-phase mixed-methods approach to explore socio-economic inequality, digital and green transitions, and decent work in the CAREC region. The three phases involved analyzing international conventions and national policies and laws, collecting quantitative data, and gathering qualitative data.

Sample Countries

The CAREC region consists of 11 member countries, including Afghanistan,[7] Azerbaijan, People's Republic of China (PRC), Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. While all regions are experiencing their own digital and green transitions, the former Soviet countries can be studied as a distinct group. They share common historical and structural factors that influence labor markets, which allows for a more coherent and focused examination of the issues of digital and green transitions. Thus, six countries were included in this study: Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan. This means that findings in this study should be approached with caution when it comes to generalizability about the CAREC region. Rather, these findings should be treated as recommendations within countries and among those countries within a particular region.

Step One: Policy Analysis

Policy analysis of green, digital, and decent work began with a foundational understanding of international labor standards, particularly the ILO's core conventions. These conventions set a global benchmark for workers' rights, including freedom of association, the elimination of forced labor, non-discrimination, and safe working conditions (Tables 4, 5, and 6). Understanding the gaps in international law for countries in the CAREC region is foundational for building robust national-level policies and regulations. Each country was assessed on which standards have been ratified and when.

Building on this framework, we analyzed national policies to see how countries are regulating the green, digital, and decent work transitions. This layered approach helps ensure alignment with global standards while identifying specific opportunities and gaps in national strategies.

Step Two: Quantitative Data Collection

Secondary data were collected from four sources. Sources were selected for their coverage of the six CAREC countries included in this study. Six key data sources were selected to provide insight into socio-economic inequality (Social Progress Index, Human Development Index, World Inequality Database), the energy transition (Energy Transition Index), the digital transition (Network Readiness Index), and decent work (ILO Decent Work Indicators). Additional quantitative data were provided by national researchers who found compelling empirical evidence to support their claims. A conceptual framework is outlined in Appendix A, including definitions and data sources.

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[7] Assurance to Afghanistan has been on pause since 15 August 2021 https://www.adb.org/where-we-work/afghanistan

Step Three: Qualitative Data Collection

Primary data were collected through Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). Standardized semi-structured interview schedules were used across all six countries, adapted where appropriate, and translated into local languages as needed. All KIIs and FGDs were summarized using standardized templates in English, including key outcomes, recommendations, key quotes, and limitations. KIIs were conducted with informants from government, academia, international organizations, development partners, and civil society organizations. The number of KIIs and FGDs varied across countries (Table 1). Interview schedules for the KIIs and FGDs are provided in Appendix B.

Table 1: Number of Qualitative Interviews

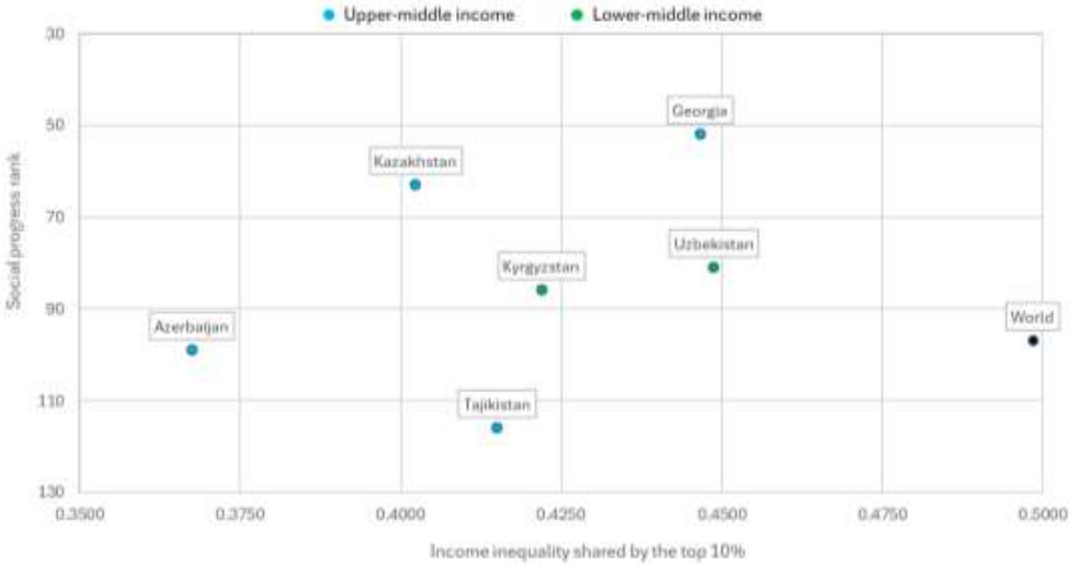
Country	Number of KIIs	Number of FGDs (participants)
Azerbaijan	5 interviews (6 participants)	2 FGDs (16, 5 participants respectively)
Georgia	8 interviews	2 (5, 3 participants respectively)
Kazakhstan	6 interviews	2 (8, 6 participants respectively)
Kyrgyz Republic	11 interviews	3 (5, 10, 12 participants respectively)
Tajikistan	8 interviews	2 (10, 10 participants respectively)
Uzbekistan	8 interviews	2 (8, 9 participants respectively)

Part I: Overview of Socio-economic Inequality and Decent Work Dimensions

Regional Outlook: The Current State of Socio-Economic Inequality in CAREC Countries

Compared with the world as a whole, the studied CAREC countries tend to have lower income inequality and higher levels of social progress (Figure 2). The exceptions are Azerbaijan and Tajikistan, where social progress is lower than the global average. Azerbaijan is an upper-middle-income country, and Tajikistan is a lower-middle-income country. This suggests that higher income levels and lower income inequality are not necessarily associated with greater social progress in the region (Social Progress Imperative, 2025; World Inequality Lab, n.d.).

Figure 2: Social Progress and Income Inequality in CAREC Countries

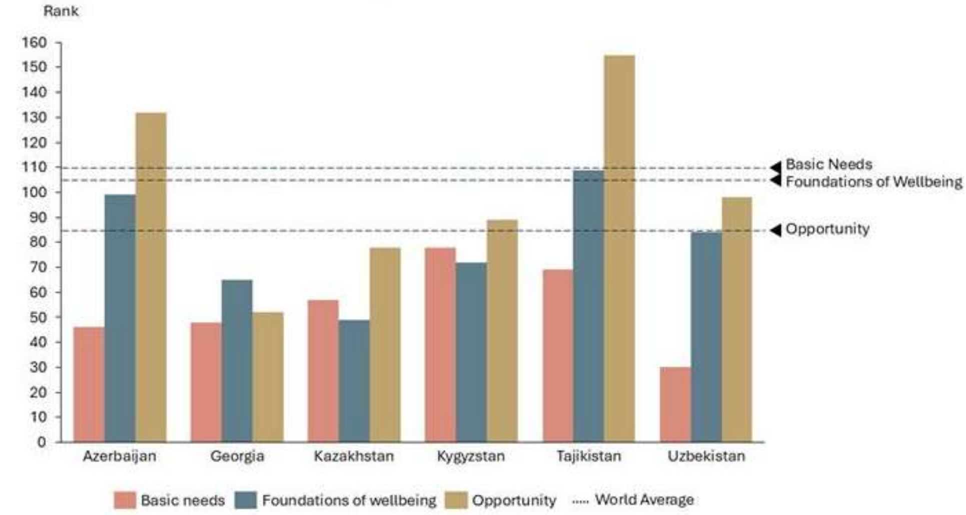


Source: Social Progress Imperative (2025); World Inequality Lab. (n.d.).

The countries in this region rank higher than the global average for basic needs like nutrition, medical care, water, sanitation, housing, and safety. However, they show significant variability in essential aspects of well-being—such as education, ICT access, health, and environmental quality—as well as in opportunities related to rights, voice, freedom, inclusive societies, and advanced education. While governments have effectively provided essential infrastructure, disparities remain in areas like education quality, digital access, environmental health, and civic freedoms. These unequal opportunities for progress pose a risk that people could meet their basic needs but still lack the skills, freedoms, or institutional support necessary to fully engage in or benefit from economic and social progress driven by digital and green transitions (Figure 3) (Social Progress Imperative 2025).

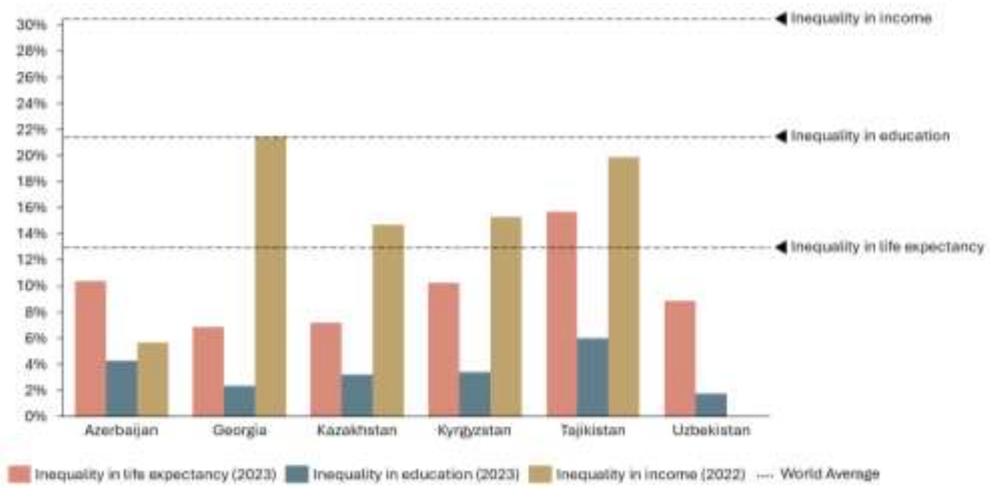
While the Social Progress Index (SPI) does not account for inequality in its ranking, whereas the Inequality-adjusted Human Development Index (IHDI) does, and these adjustments help us understand socio-economic inequality relative to the rest of the world. Across three measures of inequality in life expectancy, education, and income, the studied CAREC countries overall perform better than the rest of the world. The region experiences the greatest inequality adjustment in income, followed by life expectancy and education (Figure 4 and Table 2) (Social Progress Imperative, 2025).

Figure 3: Social Progress Index Rankings Across Key Pillars[8]



Note: Higher scores equal a lower ranking.
Source: Social Progress Imperative (2025).

Figure 4: Inequality Adjusted HDI Adjustments by Life Expectancy, Education and Income



Source: Inequality-adjusted Human Development Index (IHDI), UNDP (2025b).[9]

[8] "Social progress is the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow citizens and communities to enhance and sustain the quality of their lives, and create the conditions for all individuals to reach their full potential." https://www.socialprogress.org/methodology

[9] The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable, and having a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions. https://hdr.undp.org/data-center/human-development-index#/indicies/HDI

The Inequality-adjusted Human Development Index (IHDI) adjusts the HDI for inequality in the distribution of each dimension across the population. https://hdr.undp.org/inequality-adjusted-human-development-index#/indicies/IHDI

There was no income inequality data for Uzbekistan in the inequality-adjusted HDI.

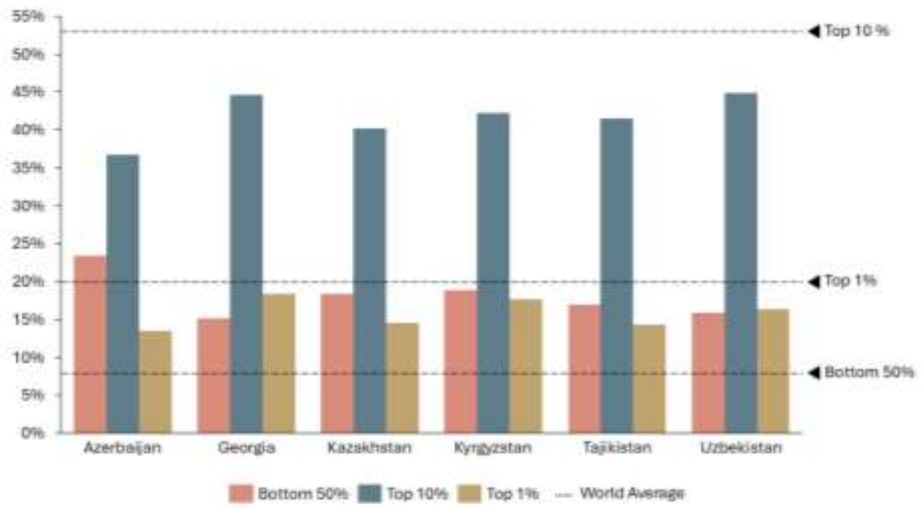
Table 2: HDI Rank, HDI Value, and IHDI Value

Country	HDI Rank	HDI Value	IHDI Value
Georgia	57	0.844	0.754
Kazakhstan	60	0.837	0.766
Azerbaijan	81	0.789	0.735
World	--	0.756	0.590
Uzbekistan	107	0.740	--
Kyrgyz Republic	117	0.720	0.649
Tajikistan	126	0.691	0.594

Source: UNDP (2025b).

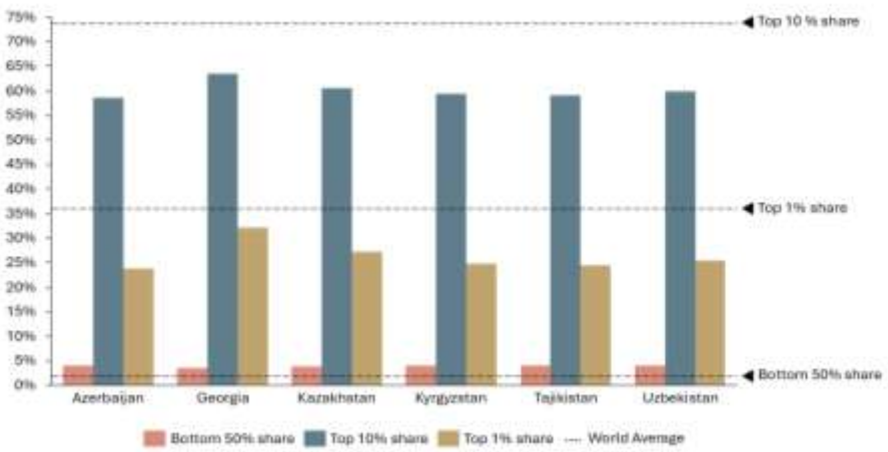
As in the rest of the world, wealth inequality is much starker than income inequality in the studied CAREC countries (Figures 5 and 6). Globally, the bottom 50% hold far less wealth than the top 10% and 1%, and CAREC countries are no exception. Even though the bottom 50% tend to have higher incomes, this has not translated into wealth accumulation. This is consistent with the widely accepted view that wealth is concentrated among a few who generate unearned income through control of assets (Christophers, 2020; Sanghera & Satybaldieva, 2020).

Figure 5: Income Distribution Across CAREC Countries, 2023



Source: World Inequality Lab (n.d.).

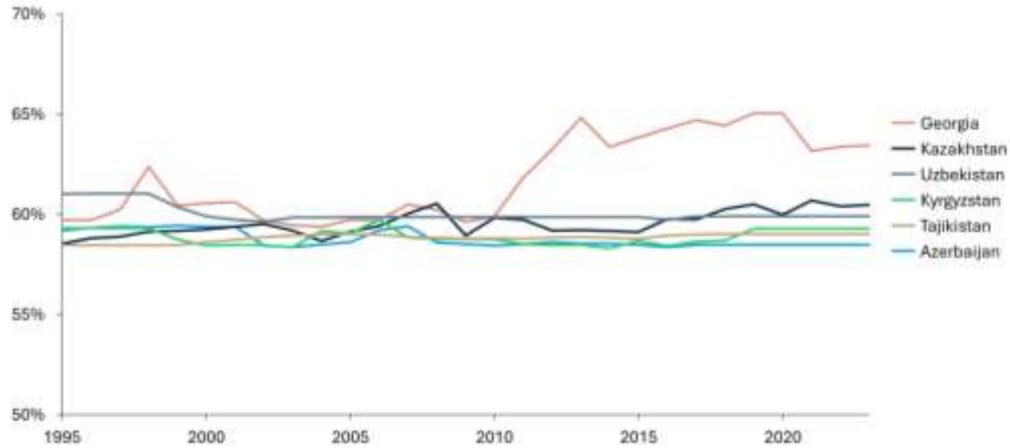
Figure 6: Wealth Distribution Across CAREC Countries, 2023



Source: World Inequality Lab (n.d.).

Importantly, there has been very little change in income and wealth inequality over time. While the World Inequality Database (WID) data (World Inequality Lab, n.d.) should be approached with caution throughout the 1990s and early 2000s, the story over time is that income and wealth inequality have remained stagnant except in the case of Georgia, where wealth inequality has noticeably increased over the last 15 years when compared to the other countries in this research (Figure 7).

Figure 7: Share of Wealth Among the Top 10%, 1995-2023



Source: World Inequality Lab (n.d.).

Although comprehensive empirical research on wealth inequality in Georgia remains limited, several possible explanations exist. Existing data and policy analyses suggest several structural and institutional dynamics that have likely contributed to its sharp increase over the past 15 years.

Active privatization is a possible factor. This process was rapid and often poorly regulated. Following 2004, the state launched an ambitious wave of privatization, particularly in the land, energy, and infrastructure sectors. According to Engvall (2012), these reforms disproportionately benefited a narrow elite that acquired high-value assets at low cost, establishing early advantages in capital accumulation that have persisted and compounded over time.

This tendency is supported by a more recent review of privatization proceedings conducted by Transparency International Georgia between 2013 and 2021. The findings reveal that nearly 70% of privatization auctions had only a single bidder, and over 40% of direct privatization contracts were signed for a symbolic price of 1 GEL. Additionally, political ties and financial gain appear closely linked: many people and businesses who purchased public property also made financial contributions to the ruling party. These dynamics raise serious concerns about elite capture, limited market competition, and institutional opacity, all of which contribute to wealth concentration. (Transparency International Georgia, 2022).

Finally, the underdeveloped state of capital markets, ongoing barriers to accessing finance, and unequal limitations placed on state-owned enterprises (SMEs) and new entrants from lower-income backgrounds persist. According to the OECD (2022), SME loans constitute a small portion of total private lending, and financial exclusion hampers upward mobility, thereby reinforcing wealth stratification (OECD, 2022).

Country Profiles

Azerbaijan: The current state of socio-economic inequality

A mixed picture is emerging in Azerbaijan regarding socio-economic inequality. As a starting point, Azerbaijan has benefited significantly from its oil and gas endowment. In the late 1990s and early 2000s, Azerbaijan's economic growth rate was often in double digits, before plateauing in recent decades to more modest levels (World Bank, 2025b).

Similarly, GDP per capita has increased significantly to approximately US$7,100 and sits firmly in the middle of its CAREC peers in this study. Today, measures of economic inequality, such as income inequality (both the WID and the IHDI), show that Azerbaijan is relatively more equal compared to its CAREC peers–the bottom 50% of workers have the most favorable income distribution across the six countries.

However, one key concern about Azerbaijan's ongoing economic position is the risk to vulnerable populations. Its economy is highly exposed to international demand for oil and gas, which accounts for 90% of exports and one-third of GDP. This indicates that Azerbaijanis, especially those in rural areas—where half of the population resides—are vulnerable to economic shocks, as noted by the World Bank (2023b). However, assessing the rural-urban divide is complicated due to limited national statistics in Azerbaijan. For example, the World Bank's most recent Gini coefficient for Azerbaijan is from 2005, making it hard to understand inequality in the country.

Across the three pillars of the SPI, Azerbaijan meets the basic needs of its citizens, but less so in the foundations of well-being and the more aspirational measure of opportunity, which includes rights and voice, freedom and choice, an inclusive society, and advanced education. Indicators within these pillars suggest that, in terms of education, Azerbaijan is performing at the expected level for basic education but underperforming in advanced education. In healthcare, Azerbaijan is performing at the expected level for access to nutrition and medical care, but underperforms in access to essential health services and in the quality of healthcare. Similarly, the HDI categorizes Azerbaijan as having high human development (global rank = 81), with modest adjustments in the IHDI for education (4.3%) and income inequality (5.7%), with a larger adjustment for life expectancy (10.4%), indicating at least some inequality across all three dimensions of human development.

Together, these suggest that Azerbaijan has some positive signals but also risks when it comes to economic inequality. First and foremost, more transparency in data reporting would help better understand internal dynamics. Secondly, Azerbaijan, compared to its regional peers, has much to do in terms of social progress, especially in strengthening its education and healthcare systems.

Georgia: Human Development Amidst Inequality in the Context of Green and Digital Transitions

Georgia presents a paradox of advancement and exclusion, ranking 57th globally in the 2023 HDI with a score of 0.844, placing it in the "Very High Human Development" group (UNDP, 2025a). However, this top-line figure masks critical underlying disparities. When adjusted for inequality in health, education, and income, Georgia's IHDI falls to 0.754, representing a 10.7% loss and revealing persistent structural inequities in the social structure (UNDP, 2025a).

When disaggregating human development and examining the gaps, Georgia's HDI is particularly revealing in its education and income dimensions. While the inequality-adjusted education component incurs only a modest 2.4% loss, this figure obscures deeper regional and socioeconomic disparities. According to the Unified National Strategy of Education and Science 2022-2030, students from high-income and urban households disproportionately access better schools and private tutoring, significantly outpacing their rural and low-income counterparts. The general education completion rate for wealthier students is approximately double that of students from the lowest socioeconomic groups (Ministry of Education and Science of Georgia, 2022).

Income inequality is even simpler to understand. The IHDI shows a 21.4% loss due to income disparities (UNDP, 2025a), and Georgia's Gini coefficient remains high at 0.36 (National Statistics Office of Georgia, 2024b). These imbalances are demonstrated in labor market fragmentation, high informal employment, and a 14%-16% national unemployment rate, which disproportionately affects rural populations, women, and youth (Gondauri, 2024).

The twin-track development can serve as an opportunity to build human capital in transition. Georgia's shift toward a knowledge-based economy, driven by green and digital transitions, offers a potential equalizer if harnessed strategically. However, the country remains at an early stage of integrating digital and green technologies. According to Gondauri (2024), technological availability alone does not drive inclusive growth. His Ricci Flow model shows that technological progress can reduce inequality, estimating that a 25% increase in digital innovation could lower the Gini coefficient by 16.5%, but only when combined with systemic interventions in education, R&D, and social protection.

This result is consistent with findings from Georgia's education sector. The 2025 SPI ranks Georgia 52nd worldwide, with a score of 77.62. While Georgia performs relatively well in Basic Human Needs (ranking 48th), it lags behind in the Opportunity pillar (ranking 52nd), which covers access to advanced education, inclusion, and personal rights (Social Progress Imperative, 2025). Key factors such as territorial inequality, skill mismatches, and gender gaps serve as significant obstacles to participation in future green and digital labor markets.

The Government of Georgia acknowledges these structural barriers. Sectoral Priority II of the Unified National Strategy of Education and Science (2022-2030) addresses equity and inclusion head-on. Goal 2.2 commits to creating "equal opportunities for learning and development for every student at all levels of general education" (Ministry of Education and Science of Georgia, 2022), with sub-objectives that target inclusive curriculum design, teacher capacity-building, and spatial equalization of educational access.

> *Georgia's educational system is not adequately preparing the future workforce, with vocational education (VET) and STEM subjects underpromoted in public schools, and sustainability topics largely absent from mainstream curricula. Vulnerable groups are clearly visible in the city and region. Qualified personnel, accessibility, jobs, and retraining courses-inequality is expected to increase in this area. Informal education centers are mainly in large cities.*
>
> *There is a strong need to expand and promote vocational education and STEM learning at the school level to ensure a pipeline of skilled workers who can meet future green economy demands. Informal education and reskilling opportunities should be scaled and decentralized to ensure that rural populations and marginalized communities can access flexible, relevant training for the green transition.*
>
> *Most investments and job creation are concentrated in Tbilisi and Batumi, leading to severe center-region inequality.*

> *Georgia's informal workers are largely disconnected from the green transition… putting them at real risk of exclusion. (Key Informant Interviews, 2025)*

Challenges go beyond formal education. KIIs reveal gender-specific barriers, including unpaid care responsibilities, limited access to vocational training, and exclusion from formal digital infrastructure. Many women-led businesses depend only on mobile devices and lack access to comprehensive e-commerce ecosystems. The underfunded care economy prevents many qualified women from participating in the workforce while they care for their families.

> *Digital technologies are empowering for small women-led enterprises, but access remains unequal; most women work via smartphones with limited access to formal digital infrastructure or e-commerce platforms. Informal employment is dominant among women in agribusiness and rural areas, limiting their eligibility for formal training, social protection, and access to green or digital jobs. Women prefer short, practical training formats, as longer vocational programs are incompatible with their caregiving responsibilities. (Key Informant Interviews, 2025)*

Kazakhstan: Socio-economic Inequality

Over the past two decades, Kazakhstan has made significant progress in its development, primarily between 2000 and 2007 and in the early 2010s, driven by commodity price-driven economic growth (World Bank, 2025c). For context, Kazakhstan's HDI increased from 0.692 to 0.781 over just 10 years, from 2000 to 2010. According to 2023 figures, Kazakhstan ranks 60th out of 193 countries by HDI, with a score of 0.837, indicating very high human development.

This, however, paints a very one-sided picture that does not consider the uneven distribution of economic resources that has accompanied Kazakhstan's growth. When we adjust Kazakhstan's HDI for inequality, it falls to 0.766, a 8.5% decline. While the HDI measures average achievements, the inequality-adjusted HDI provides a more nuanced picture by accounting for disparities within the population. This loss highlights inequalities in access to resources and opportunities, which affect the overall well-being and development outcomes experienced by individuals in the country.

This inequality is more apparent when we examine income and wealth concentration. For example, Kazakhstan's Gini Coefficient, a standard measure of income inequality, rose from 26.8 in 2015 to 29.2 in 2021 (World Bank, 2025c), suggesting a widening gap between the rich and the poor. An income breakdown reveals the scale of this divergence. Between 2013 and 2023, the share of national income earned by the top 1% rose from 13.84% to 14.53%, while the share for the poorest (the bottom 50%) fell from 19.16% to 18.4%. The picture for wealth is similar, with total net wealth held by the richest 1% rising from 25% to 27.2% (World Inequality Lab, n.d.).

Another dimension of inequality overlooked in an aggregate measure like the HDI is gender. Kazakhstan performs relatively well on the Gender Inequality Index (GII), ranking 50th out of 172 with a score of 0.182. The GII measures gender inequalities across three key dimensions: reproductive health, empowerment, and the labor market. Reproductive health is measured by the maternal mortality ratio and adolescent birth rates; empowerment is measured by the shares of parliamentary seats held and the proportion of the population with at least some secondary education, by gender; and labor market participation is measured by the labor force participation rates for women and men. However, this is not to say that gender gaps are not a problem in Kazakhstan, especially in labor markets, where wage gaps persist and women do not always have the same access to employment and career opportunities. In 2022, for example, the gender wage gap was 25.2% in favor of men (UN Women, 2024). In 2024, the country was ranked 76th out of 146 countries on the Global Gender Gap Index, which measures gender-based differences in economic participation, education, health, and political empowerment (WEF, 2024c).

Beyond income and wealth disparities at the national level, recent evidence highlights a second, equally important dimension of inequality in Kazakhstan: stark regional disparities in well-being. Rodriguez-Pose et al. (2024), drawing on Kazakhstan's first Regional Well-Being Survey conducted in 2022, provide one of the most comprehensive assessments to date. The study, based on a sample of 4,034 interviews across all 20 regions of Kazakhstan, compares individuals' well-being using a subjective well-being measure and a regional well-being indicator that combines subjective perceptions of well-being with regional-level indicators such as income, education, and health infrastructure. The results reveal significant regional differences in well-being: resource-rich areas like Atyrau and Almaty have residents reporting high well-being, while many rural regions, especially in the south and east—such as Turkestan, East Kazakhstan, Zhambyl, and Kyzylorda—lag behind. Interestingly, residents of Astana, despite strong economic indicators, report low well-being, suggesting that income does not always correlate with life satisfaction.

Kudebayeva and Sätre (2024), analyzing data from the Kazakhstan Household Budget Survey (2018-2021), estimate income inequality across regions and districts. They observe a decline in rural inequality over three years, attributed to targeted government social programs. Notably, inequality at the district level significantly impacts overall inequality and diminishes household well-being. Factors like health satisfaction, employment, education, and household size also affect well-being. Overall, the authors highlight that even in wealthier areas like Astana and Almaty, district-level inequality has noticeable effects on individual well-being.

To conclude, we focus on one more indicator of Kazakhstan's performance and outline the mixed picture regarding inequality and well-being: the SPI. In the basic needs category, Kazakhstan ranks 57th globally (out of 170 countries) and performs well, especially in access to electricity and undernourishment (Social Progress Imperative, 2025). The same is true for well-being (ranked 49th), where Kazakhstan does well on educational outcomes but less well on environmental quality and health, especially regarding non-communicable diseases (ranked 127).

In the opportunity dimension, Kazakhstan's vulnerabilities are most apparent. With a score of 55.42 and a global rank of 78, the country shows promise in individual freedom of life choices and social support networks. Still, it scores extremely low on key indicators of institutional accountability and civic freedoms (e.g., political rights, ranked 132 globally). Taken together, Kazakhstan's SPI profile highlights a familiar pattern: strong state-led delivery of basic services and education coexists with weak institutional accountability and limited civic freedoms. Kazakhstan lags in building an open, inclusive, and sustainable social contract, for example, when compared with Georgia. These gaps underscore the need to shift from technocratic delivery to deeper structural reform—particularly in governance, environmental protection, and civil liberties. Crucially, these institutional weaknesses have tangible effects on inequality and the types of work people can access. As one informant notes:

> *Rural areas experience higher poverty (7%) compared to urban areas (4.1%) and face limited access to quality jobs, education, and infrastructure. Many rural workers are engaged in subsistence agriculture or informal employment, lacking labor protections and benefits. While women make up 48% of the employed population, they account for only 36.4% of labor income. Women are underrepresented in top-paying jobs and overrepresented in low-paid, informal, or care-related sectors. Gender norms and caregiving responsibilities restrict women's labor force participation and access to decent work. (Key informant interview, 2025)*

This experience highlights that labor market inequality goes hand in hand with geographic disadvantages, where the area of residence constrains access to opportunities. For example, most employment gains in Kazakhstan were observed in urban areas, where 85% of all jobs were created between 2006 and 2022 (World Bank, 2024c). At the same time, we observe stagnating urbanization due to low levels of spatial mobility, with rural-to-urban migration contributing only 20% to the growth in the urban population between 2010 and 2015 (World Bank, 2024b,2024c).

These constraints persist over time: individuals in remote or underserved rural areas often receive lower-quality schooling, face limited transportation options, and face fewer labor market barriers to accessing quality jobs due to disparities in skills development (World Bank, 2024b, 2024c). The result is a persistent urban-rural gap in labor market outcomes, not just in wages but also in access to formal employment, training, and mobility. Digital exclusion adds another layer to the inequality and employability, which is further illustrated by qualitative findings from youth focus groups:

> *Inequality is enormous if a young person doesn't know how to use digital technologies… they're easily replaceable. (Youth Focus Group Discussions, 2025)*

Kyrgyz Republic: Twin Tracks to Economic Inclusion

The Kyrgyz Republic, like much of the region, is undergoing two profound transformations: a shift toward a green economy and the rapid digitalization of public services, education, and markets. These transitions offer opportunities to modernize the country's economic structure and create new avenues for employment and innovation. However, they also risk exacerbating entrenched social and economic disparities unless accompanied by inclusive policies. Inequality in the Kyrgyz Republic is shaped by intersecting factors—including gender, age, geography, and informality—and manifests across labor markets, access to education and services, and digital and financial inclusion.

While the Kyrgyz Republic's Gini coefficient (approximately 0.26; World Bank, 2023e) suggests relatively moderate income inequality, this metric masks deeper structural divides. The labor market is dominated by informal employment, which accounted for around 58.8% of all jobs in 2023 and over 80% in rural areas (ILO, 2023). Informality is particularly prevalent in agriculture, construction, and small-scale trade, where workers often lack contracts, health insurance, or pension contributions. By its nature, informal employment limits upward mobility and reinforces vulnerability to economic shocks.

Gender-based inequality remains a significant concern. Women's labor force participation stands at only 43.5%, nearly 30 percentage points below that of men (ILO, 2023). The gender gap is largely driven by unpaid care responsibilities and limited access to childcare services—only one in four children under age seven is enrolled in preschool (UN Women, 2023a). In rural areas, women are often concentrated in low-productivity, home-based or subsistence activities, with limited access to financial services or training. The wage gap persists across all sectors, including public employment.

Youth are similarly affected. Although the official youth unemployment rate is about 8.5% (ILO, 2023), many young people are NEET—not in education, employment, or training. Informal employment serves as the default entry point for over 79.3% of working youth (ILO, 2023), often in subsistence agriculture or seasonal labor. Young women face a double exclusion: they are more likely to leave school early and less likely to find paid employment.

Territorial inequalities further compound these patterns. Poverty rates in southern and highland oblasts—such as Batken and Naryn—exceed 40%, while rates in urban Bishkek remain below 20%

(United Nations in the Kyrgyz Republic, 2023). Access to quality education, healthcare, infrastructure, and digital services varies widely across regions. Migration has long served as a coping mechanism, and remittances from labor migrants, primarily in Russia, have historically accounted for over 30% of GDP. However, this share has declined significantly in recent years, falling to 18.8% in 2023. While migration supports consumption, it also reinforces structural dependency and social fragmentation.

The country's digital transformation, spurred by the Digital Kyrgyzstan 2019-2023 strategy, has led to near-universal mobile coverage and expanded school connectivity. However, access to digital infrastructure does not translate into equal participation in the digital economy. Device ownership, digital literacy, and usage rates are significantly lower among women, rural residents, and older adults. The digital divide limits opportunities in education, online work, and entrepreneurship—domains increasingly mediated by technology.

Similarly, green economy initiatives—including sustainable agriculture, energy efficiency, and eco-tourism—have been prioritized in national strategies. While these sectors have potential for job creation, especially in rural areas, progress remains limited. Training programs and access to green finance are not reaching informal workers, women, or youth at scale. Many informal jobs in agriculture and construction may be vulnerable to displacement without support for reskilling or integration into emerging green sectors.

Furthermore, both transitions lack a clearly defined "just transition" framework. Policies linking climate adaptation and digital innovation to labor market planning, social protection, and gender equality remain in their infancy. Without targeted inclusion strategies, these shifts may reinforce the urban, male-dominated profile of formal employment, deepening exclusion.

Despite growing recognition of these issues, the policy response has been uneven. The Kyrgyz Republic's tax system is minimally redistributive. A flat 10% income tax and heavy reliance on VAT disproportionately burden low-income households (IMF, 2022). Property and wealth taxes are underutilized (ADB, 2021a), and public social spending–excluding pensions–remains low compared to regional peers (UNICEF, 2023a; OECD, 2018).

Social protection systems offer limited coverage. Only 40% of the workforce contributes to the pension system (ILO, 2022), and informal workers are largely excluded from social insurance benefits, including unemployment and maternity benefits, as well as health coverage, because they lack formal contributions and have limited access to institutional support (ILO, 2022; ADB, 2021a). Poverty-targeted cash transfers (e.g., the Monthly Benefit for Poor Families) reach only a fraction of eligible households, and benefit levels are modest.

Care infrastructure is severely underdeveloped. Public preschool coverage remains below 25%, and eldercare services are minimal. These gaps reinforce gender inequality by restricting women's ability to participate in the workforce or pursue training.

Skills development programs are often fragmented and do not align well with labor market needs, especially in green and digital sectors. Although vocational education enrollment is increasing, many programs lack contemporary curricula, up-to-date equipment, or strong links with employers. Training centers tend to be urban-centric, limiting access for youth and women in rural areas. Additionally, weak labor inspection systems and inadequate data collection hinder effective monitoring of informal employment and inclusion outcomes.

The Kyrgyz Republic's twin transitions to a digital and green economy offer an important opportunity to tackle long-standing structural inequalities. However, this potential can only be realized if these transitions are thoughtfully designed and executed with inclusivity at their core. It is essential to prioritize informal workers, rural communities, women, and youth in policy development. A just transition is not only ethically necessary but also essential for sustainable growth. Incorporating fairness into national planning and implementation processes will be key to ensuring that advancements in technology and environmental change translates into shared prosperity.

Tajikistan: Human Development Amid Energy and Technological Shifts

Tajikistan's HDI ranking reflects its development journey, showing significant progress in education and health despite its lower position, and helps identify areas needing intervention, distinguishing it from similarly economically challenged nations. Key factors influencing its HDI include educational attainment, healthcare improvements, and economic stability, and initiatives in rural education, medical services, and job creation are vital for boosting its GNI per capita and overall HDI score (WHO, 2025). Tajikistan's HDI improved by 27.9% between 1993 and 2023, rising from 0.549 to 0.691, placing it 128th globally in the "Medium Human Development" group. Over the years, key development indicators have improved significantly: life expectancy has increased due to improved healthcare access, mean years of schooling have risen by 1.39 years, and GNI per capita has grown by approximately 136.9% (WHO, 2025; Asia-Plus, 2025).

Tajikistan is actively developing policies on inclusive education and Technical and Vocational Education and Training (TVET), with the National Strategy for Education Development (NSED) serving as a key framework. The NSED, developed by the Ministry of Education and Science, prioritizes inclusive education and vocational training alongside other areas such as early childhood development and girls' education. These initiatives are part of broader efforts to improve the quality and accessibility of education for all citizens, including those with disabilities and those seeking vocational skills. However, further progress in the inclusion of children with disabilities at the community level is hindered by prevailing professional norms rooted in a medical model of disability, in which children with disabilities are deemed better off in institutions, where there is specialist medical support (UNICEF, 2017, 2019).

Tajikistan's overall SPI of 57.45 on a scale suggests significant progress, reflecting both advances and persistent challenges. As for 2023, Tajikistan's rank of 116 places the country in the upper-middle tier globally maintains a solid upper-middle global position. While basic needs may be met, systemic reforms are critical to advancing equity, opportunity, and sustainability. Further data on SPI components would enable targeted interventions. To improve its SPI, the country should tackle inequality through social programs and invest more in education, healthcare, well-being, and sustainable growth.

Tajikistan's green transition centers on hydropower, which supplies over 95% of its electricity. Hydro Power Plant (HPP) projects like the Rogun aim to position the country as a regional energy exporter, but rural communities still face seasonal energy shortages. The OECD emphasizes the need for decentralized renewable solutions (e.g., micro-hydro plants) and policies that prioritize equity in green investments. For Tajikistan, this could mean subsidizing solar panels for remote villages or integrating climate-resilient farming practices (OECD, 2023b). The dual digital and green transitions offer synergies, such as smart agriculture optimizing water use, but also pose trade-offs, as rural farmers often lack the tech access needed to participate in digital hydropower management.

In Tajikistan, with its vast hydropower potential, it can mitigate inequalities through solutions like off-grid solar projects paired with digital training centers, supported by social enterprises and cooperatives. The UNDP emphasizes AI's potential to boost development, with 70% of the population in countries optimistic that AI will improve productivity. However, Tajikistan's digital transition needs infrastructure expansion, digital literacy programs (integrating tech education in schools), and public-private partnerships (PPPs) to bridge digital divides. Tajikistan's progress in HDI and hydropower potential offers a foundation for sustainable development. By adopting inclusive policies that bridge urban-rural divides, investing in digital literacy, and leveraging the social economy, the country can ensure that green and digital transitions uplift all citizens. As the UNDP warns, global HDI progress is slowing, making equitable action not just a moral imperative but a necessity for survival in an AI-driven, climate-conscious era (UNDP, 2025c).

Water resources are critically important to the sustainable development of Tajikistan, primarily due to the country's abundant freshwater reserves. The glaciated area within the mountains of the Central Asian Republics encompasses approximately 17,000 square kilometers, of which over 60% is situated within the territory of Tajikistan (Ministry of Energy and Water Resources of the Republic of Tajikistan, 2021). Currently, water resources are the main source of energy production, and hydropower plants generate 95% of Tajikistan's electricity. Over 60% of all freshwater resources in Central Asia are located on the territory of the Republic of Tajikistan (Embassy of the Republic of Tajikistan in the Federal Republic of Germany, 2020; IEA, 2022).

Uzbekistan: The "Capital City-regions" Gap in Uzbekistan

Uzbekistan is in the "High human development" tier, with an HDI of 0.727 and a rank of 106 in 2023/2024. The SPI shows solid performance in basic human needs, but weaker outcomes in rights, inclusion, and advanced education and health.

Although the Government of Uzbekistan has not explicitly emphasized combating inequality, nearly all key policy measures have focused on reducing poverty, creating jobs, providing opportunities for youth and women, and ensuring balanced development at the subnational level. Certain policies have addressed multiple themes. For instance, initiatives to develop ICT skills among rural youth, along with the construction of solar and wind power plants in remote regions, have not only improved energy access but also facilitated the establishment of new industries and, consequently, job creation in those localities.

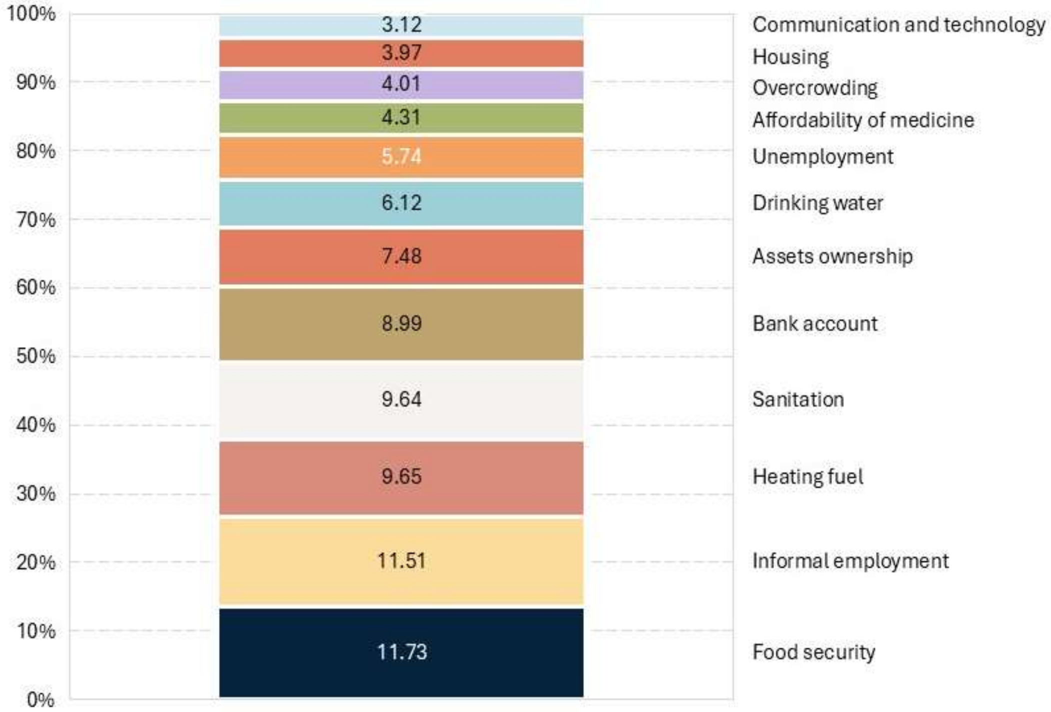
Poverty in Uzbekistan declined significantly, from 17% to 8.9% between 2019 and 2024 (Gazeta.uz, 2025a). However, income disparities across regions and professions have widened. For example, the gap in average salaries between the richest and poorest regions increased from 1.97 times in 2020 to 2.42 times in 2024. Similarly, while salaries in the education sector were 26.5% below the national average in the first quarter of 2022, they fell to 30.2% below the average by 2024. During the same period, average salaries in the healthcare sector, which were already 32% below the national average, dropped to 37.4% below the average (Gazeta.uz, 2025b).

The disparity in per capita income between the three wealthiest and three poorest groups grew from 2.18 times in 2020 to 2.6 times in 2025. The income gap between Tashkent city and Namangan is fourfold (Gazeta.uz, 2025c). This widening inequality may partly result from faster income growth among the higher-income quintiles and in sectors outside formal employment, such as entrepreneurship and the creation of profitable private enterprises. This trend warrants further investigation.

To improve the targeting and justification of public policy measures and to boost the efficiency of public assistance distribution, the Government of Uzbekistan, working with development partners, is actively analyzing poverty and inequality profiles, among other related issues. As part of this effort, new approaches to understanding the roots of inequality are being developed. One such initiative is the assessment of multidimensional inequality using the Multidimensional Poverty Index (N-MPI), which was conducted using 2022 data (UNDP, 2023a).

Other dimensions of inequality might be derived from a study piloted in 2022. According to N-MPI, 18.4% of the adult population is multidimensionally poor (4.2 million). For comparison, the monetary poverty rate was 14% in 2022. Educational attainment (13.7%), Food security (11.7%), and Informal employment (11.5%) are the highest contributors to the overall multidi-mensional poverty (Figure 8). Some factors linked to lagging in the green and digital transition contribute to multidimensional poverty: communication and technology (3.12%) and heating fuel (8.99%). Therefore, developing these aspects of the green and digital transition could reduce poverty by 12.11%.

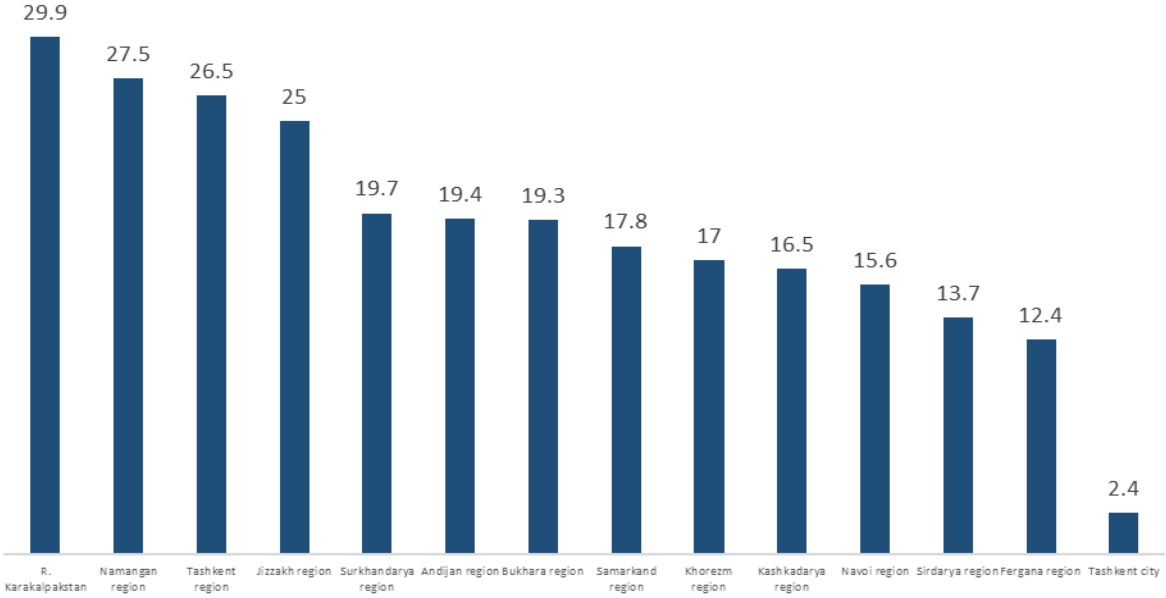
Figure 8: Percentage Contribution of Each Indicator to the Pilot N-MPI



Source: UNDP (2023a).

N-MPI varies across the regional level. The highest N-MPIs are in the Republic of Karakalpakstan (0.136), the Namangan region (0.127), the Tashkent region (0.118), and the Jizzakh region (0.111). In contrast, the Fergana region (0.054), the Sirdarya region (0.056), and Tashkent city (0.010) exhibit the lowest MPI values (Figure 9).

Figure 9: Incidence (H) of the Pilot N-MPI by Region (Sorted By H, %)



Source: UNDP (2023a).

The highest percentage of adults who are both poor and deprived in urban areas is observed in the following indicators: bank account (10.4%), educational attainment (10.3%), and sanitation (9.7%). In rural areas, the highest percentages are heating fuel (18.9%), sanitation (18.6%), and bank account (17.8%) (Table 3). Female adults experience slightly lower multidimensional poverty levels (0.065) than male adults (0.096). The largest share of the male population who are poor and deprived is observed in the following indicators: bank account (17.8%), sanitation (16.1%), and educational attainment (15.0%). Furthermore, female adults experience greater deprivation in sanitation (11.9%), educational attainment (11.5%), and heating fuel (11.2%). The difference may be explained by the fact that women are predominantly employed in the education and health sectors, which are typically public and formal. In contrast, men who often migrate to large cities or abroad in search of income are more likely to be informally employed and have limited access to utilities and education. This warrants further investigation.

Table 3: Censored Headcount Ratios by Area and Gender (%)

	Locality		Gender	
	Urban	Rural	Male	Female
Overcrowding	4.4	7.29	6.2	5.4
Housing	4.3	7.28	6.7	4.8
Heating fuel	7.6	18.9	14.8	11.2
Sanitation	9.7	18.6	16.1	11.9
Drinking water	6.4	11.5	10.1	7.6
Assets' ownership	8.0	13.9	11.9	9.8
Food security	8.1	14.7	12.6	10.1
Unemployment	2.1	3.4	3.9	1.7
Informal employment	6.6	10.2	13.8	3.0
Affordable medicine	3.6	4.8	3.4	4.9
Education attainment	10.3	16.4	15.0	11.5
Communication and technology	2.4	3.6	2.0	4.0
Bank account	10.4	17.8	17.8	10.1

Source: UNDP (2023a).

We can conclude that the key factor in inequality is the "capital city–other regions" gap; the N-MPI in Tashkent is only 2.4%, several times lower than the country average of 18.4%. The next region, Fergana, has a poverty rate five times higher. According to the qualitative analysis, the key cause is access to infrastructure, especially electricity, natural gas (heating fuel), potable water, and sanitation. The next cause is access to quality education. Large SOE monopolies provide infrastructure services. They demonstrate very low performance and efficiency (World Bank, 2024e). Despite energy and utility tariffs increasing several times over the last 3 years within the framework of energy and utility sector reforms, quality and access have improved very little. These SOEs have a very low level of accountability and transparency. IFI and all experts consistently recommend improving corporate governance and privatizing these SOEs, but the pace of reform is slow.

World Bank's survey of businesses identifies infrastructure problems as a primary constraint for manufacturing and service firms. In 2023, manufacturing firms faced electricity outages (ranging from 28 days per year for large firms to 42 days for small firms), natural gas shortages (22 to 29 days), internet downtime (17 to 44 days), water scarcity (29 to 70 days), and fuel interruptions (24 to 40 days) (World Bank, 2024e).

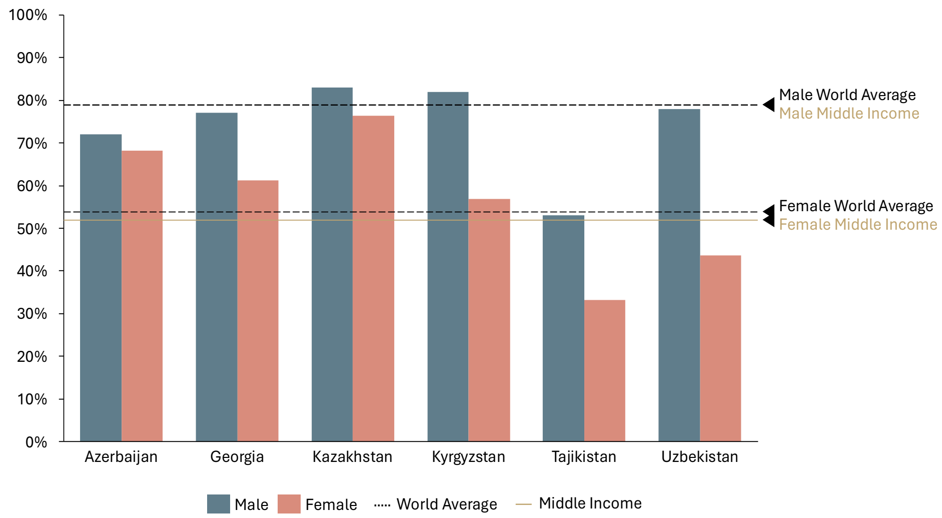
Limited infrastructure access remains a significant barrier to developing modern, competitive businesses outside Tashkent, particularly in manufacturing and high-value service sectors (World Bank, 2024d). Consequently, the main employers in rural areas tend to be agriculture, basic and small-scale manufacturing, and services, with many jobs remaining informal. Despite offering low wages, the largest formal employers in these regions are public social services, such as schools and health facilities.

Regional Outlook: Understanding the State-Labor Market Dynamics in CAREC Countries

Labor market dynamics across the CAREC countries in this study vary substantially. This is unsurprising given the economic dynamics outlined earlier in this report, particularly in resource-rich countries and those with higher levels of migration. While analysis of decent work indicators yields important insights, several key data gaps remain, and almost no data are available from the ILO on social dialogue between employees and employers. Nevertheless, the available data, coupled with existing research, provide important insights into regional labor dynamics.

Starting with broad labor force participation, four of the six countries in this study (Azerbaijan, Georgia, Kazakhstan, and the Kyrgyz Republic) outperform both the world and the middle-income average labor force participation rates (Figure 10). A close look at trend lines over time indicates that, aside from small fluctuations, this has not changed much. This is particularly interesting for women, as labor force participation rates in Azerbaijan and Kazakhstan outperform or are comparable to those in Western economies, including the United States, the United Kingdom, Canada, and Australia (World Bank, 2025d). Soviet-era research from the 1980s indicates that this is not a new phenomenon and that historically high female labor force participation (particularly among married women) could be attributed to high wages, high levels of schooling, few children, and societal norms (Ofer & Vinokur, 1998).

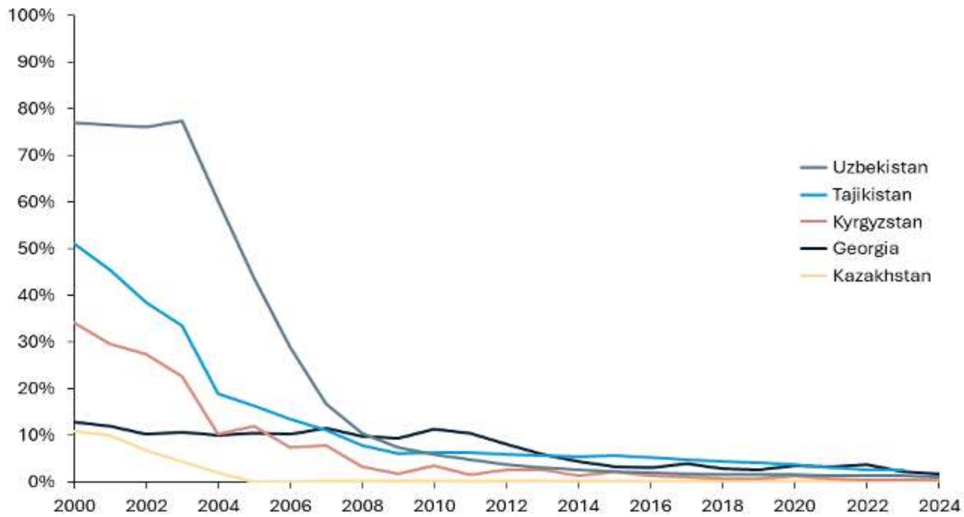
Figure 10: Labor Force Participation Rates Across CAREC Countries, 2024



Source: World Bank (2026a).

Working poverty rates[10] in most countries have declined significantly over the last two and a half decades (Figure 11). This is particularly interesting given that poverty was a new concept in the early 2000s as the region transitioned from centrally planned economies and governments that guaranteed employment, social safety nets, and subsidies. In the 1990s, post-independence, the region experienced significant economic hardship (UNESCAP, 2005). Since then, mirroring the wider economic trends in the region, the decrease in working poverty signals a positive development, indicating that the region has recovered from previous hardships despite minimal changes in its structural economic inequality.

Figure 11: Working Poverty Rates in CAREC Countries, 2000-2024



Source: ILO (2026).

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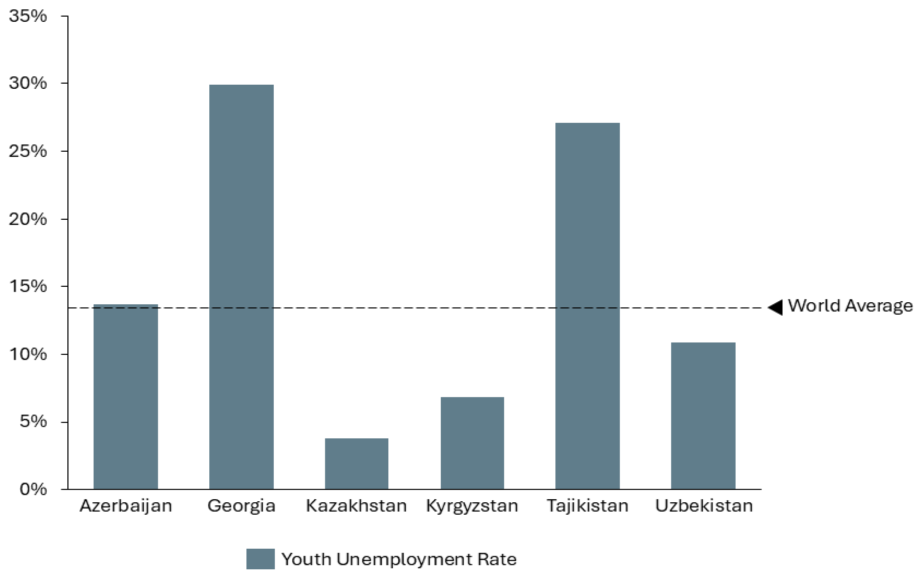
[10] "The working poverty rate is the share of persons in employment living in poverty as a percent of total employment." https://ilostat.ilo.org/data/snapshots/working-poverty-rate/

Young people across CAREC countries face significant challenges in employment and education, and therefore face a reduced potential for decent work. The proportion of young people who are unemployed varies greatly, and in some countries has been steadily increasing over time. In 2024, youth unemployment was highest in Georgia (29.9%) and lowest in Kazakhstan (3.8%). Official statistics on the proportion of NEET youth are limited. The most recent data available for the Kyrgyz Republic (2022) shows that 19.8% of young people are not in education, employment, or training. A higher figure is observed in Georgia (2022), where 24.9% of young people are NEET. The situation of young people in CAREC countries should be a significant priority for the region, especially as they prepare for the digital and green transitions.

Figure 12: Youth Unemployment Rate in CAREC Countries, 2024



Source: World Bank (2026b).

Fundamental to improving the national policy environments discussed in the sections that follow is a strong foundation in international law that trickles down to legislation and policy. The ILO's international labor conventions matter because they are the legal instruments and governance frameworks in the absence of which countries lack enabling rights fundamental to human dignity (ILO, 2012). These fundamental rights are essential as countries in CAREC move toward new ways of working through the digital and green transitions. Currently, Kazakhstan and Uzbekistan are the only countries to have ratified all ten fundamental standards (Table 4), and Azerbaijan is the only country to have ratified all governance standards (Table 5). There are significant gaps across conventions addressing tripartite dialogue, reflecting broader gaps in statistical data for these indicators. There are also significant gaps in the ratification of OHS conventions.

Table 4: Fundamental Labor Standards in CAREC Countries and Date of Ratification

Fundamental Labor Standards	Azerbaijan	Georgia	Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan
C029 - Forced Labor Convention, 1930 (No. 29)	1992	1993				1997
C087 - Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)	1992	1999	2000	1992	1993	2016
C098 - Right to Organise and Collective Bargaining Convention, 1949 (No. 98)	1992	1993	2001	1992	1993	1997
C100 - Equal Remuneration Convention, 1951 (No. 100)	1992	1993	2001	1992	1993	1997
C105 - Abolition of Forced Labor Convention, 1957 (No. 105)	2000	1996	2001	1999	1993	1997
C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	1992	1993	1999	1992	1993	1997
C138 - Minimum Age Convention, 1973 (No. 138)	1992	1996	2001	1992	1993	2008
C155 - Occupational Safety and Health Convention, 1981 (No. 155)	2023		1996		2009	2024
C182 - Worst Forms of Child Labor Convention, 1999 (No. 182)	2004	2002	2003	2004	2005	2008
C187 - Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187)	-	-	2015	-	-	2021

Table 5: Governance Labor Standards in CAREC Countries and Date of Ratification

Governance Labor Standards	Azerbaijan	Georgia	Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan
C081 - Labor Inspection Convention, 1947 (No. 81)	2000		2001	2000	2009	1992
C122 - Employment Policy Convention, 1964 (No. 122)	1992	1993	1999	1992	1993	1995
C129 - Labor Inspection (Agriculture) Convention, 1969 (No. 129)	2000		2001			2019
C144 - Tripartite Consultation (International Labor Standards) Convention, 1976 (No. 144)	1993	2018	2000	2007	2014	2019

Table 6: Selected Technical Labor Standards and Date of Ratification

Selected Technical Labor Standards	Azerbaijan	Georgia	Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan
C014 - Weekly Rest (Industry) Convention, 1921 (No. 14)	1992			1992		1992
C088 - Employment Service Convention, 1948 (No. 88)	1993	2002	2001			2022
C095 - Protection of Wages Convention, 1949 (No. 95)	1992		2015	1992		2024
C138 - Minimum Age Convention, 1973 (No. 138)	1992	1996	2001	1992		2008
C142 - Human Resources Development Convention, 1975 (No. 142)	1992	1993		1992		2019

Note for Tables 4-6: Green indicates "Ratified," while red is for "Not ratified."

Country Profiles

Azerbaijan: Achieving Decent Work for Youth and Mid-Career Workers

To understand the dynamics between youth and mid-career workers in the context of the green and digital transitions, three focus group discussions were conducted in Azerbaijan. Two were with young students aged 20-22, and one was with a mid-career professionals' group aged 36-42.

Across these focus groups, there was a good understanding of decent work as a concept, though with different priorities. The younger group understood decent work in terms of fair pay, safe conditions, a non-discriminatory environment, and opportunities for personal development. The mid-career group focused on more than employment; it also considered job security, growth prospects, flexibility, and workplace dignity. The younger group saw threats to decent work in AI, limited opportunities in rural areas, gender norms, and a lack of experience. The mid-career group was more concerned about limited training opportunities for older workers and the fast pace of digital change. The younger group saw internships, flexible work, mental health support, and investment in green and digital sectors as enablers of decent work. The mid-career group thought that lifelong learning, government-sponsored training, tax incentives, reskilling funds, and robust worker protections are essential for decent work.

> *In terms of digital and green transition, mid-career workers can be considered more vulnerable because they have more responsibilities, and it is harder for them to adapt to changes compared to younger, more flexible workers. (Mid-career Focus Group Participant, Azerbaijan)*

Regarding the digital transition, both focus groups believed it was the future, but digital skills are insufficient. They are often upskilled using platforms like Coursera, but systemic support is lacking. Additionally, the younger group felt they did not receive adequate training in digital skills at university, while the mid-career group felt that younger workers were more adaptable. As with the green transition, this is the future, but the emphasis for young people was on environmental protection and economic opportunity. Mid-career workers were again concerned about retraining and about younger workers being more competitive. Both groups felt there were limited training opportunities in the sector and that intervention would be important to achieve this.

> *Building advanced digital capabilities proactively through targeted training, self-directed learning, or certification programs can significantly enhance employability. (Youth Focus Group Participant, Azerbaijan)*

Interviews with stakeholders across government, industry, and education revealed strong consensus that lifelong learning and reskilling are central to workforce resilience. Participants consistently noted that current training opportunities are fragmented and often inaccessible, especially for mid-career professionals. Many emphasized the need for government-backed subsidies and flexible, modular training programs, citing digital competencies and sustainability expertise as areas of acute demand. Online platforms and in-house training for SMEs were identified as practical enablers of continuous education.

Respondents also underscored the widening gap between education systems and evolving labor market needs. There was broad agreement that digital and green skills development must expand, not only through vocational and higher education offerings in fields such as AI and clean technology, but also through stronger integration of Environmental, Social and Governance (ESG) principles into curricula. Incentives, whether through tax measures or grants, were seen as important levers to steer more talent into these sectors.

Workplace culture was frequently identified as a key theme. Stakeholders emphasized that inclusive and flexible work environments are vital both socially and for boosting productivity. They pointed out that remote and hybrid working models, flexible schedules, and mental health support are crucial for attracting and retaining talent. Additionally, interviewees stressed the importance of specific initiatives to enhance women's participation and include people with disabilities, while also noting existing deficiencies in both policy and practice.

When discussing labor market entry, interviewees emphasized the value of career readiness and fair employment. Practical exposure through internships, apprenticeships, hackathons, and real-world projects was widely seen as a gap that hinders young people's employability. Employers and participants often point out that structured onboarding and problem-solving training are frequently neglected, leaving first-time workers without essential skills. Additionally, there are concerns about fair wages, job security, and workplace protections, which are considered fundamental to ensuring decent working conditions.

Finally, stakeholders emphasized youth empowerment and entrepreneurship, highlighting young people's adaptability and innovation, which hold promise for digital entrepreneurship and content creation. They noted, however, that structural barriers, such as limited access to seed funding and business support, exist. Overall, respondents believed that PPPs and policy innovation are crucial for aligning training with market needs. Suggestions such as testing shorter workweeks or initiating public awareness campaigns on sustainability and digital futures were seen as vital to fostering momentum and cultural acceptance of change. The good example is Singapore's SkillsFuture Initiative, a national movement that brings together government agencies, employers, educational institutions, and community partners to foster lifelong learning and skills development aligned with industry needs.[11]

Youth Employment and NEETs in Georgia: Advancing Decent Work for Inclusive Green and Digital Transitions

Georgia, recognized for its robust business environment and recent economic resilience, still faces persistent challenges in ensuring inclusive labor market outcomes for its youth. Despite steady GDP growth, the country's socio-economic inequalities remain deeply rooted, particularly among young people facing unemployment, skill mismatches, and exclusion from the benefits of the green and digital economy.

Focusing on youth employment and NEETs as a lens for analyzing Georgia's labor market challenges is both strategically and thematically compelling within the broader CAREC agenda. This demographic is the most vulnerable to labor market exclusion and simultaneously represents the most dynamic potential workforce for Georgia's green and digital transformation. High youth unemployment and NEET rates are symptomatic of deeper structural inefficiencies in skills development, sectoral mismatches, and social inequalities, all of which fundamentally undermine inclusive economic growth. Addressing these barriers is essential to prevent a generation from being left behind and to ensure that Georgia builds the human capital required for sustainable, future-oriented sectors (World Bank, 2013). Furthermore, addressing youth exclusion amid green and

[11] https://www.skillsfuture.gov.sg/

digital transitions presents Georgia with a key chance to integrate social equity objectives with economic modernization, creating an inclusive development model that is highly relevant to other CAREC countries.

Youth unemployment in Georgia remains a critical socio-economic issue. Although the general unemployment rate decreased from 20.6% in 2021 to 16.4% in 2023, youth (15-24) unemployment persisted at 34.5% in 2023, sharply higher than the EU-27 average of 14.5% (European Training Foundation (ETF), 2024a). Simultaneously, the NEET rate for 15-29-year-olds stood at 26.9% in 2023, more than double the EU-27 average of 11.2% (ETF, 2024a; ILO, 2024a). For context, in 2020, 43.9% of those aged 15-19, 38.3% of 20-24-year-olds, and 23.2% of 25-29-year-olds were unemployed, exacerbated by the COVID-19 pandemic (United Nations Association of Georgia, 2021).

Labor market outcomes are further skewed by gender and geography. In 2023, 31% of young women were NEETs, compared with 23% of young men, largely due to unpaid care responsibilities, societal norms, and structural barriers (UN Women, 2023b; ETF, 2024a). Rural youth face significant disadvantages, with informal, low-productivity employment dominating the labor market. Agriculture, which employs 16.5% of the workforce, contributes only 6% to the country's GDP, highlighting productivity gaps (ETF, 2024a; National Statistics Office of Georgia, 2024a).

A central issue in Georgia's youth employment crisis is the persistent skills mismatch. Vocational Education and Training (VET) systems have struggled to align with labor market demands. Employers frequently cite difficulty finding workers with adequate technical, cognitive, and socio-emotional skills, including English proficiency, leadership, problem-solving, and critical thinking (World Bank, 2013; United Nations Association of Georgia, 2021). Georgia's VET system is characterized by low participation rates (7.2% of upper secondary students in 2022), limited access, and quality concerns, particularly for marginalized youth groups (ETF, 2024a). Vocational education lacks prestige, further discouraging youth engagement in sectors critical for green and digital transitions. The policy environment in Georgia is also fragmented across a range of areas. Georgia's National Youth Policy Concept 2020-2030 sets ambitious goals to reduce youth unemployment and NEET rates, promote youth participation, and advance non-formal education and economic empowerment. However, it lacks measurable targets, dedicated financing, and concrete linkages to green and digital sector opportunities (Parliament of Georgia, 2020).

The State Youth Strategy 2023-2026 emphasizes youth economic empowerment and the development of non-formal education, but still insufficiently integrates labor market activation policies with green and digital transitions (ETF, 2024a).

The VET Strategy (2024-2030), recently adopted, seeks to deliver flexible, inclusive, and labor-market-relevant vocational education. It emphasizes work-based learning, sector skills organizations, and reforms in quality assurance. Nonetheless, the implementation, especially for NEETs and vulnerable youth, is still limited in scope and scale (Ministry of Education and Science of Georgia, 2024).

The ALMPs include the Public Works Programme and vocational training initiatives under the State Employment Support Agency, which have expanded in recent years but lack a focus on green and digital job creation and are poorly targeted at NEETs (ILO, 2024a).

Policy documents recognize the importance of youth economic empowerment; however, concrete strategies to connect NEETs and unemployed youth with green and digital job opportunities are largely absent. This disconnect is compounded by limited access to quality VET for vulnerable groups, particularly young women, rural youth, and low-income households. Participation rates in VET remain low, not because of a lack of need but because of systemic barriers such as inadequate infrastructure, program irrelevance, and persistent social stigma around vocational education. Moreover, the country's skills development initiatives are poorly matched to labor market demands, especially in sectors poised for green growth and digital innovation, exacerbating youth unemployment and skills mismatches. Underpinning these issues is a critical weakness in data availability and monitoring systems, which limit evidence-based policymaking and hinder tracking progress toward youth labor market integration.

To address these entrenched challenges, Georgia needs a coherent, multidimensional policy approach that prioritizes youth inclusion within the broader framework of decent work and sustainable economic development. This entails aligning youth employment policies with green and digital transition strategies and ensuring that skills development programs are forward-looking and labor market-relevant. Expanding access to high-quality VET for NEETs through targeted outreach to marginalized groups is essential to bridging current inclusion gaps. Additionally, proactive measures are required to reduce urban-rural and gender disparities, including investments in digital infrastructure and care services to facilitate female labor force participation.

> *In theory, Georgia has established frameworks for coordinated action in priority sectors like green and digital transitions. However, in practice, the situation is much more complex. There are persistent problems at all governance levels, as the state is not accustomed to delegating mandates or abandoning centralized control. This hinders the practical implementation of policies that require cross-sector collaboration and shared ownership. (Key Informant Interview, 2025)*

> *Georgia's labor market remains constrained by stagnant employment around 14% and high informal employment at 27%, with youth NEET rates reflecting these structural weaknesses. Private sector job creation is weak, dominated by low-productivity self-employment in agriculture. Migration patterns, both emigration and internal rural-to-urban shifts, are reshaping labor dynamics, while persistent skills mismatches, especially in green sectors, and uneven regional investments continue to reinforce labor market inequalities. (Key Informant Interview, 2025)*

Kazakhstan: Policy Measures to Reduce Informal Employment and Youth Unemployment

Several reforms were introduced in the 2000s and 2010s to ease Kazakhstan's regulatory burden and combat informality. These included reducing the number of licensed activities and simplifying business registration procedures (Rutkowski, 2011; OECD, 2012). The government also took active steps to mitigate informality through SME development. In 2012, the government announced its intention to double the SME sector's contribution to GDP by 2030 as part of the "Kazakhstan-2050" long-term development strategy (Mussurov & Arabsheibani, 2015). The Labor Codes of 2007 and 2015 introduced legal recognition of part-time and multiple-job contracts. Complementing these reforms, the 2017 Tax Code simplified reporting procedures and provided clearer incentives for taxpayers. (Tatibekov & Fatehi, 2020).

In 2023, the government reaffirmed its commitment to reducing informality by adopting a new plan to reduce the shadow economy's share of GDP from 18.2% in 2023 to 15% by 2025 (Government of the Republic of Kazakhstan, 2023c). The same year, the government also approved the Labor Market Development Concept for 2024–2029. The Concept outlines a strategy to improve job quality and expand access to formal employment (Government of the Republic of Kazakhstan, 2023b).

Furthermore, the implementation of the electronic service 'Platform Employment' aims to automate registration, ensure social protection for platform workers, and introduce a special tax regime.

Kazakhstan's first national youth policy, introduced in 2004, emphasized education and employment. This was followed by the 2015 State Youth Policy, which broadened support for young people ages 14 to 29 by adding priorities such as housing and healthy lifestyles to ease their transition into the workforce (Islamic Development Bank, 2019).

The 2017–2021 Enbek program (Government of the Republic of Kazakhstan, 2018) placed a strong emphasis on NEET youth and rural residents. It offered free vocational and dual education, short-term professional training, career guidance, and access to entrepreneurship support. Moreover, as noted by the Key Informant Interview:

> *Since 2023, Kazakhstan has begun transforming employment centers into career centers and labor mobility centers. Labor mobility centers provide services to employers and citizens through career centers. There are 20 labor mobility centers and 207 career centers in Kazakhstan, located in districts and cities.*

As part of the program, the government launched the First Job project aimed at graduates and NEET youth without formal work experience (Government of the Republic of Kazakhstan, 2019).

In 2018, the government introduced the Roadmap for Employment and Socialization of Youth, which targeted multiple thematic areas, including employment, education, affordable housing, and health, for youth aged 18-29 (Islamic Development Bank, 2019, p. 8). In the following year, Kazakhstan launched the "Year of the Youth" initiative to address key issues affecting young people, including employment, education, and entrepreneurship. Following this, the government expanded the Business Road Map 2020 program to provide business grants and support services for young entrepreneurs, fostering youth entrepreneurship and reducing youth unemployment (Government of the Republic of Kazakhstan, 2019).

However, as mentioned in Focus Group Discussions for Youth, there are two main barriers. First, work experience is a major barrier for young people. Participants noted that many employers require 2-5 years of experience even for entry-level roles. Second, unpaid internships or delayed hiring are common sources of frustration. Several youths reported working for months without formal contracts or pay.

More recently, the government adopted the Youth Policy Concept for 2023-2029 (Government of the Republic of Kazakhstan, 2023a). This strategy sets specific targets, including reducing the NEET (age 15-28) rate from 6.7% to 3.5%, increasing the number of employed youth (age 15-34) to 2.3 million, and doubling the share of young entrepreneurs (age 15-34) to 20% by 2029.

Moreover, as mentioned by the Key Informant Interview, there are complications in the coordination of various programs:

> *Coordination is improving but still faces challenges. Historically, government ministries, particularly ministries of education, have struggled to coordinate international projects, often due to limited capacity and a lack of systematic communication. There have been instances where multiple international organizations developed similar training programs independently, leading to duplication of efforts. Today, there is more awareness of the need for alignment, but meaningful coordination between employers, training providers, and development partners remains a work in progress. A stronger dialogue between employers*

and educational institutions is still needed to ensure that training aligns with actual labor market demands. (Key Informant Interview, 2025)

Kyrgyz Republic: Informal Employment: Structure, Vulnerabilities, and Policy Pathways

Informal employment continues to be the main form of work in the Kyrgyz Republic, representing about 62% of employed individuals in 2022 (ILO, 2022). This high rate indicates the country's dependence on low-productivity self-employment, unregistered microenterprises, and subsistence farming. Although there has been modest economic growth, informality remains central to the Kyrgyz labor market, creating obstacles for inclusive development, social protection, and labor rights.

The structure of informal employment is strongly influenced by gender and varies by region. Men experience a marginally higher informality rate at 77%, compared to 63% for women (ILO, 2022; UN Women, 2023a). However, women encounter greater vulnerabilities because of lower participation in the labor force and their disproportionate burden of care. Informal employment among women is concentrated in low-paid and low-productivity sectors—particularly agriculture, trade, and home-based services—and many women work as unpaid contributing family members. The absence of formal childcare and eldercare infrastructure further restricts women's access to formal labor markets, reinforcing cycles of gendered economic exclusion. On average, Kyrgyz women perform five times as much unpaid domestic and care work as men (National Statistical Committee of the Kyrgyz Republic, 2022), which directly affects their earnings, employment stability, and future pension entitlements. Addressing these challenges through publicly funded childcare services combined with paid parental leave policies—such as those implemented in Sweden—can be effective. Sweden provides affordable, high-quality childcare accessible to all families, along with generous paid parental leave that can be shared by both mothers and fathers. This policy framework reduces women's unpaid care burden, supports work-life balance, and promotes gender equality in caregiving roles, thereby increasing women's participation in formal employment.[12] Such initiatives offer valuable models for enhancing women's inclusion in the labor market amid green and digital transitions.

Youth are another group heavily impacted by informal work. Although official youth unemployment is about 14% (National Statistical Committee of the Kyrgyz Republic, 2023), many young people—especially women—are classified as NEET (not in employment, education, or training). Informal jobs often act as the main entry point into the labor market for youth, particularly those without access to quality education or vocational training (Tilekeyev et al., 2020). Over 85% of employed young people work informally (World Bank, 2022b), mostly in subsistence farming, low-wage service jobs, or seasonal work. Rural-to-urban migration and labor migration abroad, especially to Russia, are common coping strategies but often lead to informal, unstable employment with limited rights protections.

Rural informality, affecting over three-quarters of rural workers, is predominantly linked to small-scale, semi-subsistence farming and informal petty trade. Agricultural informality is associated with underemployment, seasonal labor, and low earnings. Farmers and rural entrepreneurs often lack access to extension services, financial products, and formal markets, exacerbating productivity gaps.

[12] https://familyandjob.eu/childcare-in-europe/sweden/

Informal rural work also correlates with limited access to social protection, limited public services, and persistent poverty.

The implications of widespread informality for social protection are stark. Only 40% of the labor force contributes to the national pension system (ILO, 2022), putting long-term pension adequacy and coverage at risk. Informal workers are largely excluded from health insurance, paid maternity and sick leave, and unemployment support. Although non-contributory benefits such as the social pension and targeted health insurance subsidies provide some relief, coverage gaps remain wide, and benefit adequacy is low (ADB, 2023). The majority of informal workers, especially women and the self-employed, navigate their livelihoods without any form of social safety net.

In response, the Kyrgyz Republic has implemented various policy measures. Recent tax reforms, such as eliminating the patent-based tax system, aim to create a level playing field and encourage formalization. The country has introduced simplified registration processes and contributory schemes for self-employed and agricultural workers to boost compliance. Moreover, it has expanded health insurance coverage for vulnerable populations (Ministry of Economy and Commerce of the Kyrgyz Republic, 2023) and is working on a National Strategy for Transition to the Formal Economy, aligned with ILO Recommendation 204. Nonetheless, participation in voluntary contribution schemes is still limited, and the benefits of formalization are not always clear to the informal workers.

Ongoing policy gaps continue to hinder formalization efforts. Insufficient public investment in care services disproportionately impacts women, especially those in low-income and rural households, lowering their participation in formal employment. Vocational training and ALMPs for youth are underdeveloped and do not sufficiently match labor market demands (Pesci & Dzhamangulov, 2023). Rural infrastructure issues limit market access and productivity growth. Additionally, weak enforcement capacity and inadequate data systems hamper efforts to monitor informal employment trends, restricting evidence-based policymaking.

Addressing these issues requires a comprehensive policy approach. Initially, investing in care infrastructure—especially early childhood education and community-based childcare—can lower barriers to workforce participation, mainly for women, who shoulder a large share of unpaid care. Next, establishing a simple formalization process for micro-enterprises and farmers, with easier tax and social protection contributions, is crucial. Third, expanding social protection through subsidized insurance and micro-pension schemes can boost resilience and income security for informal workers. Fourth, targeted initiatives for youth—such as quality TVET, entrepreneurship support, and apprenticeships—can help facilitate smooth transitions to decent work. Lastly, investments that enhance productivity in rural areas, including cooperative development, digital connectivity, and support for off-farm activities, are essential for reducing informality and improving livelihoods.

Informality in the Kyrgyz Republic is not merely a regulatory challenge but also a reflection of broader structural and institutional constraints. Addressing it requires coordinated, multisectoral reforms that link labor market regulation, expansion of social protection, and inclusive human capital development. Advancing these reforms is crucial not only to meet the ILO decent work Agenda and SDG targets (1.3, 5.4, 8.3) but also to ensure that no worker remains excluded from the benefits of economic progress.

Tajikistan: Decent Work and Evaluation of Existing Policies

In Tajikistan, challenges such as informal employment (IOM, 2019; ILO, 2020), youth unemployment, and gender disparities have made decent work a critical focus for policymakers (ILO, 2015). The inflow of remittances, which currently supports Tajikistan's economy, creates a stable foundation, offering the country an opportunity to diversify its economic base and enhance domestic labor standards (World Bank, 2024a).

There are several policy programs in Tajikistan promoting decent work. The Decent Work Country Program (DWCP) 2015–2017 aimed to promote decent work by formalizing the economy, enhancing social protection, and strengthening labor market systems through tripartite dialogue among government, employers, and unions. Key focus areas included reducing informal employment with awareness campaigns and reforms, addressing youth unemployment through gender-sensitive labor market strategies, and enhancing occupational safety while eliminating child labor via the National Action Plan. The program aligned policies with international labor standards, prioritizing inclusive growth and fair labor practices. By tackling informality, youth unemployment, and workplace hazards, the DWCP aimed to foster a more equitable and sustainable employment landscape (ILO, 2015).

The DWCP 2020-2024 for Tajikistan, developed jointly by the ILO and national tripartite partners (government, employers, and trade unions), builds on the achievements of the previous DWCP (2015-2017) and aligns with Tajikistan's National Development Strategy (NDS) 2030, labor market strategies, and the UN SDGs. It promotes decent work as a key driver of sustainable development, focusing on policy priorities in employment, social protection, and labor rights, and ensuring coordination with the UN Development Assistance Framework and international partners, such as UNDP, to integrate decent work principles into national reforms and SDG implementation (ILO, 2020).

The 2018 Conference on Informal Employment underscored the need to strengthen trade unions and implement policies to formalize labor markets. A key focus was the ILO's project "From Crisis Towards Decent and Safe Jobs," which aimed to extend social protection and improve working conditions for informal workers by integrating them into formal social security systems. The discussions emphasized the need for legal reforms, stronger labor inspections, and inclusive policies to reduce informal employment and ensure decent work standards (ILO, 2018). Tajikistan's labor and development policies have achieved notable successes, including effective tripartite collaboration through the DWCP's Tripartite Commission, which fostered inclusive policymaking. Additionally, youth and gender initiatives under NDS 2030 have expanded access to vocational training, though gender gaps remain. Despite progress, informal employment persists due to weak or insufficient formalization incentives. Regional disparities in rural areas limit access to electricity, worsening unemployment.

The NDS 2030 aligns with the SDGs, particularly focusing on productive employment (SDG 8) and energy security (SDG 7). It seeks to shift Tajikistan from an agrarian-industrial to an industrial-agrarian economy, boosting job creation in key sectors such as hydropower and tourism (Ministry of Economic Development and Trade of the Republic of Tajikistan, n.d.). Additionally, the strategy emphasizes human capital development through education reforms and vocational training, ensuring a skilled workforce to support economic transformation and sustainable growth. By integrating these priorities, NDS 2030 aims to drive long-term development while addressing critical labor market and energy needs. NDS 2030 also takes into account the Republic of Tajikistan's international commitments to the SDGs. National consultations on the SDGs Agenda revealed the country's development priorities after 2015, and the basic principles and set of measures specified in NDS-2030 are intended to implement these priorities, such as education, health care, employment, inequality, combating corruption, food security and nutrition, good governance, social welfare, prevention of potential conflicts, energy security, environmental protection, and management of demographic processes.

The ADB's Country Partnership Framework (2021–2025) aims to support Tajikistan's economic diversification by encouraging decent work. This strategy focuses on improving the quality of growth through three main areas: (i) implementing structural reforms to better allocate resources and transition to a market economy, (ii) increasing labor productivity via investments in human capital, and (iii) creating better livelihoods by leveraging Tajikistan's land-linked economy through targeted infrastructure and connectivity projects (ADB, 2021c). These initiatives seek to address gaps in infrastructure, finance, and technology, thereby strengthening Tajikistan's long-term economic resilience and integration into the global economy competitiveness.

In February 2015, approved by Tajikistan Government Decree (No. 104), the government aimed to implement state employment policies, formalize labor participation, ensure workers' rights, improve labor force statistics, strengthen social insurance funding, and enhance social protection for citizens. The key tasks included improving legal frameworks, enhancing interagency coordination, conducting awareness campaigns on the negative impacts of informal work, and promoting tax compliance to reduce informal employment (Ministry of Justice of the Republic of Tajikistan, 2015).

Tajikistan adopted its Labor Market Development Strategy (2011-2020) and later approved the State Employment Program (2020-2022) under Decree No. 644, aiming to enhance job stability, reduce labor market pressures, and promote employment opportunities for youth and persons with disabilities through targeted labor market initiatives.

The Government of Tajikistan is actively tackling employment challenges through legislation, labor market policies, and programs, including the State Labor Market Development Strategy till 2020, the State Youth Policy Strategy till 2020, and the State Program of Employment Support (2020-2022). A key priority of the Ministry of Labor, Migration and Employment is strengthening the Agency for Labor and Employment of Population, which plays a vital role in fostering an inclusive labor market and creating decent jobs for vulnerable groups such as unemployed youth, returning migrants, and rural workers. This program focuses on enhancing the Agency for Labor and Employment of the Population's capacity through training and knowledge-sharing on Active Labor Market Policies, improving labor market information systems, and developing gender-disaggregated statistics to track SDG decent work Indicators better.

Tajikistan's efforts to tackle the dual issues of return migration and informal employment rely on an integrated policy framework that connects skills recognition, reskilling initiatives, and social protection formalization. This strategy aims to leverage returning migrants' potential while minimizing labor market informality. Nonetheless, its effectiveness depends on coordinated actions, steady funding, and private sector participation; otherwise, returnees may be pushed back into the informal economy. To enhance labor market reintegration, Tajikistan, with support from the ILO, UNDP, and EU, has implemented skills certification programs like Recognition of Prior Learning and the National Vocational Qualifications Framework to validate migrants' skills particularly in construction, manufacturing, and services and align them with domestic job opportunities, facilitating their transition into formal-sector employment (ILO, 2020; ETF, 2024c).

Uzbekistan: Toward Decent Work in an Informal Market

Like other countries in the region, Uzbekistan has a young population with a high birth rate, which creates both opportunities and challenges. For decades, job creation in the country lagged behind labor force growth. There are 300,000–500,000 fewer jobs created than the number of people entering the labor market (World Bank, 2024e).

According to the World Bank (2018), economic policies in the 2000s and early 2010s were marked by "jobless growth." In response, the government introduced stronger employment policies and expanded active labor market programs after 2017. Key institutional reforms included the creation of the Public Works Fund and the Foreign Labor Migration Agency, as well as strengthened operations of the Employment Fund. These efforts included training for the unemployed and subsidies for employers who hire vulnerable groups. Additionally, various initiatives were introduced to encourage self-employment and small business growth, such as low-interest loans, subsidies, training programs, and better access to resources.

The government issues an annual Employment Program that consolidates all activities in this area. Known as the "New Jobs Creation and Employment Support Program," it is developed and updated each year.[13] However, most implementation tools remain administrative in nature, with unreliable reporting systems. For example, in 2024, the Prosecutor General's Office found that more than 700 new jobs were not created (Gazeta.uz, 2024).

Economic analysis shows opportunities to create more jobs by improving investment and growth policies and coordinating them with employment policy. Recent World Bank research (World Bank, 2024e) found that growth from 2017 to 2022 was driven by capital deepening and that job creation was lower. Almost half of investment has been in machinery and equipment, with residential and nonresidential property the next-largest category. Investment in research and development is low, at just 0.04% of GDP. High investment has pushed the capital-output ratio in the economy from 1.9 over the period 2010-16 to 2.5 in 2017-2022, and the incremental capital-output ratio rose slightly from 1.0 to 1.1, suggesting lower returns to investment. Declining returns to capital point to economic inefficiencies and may be associated with lower total factor productivity. As a result, employment growth from 2017 to 2022 was outpaced by working-age population growth, with employment growth averaging 0.5% compared to 0.9% for the working-age population. Therefore, improving investment policy, especially the Public Investment Program, could help reduce the gap between net new jobs and labor force growth. Despite this, excessive regulation, high transaction costs, monopolies, SOEs, and poor infrastructure block the development of the private sector and decent job creation. Poor governance, low transparency, and accountability result in underperformance of employment policy measures.

Uzbekistan's ability to create high-paying, decent jobs is limited by its small human capital base. The 2022 PISA results reveal that 80% of Uzbek students lack basic skills in Mathematics, Reading, and Science. Although students are supposed to complete 11 years of schooling, the effective years are only 9.1 for girls and 9.2 for boys due to quality issues. Additionally, a recent World Bank report (Abdul-Hamid et al., 2021) indicates that the productivity of Uzbekistan's youth would be about 40% higher if they had better education and health care. The education reform program in Uzbekistan,

[13] This program was adopted in 2024 by the Presidential Resolution #PP-7 dated January 9, 2024 "On Program of new jobs creation and supporting employment in 2024."

focusing on quality improvement, can yield a GDP that, as students join the workforce, is 5% higher than it would have been without these reforms.

The informal sector accounts for a significant share of Uzbekistan's labor market, particularly in rural areas, agriculture, services, and construction. The government has begun measures to formalize the labor market, including granting "self-employed" status with lower tax obligations to encourage formal registration. If the self-employed person's annual income is less than 100 million UZS (approximately US$ 7,800), they pay a small contribution to the Pension Fund and have the right to receive a retirement pension. As a result, the number of self-employed people increased to 4.4 million as of January 2025 (Kun.uz, 2025).

Uzbekistan has introduced several policies and initiatives to promote decent work, primarily focusing on workers' rights and social protection. On the one hand, as a legacy of the Soviet era, workers' rights are strongly protected in legislation. On the other hand, this protection has mixed results owing to high transaction costs (complying with legislative requirements, maintaining documentation, etc.) for small businesses.

Uzbekistan's social protection system has significantly improved in recent years. It is now more targeted and aims to provide tailored support to help lift people out of poverty. A key reform has been the shift from the Unified Register of Social Protection to the new Register of Poor People, which is designed to identify better and assist those in need. The establishment of the Social Protection Agency has also helped address previous issues of institutional fragmentation. Additionally, all citizens are entitled to a retirement pension. However, over the past decade, the number of people reaching retirement age without an official employment record and social tax history has increased. These persons are eligible for old-age allowances rather than retirement pensions.

The government places strong emphasis on promoting gender equality and youth employment. Targeted subsidies and support programs are provided to these groups. For example, there are special hiring quotas for unemployed university graduates. Each year, the government allocates 200 billion UZS to cover tuition for female students pursuing master's degrees at state universities. Additionally, 1.8 trillion UZS is allocated for low-interest education loans to support students at the bachelor's level.[14]

The government also focuses on underdeveloped regions, such as the environmentally unfriendly Republic of Karakalpakstan (which has suffered significant environmental damage due to the shrinking Aral Sea) and the overpopulated Fergana Valley (which therefore needs more jobs and access to resources).

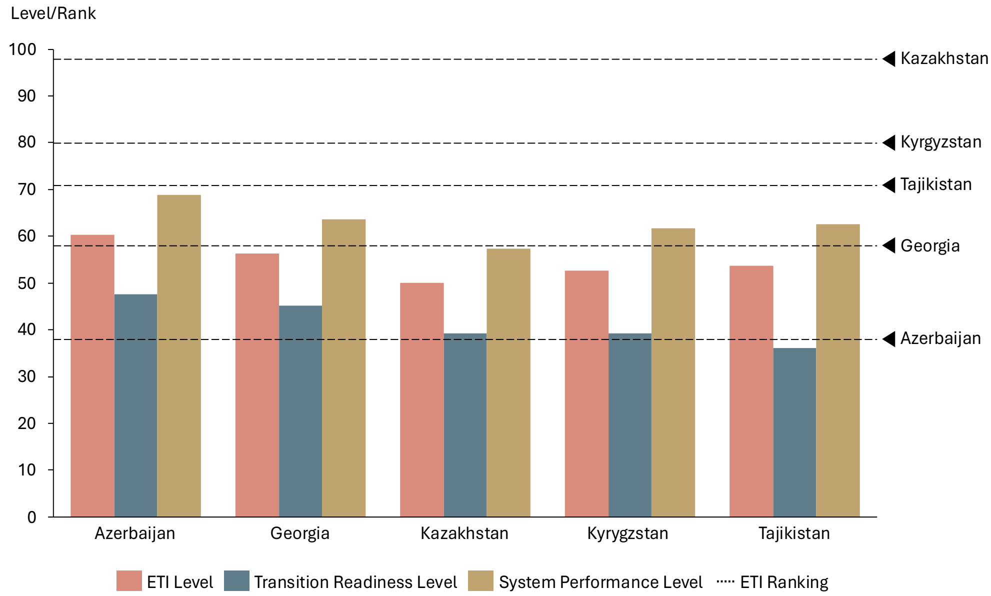
[14] Presidential Decree #PF-47 dated March 7, 2022 "On Further measures to support family and women."

Part II: Analysis of Twin-Track Transitions

Regional Outlook: Analysis of Green Transition and Evaluation of Existing Policies

CAREC countries have enormous potential for the energy transition. This is because of their vast endowment of natural resources, both fossil fuels and renewables, and the significant demand for these resources both within the region and from other major global economies (Cornell & Shaffer, 2024). While the region has significant potential to shift to renewable energy, the Energy Transition Index (ETI) shows considerable differences in readiness across countries. In 2024, Azerbaijan ranked 38th globally, whereas Kazakhstan ranked 98th. Most countries perform relatively well across system performance indicators, including energy security and access, environmental sustainability, and economic development and growth. They do not perform as well on transition readiness, which includes regulatory frameworks, investment climate, human capital, and consumer engagement (Figure 13). This suggests that while supply and economic conditions are in place, regulatory frameworks and appetite for transition are not yet fully developed. Some observers suggest that governments and societies are not yet ready for this transition (Davis Centre for Russian and Eurasian Studies, 2025).

Figure 13: Energy Transition Index, 2024[15]



Note: There is no ETI score or ranking available for Uzbekistan.
Source: WEF (2024b).

Despite this, interesting shifts are underway across the region, spurred by the energy transition and broader energy security concerns, especially amid shifting global power dynamics. Recent analysis by the CAREC Institute (2022) suggests that, while the evolution of competitive energy markets has been slow and has started from a low base, creating regulatory environments, strengthening regional coordination, managing supply and demand, and establishing stable government frameworks are all actionable. As Russia's influence wanes due to the conflict in Ukraine, countries

[15] The Energy Transition Index is a composite benchmark that scores countries based on their current energy system's performance (60% weight on equity, security, and sustainability) and their readiness for transition (40% weight on enablers like regulation, investment, and infrastructure).

such as China, Türkiye, the EU, and Japan are deepening engagement with the region, which is a positive sign for investment. Kazakhstan is emerging as a regional leader, driving initiatives such as the Central Asia 2040 strategy.

CAREC, as a region, is also taking essential steps toward a regionally cohesive approach to managing the energy transition through demand-supply matching across the region, designed to reduce reliance on fossil fuels while increasing the use of renewable energy (CAREC Institute, 2022). Despite forging ties with new partners, the region remains cautious, maintaining formal links with Russia and balancing diverse geopolitical interests (Mikovic, 2024; Sharifli, 2024).

Country Profiles

Azerbaijan: Public-Private Partnerships for Driving the Energy Transition

Azerbaijan performs the weakest among its regional peers in the 2024 ETI, ranking last in the group. While its current energy system demonstrates relatively high performance, providing reliability and affordability, this masks deeper vulnerabilities. Azerbaijan remains heavily dependent on oil and gas exports, which limit incentives for diversification and slow progress toward adopting more sustainable energy practices.

At the same time, Azerbaijan's transition readiness lags significantly. This reflects shortcomings in policy frameworks, the investment climate, and innovation capacity, which are critical to enabling a green transition. The gap between system performance and readiness illustrates a paradox–Azerbaijan has a functioning energy system today, but is poorly positioned to navigate future global energy shifts. Without substantial reforms and targeted investment, it risks falling further behind as other regional economies strengthen their transitions.

Having said that, there is optimism about reform in Azerbaijan, where government strategy and private-sector innovation are driving its energy transition agenda. This includes the 2021 Renewable Energy Law, which aims to achieve 30% renewable energy by 2030 and a 40% emissions cut by 2050. Private-sector initiatives have also been active in projects such as the AI for Energy Efficiency initiative, which explores AI-driven solutions for energy optimization in partnership with the World Economic Forum. Other private-sector collaborations with COP29 stakeholders have led to policy discussions on the role of geospatial data in tackling climate challenges. Furthermore, private-sector businesses have joined the UN's "Global Compact" initiative, committing to integrating the 10 universal principles on environmental sustainability, social responsibility, and corporate governance.

Azerbaijan's green transition could affect rural areas, informal workers, and marginalized communities, presenting both challenges and opportunities. For example, Azerbaijan's Socio-Economic Development Strategy 2022-2026 outlines sustainability goals but lacks specific provisions for informal workers and vulnerable communities. Supporting an inclusive green transition requires developing AI-driven energy-efficiency solutions, promoting smart industrial policies, and leading digital upskilling initiatives. Smart Industry Readiness Index assessments and AI-driven workforce programs can help formalize jobs and ensure rural populations benefit from the digital and green economy.

Georgia: Skills: The Missing Link in Georgia's Green Transition

Georgia has made impressive progress in its energy transition, jumping from 83rd to 56th on the ETI between 2020 and 2024. This leap reflects major reforms in energy market liberalization, renewable energy policies, and regulatory modernization, including the adoption of the Integrated National Energy and Climate Plan 2021 (WEF, 2024a). Georgia's policy drive builds on a strong foundation of renewable energy potential, though only 1.1% of its installed energy capacity is currently renewable. The most abundant renewable energy source is small hydropower, reflecting the government's advancement of hydropower as the sole renewable energy source thus far. Through its Renewable Energy State Program, the government has long prioritized small hydropower and offered investor-friendly terms, such as simplified permitting, long-term power purchase agreements, and tariff flexibility (UNDP, 2014c). However, while policy ambition is strong, skills development remains a critical bottleneck. This poses a real threat to the successful implementation of Georgia's green agenda.

Despite visible progress, Georgia's education and training system remains fragmented and underpowered. Although environmental awareness has improved in certain circles, a 2022 study found that 25% of the population had never participated in environmental awareness initiatives, and another 40% did so only rarely (Institute of Social Studies and Analysis, 2022). Green skills and sustainability topics are still minor in most educational and vocational curricula, lacking coordinated national efforts and systematic promotion (Frigerio, 2024).

Efforts are underway to bridge this gap. The Eco-Schools program, spearheaded by Keep Georgia Tidy with support from the Foundation for Environmental Education (FEE), has expanded to 300 schools across 62 municipalities (Institute of Social Studies and Analysis, 2022). Civil society organizations, notably the Caucasus Environmental NGO Network and the Environmental Information and Education Centre, are providing green camps, teacher training, and youth leadership programs to build environmental competencies from an early age (Frigerio, 2024).

Higher education institutions like Grigol Robakidze University, Business and Technology University, and Caucasus University have incorporated sustainability topics into their curricula. However, this remains limited: only 10–12 out of approximately 60 universities offer comprehensive environmental education, and few explicitly define "green skills" as learning outcomes (Frigerio, 2024). To support academic pathways, the Green Scholarship Program, initiated by the Ministry of Environmental Protection and Agriculture of Georgia and supported by UNDP, the Green Climate Fund, Sweden, and Switzerland, provides targeted scholarships in environmental fields (Frigerio, 2024).

At the VET level, enrolment increased by 30% between 2021 and 2023, reaching 24,449 students. However, most green VET programs remain niche, poorly promoted, and face a shortage of qualified trainers and green sector experts (Frigerio, 2024). This mismatch between labor market demand and skills supply is already evident.

Georgia's economy is seeing increased demand for renewable energy engineers, energy auditors, ESG consultants, and specialists in sustainable waste and water management. However, the education system is struggling to keep up with training enough skilled workers to fulfill this need (Frigerio, 2024). Reflecting this lag, Georgia's ETI innovation score declined by 8.2 points, underscoring the economic risks of under-investing in human capital and applied research (WEF, 2024a).

Experts warn that the skills mismatch risks deepening social inequalities, especially for vulnerable groups such as youth, women, minorities, and informal workers. With 27% of young people aged 15–25 classified as NEETs and much of the informal workforce trapped in low-value sectors like agriculture, the green transition could widen disparities unless accompanied by deliberate, inclusive skills policies (Frigerio, 2024; Kvaratskhelia & Mukhigulishvili, 2023). As one senior energy policy consultant put it:

> *The skills mismatch in Georgia is already visible, and the green transition will deepen it. Businesses are struggling to find personnel with the right qualifications, especially in emerging sectors like renewable energy, energy efficiency, and sustainable construction. Vulnerable populations, including women, youth, ethnic minorities, and informal workers, are at risk of being further excluded as labor demand shifts toward technical and green professions. With around 27% of young people aged 15-25 classified as NEETs and a large portion of informal employment concentrated in low-value agriculture, there is a significant danger that transitions will exacerbate inequality unless deliberate, inclusive policies are adopted. (Key Informant Interview, 2025)*

As Kvaratskhelia and Mukhigulishvili (2023) note, the green transition in Georgia is still emerging but has significant potential if the human capital challenge is addressed.

Kazakhstan: Toward a Decarbonization Strategy

In 2013, Kazakhstan adopted the "Concept for the Transition of the Republic of Kazakhstan to a Green Economy up to 2050," outlining the principles of the green economy as a development path for the future. One of the objectives of the Green Economy Concept is to increase the share of renewable and alternative energy sources to 30% by 2030 and 50% by 2050 (PAGE, 2020).

In a 2014 assessment of Kazakhstan's renewable energy capacity and potential, the UNDP highlighted that renewable energy accounted for only 0.6% of its electricity-generating capacity, with significant potential gains from investments in solar and wind energy technologies (UNDP, 2014b). Despite this enormous potential, financing and inconsistent pricing policies have been identified as the main barriers to investment (UNDP, 2014b). A decade later, Kazakhstan has made progress. The government, with UNDP's support, has been working to provide new financial instruments, such as energy auctions (i.e., site-specific renewable energy auctions), green bonds, and blended finance, to incentivize investment (UNDP, 2024b). In the long run, the Kazakh Ministry of Energy hopes to increase the share of renewable energy capacity to almost 25% by 2035, as per the Action Plan for the Development of the Electricity Industry (UNDP, 2024c).

Kazakhstan has committed to achieving carbon neutrality by 2060, with its Decarbonization Strategy integrating ESG principles, gradually introducing cost-reflective tariffs (coupled with targeted assistance to vulnerable consumers as part of a just transition) and digital monitoring of carbon emissions (EBRD, 2023). Under the Paris Agreement, Kazakhstan set an unconditional target to reduce GHG emissions by 15-25% below 1990 levels by 2030 (PAGE, 2020).

The energy sector (power and heat generation) accounts for 84% of Kazakhstan's overall carbon emissions (World Bank, 2022a). Most electricity is produced using coal, so plans include phasing out outdated coal plants and promoting clean energy alternatives (PAGE, 2020). Between the early 2000s and the late 2010s, emissions from the energy industry more than doubled, and emissions from the transport sector nearly tripled (World Bank, 2022a). Residential energy use has grown by more than a factor of five since 2000 and now accounts for 12% of Kazakhstan's energy emissions (World Bank, 2022a). In 2023, electricity consumption surpassed production capacity, and recent reforms designed to curtail regional disparities in electricity pricing and to facilitate more effective planning of electricity consumption and generation ultimately enhanced grid stability (EBRD, 2023; 2024).

The energy sector has suffered years of underinvestment, leading to significant infrastructure wear and tear. Solving energy challenges will require upgrading existing generation capacity and transmission lines, as well as introducing additional renewable energy sources (EBRD, 2024). Kazakhstan relies heavily on carbon-intensive energy sources to meet domestic energy needs (coal: 51%; natural gas: 25%; oil: 22%), according to the International Energy Agency (2024c). The share of renewable energy in Kazakhstan's electricity mix increased to 6.5% in early 2024, and the country's progress on its green agenda includes joining the Global Methane Pledge at COP28 in November 2023 and aligning methane abatement efforts with its 2060 decarbonization goals (EBRD, 2024).

According to the World Bank (2022a), energy-efficiency programs aimed at decarbonization are expected to create jobs in areas such as high-tech energy data collection, digitization, energy audits, and benchmarking analysis. Improving energy efficiency in existing buildings and adopting advanced technologies—such as heat pumps, geothermal heating, and rooftop solar—will generate both skilled and semi-skilled construction jobs. Additionally, these efforts will promote SMEs in energy audits and contracting, while also driving the growth of green lending and related due diligence in the domestic banking sector.

> *The shift to renewable energy is uneven across the region, with varying levels of investment and policy ambition. This creates asymmetries in green job creation and complicates the development of integrated energy markets that could drive more sustainable economic growth. Transboundary water issues are a major source of tension in the region. Lack of coordination in water management limits agricultural productivity and energy cooperation, threatens environmental sustainability and rural livelihoods, and deepens inequality. (Key Informant Interview, 2025)*

> *Because we have oil, coal, and all the resources. Until it all runs out, we won't move to a green economy. (Mid-career Focus Group Discussions, 2025)*

> *Well, for me, the green economy is also connected to an economy that develops without harming the environment. I think that here, for the most part, it is what, on the contrary, creates jobs, but at the same time, we can consider such a perspective as making it more difficult to find a job. Because green policy can limit the country, for example, in using resources for the benefit of the environment. Accordingly, there will be a reduction. The company will close. And therefore, such an outcome of the event cannot be ruled out, as it is quite likely. And it seems to me that the prospects for the green economy are very big. (Youth Focus Group Discussions, 2025)*

Kyrgyz Republic: Turning Clean Energy Potential into Sustainable Growth

The Kyrgyz Republic's green transition agenda arises from an acute convergence of environmental vulnerability and structural development challenges. As a landlocked, lower-middle-income country with 94% of its territory classified as mountainous, the Kyrgyz Republic faces heightened exposure to climate risks, including glacier retreat, more frequent natural disasters, and water stress (Kadyrberdieva, Solovyeva & Poghosyan, 2023). Over 1,000 glaciers have disappeared in the past 50 years, reducing river flow and threatening both hydropower production and agricultural livelihoods (UNECE, 2024). Coupled with intensifying urban air pollution—especially in Bishkek, where PM2.5 levels routinely exceed WHO limits by 4-6 times in winter (UNICEF, 2023b)—the transition to a low-carbon, climate-resilient development model is no longer optional but essential. The Kyrgyz Republic has taken important policy steps to integrate sustainability into national development. The National Development Strategy 2040, the Green Economy Concept (2018), and the Green Economy Development Programs (2019–2023 and 2024–2028) serve as foundational documents. In 2021, the country submitted an enhanced NDC under the Paris Agreement (NDC Partnership, 2021), committing to reduce greenhouse gas emissions by 16% unconditionally and up to 44% conditionally by 2030, relative to the BAU scenario.

The ETI ranks the Kyrgyz Republic 80th out of 120 countries in 2024, with a score of 52.7, reflecting steady improvement from 43.1 in 2019. Although the country exceeds the global average in environmental sustainability, it lags behind regional peers in transition readiness, investment mobilization, and institutional capacity—highlighting a notable gap between its long-term goals and short-term implementation capability.

The Kyrgyz Republic's energy mix is relatively clean by global standards. Hydropower accounted for 77.7% of electricity generation in 2022, followed by coal (17.1%) and imported gas (4.2%) (IEA, 2024b). The country's per capita electricity emissions are among the lowest in Central Asia, estimated at 0.56 metric tons CO_2e per capita, compared to 1.8 t CO_2e in Kazakhstan and 0.95 t CO_2e in Uzbekistan (World Bank, 2023f). However, this clean energy advantage masks critical weaknesses in supply reliability, infrastructure age, and energy intensity.

The hydropower-dominated system is highly seasonal: winter shortages are routine due to low water levels, increasing reliance on coal-fired plants and electricity imports. The system's technical losses exceed 23%, among the highest in the region (ADB, 2021a). Over 70% of grid infrastructure is older than 30 years, with an urgent need for rehabilitation and digital upgrades (IEA, 2024b).

Access to electricity is nearly universal (99.6%), yet quality of service remains poor, particularly during winter peak periods. In 2022–2023, Bishkek and Osh experienced rolling blackouts lasting 3-6 hours per day during peak load periods. In response, authorities increased winter coal use, undermining sustainability gains.

The Kyrgyz Republic's electricity tariffs are among the lowest in Central Asia. As of 2023, the residential tariff stood at 0.77 KGS/kWh (≈ US$0.009), well below the regional average of US$0.04–$0.07/kWh. These tariffs are politically popular but economically unsustainable: state-owned utilities operate at persistent losses, rely on fiscal transfers, and defer capital maintenance and investment.

The energy sector's cumulative debt limits utilities' ability to modernize infrastructure, expand renewable generation, or improve resilience. Despite donor support, cost recovery remains elusive, discouraging private sector participation. Attempts to raise tariffs have faced social and political resistance, particularly amid post-COVID economic pressures and rising inflation (17.3% in 2022).

Additionally, the Kyrgyz Republic's energy intensity remains high, at 0.6 kg of oil equivalent per US$ of GDP, compared to 0.19 in OECD countries (World Bank, 2023g). Outdated industrial processes, inefficient heating systems, and poor building insulation contribute to this inefficiency. These factors constrain productivity and raise the baseline for emissions.

The Kyrgyz Republic has strong technical potential for solar and wind energy. Average solar radiation ranges from 4.1 to 4.9 kWh/m²/day, with approximately 3,000 sunshine hours per year, making the country well suited for photovoltaic deployment. Wind resources, particularly in Issyk-Kul and Naryn, average 6.5–7.2 m/s, exceeding commercial viability thresholds (UNDP, 2021).

The UNDP's Renewable Energy Snapshots (UNDP, 2023c) notes that while the Kyrgyz Republic has considerable technical potential for solar and wind energy, the realistically deployable capacity—taking into account economic viability, land availability, and existing grid constraints—is significantly lower. By 2030, the country could develop up to 600 MW of solar and around 150 MW of wind generation in regions such as Issyk-Kul, Jalal-Abad, and Naryn. These figures offer a more grounded perspective than theoretical models and should serve as a reference point for national planning. Prioritizing these zones in investment roadmaps and incorporating them into future energy strategies could help accelerate project implementation and attract interest from credible developers.

Despite considerable potential, the deployment of renewables in the country remains limited. As of 2023, installed solar capacity was below 15 MW and largely confined to small-scale, off-grid applications. No commercial wind project has yet been commissioned, while more than 1.5 GW of renewable projects remain at the negotiation stage—including a high-profile memorandum of understanding with Chinese investors for a 1 GW solar project—which have not reached financial close.

Several structural barriers continue to impede investment. The absence of standardized Power Purchase Agreements and adequate risk-mitigation tools makes projects less bankable. At the same time, the country lacks a competitive procurement framework, such as renewable energy auctions, that could attract new entrants in a transparent and predictable manner. Grid limitations and unclear connection rules further undermine investor confidence (International Renewable Energy Agency, 2022). Finally, unpredictability in policy implementation, along with delays in permitting and land allocation, compounds overall uncertainty and slows progress toward scaling up renewable energy.

Although the 2023 amendments to the Renewable Energy Law introduced incentives such as VAT exemptions and customs waivers, their effect remains marginal without comprehensive investment frameworks.

The transport sector is a major contributor to greenhouse gas emissions, accounting for approximately 28% of the national total and ranking second-largest after energy. In Bishkek, the sector also plays a central role in deteriorating air quality. Average winter concentrations of fine particulate matter (PM2.5) frequently exceed 80 $\mu g/m^3$—more than five times higher than the World Health Organization's recommended limit of 15 $\mu g/m^3$. Several structural factors explain these outcomes. The national vehicle fleet is both old and inefficient, with an average age of 17 years. Regulatory gaps persist: neither fuel-economy standards nor vehicle-emission norms are in place, and enforcement of technical inspections remains weak. Moreover, public transport services are largely limited to Bishkek and a few other urban centers, leaving much of the population reliant on aging private vehicles.

Despite these hurdles, recent years have shown some progress. With assistance from the Asian Development Bank and the European Bank for Reconstruction and Development, Bishkek has begun procuring 120 electric buses, expected to arrive between 2023 and 2025. Pilot initiatives for compressed natural gas buses and the first electric vehicle charging stations have also been launched. Additionally, sustainable mobility strategies have been integrated into the Bishkek General Urban Plan, indicating a slow move toward greener and more efficient transport system.

However, the Kyrgyz Republic lacks a national low-emission transport strategy, vehicle fuel standards, and incentives for electric vehicle adoption. Rural areas and secondary cities remain underserved by public transportation and excluded from green infrastructure programs. The absence of a coherent national mobility plan leaves the sector fragmented and heavily donor-dependent.

The Kyrgyz Republic performs particularly poorly on the ETI's transition-readiness sub-index, underscoring institutional weaknesses across regulatory, financial, and coordination dimensions. Sector governance remains fragmented, with the ministries of energy, economy, and environment operating largely in silos. Their overlapping mandates, coupled with the absence of a central body to coordinate implementation, have slowed progress on the green transition. Regulatory frameworks also remain underdeveloped: the country lacks a green taxonomy, has yet to introduce carbon-pricing instruments, and has made limited progress in adopting energy performance standards.

The absence of a robust project pipeline similarly constrains the investment environment. Most renewable energy initiatives remain at the memorandum of understanding or preliminary feasibility study stages, and there is no consolidated roadmap to guide investment priorities. Furthermore, the Kyrgyz Republic's transition efforts are heavily dependent on external financing. Large-scale projects such as CASA-1000, the introduction of electric buses in Bishkek, and grid modernization initiatives are primarily donor-driven, with limited mechanisms for domestic ownership, replication, or long-term sustainability.

The Climate Finance Centre—established under the Cabinet of Ministers—lacks budget autonomy and operational authority to coordinate climate investment. Monitoring, Reporting, and Verification systems for emissions are in early development, limiting transparency and investor confidence.

Kyrgyz Republic's clean generation base gives it a structural advantage, but lags behind Kazakhstan and Uzbekistan in investment mobilization, market design, and project delivery. While its neighbors have introduced competitive auctions, sovereign green bonds, and PPP platforms, the Kyrgyz Republic's renewable sector remains constrained by policy ambiguity and low bankability.

However, the Kyrgyz Republic is notable for its grassroots environmental initiatives, such as community-managed pastures, decentralized reforestation efforts, and initial green procurement practices in municipalities. These elements are mostly missing from more centralized models in the region.

The Kyrgyz Republic's green transition is characterized by high-level ambition, strong policy alignment, and international support. Its low-carbon energy base, public awareness, and regional cooperation initiatives provide a solid starting point. However, deep-seated structural, fiscal, and institutional barriers threaten to stall progress.

Going forward, the Kyrgyz Republic should shift from a policy-driven approach to one focused on delivery, enforcement, and investment readiness (Opitz-Stapleton et al., 2022). With targeted reforms, the Kyrgyz Republic can convert its natural endowment and clean energy base into a source of economic competitiveness, climate resilience, and inclusive development.

Tajikistan: Contending with the Green and Energy Transition

Tajikistan has emerged as a rising contender in the global energy transition, advancing its ETI ranking from 120th in 2020 to 95th in 2024, a leap that underscores its commitment to sustainable energy development. Tajikistan ranked first in Central Asia and 71st globally in the 2024 ETI, scoring 53.6 (WEF, 2024a; The Times of Central Asi 2024,), ahead of Kazakhstan (98th) and the Kyrgyz Republic (80th). The global average ETI was 56.5, slightly above Tajikistan's score. This progress is anchored in the country's aggressive efforts to leverage its abundant hydropower resources, which provide over 98% of its electricity and position it as one of the world's most hydro-reliant nations. Key achievements include completing the 900 MW Sangtuda hydropower plant, advancing the Rogun hydropower plant, and participating in the CASA-1000 project to export surplus electricity to neighboring countries. These efforts aim to stabilize the energy supply despite seasonal fluctuations in hydropower. The National Development Strategy through 2030 outlines ambitious goals for energy sector growth, industrialization, sustainable development, and green growth. In 2016, Tajikistan, with support from the UNDP, started preparing its Fourth National Communication under the United Nations Framework Convention on Climate Change. The report, aligned with the Paris Agreement, was finalized and officially approved in 2021 (IEA, 2022, 2024a; Agency for Hydrometeorology of the Committee for Environmental Protection under the Government of the Republic of Tajikistan, 2025).

However, Tajikistan’s energy transition faces complex hurdles. Aging Soviet-era grid infrastructure is inefficient, with transmission losses exceeding 15% in some regions, hampering reliability and access in remote areas. Climate vulnerability also looms large; rising temperatures threaten glacial melt, which feeds 60% of Central Asia’s water systems, risking long-term hydropower sustainability. Additionally, seasonal fluctuations in water flow have led to winter energy shortages, forcing reliance on fossil fuels and imports. To address these challenges, Tajikistan is diversifying its renewable energy mix through pilot projects in solar and wind energy, supported by partnerships with international organizations such as the World Bank and the Asian Development Bank (ADB, 2024). Meanwhile, regional cooperation frameworks, such as the Green Central Asia Initiative, are fostering cross-border climate resilience and renewable energy integration. While Tajikistan’s hydropower-driven model offers a blueprint for low-carbon growth in resource-rich nations, balancing ecological preservation, economic stability, and energy security remains critical. Sustaining its ETI momentum will depend on securing foreign investment, adopting smart grid technologies, and building adaptive policies to counter climate risks, a multifaceted journey that could solidify its role as a clean energy hub in Central Asia.

Tajikistan has adopted the “Green Economy Strategy” to transition toward a sustainable, green economy, aiming to double renewable electricity production by 2050 and transform into a “Green country” by 2037 by integrating green technologies and eco-friendly practices across all sectors. The objective of this Strategy is to implement institutional reforms, ensure the efficient use of natural capital, attract investments, introduce modern and innovative technologies, and strengthen international cooperation in the field of the green economy. The implementation of this Strategy will contribute to sustainable development across economic sectors, social stability, ecological balance, and improved living standards for the people of Tajikistan (United Nations High-Level Political Forum on Sustainable Development, 2023). The Government of Tajikistan aims to achieve a green economy with net-zero emissions in the power sector by 2037, and both its Reference and Low-Carbon Development scenarios meet the Nationally Determined Contribution targets by 2030. While the power sector already has low emissions, unchecked trends would lead to rising emissions in buildings, industry, and transport. However, the low-carbon growth scenario can reverse this trajectory, reducing emissions in these sectors while leveraging benefits from the Carbon Border Adjustment Mechanism to support sustainable development (World Bank, 2024a). By 2033, the country aims to generate at least 1,000 MW of solar and wind energy, supplementing its dominant hydropower sector. Key projects include large-scale hydropower developments such as the Rogun HPP and upgrades to existing plants (Nurek, Kairokkum, and Sarband HPPs), expected to add 4,000 MW of renewable capacity by 2032. These efforts will solidify Tajikistan’s regional leadership in renewable energy and enable a full transition to 100% clean electricity, ensuring a sustainable and low-carbon future (Regional Environmental Centre for Central Asia, 2024).

Uzbekistan: Unlocking Green Transition Opportunities: Overcoming Institutional Inertia

The economy of Uzbekistan, shaped by the Soviet era, relied on the intensive use of natural resources, particularly natural gas, oil, and water. Despite the collapse of the Soviet Union, strict administrative regulation and active state participation in the production processes of industry, agriculture, and construction de facto "froze" such highly inefficient and harmful business models until reforms at the end of the 2000s. As a result, Uzbekistan is one of the most energy- and resource-intensive countries in the world; in terms of energy intensity, Uzbekistan is in the bottom 20 in the world, and, in water intensity, it is the second lowest in the ECA region. Water overuse in agriculture led to one of the largest environmental disasters–the shrinking Aral Sea, which began in Soviet times. The World Bank estimates show that the annual cost of air pollution alone (measured by damage to health) equals 6.5% of GDP. Furthermore, inaction will compromise energy, water, and food security and lead to land degradation. To adapt to the adverse impacts of climate change, Uzbekistan would need to invest an additional US$46.7 billion over 2023-2060 (in present value terms) to address and mitigate climate impacts on labor productivity, roads and bridges, livestock, and the irrigation sector alone in the wet/warm scenario, and US$59.8 billion in the dry/hot scenario (World Bank, 2023d).

As Uzbekistan does not have an ETI ranking, this section analyzes the status of green solution uptake through the lens of relevant public policy implementation.

The Government of Uzbekistan launched several reforms to address this problem from the end of the 2010s and the mid-2010s, including limited modernization of the electricity generation sector and a reduction in cotton-growing areas. These reforms became more comprehensive and diverse after 2017. Examples of approved key policy documents are: Program on transition to green economy and green growth until 2030, State Program for 2025 "Environment Protection and transition to Green Economy," National Program against Dust Storms and Mitigating Negative Effects of Dust Storms, Decree "On improving governance on energy efficiency and developing market of energy saving services," Concept of Water Management Development until 2030, Concept of Environment Protection until 2030, Agriculture Modernization Strategy.

Uzbekistan's green transition centers on decarbonization and greening agriculture. Regarding decarbonization, the government has committed to reducing the economy's energy intensity by 35% by 2030 relative to 2010 and reaching net-zero emissions by 2060. Decarbonization policies focus first on expanding the renewable energy mix. The country has substantial technical potential–593 GW of solar, 1.6 GW of wind, 1.8 GW of small hydro, and 800 MW of biomass (UNDP, 2014a). While only hydropower was operating in 2018, by 2025 Uzbekistan expects to add 5 GW of solar and wind capacity. The government has also raised its 2030 target for the share of renewables in the energy balance from 25% to 54%. Almost all large renewable projects are being delivered through PPPs, and since 2024 the government has supported rooftop solar installations for households and businesses.

Energy saving is a second pillar, though efforts have historically been fragmented and limited in scale despite expert advice to prioritize it. Past actions included modernizing some chemical plants, thermal power plants, and public social-sector buildings. The building and construction sectors–among the largest energy consumers–remained largely unchanged under outdated construction codes. In 2025, the government established an Energy Saving Agency to design and implement policies more systematically. Concurrently, it introduced measures such as subsidized loans for "green" home retrofits, energy audits, and the rollout of ESCO contracts.

A third component is the gradual elimination of energy subsidies, which had amounted to 6-10% of GDP and undermined incentives to decarbonize. Tariff reforms between 2019 and 2025 have begun to stimulate demand for efficiency and renewable solutions among businesses and households. To mitigate social impacts, the government has provided targeted protection for low-income households facing higher energy and utility costs. Decarbonization policies in other sectors–such as waste management and recycling–are at an early stage.

Despite strong policy direction, the effectiveness of green investments is often constrained by institutional factors. These include an underdeveloped system for capturing and transferring knowledge and lessons from previous projects, which leads to repeated mistakes; monopolies and restrictions on technology imports that inflate the costs of green solutions; outdated norms and regulations, especially in the building sector; and intrusive involvement by government agencies, state-owned enterprises, and state-owned banks in private-sector implementation. The latter, combined with limited competence and weak accountability and transparency, contributes to suboptimal solution choices, underperformance, and higher costs.

Agriculture consumes 90% of the water and these two topics are tightly interlinked. State order system for cotton and wheat and implicit taxation resulted in very low water productivity (only 42 cents of agricultural output per 1 m^3 of water) and low value added per hectare of arable land and livestock. The Government of Uzbekistan eliminated the state order systems for cotton and wheat in 2020-2023. Climate change, coupled with low water-use efficiency, has led to water shortages for irrigation. This, in turn, has reduced irrigated areas, led to the abandonment of remote fields, lowered yields, and, consequently, reduced income for the rural population. A large water-saving campaign was launched in 2020, with the goal of covering one million ha of arable land with water-saving technologies. The program was successful in the horticulture subsector, but in the key water-consuming cotton subsector it was accompanied by large leakages, price inflation, and technical problems. In addition to water depletion, the existing business model causes soil degradation and harms biodiversity. The Government of Uzbekistan spends a considerable amount on agricultural support–2.6% of GDP in 2023. However, the share of climate adaptation/mitigation-focused support has been declining since 2021. Meanwhile, the share of harmful variable input subsidies increased from 32% to 42% in 2020-2023, and coupled livestock output subsidies rose from zero to 5%. Also, almost half of agricultural public spending is still focused on "triple harmful" cotton and wheat. Therefore, redirecting these climate-harmful public funds to the implementation of green solutions in agriculture would be a source for such a transition.

Modeling the application of climate-smart agriculture (CSA) indicates that Uzbekistan needs to adopt a more ambitious, optimistic CSA uptake scenario to continue farming amid current dynamics of reduced water availability and soil degradation. It is estimated that implementing the optimistic scenario will create 106,000 full-time jobs. The main barriers to implementing CSA are not so much financial as institutional–weak guarantees of land tenure, the de facto crop placement system, and the underdevelopment of general support services, particularly in agriculture knowledge, innovation, and science.

Prioritizing CSA implementation in the Amu-Darya basin would benefit the low-income rural population in lagging socio-economic development regions of Uzbekistan - the Republic of Karakalpakstan, Khorezm, Kashkadarya, and Surkhandarya.

Implementing CSA will also increase demand for digital technologies such as agricultural drones, remote sensing, yield forecasting, and IT solutions for efficient irrigation systems and farm management. CSA uptake generates demand for new, high-paying professions in rural areas. This creates an opportunity to move the rural population, especially youth, from low-productivity, informal, and agricultural livelihoods into higher-productivity jobs, mainly in the manufacturing and service sectors. Another advantage of these new CSA-generated jobs is that they are created in rural areas.

Uzbekistan has considerable potential for green exports–the Global Trade Gravity Modeling by the World Bank indicates that Uzbekistan has a sizable green export potential of US$500 million per annum, equivalent to around 2.5% of today's exports of goods and services. To unleash the potential, trade and investment policies would need to create an attractive environment for FDI in the green sector. Moreover, Uzbekistan would benefit from conducting an in-depth assessment of its comparative advantages in the green trade sector by identifying value chain segments and recognizing that green technologies often involve complex systems composed of components located worldwide (World Bank, 2024e).

Regional cooperation on shared water resources, particularly with neighboring Central Asian countries, is also critical for sustainable water management. Upgrading regional cooperation in the energy-water-food nexus will generate enormous benefits by properly leveraging each country's competitive advantages rather than continuing to produce "everything needed" domestically. Regional cooperation on green development has not been optimized due to trade restrictions and weak institutional structures for inter-state coordination.

There are some examples of regional cooperation–a joint venture to build Kambarata-1 hydropower station in the Kyrgyz Republic, which will be implemented by three countries located on the Syr-Darya river. Another future project is the CA-EU electricity transmission line to export renewable energy generated in Central Asia to Europe.

Regional Outlook: Analysis of Digital Transition and Evaluation of Existing Policies

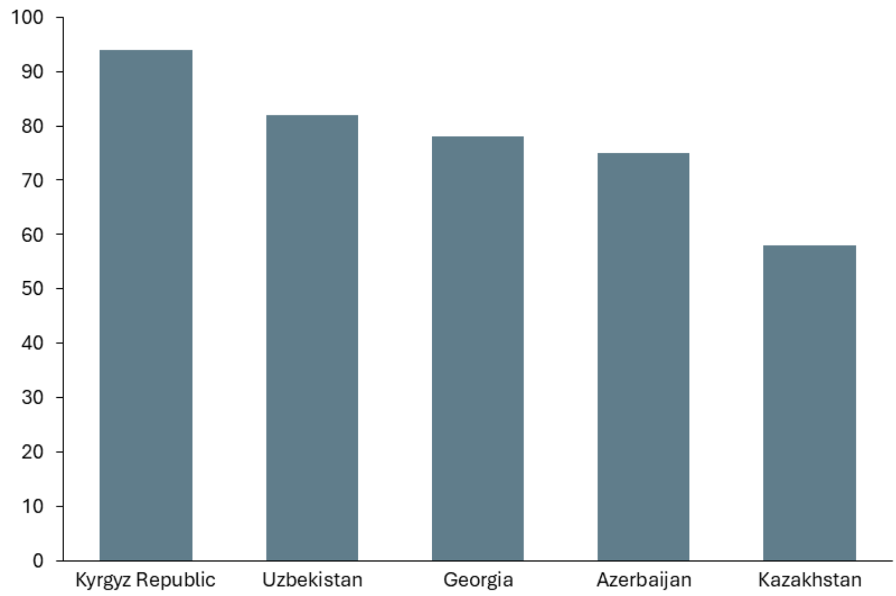
With a global digital transition underway, CAREC countries can benefit significantly from economic growth and improved service delivery. However, the region faces unique challenges in digital connectivity. Central Asia is largely landlocked and is far from the key fiber-optic cable routes (CAREC Institute, 2022). The digital divide and limited access are problems, especially in regional and remote areas. This is compounded by low infrastructure investment, difficult geographic conditions, and political obstacles to advancing the agenda (Ali, 2024). While connectivity will be a key enabler of the digital transition, how people connect and the barriers they face must be kept in mind when considering how policy reforms can meet people where they are in the region.

The countries in this study do not rank particularly high in the Network Readiness Index (NRI) (Tajikistan was not ranked). This is clear in the NRI sub-indices, where CAREC countries tend to score relatively low–albeit largely increasing over time - on measures of technology, people, governance, and impact (Figure 14).

Tajikistan's absence from the NRI stems from data gaps, early-stage digital infrastructure, and misalignment with the index's universal metrics, despite notable progress in localized innovations such as eHukumat.tj and Tajik-language AI. These advancements, rooted in the country's 2021 National AI Strategy, reflect a strategic focus on leapfrogging traditional benchmarks to address local needs, even as Global South nations often struggle for visibility in standardized indices. While Tajikistan's exclusion from the NRI reflects current measurement limitations, its tailored approach to digital sovereignty positions it as a unique case study in context-driven technological transformation.

In many CAREC countries, individuals' digital connectivity is overwhelmingly through mobile rather than fixed internet connections; however, most countries, except for Azerbaijan, still lag behind the global average (GSMA, 2023). Overcoming these challenges in CAREC countries is essential, as nearly half the population in the region is not connected to the internet, many in regional and remote areas. The World Bank estimates suggest that a just 10% increase in broadband connectivity can add at least 1% to economic growth. A 1% increase in internet connectivity could boost exports by 4.3% (Burunciuc, 2021).

Figure 14: Network Readiness Index - CAREC Countries 2023



Source: Portulans Institute (2024).

Another important digital dynamic in the region is connectivity among CAREC countries. Currently, the region depends heavily on the bandwidth that passes through Russia to reach Kazakhstan before reaching other Central Asian markets. This creates vulnerability, particularly for landlocked countries like the Kyrgyz Republic, Tajikistan, and Uzbekistan, which stand to gain the most from stronger regional infrastructure (World Bank, 2023c).

As more people come online in CAREC countries, the extension of rentier capitalism into technology is increasingly concerning (Christophers, 2020; Sanghera & Satybaldieva, 2020). Research on wealth concentration in Kazakhstan more broadly revealed that just five wealthy individuals owned telecommunications companies with rights to broadband and mobile access. Similarly, in the Kyrgyz Republic, just four wealthy individuals owned companies with exclusive rights to broadcast radio and television and to provide mobile broadband. A high proportion of these people have also held public office or are related to someone who has (Sanghera & Satybaldieva, 2020). This means that hyper-concentration of technology companies has the potential to reinforce the structural economic inequality we see in the digital transition.

There is an enormous opportunity for the CAREC region to attract Digital Foreign Direct Investment (FDI), which can help boost productivity and competitiveness (Razzaq et al., 2022). Previous CAREC Institute research found wide variation across the region (and the countries included in this study) in their enabling environments for Digital FDI, as measured by digital adoption, digital infrastructure, and FDI restrictions. The challenges vary across the region, including governance, security and privacy, digital skills, and more. However, the research highlights the importance of regional coordination and cooperation in overcoming some of these barriers to attracting Digital FDI (Razzaq et al., 2022).

Country Profiles

Azerbaijan: A Workforce in Digital Transition

Azerbaijan's performance on the 2023 NRI sits in the middle of the regional pack. While ahead of Kazakhstan, it trails behind the Kyrgyz Republic, Uzbekistan, and Georgia. This positioning reflects a digital ecosystem that has made progress in connectivity and access, yet where structural barriers—such as limited competition in the telecom sector and heavy state involvement—continue to constrain broader digital transformation.

The country's NRI score suggests that while infrastructure exists, readiness to leverage digital tools for innovation, government services, and inclusive growth remains underdeveloped without stronger reforms to boost competition, invest in digital skills, and foster innovation ecosystems. Azerbaijan risks falling further behind peers who are moving more decisively on digital transformation.

Azerbaijan's workforce transition to a digital economy requires strategic policies and targeted programs. Expanding digital skills training through AI, blockchain, and cybersecurity education will ensure a future-ready workforce. Workforce upskilling initiatives must align with industry demands by integrating Industry 4.0 courses into universities and vocational training programs. Legislative reforms, such as simplified visa processes for foreign tech entrepreneurs and remote business registration, will attract global talent and investment. Developing AI-driven energy-efficiency programs and green workforce training in renewable energy will support sustainability efforts. Strengthening industry-academia collaboration through the Industry 4.0 Acceleration Center will foster research and innovation, ensuring Azerbaijan's workforce remains competitive in a rapidly evolving job market.

> *Looking ahead 5-10 years, Azerbaijan's workforce will be defined by digital transformation, Industry 4.0, and a strong knowledge-based economy. The country will transition from traditional industries to high-value, tech-driven jobs, supported by AI, blockchain, and automation. Education and workforce policies will focus on bridging skill gaps, expanding access to digital training, and fostering innovation. (Key Informant Interview, 2025)*

Findings from the KIIs and FGDs indicate that the biggest risks to an inclusive and fair future of work in Azerbaijan include regional disparities, skill mismatches, and unequal access to digital opportunities. The digital divide between urban and rural areas limits access to advanced technology education and high-paying jobs. Some university graduates lack practical skills in AI, data science, and automation, creating a gap between education and labor market needs. Women's underrepresentation in STEM and leadership roles requires targeted mentorship and upskilling programs.

Additionally, AI-driven automation risks job displacement in traditional sectors, making reskilling and lifelong learning policies essential. The green workforce transition also needs stronger policies to prepare workers for sustainable energy and smart infrastructure jobs. Addressing these blind spots through inclusive education, digital access, and workforce adaptability will ensure equitable economic growth.

Enhanced collaboration with development partners and regional platforms is needed to accelerate digital and green workforce transformation. Expanding technical and financial support for AI, cybersecurity, and blockchain training through the World Bank and ADB will help upskill the workforce. Investment in green economy training from UNIDO and World Economic Forum (WEF) will support renewable energy and AI-driven sustainability projects. Policy alignment on digital trade and FinTech through regional agreements, such as the Digital Economy Partnership Agreement, will enhance cross-border collaboration. Additionally, cooperation on AI governance and automation policies with the ILO and OECD will help balance technological advancement with workforce protections. An enhanced, coordinated approach to skills development, innovation, and regulatory harmonization will ensure Azerbaijan's workforce remains competitive and future-ready.

Georgia: Georgia's Fast-Track Digital Rise

Georgia is steadily positioning itself as a regional digital leader in the CAREC region, showing one of the most consistent upward trends on the NRI. Between 2022 and 2024, Georgia's NRI score surged from 45.25 to 49.3, and its global rank climbed from 78th to 68th (Portulans Institute, 2024). Unlike its regional peers, Georgia's progress spans all four sub-pillars: Technology, People, Governance, and Impact. This demonstrates a holistic, governance-led digital transformation.

At the heart of Georgia's digital rise are institutional and regulatory reforms. The establishment of the Digital Governance Agency in 2020 and the rollout of more than 700 digital public services via my.gov.ge have been pivotal in enhancing transparency and improving citizen engagement. Complementary reforms in insolvency law and business registration procedures have further streamlined the business environment, increasing investor confidence (OECD, 2022). Georgia now ranks among the global top 30 for Regulatory Quality (30th) and ICT Regulatory Environment (31st), reflecting the strength of its digital governance framework (WEF, 2024a).

The Russia-Ukraine conflict in 2022 served as a catalyst, accelerating the relocation of tech firms and skilled professionals to Georgia. Leaning on its geostrategic position at the crossroads of Europe and Asia, Georgia became an attractive hub for displaced talent and businesses from Russia, Ukraine, and Belarus. This influx has strengthened the local ICT ecosystem, expanding both capital and human resources.

A pro-ICT tax regime, introduced in 2020, has further amplified Georgia's appeal, offering a 5% profit tax and 0% tax on dividends and property for eligible international tech firms. These measures have significantly contributed to the sector's growth, with ICT's share of GDP reaching 6.4% by 2024. From 2017 to 2023, the ICT sector's turnover grew 13-fold, while value-added expanded 15-fold, underlining its growing economic weight (Policy and Management Consulting Group, 2025).

However, challenges persist. Despite impressive gains in governance and digital adoption, digital business integration lags. E-commerce legislation ranks 119th, and the cloud computing market ranks 102nd, indicating a gap between regulatory preparedness and market application (Portulans Institute, 2024). Additionally, infrastructure investment remains insufficient, with Georgia ranking 104th in annual telecom investments and 117th in future tech readiness, particularly lagging in AI, robotics, and other emerging technologies.

Education is a relative strength, with Georgia ranking first globally for internet access in schools and 13th in adult literacy (Portulans Institute, 2024). However, this has not fully translated into workforce readiness. ICT skills integration in formal education ranks only 69th, underscoring the need to align digital literacy with labor-market needs better. A key informant noted, "Digital transformation is ongoing but uneven. There is strong momentum in financial services and e-commerce, but other sectors and many public services are being held back by outdated infrastructure and limited innovation capacity." The interview further highlighted that the ICT workforce is predominantly young (ages 18-40) and male, although gender balance is slowly improving in some roles. However, the skills pipeline remains a major bottleneck. "Most digital skills are developed on the job. University programs only graduate around 300 ICT specialists a year, which is nowhere near what the market needs," the expert explained. Opportunities are also highly centralized: "Outside of Tbilisi and Batumi, access to digital education and jobs is limited. Rural areas are largely left behind" (Key Informant Interview, 2025).

To sustain its digital trajectory, Georgia must increase investment in future technologies and infrastructure, bridge the digital divide for SMEs, and strengthen ICT education and R&D ecosystems. While Georgia's governance model provides a strong foundation, achieving true digital competitiveness will depend on closing the gap between policy and practice.

Kazakhstan: The Role of National Policy and Digital Skills in E-Government Use

In recent years, Kazakhstan has made progress in digital development and is performing well compared with its neighbors, with modest gains in global rankings. Kazakhstan ranks 61st out of 133 economies in the NRI 2024, with a score of 50.52 (Portulans Institute, 2024). This places Kazakhstan second only to China among the CAREC countries. Among Kazakhstan's strongest indicators in the NRI are e-commerce legislation, the adult literacy rate, and government online services, in which the country ranks 1st, 6th, and 8th globally respectively. Data also shows that the weakest indicators ranked on the global scale are ICT regulatory environment (129th), privacy protection by law content (119th), and computer software spending (125th).

Much of Kazakhstan's recent success in developing its digital capabilities owes itself to the Digital Kazakhstan program, a five-year national strategy launched in 2018 by the Government of Kazakhstan to accelerate the country's digital transformation and foster long-term economic growth. Its main goals included: promoting digital adoption in key sectors such as agriculture, energy, transport, and e-commerce; fostering digital innovation, notably through initiatives such as establishing the Astana Hub technology park; strengthening cybersecurity and expanding ICT infrastructure; and ensuring broader and more affordable internet access across urban and rural areas. According to the OECD (2023a), one of the program's key achievements was the rollout of a comprehensive digital government system. Other achievements included progress in creating legal and regulatory conditions for digital transformation, nearly universal mobile coverage, and improved broadband speeds in urban areas. Between 2015 and 2020, ICT services grew significantly, with SMEs increasingly contributing to the sector: ICT services represented 7.9% of all services supplied by SMEs in 2020, up from just 3.3% five years earlier (OECD, 2023a).

According to the United Nations E-Government Survey, significant improvements in ICT infrastructure have occurred since the program's introduction: in just two years (2018 to 2020), the number of people in rural settlements with access to fiber-optic internet speeds increased eightfold, from 100,000 to 800,000. The transport and logistics sectors have also benefited from digitalization, including the introduction of a smart traffic system and the use of digital tools to monitor, manage, and maintain roads and related infrastructure (UNDESA, 2022).

More recently, according to UNDESA (2024), Kazakhstan ranked 24th out of 193 countries on the E-Government Development Index in 2024 (compared with 39th in 2018), which measures a country's ability to deliver public services digitally. This is the highest ranking among the CAREC economies.

These gains, though substantial, do not fully capture the ongoing challenges that continue to constrain Kazakhstan's digital transformation. Challenges include poor mobile internet quality, limited broadband coverage in rural and small urban areas, high regulatory and economic barriers in the telecom sector, low digital uptake (with only 11% of firms using digital technologies), a slow and frequently changing regulatory framework, and widespread cybersecurity vulnerabilities among SMEs, which continue to constrain progress toward Kazakhstan's digitalization goals (OECD, 2023a).

Finally, in 2024-2025, along with establishing an AI ministry, the government also introduced two policy initiatives to advance its national AI agenda: the Concept for the Development of AI (2024-2029) and the Draft Law on Artificial Intelligence. The former aims to facilitate sustainable AI adoption and growth, with priority areas including investment in supercomputing and broadband infrastructure, the establishment of a national AI platform and data processing centers, and the development of digital skills and scientific research in AI. The latter will introduce a legal framework for the responsible use of AI by classifying AI systems, banning fully autonomous systems, and imposing clear legal obligations on developers, users, and data holders. While policy formulation efforts are taking shape, implementation may face some headwinds. For example, according to the 2025 KPMG AI Readiness Survey (based on more than 50 companies in Kazakhstan, with annual revenues ranging from less than US$1 million to over US$100 million), "only 20% have implemented AI-specific regulations" and half considered their data infrastructure inadequate or needing improvement (KPMG, 2025). This suggests that businesses may find it challenging to achieve successful AI adoption, highlighting the need for better calibration between national AI strategies and on-the-ground readiness among businesses.

As Kazakhstan continues to make strides in digital development, a key question for policymakers is who is using (and benefiting from) these services. Using a nationally representative household survey of 56,649 adults conducted by Kazakhstan's Bureau of National Statistics in 2021, the authors of this report examine the factors behind the use of online public services. To aid analysis, we have constructed a skills index to isolate the role of digital literacy in e-government uptake. Estimates from our linear probability model show that digital literacy and higher levels of education have the greatest impact on the use of electronic public services. The likelihood increases from secondary to university education. Wage workers are more likely to use online services, while students, pensioners, and the unemployed are each roughly 7% less likely. Major cities such as Astana, Almaty, and Shymkent lead and outperform others, while notable regional differences persist. For example, residents of East Kazakhstan are 32% more likely to use e-government services than those living in Mangystau (our reference category). Usage also varies by demographic group. Those aged 56 and older are the least likely of all age groups to use these services, while women are more likely than men.

The key inference from our analysis is that without a deliberate focus on inclusion, digitalization can exacerbate and reflect existing inequality. Policy must focus on targeted programs to help the elderly, people with limited education, the unemployed, and rural residents access public services.

Kyrgyz Republic: Digital Ambition vs. Readiness Gap

The Kyrgyz Republic has consistently positioned itself as a digital reformer in Central Asia. The government's commitment is reflected in national frameworks such as the Digital Kyrgyzstan 2019-2023 Strategy and the extended Digital Transformation Concept 2024-2028, which aim to build a seamless digital state and a data-driven economy. However, despite this ambition, the Kyrgyz Republic ranked only 86th out of 133 economies on the NRI 2024, with a score of 44.16, signaling a growing disconnect between policy vision and real-world impact.

Unlike some CAREC peers, the Kyrgyz Republic's progress across the four NRI pillars–Technology (97th), People (80th), Governance (89th), and Impact (55th)–has been uneven. Strengths in inclusion, affordability, and digital governance are offset by deficits in infrastructure quality, investment in emerging technologies, and business uptake.

The Kyrgyz Republic's digital architecture is underpinned by flagship initiatives such as the Tunduk interoperability platform, which connects more than 80 state bodies and enables real-time data exchange. The rollout of the Unified Digital Identification System and a mobile app for digital documents have simplified access to more than 250 public services. Additionally, the High Technology Park and a supportive tax regime have enabled a modest but growing ICT export base.

The Kyrgyz Republic is also laying the groundwork for next-generation digital technologies. The government is finalizing a National Artificial Intelligence Strategy, supported by the newly established National AI Council, which coordinates policy and expert oversight. The strategy focuses on AI-enabled public services, agriculture, and Kyrgyz-language technologies, while emphasizing ethical and inclusive usage (Digital Development Agency of the Kyrgyz Republic, 2025). In 2025, the government introduced Aitil, Kyrgyzstan's first AI platform in Kyrgyz, providing speech recognition, translation, and conversational tools (Tech.az, 2025). These initiatives seek to establish the Kyrgyz Republic as a regional leader in CAREC's digital innovation agenda.

Adoption and readiness are still weak, especially for advanced technologies such as cloud computing and AI. In NRI 2024 (Portulans Institute, 2024), the country's Technology score is among the lowest in the region, mainly due to poor cloud readiness, limited use of emerging technologies (ranked 115th), and high device and mobile data costs. Additionally, People indicators highlight structural issues in digital skills. While adult literacy rates are high, vocational ICT training remains limited, and only a few hundred tech graduates emerge each year from higher education—far below industry demand.

As one digital reform consultant observed, "We have the technical backbone–Tunduk, cloud signature, e-ID–but the workforce and user base aren't moving fast enough. It's not just access; it's ability and motivation." According to the NRI 2024, business usage of digital tools remains moderate (ranked 77th), and the government's own technology use ranks only 85th globally (Key Informant Interview, 2025).

SME digitalization, especially in rural regions, remains slow. While mobile payments and e-commerce platforms are expanding, less than 7% of Kyrgyz citizens shop online, and trust in digital platforms remains fragile. "Users are still skeptical—security concerns, lack of redress, and poor user interfaces hold people back," noted a recent e-commerce specialist (Key Informant Interview, 2025).

Yet the country outperforms expectations for its income group on multiple indicators—particularly in digital inclusion (ranked 58th) and e-government services. The digitalization of public services has improved transparency and efficiency, with millions of transactions now processed online (Digital Development Agency of the Kyrgyz Republic, 2024). The Kyrgyz Republic has also piloted biometric voting, open data portals, and digitized health and civil registry systems, laying the foundation for a more accountable state. Still, the economic returns of digital transformation remain modest. The ICT sector contributes under 5% of GDP, and most innovation remains confined to Bishkek. In contrast, Kazakhstan (NRI 2024 rank: 62nd, score: 53.92) has established nationwide digital hubs and platforms, while Uzbekistan (ranked 82nd) has accelerated SME digitization and fintech adoption through targeted investment and skills programs.

For CAREC, the Kyrgyz Republic's experience underscores a regional imperative: digital transformation depends not only on strategy but also on deep, sustained investment in skills, trust, and implementation. As the region moves toward a shared digital space under the CAREC Digital Strategy 2030, aligning on measurable outcomes–not just shared infrastructure–will be key to inclusive growth.

Tajikistan's Digital Leap: Advancing Connectivity, AI, and E-Commerce for Economic Transformation

Tajikistan's digital transition is a cornerstone of its national development strategy, driven by government initiatives, international partnerships, and recognition of technology's role in economic growth and social inclusion. The Government of Tajikistan has prioritized digitalization through ambitious policy frameworks. In 2025, the Government declared 2025-2030 the "Years of Digital Economy and Innovation Development" to expand innovation and comprehensively utilize the opportunities offered by digital technologies in the economy.

This initiative is both necessary and timely, as contemporary information and communication technologies directly affect all spheres of human life. The emergence of various forms of the digital economy and the application of modern innovations across fields of human activity are clear examples of the importance of developing information and communication technologies (Communication Service under the Government of the Republic of Tajikistan, 2025). The government is strengthening digital infrastructure (data centers, national databases), digitizing public services, and reforming laws to support this transition. Efforts include upskilling the workforce through domestic and international IT training, integrating AI into government systems, ensuring cybersecurity, and promoting e-commerce. These measures aim to enhance transparency, efficiency, and economic resilience by accelerating Tajikistan's shift to a digital economy (Government of the Republic of Tajikistan, 2025).

The COVID-19 pandemic exposed and intensified development challenges in Tajikistan, particularly in healthcare, socio-economic stability, and private-sector collaboration. With a young, rural population and limited connectivity, the country faces infrastructure constraints. However, digital transformation offers a key opportunity for recovery and long-term resilience. Tajikistan's ICT sector showed early promise (2000–2015) with rapid growth, but declining revenues and limited internet access, especially in rural areas, now hinder progress. Expanding affordable, high-speed internet is critical for e-government, digital services, and economic growth. The government, with World Bank support through the Digital CASA project, aims to improve internet affordability, attract private investment, and enhance digital public services.

Regional cooperation could position Tajikistan as a connectivity hub. Key reforms include modernizing regulations, reducing taxes on ICT firms, and incentivizing broadband expansion. Successful digital transformation could spur socio-economic development, create jobs, and reduce reliance on migration. For Tajikistan's youth, a digital economy offers a viable alternative to unemployment but requires urgent policy action to remove barriers and foster innovation (World Bank, 2021a).

In the NRI 2022 Report (Portulans Institute, 2022), Tajikistan ranks 111th, with an overall score of 34.73, indicating its digital progress. While the country performs below the global average, it shows notable strengths in Impact (ranked 93rd), particularly in SDG Contribution (60th), Quality of Life (77th), and Individuals (77th), with high marks for adult literacy (5th) and mobile broadband traffic (6th). Regionally, it ranks 6th among the Commonwealth of Independent States and 30th in its income group, demonstrating resilience in socio-economic digital inclusion. Despite Tajikistan's progress in digital impact and literacy, its growth potential remains untapped, requiring targeted reforms to its infrastructure and regulatory frameworks. With these advancements, Tajikistan is not only strengthening its digital economy but also positioning itself as a regional leader in e-commerce. With a young, tech-savvy population, Tajikistan is leveraging e-commerce to boost regional trade and job creation. The government has implemented policies, including the Concept of the Digital Economy (Government of the Republic of Tajikistan, 2019) and the Artificial Intelligence Strategy until 2040, as well as establishing the Agency for Innovation and Digital Technologies and adopting the National E-Commerce Program from 2025 until 2029 to drive digitalization forward. With 70% of its population under 30, Tajikistan sees e-commerce as a key growth driver. The country has invested in internet infrastructure, mobile services, and digital registrations, creating a strong foundation for its National Program on E-Commerce.

These efforts have laid a solid foundation for implementing the National Program on E-Commerce, positioning Tajikistan to enhance its economic influence both regionally and internationally (International Trade Center, 2024). E-commerce in Central Asia is emerging as a transformative tool to connect regional products with global markets, modernize supply chains, and promote inclusive growth by creating employment opportunities for women, youth, and persons with disabilities.

This digital shift helps overcome the region's landlocked constraints while leveraging its young, tech-oriented workforce, a particularly valuable asset for Tajikistan, which boasts the region's youngest and fastest-growing population. To support this growth, Tajikistan enacted the Law "On Electronic Commerce," which safeguards the rights of e-commerce participants and fosters a conducive environment for digital trade.

On August 4, 2025, the Agency of Innovation and Digital Technologies under the President of Tajikistan launched two pioneering digital projects: ehukumat.tj, a national e-government portal currently used by 1.5 million people offering over 20 services from 45 government agencies (expected to expand to over 50 by 2025), and Bonoor, the country's inaugural AI assistant fluent in Tajik. These initiatives demonstrate Tajikistan's strategic commitment to digital sovereignty and inclusive governance, aiming to reduce dependence on foreign technology and emphasize local needs. A key feature is Bonoor's support for the Tajik language, a vital innovation as most global AI tools tend to ignore minority languages. This enhances accessibility and promotes cultural preservation within the digital age. By integrating AI with e-governance in the native tongue, Tajikistan ensures broader public participation while setting an example for how nations can balance technological progress with linguistic and cultural identity. These advancements build upon the foundational framework laid by Tajikistan's National AI Strategy, adopted in 2021, which set the stage for the country's ambitious digital transformation by targeting AI-driven economic growth and sectoral innovation. In 2021, the Government of Tajikistan adopted a National AI Strategy with an ambitious goal of deriving 5% of GDP from AI by 2040. Officially launched in September 2022, it is Central Asia's first comprehensive AI policy, positioning Tajikistan as a regional AI hub across finance, agriculture, and public services. The Strategy rests on four pillars: (1) Talent Development (training 300+ AI experts by 2025), (2) Data Enhancement (using synthetic data for AI model exports), (3) Model Deployment (scaling domestic AI solutions like zypl.ai's credit-scoring tools), and (4) Ethical Governance (decentralized, sector-specific regulations). Aligned with Tajikistan's industrialization and the "Decade of Natural Sciences" initiative, the Strategy fosters innovation while avoiding bureaucratic over-centralization (AI Council of Tajikistan Council under the Ministry of Industry and New Technologies of the Republic of Tajikistan, 2023; Asia-Plus, 2024; Oxford Insights, 2023).

On July 25, 2025, the United Nations General Assembly (UNGA) unanimously adopted a pivotal resolution titled "The Role of Artificial Intelligence (AI) in Creating New Opportunities for Sustainable Development in Central Asia," proposed by Tajikistan. This initiative stemmed from a proposal by the Government of Tajikistan during the 79th UNGA General Debate on September 24, 2024. A landmark achievement came in July 2025, when the UN General Assembly unanimously adopted Tajikistan's resolution on AI's role in sustainable development, paving the way for a Regional AI Center in Dushanbe. This initiative highlights Tajikistan's leadership in shaping ethical AI frameworks and fostering cross-border collaboration. The resolution marks a major step toward international consensus on ethical AI governance, emphasizing self-regulation and responsible AI deployment at the regional and national levels. A key component of the resolution is the creation of a Regional Artificial Intelligence Centre in Dushanbe, designed to facilitate collaborative AI initiatives across Central Asia. This center aims to develop joint AI education programs and support regional AI startups; foster collaborative AI research among universities and laboratories; establish shared data centers to enhance access to AI infrastructure; harmonize AI governance frameworks to ensure responsible, self-regulatory practices; and strengthen global AI cooperation through partnerships with international organizations. The resolution underscores Tajikistan's leadership in global AI discourse and reflects the government's strategic policy direction. By promoting ethical AI development and regional cooperation, the initiative seeks to establish a model for balancing innovation with regulatory oversight, contributing to sustainable development in Central Asia and beyond (Ministry of Foreign Affairs of the Republic of Tajikistan, 2025; United Nations, 2025; The Caspian Post, 2025).

In summary, Tajikistan holds considerable potential to boost economic growth and social development through digital transformation by adopting advanced technologies in both public and private sectors. Achieving this requires coordinated efforts to build adaptable digital infrastructure that guarantees equitable access, promotes innovation, and enhances cybersecurity. Investing in digital literacy and skills training will empower the workforce, while PPPs can speed up smart solution adoption in sectors like agriculture, healthcare, and finance. Focusing on these priorities can improve efficiency, service delivery, and foster an inclusive digital economy for sustainable long-term development. Tajikistan's experience provides useful lessons for developing countries aiming for technological leapfrogging. Its approach, blending high-level political support with targeted international collaborations, proves that nations facing constraints can actively shape their digital futures rather than merely importing technology. The next five years will be crucial in turning this ambitious digital vision into a widespread socio-economic reality.

For CAREC, Tajikistan's path to digital transformation highlights a critical lesson: national policy and digital literacy are inseparable drivers of e-government success. As the country advances its digital agenda, sustained focus on closing skills gaps, fostering public trust, and ensuring equitable access will determine whether reforms translate into tangible benefits. Under the CAREC Digital Strategy 2030, Tajikistan's progress, like that of its neighbors, will depend on prioritizing inclusive digital ecosystems, where infrastructure investments are matched by efforts to empower citizens and institutions alike. Regional collaboration, grounded in shared learning and measurable outcomes, can accelerate this transition, turning connectivity into collective prosperity.

Uzbekistan: From Laggard to Transition

Uzbekistan's digital transition began relatively late, in the mid-2010s. Uzbekistan has adopted several policies to close this gap and position itself as a potential IT hub in Central Asia. Uzbekistan ranks 81st on the 2023 NRI with a score of 44.87, reflecting a mixed performance across the four pillars. The country performs relatively well in the Technologies pillar, ranking 72nd with a score of

41.57, highlighting progress in digital infrastructure. However, weaknesses emerge in the People pillar, where Uzbekistan ranks 101st, largely due to very low performance in the "business" subindicator. Governance is another area of concern, with an overall rank of 90 driven by a particularly poor result in "Regulation" (127th). Even so, Uzbekistan shows strengths in "inclusion" under Governance, suggesting positive steps toward bridging digital divides. On outcomes, the country delivers strong results in the "quality of life" subindicator, ranking 26th, but has limited impact on the economy (110th) and on SDG contribution (111th). Overall, the data suggest that while Uzbekistan is building a foundation in technology and inclusivity, weak governance and limited economic spillovers constrain its digital transformation.

The launch of the IT Park in Tashkent aims to create an enabling environment for the production of information technology. The IT Park already has over 1,300 residents, employing over 37,000 people (as of the end of the third quarter of 2024). The number of foreign firms has grown from just 12 in 2019 to almost 200. IT Park residents currently plan to reach US$1 billion by the end of 2025. The digital connectivity for IT Park residents is world-class. To strengthen capabilities, Tashkent's IT Park also operates 200 IT centers, offers several online courses in mathematics, data science, programming, and AIand runs the Digital IT University—the first in Central Asia. Contestability is also a factor. Residents pay no value-added tax on imported ICT hardware and software. In addition, no work permits are required; investors, IT specialists, and start-up founders are eligible for IT visas valid for up to 3 years. Firms also have access to a one-stop shop helping them with tax registration, bank accounts, and office space. There are also fiscal incentives available to foreign firms. Residents neither pay corporate income tax nor make social security contributions. They also receive free rent for an office outside Tashkent for one year, free technical equipment for up to 50 employees, up to 15% salary coverage per employee, and training grants of up to 50%. Broader progress on the 3Cs can further improve the sector's prospects (World Bank, 2024d). The Government of Uzbekistan has also introduced significant updates in its broader legal framework for digital trade. These updates include the adoption of critical amendments and the introduction of laws such as the E-Commerce Law, Cybersecurity Law, and the Law on Digital Electronic Signatures, among others. These laws address vital aspects of digital services, including electronic transactions, data protection, consumer rights online, and cybersecurity, and align with international standards. These regulatory efforts position Uzbekistan as one of the regional leaders in regulatory "readiness," with some of the most advanced regulations in key areas (e.g., data protection, electronic documents, and paperless trade).

E-commerce accounts for about 4% of total trade volume. Given the current pace of development and market potential, the regulator anticipates this figure rising to 10-15% over the next five years. According to KPMG forecasts, the e-commerce market in Uzbekistan is expected to reach US$2 billion by 2027. There are more than 50 marketplaces in Uzbekistan. Their annual turnover amounts to US$300 million, and it is expected to reach US$ 1 billion by 2027 (Spot.uz, 2024). The policies in this area are expressed in the "Digital Uzbekistan 2030 Strategy." This comprehensive plan aims to accelerate the adoption of digital technologies across all sectors, improve access to digital services, and create a robust digital ecosystem. The strategy identifies key areas of focus, including e-government, digital infrastructure, education, healthcare, and IT sector development.

Uzbekistan's digital transition rests on several interconnected pillars. First is the digitalization of public administration. A broad suite of e-government platforms has been rolled out to improve service efficiency and transparency, and the country has climbed in global e-governance rankings. However, paradoxically, some tools have been applied in ways that have constrained rather than expanded personal and economic freedoms. This tension underscores the need for continued institutional reforms aimed at transparency, accountability, service orientation, and performance across government.

A second pillar is the rapid expansion of digital infrastructure. Investments are expanding broadband access, modernizing telecommunications networks, and introducing 5G in urban centers. The government aims to achieve universal high-speed internet by 2030 and narrow the urban-rural digital divide. Despite these efforts, telecommunications capacity still lags behind the pace of digitalization, constraining the growth of the IT industry. Sector performance is hampered by outdated and inefficient regulation and by market concentration, with the state-owned Uzbektelecom holding a dominant position and two of the five largest mobile operators also state-owned (World Bank, 2024d).

The third pillar focuses on cultivating the IT sector as a driver of services-led growth. The IT Park special economic zone and its regional network support startups and attract foreign investment. While the current export profile remains weighted toward business process outsourcing, higher-value products and services are gaining ground. Recent decrees promote venture financing: the UzVC Venture Fund, the Business Development Bank, and the Entrepreneurship Development Company, together with private venture funds, are tasked with launching at least 200 startup projects by the end of 2026. The Central Bank, in coordination with commercial banks, has been instructed to mobilize US$ 50 million domestically and to help secure an additional US$50 million from foreign investors.

Complementing this, the Artificial Intelligence–Based Technologies Development Strategy to 2030 targets at least 10 AI laboratories, aims to expand AI-based software products and services to US$1.5 billion, and aspires to place Uzbekistan among the top 50 countries in the Government AI Readiness Index. A pipeline of 60 AI projects is slated for 2025–2026 (Government of the Republic of Uzbekistan, 2025a).

Human capital development is the fourth pillar. Programs such as One Million Uzbek Coders seek to equip citizens—especially youth—with foundational and intermediate digital skills. Nonetheless, Uzbekistan ranks 9th of 11 comparator countries on three dimensions of digital skills. Roughly 15% of the population has basic digital skills, only about 7-8% possess standard skills, and data on advanced skills are unavailable (Gazeta.uz, 2025e). Employers frequently report gaps in graduate quality, alongside high salary expectations.

Finally, sectoral digitalization is advancing unevenly. While finance and retail sectors have achieved significant milestones, many state-owned enterprises—comprising nearly half of GDP—are still hesitant to adopt digital technologies. These entities, enjoying natural rents, market dominance, and limited performance incentives, often lack the motivation to modernize, which hampers the widespread adoption of digital technologies economy.

Some activities are being implemented at the intersection of digital and green transitions, for example, establishing new data centers coupled with building renewable energy generation capacities of 500 MW, implementing IT solutions that accompany some CSA initiatives, and digitizing the utilities sector to promote resource-saving.

The Government of Uzbekistan has tried to reduce the IT gap in regions by establishing subnational branches of IT Parks and allocating subsidies/grants to people experiencing poverty, youth, and women to study foreign languages and IT specialties. For example, the Government of Uzbekistan plans to allocate 100 billion UZS to school students' start-up ideas, with student winners receiving up to 300 million UZS (Gazeta.uz, 2025d). Furthermore, the IT sector pays very well in Uzbekistan, which is positive for those working in it. Employment in the sector is growing, and average salaries are the second highest of all occupations, at 13.15 million UZS monthly, compared to the country average of

5.36 million in 2024 (Spot.uz, 2025). Although Uzbekistan has made significant progress, some factors limit the full realization of IT-related advantages.

First, broadband connectivity quality continues to lag. Coverage of slower telecommunications technologies, 2G and 3G, is similar to that of regional peers. However, coverage of faster mobile internet, such as 4G/LTE, remains lower than in peer countries and in a broader set of countries at similar levels of per capita income. Uzbekistan is also in the bottom half of global rankings for internet speed. Tests conducted by SpeedTest rank Uzbekistan 99th for mobile speed (out of 145 countries) and 90th for fixed broadband (out of 181 countries). Mobile download speeds are low compared with other countries in the region and at similar income levels, while fixed broadband download speeds are at levels similar to neighboring countries but still fall short of the global frontier.

Second, prices for telecommunication services are lower than before but remain higher than in some peer countries and advanced economies. Telecommunication service costs in Uzbekistan were very high. Recently, prices have been decreasing, and this has been achieved without any price controls. Nevertheless, scope remains to increase affordability further. The root cause of these limiting factors is low competition in the telecom market: the market depends on the state-owned Uztelecom for international gateway access. Uztelecom has a de facto monopoly on providing international gateway access to internet providers and mobile network operators. Providers depend on wholesale prices set by Uztelecom in order to provide internet access to their customers. In 2018, the liberalization of the international gateway was identified as an objective under the Strategy on Innovation Development, but it was never realized. A lack of competition in this market is reflected in the Service Trade Restrictiveness Index scores across all service sectors. For example, fixed-line telecommunications scored 56, while mobile telecommunications scored 54. Recent World Bank (2024d) studies estimate that the communications sector could expand by 39% if contestability-focused regulatory reforms were implemented.

Third, there are factors limiting demand for IT services. First, the output shares of more services-intensive industries are relatively low. Shifting production into higher-value-added industries will increase demand for IT sector inputs. Second, use of even the most basic digital technologies in Uzbekistan is low. For example, only about 20% of low-skilled service firms use a website to communicate or transact with customers. This is lower than in all other countries in the region. It is also considerably lower than the average for its level of per capita income. The comparison with the Kyrgyz Republic is illustrative: even at a lower level of per capita income, the share of enterprises using websites in low-skilled services is as high as 60%. The use of online platforms in Uzbekistan is more consistent with its level of per capita income than the use of digital payment systems, which are extremely relevant for small retailers and other informal enterprises in low-skilled services. Because of domestic market constraints, the offshoring of global IT services can be an important source of better jobs in Uzbekistan.

Fourth, the supply of skilled workers is a key limiting factor in meeting even the existing demand. Owing to limited workforce supply, wages are currently almost equal to the EU level (Key Informant Interview, 2025). Therefore, some foreign investors are unwilling to establish joint ventures in Uzbekistan’s IT sector.

Part III: Interlinkages and Synergies of Dimensions and Transitions: A Call for Actions

Structural Deficiencies and Rentier Characteristics in CAREC Economies

A deeper understanding of socioeconomic inequality challenges in the CAREC region requires an appreciation of the structural foundations of these economies, which vary in the extent of rentierism, path dependency, and institutional weaknesses rooted in their post-Soviet economic legacies. Rentier character, defined as reliance on unearned income from natural resources or external rents rather than diversified production, has shaped both employment structures and the state's approach to welfare and labor governance across the region (Sanghera and Satybaldieva, 2021). This rentier logic has produced persistent structural deficiencies, limiting progress toward inclusive, sustainable, and decent work (Akizhanov, 2025).

Azerbaijan and Kazakhstan exemplify classic rentier states in the CAREC context. Both economies have built their fiscal and export structures around hydrocarbons, generating substantial oil and gas rents that finance state budgets and social spending (Pomfret, 2020). This has created a state-centered growth model that prioritizes revenue extraction and redistribution over economic diversification. In these contexts, the state acts as both a regulator and a major employer, leading to segmented labor markets: a relatively secure, formal public sector versus a large, informal, low-productivity private sector. Reliance on commodity rents has also entrenched fiscal vulnerability to global price shocks, discouraging private-sector innovation and high-productivity employment. While resource rents have enabled governments to sustain generous public employment schemes and subsidized social benefits, they have also reduced incentives for structural reform and the development of dynamic SMEs, one of the key engines of decent job creation. As a result, even amid high GDP growth, labor market outcomes remain polarized, with limited formal job creation and weak collective bargaining structures.

Uzbekistan's economy historically shared many of the rentier characteristics of Azerbaijan and Kazakhstan, though in a different form: state-controlled rent distribution through the cotton and energy sectors. Since the liberalization reforms began in 2016, Uzbekistan has been working to dismantle the quasi-rentier structures of the old system by opening markets, cutting subsidies, and liberalizing the exchange rate. However, the reform process has exposed institutional inertia and uneven capacity to develop inclusive labor markets. While state enterprises still dominate, the private sector is mainly expanding in low-wage services, construction, and agriculture, often through informal or semi-formal means. Additionally, although progress has been made in eliminating forced and child labor in the cotton industry, the labor system remains weakly institutionalized, with trade unions largely dependent on the government structures. Thus, the transformation away from rentierism in Uzbekistan is partial, creating a hybrid model where old redistributive institutions coexist with new market-oriented initiatives, producing contradictory outcomes for decent work.

Unlike the hydrocarbon exporters, Tajikistan and the Kyrgyz Republic exemplify external rentierism based on labor migration and remittance dependence. In these economies, remittances from migrant workers constitute between 25% and 35% of GDP. This inflow of unearned income has partially substituted for domestic job creation, enabling household survival while reducing pressure on governments to pursue active labor market or industrial policies. This form of "migrant rentierism" generates dual structural deficiencies: on the one hand, domestic industries remain underdeveloped and unable to absorb labor productively; on the other, state social protection systems are limited. Consequently, the longevity of these economies depends more on external labor demand than on domestic structural factors.

Georgia's case illustrates a distinct variant of structural deficiency, in which liberalization rather than rentierism has produced developmental constraints. The rapid privatization and deregulation of the 2000s dismantled the remnants of the Soviet industrial base and reduced the state's redistributive role. Although this model improved macroeconomic efficiency and attracted foreign investment, it led to premature deindustrialization, high informality, and weak labor institutions (Gugushvili & Meuleman, 2022). Without significant fiscal rents, Georgia's economy relies on tourism, services, and remittances, sectors that are volatile and offer limited opportunities for stable, decent employment. Labor inspection systems and collective bargaining remain underdeveloped, and fiscal constraints limit investment in education, active labor market policies, and social protection, all of which are critical for enabling green and digital transitions. Hence, while not a rentier state in the classic sense, Georgia's market-liberal trajectory has created institutional fragility that parallels rentier deficiencies in its effects on labor and inequality.

Across these six economies, structural deficiencies manifest as low economic diversification, weak industrial linkages, and underdeveloped labor-market institutions. Whether through dependence on natural resources (Azerbaijan, Kazakhstan), remittances (Tajikistan, Kyrgyz Republic), or narrow service sectors (Georgia, Uzbekistan), CAREC economies face a common challenge: their growth models have historically emphasized macroeconomic stability and revenue extraction rather than productivity upgrading and equitable labor outcomes. Over the past three decades, these development trajectories have largely positioned the countries of the region as peripheral or semi-peripheral economies within the global capitalist system, integrated primarily through the export of raw materials, low-value-added services, and migrant labor. This structural position generates a central challenge for their future development paths, particularly in the realm of redistribution and social protection, as it will significantly shape whether the ongoing green and digital transitions unfold in ways that are socially just and inclusive.

This path dependence limits the scope for integrating decent work principles into the green and digital transitions. Rentier systems tend to prioritize capital-intensive projects with limited employment spillovers, while external rent dependence and structural imbalances weaken domestic demand for skilled labor. Unless structural diversification and institutional strengthening are pursued in tandem with technological and environmental reforms, the twin-track transition risks deepening existing inequalities rather than resolving them. In this context, decent work becomes a structural reform agenda rather than a purely social policy goal. Embedding labor rights, inclusive industrial policies, and social dialogue mechanisms within the frameworks of the digital and green transitions can help shift CAREC economies from rentier and externally dependent trajectories toward productive, equitable, and sustainable development paths.

Insights and Discussions: Resolving Inequalities Through Twin-track Transitions

A major challenge in promoting decent work is the high prevalence of informal employment (Marnie, 2024). In the studied CAREC economies, informal employment accounts for a large share of the labor market, and workers do not participate in national social security programs, have no formal contracts, and lack access to occupational safety standards. Informal workers receive low wages, work longer hours, have no paid annual leave or access to skills development, and lack representation in trade unions, thereby making them vulnerable to economic shocks. Moreover, the studied countries face economic conditions that sometimes undermine efforts to ensure full formalization and decent work for all. For example, in some cases, informal workers earn more than those in the formal public sector as we discussed in the case of the Kyrgyz Republic above. Interviews and focus group discussions with national experts reveal that many view informal employment as a survival strategy for people facing poverty.

Labor emigration presents another significant challenge to promoting decent work, particularly in migrant-sending countries such as the Kyrgyz Republic, Tajikistan, and Uzbekistan (Abdulloev, Gang, and Epstein, 2020). In these countries, a predominantly male, economically active population migrates to seek better employment opportunities in the richer economies of Kazakhstan and Russia. For many households, labor emigration serves as a coping strategy, involving difficult choices that affect the labor force participation of other household members, including women, the elderly, and children. Children often take on additional household chores, and women and the elderly do agricultural work or work in local markets to compensate for the absence of male family members. Paradoxically, labor emigration reduces informal income, becoming a substitute for migrant families who lack other informal work opportunities. Furthermore, the desire to work in higher-paid low-skilled jobs in destination countries caused the "forsaken schooling phenomenon" in these countries, where young men, after completing compulsory education, often choose to migrate for low-skilled work, while young women take on domestic responsibilities--both forgoing further professional education as a result (Abdulloev, Gang and Epstein, 2024).

The countries studied also face a persistent skills mismatch–the skills and competencies provided through formal professional education often do not align with the demand of the evolving job market and employers' needs. While continuously improving the quality and equity of education remains important, weak cooperation between industries and vocational institutions exacerbates the problem. The post-Soviet privatization process led to enterprise restructuring, breaking traditional ties with educational institutions and resulting in outdated curricula and study equipment. Furthermore, vocational and technical schools suffer from low prestige among youth, often perceived as educational options for families with lower incomes and social status (ADB, 2021b).

CAREC countries' skills mismatch may further widen as new digital and green jobs require different or new skills. Workers will need to upgrade their skills or acquire new competencies to work with new technologies. Furthermore, new automation processes and the use of robotics may reduce work hours. For example, several developed countries are already experimenting with a four-day workweek, which could give workers more time for leisure and opportunities for skills training.[16]

Low labor force participation among women and youth remains a persistent challenge in achieving decent work across the studied countries. Youth unemployment is another major concern in many CAREC countries, driven by demographic trends and structural challenges. In addition, young people exhibit high rates of job discouragement—they do not actively seek employment because of perceived barriers or their belief that suitable job opportunities are absent. This high job discouragement contributes to labor emigration, as previously discussed, and to a larger share of women who are NEET (ILO, 2024b, 2024c).

A gender gap exists in labor supply across the studied CAREC countries, as observed in employment, wages, occupational segregation, and leadership representation. The informal workers are mainly female, which increases their vulnerability, as these jobs are usually low-paid and lack social protection. Access to education and finance is also disproportionately lower for women. All these factors reduce women's opportunities to participate in and benefit from the green and digital economies. There is also evidence that men's labor emigration may positively affect women's labor

[16] https://www.theworkersrights.com/companies-with-a-4-day-work-week-in-2025/

force participation decisions, enhancing their economic empowerment and decision-making (Abdulloev, Gang and Yun, 2014).

All six countries inherited extensive social protection systems from the Soviet Union that were mostly dismantled. While progress has been made toward introducing a social protection floor and expanding social pensions, significant challenges remain. Current social protection coverage remains limited for workers in the informal sector. Even when social protection benefits are available, their amounts are insufficient to provide meaningful support during times of need, and bureaucratic application processes create an additional burden for workers. Digitalization of social protection systems shows promise in addressing these issues, but its implementation is slowed by the digital divide within countries and low levels of digital literacy among their populations.[17]

While all countries maintain trade union representation for workers, informal workers' participation in these unions remains limited. This limited engagement undermines effective negotiations and cooperation with both employers and governments. Innovative approaches to organizing and representing informal workers are being used in some cases in the region and could be shared with other CAREC countries (ILO, 2025b). Strengthening independent and representative trade unions—including their capacity to organize workers in informal and precarious forms of employment—will therefore be critical for ensuring that labor interests are effectively represented in economic policymaking and in shaping equitable outcomes of structural transformations in the region.

Additionally, these countries continue to face gaps in rural-urban development. This disparity significantly restricts decent work prospects for rural communities. The studied CAREC countries face a persistent urban-rural divide, with economic opportunities unevenly distributed and rural (remote or mountainous) regions consistently lagging. People in rural areas usually face limited access to quality professional education, healthcare, and formal employment, which exacerbates poverty and pushes the economically active population to emigrate. Such geographic inequality should be considered during the two-track transition by promoting policies that promote inclusive development and social cohesion.

The countries in the CAREC region are also facing a gap in digitalization and access to new technologies. The gap exists both between and within countries (Razzaq et al., 2022). Countries with more advanced technologies can replace low-skilled labor with automation, creating reskilling opportunities and higher wages. This further increases socioeconomic inequalities between countries. During the digital transition, some population groups, such as rural residents, women, older workers, and persons with disabilities, will face limited access to technology, the internet, and digital literacy. Similarly, the benefits of the green transition may not be evenly distributed across countries, districts, and even communities. Areas with high natural endowments may see declines in traditional industries, while other regions may benefit from growth in green sectors. This disparity in opportunities may further exacerbate existing inequalities.

The accelerating pace of green transformation and technological advancements is transforming the nature of work. Automation, artificial intelligence, green skills, and the gig economy are reshaping job roles, requiring workers to adapt to new skills and competencies (Arias et al., 2025). The digital and green transitions will help increase labor productivity and create new job opportunities. However, such structural changes will also result in job displacement and losses (especially in fossil fuel extraction and carbon-intensive industries), as well as temporary unemployment, increasing

[17] For more discussion, see ILO (2025a).

inequalities between high- and low-skilled workers. Furthermore, the newly created jobs must offer stable, long-term employment.

Job displacement and job loss can lead to stress and mental health issues among workers during transitions, which can further increase socioeconomic inequalities, especially among vulnerable groups. Such fear of job loss can lead to resistance among institutions to adopting new technologies and practices associated with green and digital transitions, which may slow progress.

With digitalization, companies tend to use online platforms to attract workers for gig work. As gig economies grow in the CAREC countries, governments face policy challenges in ensuring social protection coverage, including health insurance, unemployment benefits, maternity leave, and pensions, for gig workers. Such expansion of gig economies may increase inequalities and vulnerabilities, especially during economic restructuring associated with transitions.

Furthermore, environmental vulnerabilities driven by global climate change can deepen socio-economic inequalities. Communities often face disproportionately high costs related to pollution, climate change, and resource depletion. Additionally, unregulated poor working conditions in some industries can heighten health risks and disparities. Without the integration of environmental justice principles into policymaking during transitions, marginalized communities may end up shouldering the brunt of environmental degradation, worsening socio-economic inequalities.

Despite these challenges, it is important to recognize the substantial efforts underway across the region to advance decent work. National governments are collaborating with the International Labor Organization and international development partners on multiple initiatives. These include promoting labor market formalization, improving the quality and equity of education, ensuring its relevance to evolving skill demands, strengthening collective bargaining through tripartite social dialogue, and expanding social protection coverage. Furthermore, increased ratification of ILO conventions is helping align national labor laws with international standards, thereby creating a stronger foundation for protecting workers' rights and dignity. In addition, countries may consider integrating their current policies on decent work and active labor market programs with the crucial green and digital transitions.

Such progress may benefit more from regional collaboration and sharing the best policy practices in the CAREC region. The member countries need to learn from each other's experiences in implementing effective labor and social protection policies and active labor market programs. There are good examples in the region. For example, in Kazakhstan, the Employment Platform is established to automate worker registration, helping with formalization, and ensuring better social protection.[18]

In Tajikistan, public efforts are focused on the socio-economic reintegration of returned migrants. The initiatives aim to help migrant returnees rebuild their livelihoods, formalize the professional skills acquired during overseas employment, and find employment or start their own business. Uzbekistan has introduced an innovative policy measure—the Self-Employment Tax Incentive—which imposes a 1% turnover tax on self-employed individuals (Government of the Republic of Uzbekistan, 2025b). This initiative helps formalization while fostering entrepreneurship, particularly among marginalized groups and at the grassroots level.

[18] www.enbek.kz

Emerging Policy Opportunities in Dual Transitions

The two-track–green and digital–transitions pose both challenges and opportunities for addressing socio-economic inequalities through economic and decent work policies in the CAREC region. Policymakers should capitalize on emerging opportunities to foster fair and inclusive societies by implementing targeted policy measures that address labor markets, economic institutions, and social dynamics.

The transitions driven by urgent needs for environmental sustainability and technological advancement may benefit narrow interest groups and select corporations. As explained by the Economic and Political Feedback Effect, these beneficiaries may gain disproportionate influence over policies. To ensure these transitions benefit the whole society rather than select groups, collective action is needed to mitigate the potential adverse effects of these power gains. Therefore, decent work is crucial during such transitions to safeguard inclusive development by guaranteeing workers' bargaining power and participation in policy decisions that affect their livelihoods.

Furthermore, countries want to benefit from the opportunities for advancement these transitions create. However, they face a traditional dichotomy between *efficiency* and *equity* in policymaking. To achieve necessary progress, these countries must balance promoting market efficiency with ensuring equitable outcomes for their populations. Policies that heavily support workers or certain regions (improving equity) may inadvertently distort markets or slow economic growth (decreasing efficiency). Conversely, some efficiency-focused, market-driven policies may leave vulnerable groups behind, increasing socio-economic inequality. Therefore, addressing the challenges brought by green and digital transitions requires carefully calibrated policy approaches.

This underscores the importance of the concept of decent work in achieving socio-economic equality during two-track transitions. Serving as a fundamental pillar of inclusive and sustainable development, decent work helps maintain social cohesion. Furthermore, ignoring this concept in policymaking may risk exacerbating existing disparities during these transitions. Despite these significant challenges, it is crucial to recognize that policymakers also face a unique window of opportunity. The urgency and visibility of these twin transitions provide a powerful impetus for action. Policymakers have a distinct chance to strengthen their mandates and timely adopt the policies needed to guide this shift effectively. This is not just about reacting to problems, but about proactively shaping a better future. Table 7 outlines the policy challenges and opportunities.

To prepare for possible job losses during transitions—particularly in fossil fuel extraction and other high-carbon industries—governments should prioritize developing new employment opportunities in green sectors, including renewable energy and digital industries. Technological advancements in these areas can enhance labor productivity and benefit the broader economy. As transitions create additional skill mismatches that may widen the skills gap, governments need to ensure that the national workforce has adequate skills to support the growth of new industries. To avoid the potential unemployment and socio-economic inequalities caused by skill mismatches and gaps, especially among vulnerable workers—youth and women—governments and industries should proactively invest in and contribute to national education systems, including higher, technical, and vocational education. Continuing education units should actively fund reskilling programs to equip current workers with the skills needed for future jobs in the green and digital sectors. These proactive efforts will help turn the skills gap into a skills bridge.

The digital transition is accelerating the expansion of gig economies, particularly in countries where regulations to support gig workers with essential social protections have not been established, leaving them vulnerable and insecure. Governments and international organizations are working together to expand existing labor laws and legal and social protections for gig workers as part of their formalization policies. The targeted approach can further improve the quality of jobs and security and ensure fair treatment of all types of employment, including the newly emerging ones.

Since the transition might affect different groups unevenly, vulnerable populations–including women, youth, elders, and rural workers–may find it difficult to access and benefit from opportunities in the green and digital economies. To overcome these barriers, governments should expand vocational training and educational programs specifically designed for marginalized groups, helping them gain essential green, technological, and digital skills. Additionally, to promote fairness and close the digital divide, governments should prioritize substantial investments in digital and green infrastructure, especially targeting underserved areas.

The costs of pollution and the impacts of climate change are not shared equally across groups, creating burdens for certain communities and exacerbating socioeconomic inequalities. Therefore, to ensure a just and equitable transition, governments should use distributional policies and promote investments in sustainable practices, technologies, and skills to mitigate environmental damage and create high-quality jobs in emerging green sectors. Although job losses during transitions might be mitigated but not fully eliminated, governments should use targeted policies to support both workers and institutions affected by these impacts. These policies should be developed through closer collaboration with affected communities, workers' groups, their trade unions, and businesses. This will help address specific concerns and find common ground for policies more effectively. To address the increased stress and mental health issues associated with job loss, social protection coverage should be more comprehensive, providing unemployment benefits and crucial mental health support to help workers navigate periods of change.

Table 7: Challenges and Opportunities During Green and Digital Transitions

Challenges	**Policy opportunities**
Job Displacement: Transitions may may lead to job losses, particularly in fossil fuel extraction and carbon-intensive industries.	*New Job Creation*: The transitions can create new job opportunities in green sectors (e.g., renewable energy) and digital industries, potentially increasing labor productivity.
Skills Mismatch and Gap: Workers, especially youth and women, may lack the skills for emerging roles, leading to increased unemployment and inequality.	*Skills Development Initiatives*: Investment in vocational training and reskilling programs can equip workers with the skills needed for future job opportunities in green and digital sectors.
Growth of Informal Employment: The rise of gig economies may leave many workers without social protections and rights, increasing vulnerability.	*Strengthened Labor Rights*: Expanding labor rights and protections to gig and informal workers can improve job quality and security, ensuring fair treatment.
Access Barriers: Vulnerable groups (women, youth, elders, rural population, etc.) may benefit less from the green and digital economies.	*Inclusive Education Policies*: Tailored training programs and educational initiatives can enhance access to green, technology and digital skills for marginalized groups. *Infrastructure Investment*: Investment in digital and green infrastructure, particularly in underserved areas, will help to reduce the digital divide.
Environmental Vulnerabilities: Communities may unequally bear the costs of pollution and climate change, exacerbating existing inequalities.	*Green Investments*: Promoting investments in sustainable practices and technologies can help mitigate environmental impacts while creating jobs in green sectors.

Resistance to Change: Fear of job loss and the stress associated with transitions may lead to resistance from institutions and workers.	*Stakeholder Engagement*: Fostering collaboration among governments, businesses, and civil society can facilitate smoother transitions and address concerns effectively.
Mental Health Challenges: Job displacement and uncertainty can lead to increased stress and mental health issues among workers.	*Comprehensive Social Protection*: Implementing robust social protection systems can provide support for affected workers, including mental health resources and unemployment benefits.
Powerful Rentier Interests: Entrenched political and economic elites benefiting from resource rents may resist diversification and inclusive reforms that threaten existing privileges.	*Governance and Transparency Reforms*: Strengthening fiscal transparency, enforcing anti-corruption frameworks, and linking rent revenues to inclusive green and digital investment funds can realign incentives toward equitable development and decent work outcomes.
Regressive Distributional Patterns: Resource and income concentration within urban or capital-intensive sectors widens inequality and limits the redistributive impact of growth.	*Progressive Redistribution and Local Empowerment*: Implementing progressive taxation, decentralized budgeting, and targeted social transfers can redistribute transition gains to rural, low-income, and informal workers, fostering social cohesion and shared prosperity.

Source: Authors' compilation.

Policy Discussions and Recommendations

As CAREC countries navigate the twin transitions to green and digital economies, there is a critical opportunity to shape these transformations to promote decent work and reduce inequality. This section offers forward-looking policy discussions for CAREC member countries to embed decent work principles into green and digital transitions, ensuring that no one is left behind as economies modernize and that new growth opportunities translate into real social and economic gains for all.

Integrating Re- and Pre-Distribution

To promote fairer societies through socio-economic equity, redistribution is a key concept. By taxing income or wealth, the government can redistribute funds to support essential welfare programs. The progressive income tax is an example that ensures those who earn more or have more wealth contribute more to supporting vulnerable communities and groups. However, implementing redistribution, as economic theory suggests, is not as simple as taxation, its main component, because it faces several challenges. It distorts economic decisions, creates additional administrative costs, and leads to deadweight loss by interfering with market efficiency.

As countries transition to a digital economy, the use of automation and AI is rising rapidly. This raises another concern: traditional wage taxes may make labor relatively more expensive than machines, accelerating the shift toward automation as capital tends to receive more favorable tax treatment. If this trend continues, automation and AI use could shrink the tax base derived from labor, reducing revenue from payroll and wage taxes as more and more firms substitute labor for machines. This will have a particularly severe impact on developing countries, which rely on wage taxes as a source of public revenue. These countries will struggle to fund essential public goods and comprehensive social protection systems if labor tax revenue declines.

The mechanisms for income redistribution should be strengthened to support individuals affected by economic transitions and ensure a minimum standard of living. Green taxation, such as taxes on carbon emissions and environmentally harmful practices, should be strengthened to fund sustainable initiatives. Tax incentives for businesses adopting sustainable practices and investing in green technologies should be encouraged, while transparency and accountability in tax collection and expenditure will help build public trust and demonstrate a commitment to social welfare. Targeted income support for displaced workers, such as temporary unemployment benefits and assistance, will help them manage the impacts of job loss during the green and digital transitions.

The CAREC countries should proactively adopt an integrated approach combining redistribution with proactive pre-distribution policies, as necessary, to reduce socio-economic inequality. This requires implementing progressive tax systems and funding social programs and skills development that benefit lower-income groups. Regularly revisiting living wage standards during these two-track transitions is necessary to ensure that all workers receive sufficient compensation for their basic needs, thereby reducing poverty and dependence on redistribution mechanisms such as social assistance. These CAREC governments should also increase access to capital, technology, and training for marginalized populations, micro-entrepreneurs, and farmers, thereby empowering their participation and competitiveness in green and digital economies. Additionally, governments should implement reforms in corporate governance, financial regulations, inheritance taxes, and land reform to influence the distribution of ownership and capital.

Enhancing Labor Market & Employment Policies

Socio-economic inequality can be reduced through fair and inclusive employment policies.[19] Tackling labor issues arising from transitions requires a multidimensional approach: strong labor laws, robust social protection, safety, and adaptability. Governments should prioritize ratifying and enforcing ILO conventions and aligning national labor laws with international standards to foster a more equitable labor market that ensures coverage for all workers, regardless of employment status.

As new technologies reshape labor markets, it is imperative that governments also consider labor-market and employment policies that address the future of work. Countries should continue strategically investing in emerging and future sectors, such as green industries and technologies, to create sustainable, inclusive, and equitable jobs that benefit everyone and foster long-term prosperity. Governments need to integrate environmental justice into labor policies, reinforcing workplace safety regulations and ensuring compliance to protect workers in newly emerging sectors from hazards. This ensures the green transition is just and protects vulnerable workers and disadvantaged communities. Policies must adapt to new technologies and support work-life balance through flexible arrangements that enhance quality of life. Supporting flexible working arrangements and remote work through policy can encourage the work-life balance principle, enhancing both quality of life and productivity.

Promoting Formalization & Enhancing Social Protection

During transitions, countries should continue promoting formalization and strengthening social protection. To promote formalization, simplifying business registration, offering incentives for formal jobs in emerging sectors, strengthening labor inspections and enforcing standards, and promoting participation in decision-making—empowering workers to negotiate better conditions—are important.

Formalization programs should be complemented by new green and digital skills development and robust social protection. Workers need training, which also incentivizes formalization, to become competitive in emerging sectors. Universal social protection systems are important, covering

[19] For more discussions see: Beegle et.al (2013).

healthcare, unemployment, and pensions for all workers, including those in non-standard employment—such as informal and new forms of work. This requires legal reforms, innovative financing, and fintech, especially for non-traditional workers, to ensure that vulnerabilities across all segments of the workforce are addressed and to provide a safety net during transitions.

Regulating Dynamic Markets Through Fair Competition and Support

As new markets emerge, driven by rapid innovations during the green and digital transitions, countries need to address the fundamental nature of these markets. In new markets, innovative firms often enjoy substantial profits as first movers. Economic theory holds that in contestable markets—where entry and exit are easy and no significant administrative barriers exist—initially, substantial profits will be competed down to zero as new competitors enter.

However, in practice, legal barriers may protect innovative firms by providing incentives for R&D investment. Additionally, if an innovation requires very narrowly specialized and scarce skills that are difficult for other firms to develop, initial profits for first movers can persist longer and even grow. Such dynamics can contribute to widening inequality.

To mitigate these effects, countries should ensure fair competition policies to foster dynamic markets that benefit both consumers and workers. These include antitrust regulations, which help prevent excessive market concentration by new technology companies and promote innovation and opportunities for smaller enterprises. Countries need to be cautious about new tech companies that could dominate and ensure fair competition, which, in turn, promotes innovation and creates opportunities not just for giants but also for smaller enterprises. Governments can also support startups and SMEs through grants, technical assistance, low-interest loans, mentorship programs, and access to market opportunities, further promoting innovation and job creation. Policies should specifically create pathways for these businesses to access market opportunities.

By the nature of their operations, technology firms collect vast amounts of information about their customers and suppliers. While this information can help them provide valuable goods and services, it may also create negative externalities, such as the risk of data monopolization by a few dominant players. These leading companies may amass vast datasets, raising the barrier to entry for new competitors. Privacy issues and security breaches are also major concerns. Consequently, countries must establish clear data regulations. These rules will safeguard individual privacy, enhance data security, and prevent the concentration of data power in a few firms, which could hinder competition and innovation and increase inequality.

Balancing IP, Data, & Infrastructure for Innovation & Equity

Regulating data is crucial, but it alone is insufficient to foster innovation and promote equity. A holistic approach is needed–one that balances intellectual property rights, data governance, and digital infrastructure. By adopting flexible intellectual property frameworks, countries can encourage innovation and facilitate knowledge and technology sharing, particularly in critical sectors such as green technologies, education, and public health. Open-access initiatives that make publicly funded research and technological advances available to all businesses can further maximize societal benefits.

At the same time, governments must safeguard data privacy and promote fair data use for all stakeholders. This approach prevents monopolistic practices while sustaining innovation. To achieve this, governments should implement policies that enable ethical, responsible data access for researchers, businesses, and individuals.

Finally, expanding digital infrastructure is a key enabler. Policies that improve affordable, high-quality digital connectivity, especially in underserved and rural areas, are essential to ensure universal access to broadband and devices. CAREC governments can accelerate this expansion by strengthening PPPs and international cooperation.

Driving Strong Technology Policies

As CAREC countries look toward the future, they must recognize that innovation and new technologies entail significant uncertainty and potential risks. The adoption of labor-saving technologies, such as automation and AI, may be attractive to developed countries, where low-skilled labor is significantly more expensive. These nations may implement such technologies on a larger scale to boost productivity and reduce costs.

However, rapid cross-border diffusion of technology could erode the comparative trade advantage of developing countries, which have traditionally relied on cheap, abundant, low-skilled labor. Many developing economies depend heavily on labor-intensive sectors such as agriculture and manufacturing. The widespread adoption of automation and AI will force these countries to rethink their development strategies, moving beyond reliance on low-skilled labor. Given these anticipated shifts, countries must proactively implement strong industrial and technological policies to shape future development strategies and ensure that new technologies benefit all. First, countries should promote inclusive technology policies. Innovation should not enrich only a few but must distribute benefits broadly. This requires targeted R&D investments that prioritize social welfare and environmental sustainability, along with open access to research results to maximize public benefits. Second, countries in the region must establish robust regulatory frameworks to address ethical dilemmas, privacy concerns, and labor-market disruptions caused by emerging technologies. Finally, investment policies should align with sustainable and inclusive growth by fostering a business environment that supports the green and digital transitions while promoting strong Environmental, Social, and Governance standards.

Aligning Skills Development with Green and Digital Labor Market Needs

To facilitate the adoption of effective technology policies, countries need to enhance their national education systems to provide workforces with the necessary skills to fulfill the requirements of businesses in emerging green and digital industries. Policies should focus on skills development and lifelong learning initiatives that are aligned with labor market demands, promoting collaboration between educational institutions and companies—especially in green and digital sectors—to prepare workers for the future competencies.

Efforts should focus on improving both the quality (e.g., vocational curricula and training facilities) and the equity (e.g., access for youth and women) of education and training, ensuring all groups have equal opportunities. PPPs can enhance skills matching through apprenticeships, internships, and on-the-job training programs.

Technical and vocational training, together with reskilling and upskilling efforts, are vital for preparing workers for green and digital roles, including acknowledging skills acquired through hands-on experience. Moreover, career counseling and comprehensive labor market information systems should help job seekers identify sustainable, future-focused careers by offering transparent data on employment trends and necessary skills.

Cross-Cutting: Bridging Urban-Rural Development Gap

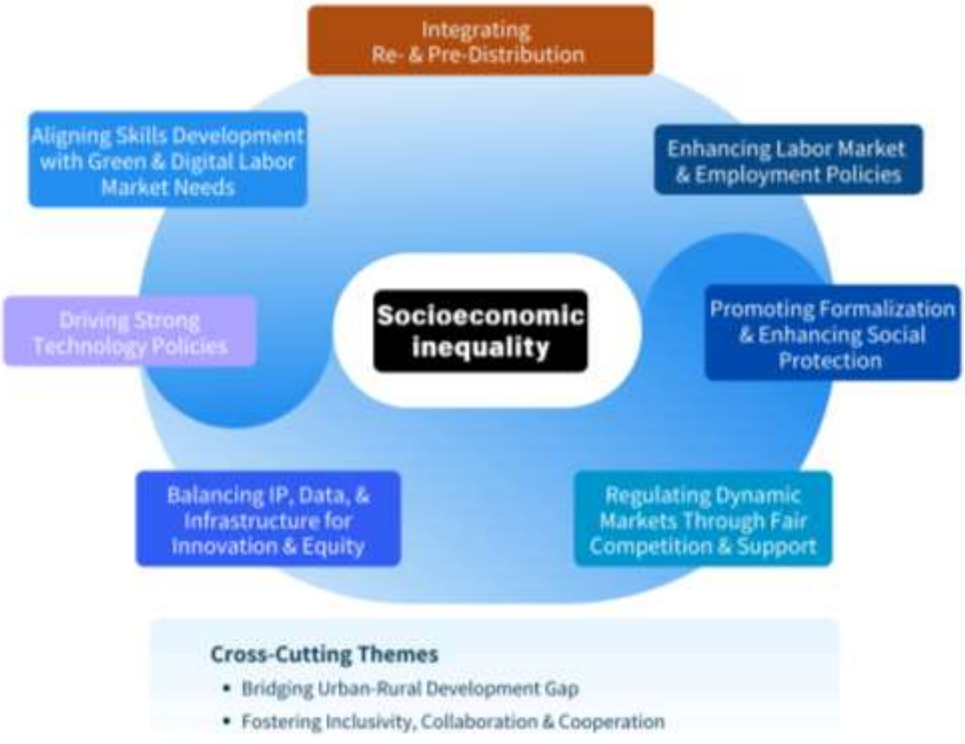
To ensure a just and fair transition for workers, the implementation of the above-mentioned policies must address the urban-rural development gap. A one-size-fits-all approach will not work across all regions; therefore, subnational policies should be tailored to meet the unique needs of areas affected by green and digital transitions. This involves targeted investments in infrastructure, capacity-building for rural workers, social dialogue, and social protection to support local economies' adaptation. Strategic investments in rural renewable energy, broadband, sustainable agriculture, transport links, and eco-tourism can generate sustainable jobs, improve food security, boost farmers' livelihoods, and increase local economic resilience. Promoting sustainable employment in rural areas can also help countries reduce migration from rural to urban areas.

Cross-Cutting: Fostering Inclusivity, Collaboration, and Cooperation

Fostering collaboration and stakeholder engagement will ensure inclusivity in policy development and implementation. Governments should facilitate ongoing dialogues with businesses, labor unions, and civil society to discuss challenges and jointly develop necessary solutions. Local communities should be actively involved in decision-making on green and digital initiatives to ensure that their needs are considered. For example, fostering inclusive labor market policies that target marginalized groups, such as women, youth, and persons with disabilities, is necessary to ensure their full participation. This includes provisions like equal pay for equal work, parental leave, and flexible working arrangements, which can be supported by tailored training programs and employer incentives. In addition, recognizing and remunerating care work would be essential for achieving gender equality in labor force participation. Strengthened tripartite dialogue mechanisms among governments, employers, and workers can help address labor market challenges in a timely and effective manner and develop policies that promote decent work during transitions.

Regional and global cooperation is crucial for sharing knowledge on best policy practices, resources, and technical expertise to effectively address transition challenges, since no single country has all the solutions. Countries should utilize regional and international platforms–such as CAREC, bilateral agreements, and global organizations–to exchange best practices, pool resources, and access expertise. This approach will strengthen the CAREC region's collective ability to manage transition challenges more effectively.

Figure 15: Recommended Policy Areas



Source: Authors' contribution.

Conclusion

As the CAREC countries navigate the multifaceted and rapidly evolving landscapes of green and digital transitions, this report underscores that placing decent work and the reduction of socio-economic inequalities at the heart of all policy initiatives is imperative. These transformational processes present significant opportunities to modernize labor markets, diversify economies, and enhance the quality of life for populations across the region. However, if access to quality employment, comprehensive social protection, and inclusive skills development is not equitably ensured, these transitions risk deepening existing disparities and marginalizing vulnerable groups.

The dual green and digital shifts provide CAREC governments with a critical opportunity to tackle socio-economic inequalities by promoting decent work principles. Through revising economic policies and fostering collaborative mechanisms at both national and regional levels, CAREC member countries can ensure inclusive economic progress that benefits all nations and communities, thereby contributing to the construction of a fairer and more equitable society. The success of these transitions will depend fundamentally on a collective commitment to align economic growth with social and economic gains for every segment of the population, especially those historically marginalized.

The green transition, essential to achieving sustainable development, brings with it significant employment and industrial challenges. Shifting toward environmentally friendly practices and low-carbon industries can lead to job displacement in traditional, carbon-intensive sectors. To mitigate such impacts, countries should proactively implement targeted reskilling and training programs tailored for vulnerable workers, enabling their smooth transition into emerging green industries and promoting sustainable livelihoods.

In parallel, the digital transition is reshaping employment structures and business models across the CAREC region. While digitalization has the potential to enhance productivity and generate new economic opportunities, it also carries the risk of exacerbating social inequalities and excluding disadvantaged populations. Addressing the digital divide is thus a top priority. Initiatives that expand digital literacy, improve equitable access to technology, and support the digital inclusion of rural populations, women, youth, and informal workers are pivotal to realizing the benefits of digital transformation.

Reforming labor legislation and strengthening labor institutions will be equally important to ensure that these structural transitions unfold in a socially just manner. Across many CAREC countries, existing labor laws and regulatory frameworks remain weakly aligned with international labor standards and often fail to adequately protect workers in emerging sectors and non-standard forms of employment. Aligning national labor legislation with ILO conventions and best practices—including stronger protections for collective bargaining, freedom of association, and decent working conditions—would provide an essential institutional foundation for inclusive economic transformation. At the same time, strengthening the institutional capacities and independence of trade unions is critical for enabling meaningful social dialogue among workers, employers, and governments. Effective and autonomous labor organizations can play a key role in representing workers' interests during green and digital transitions, helping to ensure that economic restructuring is accompanied by fair labor standards, equitable redistribution, and broader social inclusion.

Looking to the future, this report's strategic recommendations emphasize the urgent need to strengthen digital skills development, promote decent work standards, and leverage regional cooperation to manage these complex transitions effectively. Robust social protection systems play a critical role in safeguarding workers during periods of systemic change, providing the necessary support to adapt to evolving labor market demands. Moreover, fostering PPPs can stimulate innovation and mobilize investments in green and digital sectors, thereby cultivating a more sustainable and inclusive regional economy.

Ongoing dialogue and cooperation among governments, employers, workers' organizations, and development partners are essential to adapt to the changing nature of work and ensure that the benefits of the green and digital transitions are equitably shared. By prioritizing principles of equity, sustainability, and innovation, CAREC countries can co-create a future of work that not only meets the demands of a transforming global economy but also embodies shared values of fairness, social justice, and equal opportunity.

This study also identifies critical areas for further research to deepen understanding and support evidence-based policymaking throughout the CAREC region. Longitudinal labor market monitoring is vital for tracking how individuals adjust as industries evolve with digital and green technologies. Following cohorts exiting fossil fuel-reliant or low-skilled digital jobs can reveal patterns in employment trajectories, wage evolution, and vulnerabilities over time, highlighting where targeted interventions are most needed.

The structure and implications of informality and the gig economy require comprehensive investigation. Mapping gig and platform workers across the region can shed light on their earnings, labor rights protections, and access to social safety nets, illuminating gaps between policy aspirations and actual conditions. Further research should evaluate formalization pathways and their effectiveness in improving decent work outcomes. Understanding how informal workers utilize digital financial services to enhance income stability and savings could inform more inclusive economic policies.

Continuous assessment of social protection coverage and inequality measures is necessary to gauge the impact of policy interventions. Research agendas should explore extending health insurance, pension schemes, and unemployment benefits to non-standard and informal workers. Using microsimulation models, studies can analyze how various progressive tax reforms—such as carbon taxation or digital economy levies—affect household welfare and social protection systems. Tracking inequality alongside indices such as the NRI, ETI, and decent work indicators over time can provide a nuanced picture of transition impacts.

The rapid diffusion of frontier technologies, including AI, commands focused research attention. It is crucial to identify occupations most vulnerable to automation and AI substitution—particularly within manufacturing, logistics, and services—and to assess whether AI adoption amplifies skill and income disparities or leads to labor market polarization. Investigations should also monitor AI literacy levels, STEM education participation, and workforce reskilling initiatives aimed at emerging AI-driven roles. Parallel scrutiny of implications for worker rights, data privacy, and marginalized groups' access to digital services is essential.

Addressing these complex challenges demands enhanced institutional coordination, engaging ministries of labor, economy, environment, and digital development, alongside active participation from employers, trade unions, and civil society. Regional platforms like CAREC serve a pivotal function as conveners and facilitators of policy dialogue, knowledge exchange, and capacity building. Through fostering collaboration, CAREC can accelerate the harmonization of labor standards, promote cross-border trade of renewable energy, and spur development of an inclusive digital economy aligned with sustainable growth objectives.

A green and digital economy necessitates a workforce equipped with versatile new skills. Expanding high-quality education, vocational training, and lifelong learning opportunities with targeted support for youth, women, rural communities, and informal sector workers will be critical. Strengthening social protection—such as unemployment insurance, income support, and healthcare coverage—will help buffer workers impacted by structural transformations. Embedding social dialogue mechanisms ensures that reforms uphold labor rights and advance decent work principles across all sectors.

Recognizing persistent labor market disparities, policy frameworks must dismantle barriers impeding women, persons with disabilities, ethnic minorities, and other marginalized groups. Digital inclusion programs that enhance access to affordable connectivity, tailored digital literacy, and technology adoption can empower these populations. Concurrently, green jobs initiatives should be designed to facilitate equitable access and career progression, opening pathways out of poverty and reducing precarious employment.

Innovation and technology deployment ought to be aligned with sustainability and social equity goals. CAREC countries are encouraged to establish and implement policy frameworks that incentivize sustainable investments, promote resource efficiency, and enhance climate resilience. By advancing a "triple bottom line" approach that integrates economic viability, social equity, and environmental stewardship, green and digital transitions can generate widespread benefits, reinforcing the region's commitments to international climate and sustainable development goals.

Recent global shocks have highlighted the critical need to build resilient, adaptable labor markets that can withstand disruptions. CAREC countries should prioritize economic diversification, expand digital infrastructure, and enable flexible working modalities—including appropriate regulation and support for emerging forms of work like platform and gig employment. Rigorous monitoring and evaluation mechanisms should underpin policy frameworks to allow rapid and responsive adjustments to evolving labor market trends and vulnerabilities.

Going forward, strengthened technical and financial cooperation with multilateral development banks and international organizations will be indispensable for scaling best practices and mobilizing resources. Joint endeavors focused on data collection, policy research, and pilot projects can provide robust evidence for formulating sustainable and inclusive interventions. Furthermore, fostering an enabling environment for PPPs will catalyze innovation and investment in green and digital sectors.

Finally, the political economy of distributional patterns remains underexplored. Studies in this area could examine how institutional arrangements, vested interests, and governance structures shape the distribution of economic gains from both green and digital transitions. Understanding these dynamics is essential to designing policies that ensure inclusive, equitable, and sustainable development. By addressing these research gaps, policymakers and stakeholders in the CAREC region can better anticipate challenges, craft informed strategies, and ensure that the twin transitions advance both economic growth and social equity.

Finally, the CAREC region's vision for the future of work rests on an integrated, forward-looking strategy that harmonizes economic transformation with social justice and environmental protection. By embedding inclusive decent work policies within green and digital transition frameworks, CAREC countries can realize sustainable development that uplifts all segments of society, reduces inequalities, and secures enduring shared prosperity for present and future generations.

Limitations

Several limitations of this study should be considered when interpreting the research's findings. First, this study includes six of the 11 CAREC member countries. As a result, the findings may not be generalizable but rather indicative of trends and challenges that could inform broader regional insights or guide further comparative analysis across the full CAREC membership.

Second, significant data availability gaps constrained the scope of the statistical analysis, limiting the robustness of evidence-based conclusions and underscoring the need for strengthened data collection and reporting systems. Although the research team aimed to gather data as early as 1991, meaningful datasets began to emerge only in the 2000s, with substantial gaps remaining. Furthermore, cross-country comparability of data sources was limited, underscoring the need to adopt a harmonized regional approach to statistical standards across CAREC member countries.

Third, the qualitative part of the study faced some methodological limitations, mainly during KIIs and FGDs. Participants often had expertise confined to certain regions or sectors, influencing the scope of insights gathered. For example, some respondents showed detailed knowledge of industries like e-commerce and telecommunications but only provided a general overview of wider national or regional dynamics.

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Appendix A: Conceptual Framework

This conceptual framework addresses the intersection of digital and green transitions, decent work, and socioeconomic inequality. In this section, we briefly review existing frameworks before presenting our research approach.

Some approaches frame broader sustainability goals within existing economic frameworks. For example, the Triple Bottom Line Framework evaluates sustainability through three pillars: People (social), Planet (environmental), and Profit (economic). It shifts business and policy focus beyond economic growth to long-term environmental and social value creation (Miller, 2020).

Others are more comprehensive, such as the SDGs Framework, which is based on the 17 Sustainable Development Goals (SDGs). This framework provides a holistic approach to sustainability, integrating economic, social, and environmental goals. It serves as a blueprint for sustainable development, guiding policymaking and investment (United Nations, n.d.). The Capability Approach Framework is also a human-centered approach that assesses development by measuring people's real freedoms and opportunities (capabilities) rather than just economic resources. It informs policies on education, digital inclusion, and social justice (Sen, 1999).

Structural conceptual approaches focus more on broader social and economic systems and governance change. The Transition Management Framework offers a governance approach for managing long-term, complex transitions, such as the energy shift. It emphasizes experimentation, multi-level governance, and adaptive policy cycles to guide sustainability transitions (Loorbach, 2007). The Social-Ecological Systems Framework examines interactions between human societies and ecosystems, emphasizing resilience, feedback loops, and sustainability. It is widely used in climate adaptation and resource management studies (Partelow, 2018).

Other frameworks specifically examine the green or digital transition and its impact on inequality. However, they do not comprehensively integrate both transitions to offer a framework for understanding the inequality or decent-work outcomes of both. For example, the Digital Transformation and Inequality Framework analyzes how technological advancements affect economic and social inequalities. It focuses on people, connectivity, government, regulation, and the economy to ensure inclusive digitalization (UNDP, 2023b). The Green Jobs and Equity Framework examines how green jobs contribute to economic equity and workforce development, ensuring that new opportunities in the renewable energy, circular economy, and sustainability sectors are accessible to all, especially marginalized groups. The Just Transition Framework focuses on ensuring that the shift to a green economy is equitable and inclusive, protecting workers, communities, and industries affected by climate policies. It emphasizes social dialogue, reskilling, and support for displaced workers in sectors such as fossil fuels. This study draws on existing frameworks and develops an integrated, regionally specific framework for the CAREC region. It will bring together twin-track transitions (green and digital) with two dimensions of decent work and inequality. This section defines these transitions, interventions, and outcomes for this research.

Socio-economic Inequality

Socio-economic inequality refers to systemic disparities in income distribution, wealth accumulation, and access to essential resources, including education, healthcare, technology, and employment opportunities. Structural economic transformations and policy failures often exacerbate these inequalities (Cecchini et al., 2021). In the CAREC region, socio-economic disparities are particularly evident in the unequal distribution of resources between urban and rural populations and across income groups (Hasanova & Mambetova, 2020). Addressing these disparities requires targeted policies that promote inclusive economic growth, equitable access to opportunities, and social mobility.

Decent Work

Decent work is defined as productive employment that ensures equitable remuneration, safe and secure working environments, access to social protection, and adherence to labor rights. It is a cornerstone of inclusive and sustainable economic development. In the CAREC region, where informal labor dominates the economy, decent work is integral to mitigating potential labor market disruptions (UNDP, 2024a). Policies that foster vocational skill development, labor market inclusivity, and social protection are vital to equitable employment opportunities.

Green Transition

The green transition refers to the shift toward environmentally sustainable economic and social systems. It involves gradually adopting low-carbon technologies, renewable energy sources, and sustainable practices across sectors such as agriculture, mining, transport, and energy. This transition is a vital element for mitigating climate change-related risks, reducing environmental degradation, and ensuring the long-term sustainability of socio-economic systems (ETF, 2022). In the CAREC region, where environmental challenges such as resource depletion and climate vulnerabilities hinder long-term development, the green transition is a strategic imperative for fostering resilience and socio-economic stability (CAREC Program, 2024). CAREC countries could reap a "triple dividend" from investing in climate change adaptation, including avoided losses (first dividend), induced economic benefits (second dividend), and additional social and environmental benefits (third dividend).

Digital Transition

The digital transition refers to the systematic integration of digital technologies into socio-economic and governance systems. It encompasses advancements in artificial intelligence, automation, cloud computing, digital public infrastructure, and digital connectivity, which foster efficiency, innovation, and progress (European Commission, n.d.). Within the CAREC region, the digital transition offers opportunities to modernize industries, build e-governance, and enhance regional integration. Leveraging digital infrastructure can help bridge digital divides and expand economic opportunities (ADB, 2022).

Quantitative Data Sources

Social Progress Index

The Social Progress Index (SPI) is a comprehensive tool that measures a country's social and environmental performance independently of economic indicators such as GDP. Developed by the nonprofit Social Progress Imperative, the SPI evaluates how effectively nations meet their citizens' basic human needs, lay the foundations for well-being, and create opportunities for individuals to reach their full potential. The SPI comprises three key dimensions:

- Basic Human Needs: Evaluates access to essentials like nutrition, medical care, clean water, and shelter.
- Foundations of Well-Being: Assesses factors such as access to basic knowledge, information,

and communications, health, and environmental quality.
- Opportunity: Measures personal rights, freedom of choice, inclusiveness, and access to advanced education

Each dimension comprises four components, which are further broken down into specific indicators, totaling 60 indicators used to calculate the overall SPI score.

Human Development Index

The Human Development Index (HDI) is a composite measure developed by the United Nations Development Programme (UNDP) to assess and compare countries' overall well-being and development levels. Introduced in 1990, the HDI was designed to shift development analysis from purely economic indicators to a broader perspective that includes the social dimensions of human welfare. The HDI comprises three-dimensional indices, including:

- Life expectancy index: measures life expectancy at birth
- Education index: measures expected and mean years of schooling
- DNI index: GNI per capita (PPP $)

The Inequality-adjusted Human Development Index (IHDI) modifies the standard HDI to reflect how equally health, education, and income are distributed within a population. Developed using a method proposed by Foster, Lopez-Calva, and Szekely (2005) and based on Atkinson's (1970) inequality measures, the IHDI calculates a geometric mean for each dimension after adjusting for inequality. The IHDI reduces the average HDI score in proportion to the degree of inequality. When everyone in a society has equal access to resources and opportunities, the IHDI matches the HDI. However, as inequality increases, the IHDI drops below the HDI, offering a more accurate picture of human development outcomes in unequal societies.

World Inequality Database

The World Inequality Database (WID) is an extensive, open-access resource that provides data on the historical evolution of income and wealth distribution both within and between countries. Maintained by the World Inequality Lab, the database compiles and updates information contributed by over 100 researchers from nearly 70 countries. The WID includes six key indicators, including:

- Average income: per adult national income, per adult GDP
- Income inequality: top 10% share, bottom 50% share, top 1% share
- Average wealth: per adult national wealth, wealth-income ratio
- Wealth inequality: top 10% share, bottom 50% share, top 1% share
- Carbon inequality: top 10% carbon emitters
- Gender inequality: female labor income share

The WID is managed by the World Inequality Lab in Paris, France. Commonly used measures, such as GDP, are often inadequate for understanding economic welfare. Instead, the WID uses national income, which adjusts GDP by subtracting capital depreciation and adding net foreign income, as this provides a more accurate picture of the resources available to a country's residents. This is because NI accounts for the loss of capital value and income flowing to foreign owners, which GDP does not. A country may have a high GDP but relatively little income to distribute if much of its output is devoted to depreciation or to overseas investors. More importantly, GDP provides only averages and does not show how income is distributed across different social groups. To address this, the WID uses Distributional National Accounts (DINA) to track how income and wealth are distributed across population percentiles, aiming to provide data that is both meaningful and comparable across countries and over time.

There are significant limitations in measuring income and wealth inequality, as no single data source is fully reliable or complete. The aim of the WID is not to present perfect data but to clearly outline what is known and what remains uncertain. By systematically combining various sources - national accounts, household surveys, tax data, and wealth rankings - the WID strives to offer the most transparent and informed picture possible. While inconsistencies exist, especially in wealth distribution estimates, the WID approach supports a more robust public debate. All data, methods, and code are openly shared to enable further scrutiny and improvement and are available through the WID website.

Energy Transition Index (ETI)

The World Economic Forum's ETI is a comprehensive benchmarking tool that evaluates and ranks 120 countries on their energy system performance and readiness for a transition to a secure, sustainable, affordable, and reliable energy future. The ETI assesses countries based on two primary dimensions:

- System Performance: This dimension evaluates the current state of a country's energy system, focusing on three key aspects:
- Energy Security and Access: Measures the availability and reliability of energy supply.
- Environmental Sustainability: Assesses the environmental impact of energy production and consumption.
- Economic Development and Growth: Considers the role of energy in supporting economic activities and growth.
- Transition Readiness: This dimension examines the enabling factors and conditions that facilitate a country's energy transition, including:
- Regulatory Frameworks: The presence of policies and regulations that support energy transition.
- Investment Climate: The attractiveness of the country for investments in sustainable energy infrastructure.
- Human Capital and Consumer Engagement: The availability of skilled labor and the level of public awareness and participation in energy transition initiatives.

The ETI is an analytical framework for monitoring global progress toward more sustainable, secure, and inclusive energy systems. It provides insights into the effectiveness of policies and identifies areas where countries can improve to accelerate their energy transitions.

Data for all countries except Uzbekistan were available through the ETI, making it the most comprehensive source among existing energy transition indices. For the five countries with data available, full data were available for the ETI ranking, ETI level, System Performance overall, and Transition Readiness overall. Some data were missing for sub-indices, so these were excluded from analysis.

Network Readiness Index

The Network Readiness Index (NRI) is a comprehensive metric that evaluates and ranks countries by their capacity to leverage information and communication technologies (ICT) for economic and societal development. The NTI is published by the Portulans Institute and Saïd Business School at the University of Oxford. The NRI assesses 133 economies across four pillars:

- Technology: Examines the infrastructure and adoption of emerging technologies.
- People: Evaluates the digital skills and engagement of individuals, businesses, and governments.
- Governance: Assesses the regulatory framework and trust in digital environments.
- Impact: Measures the economic and social outcomes of digital transformation.

The NRI is a valuable tool for policymakers, businesses, and stakeholders to identify strengths and areas for improvement in their digital strategies, fostering informed decisions to enhance a country's competitiveness in the global digital economy.

Data for Azerbaijan, Georgia, Kazakhstan, and the Kyrgyz Republic were available for most pillars and years. Tajikistan has data only for 2016, and Uzbekistan had non available. A methodological change in 2019 meant that previous years were excluded from the final data set.

Decent Work Indicators

The Decent Work Indicators are a set of statistical and legal framework indicators developed by the ILO to assess the quality and conditions of work. They help countries monitor progress toward achieving Decent Work for All, a goal central to the ILO's mandate and the UN Sustainable Development Goals (especially SDG 8). The ILO decent work indicators cover ten substantive elements corresponding to the four strategic pillars of the Decent Work Agenda (full and productive employment, rights at work, social protection, and the promotion of social dialogue), as following:

- Employment opportunities
- Adequate earnings and productive work
- Decent working time
- Combining work, family and personal life
- Work that should be abolished
- Stability and security of work
- Equal opportunity and treatment in employment
- Safe work environment
- Social security
- Social dialogue, employers' and workers' representation

Each element includes both statistical indicators (quantitative) and legal framework indicators (qualitative). Legal indicators are presented in the policy analysis.

Data were obtained from ILO Stat from 1991 to 2024 and disaggregated by sex (male, female, and total). There were significant gaps in data availability; thus, data from 2000 onward were included in the analysis. Initially, the data were disaggregated by age, but there was too little data for any meaningful analysis, so this was excluded from the quantitative analysis and included in the qualitative data collection.

Appendix B: Youth Focus Group Discussion Schedule

Theme: Green and Digital Transitions, Decent Work, Inequality, and the Future of Work
Duration: 90 minutes

Section 1: Introduction & Warm-up (10 minutes)

- Can you briefly introduce yourself (name, age, and what you do – student, working, in training, etc.)?
- When you think about the future of work, what words or ideas come to mind?

Section 2: Experiences with Work & Digitalization (15 minutes)

- What types of jobs or work experiences have you had so far?
- How has technology (like the internet, apps, or digital tools) changed how you find or do work?
- Do you feel you have the digital skills needed for the jobs you want? Why or why not?

Section 3: Green Transition & Awareness (15 minutes)

- When you hear "green jobs" or "green economy," what does that mean to you?
- Have you seen or heard of opportunities for young people in green sectors (renewable energy, sustainable agriculture, environmental services)?
- Do you think green policies (insert country-specific policies) are creating new jobs or making it harder to find work?

Section 4: Inequality & Barriers to Decent Work (15 minutes)

- What are the biggest barriers young people face in finding decent work (fair pay, safe conditions, rights respected)?
- Do you think some groups (like women, rural youth, or young people with disabilities) face more challenges than others?
- How do digital technologies either reduce or widen inequalities among young people seeking work?

Section 5: Decent Work & Future Expectations (15 minutes)

- What does "decent work" mean to you personally?
- Have you participated in any government programs, internships, or training related to green or digital skills? If so, were they useful?
- What kinds of support or policies would help you better prepare for the future of work?

Section 6: Vision for the Future (10 minutes)

- In 10 years, what do you hope the world of work looks like for young people like you?
- What is one change you would like to see to make sure the green and digital transitions benefit all young people fairly?

Closing (5 minutes)

- Any final thoughts or issues we haven't covered that you think are important for the future of work?
- Thank you for your time – your insights will help shape better policies for young people.

Focus Group Discussion (FGD) Guide

Theme: Mid-Career Workers and the Future of Work – Navigating Green and Digital Transitions, Decent Work, and Inequality

Target Participants: Mid-career workers (aged 35-55) across various sectors and various types of employment arrangements (casual, part time, full-time, gig workers, informal workers)

Facilitator's Opening Remarks (5 minutes)
- Welcome participants and introduce the purpose of the discussion.
- Explain confidentiality – all responses are anonymous, and there are no right or wrong answers.
- Ask each participant to introduce themselves: name, occupation, years in workforce, and one word they associate with "the future of work."

Discussion Sections & Key Questions

Section 1: Current Work and Career Transitions (15 minutes)
- How would you describe your career journey so far?
- Have you changed jobs, industries, or roles due to technological changes or new business models?
- What has been the most significant challenge in adapting to changes in your industry over the past 5-10 years?
- Do you feel secure in your current job or career path, or do you see potential risks ahead?

Section 2: Digital Transformation and Its Impact (20 minutes)

- How has technology changed the way you work over the past decade?
- Have you had to learn new digital skills to keep up? If so, how did you acquire them (formal training, self-learning, employer-led programs)?
- Do you feel your employer or industry is providing sufficient support for mid-career workers to adapt to digitalization?
- What are your biggest concerns or opportunities regarding automation, AI, and digital work?

Section 3: Green Transition and Changing Work Environments (20 minutes)

- Have you noticed shifts toward more sustainable or green practices in your industry? How has this affected your work?
- Do you see new opportunities in green jobs, or do you worry about job losses in certain industries?
- What skills or knowledge do you think mid-career workers need to transition into green jobs?
- Do you feel that mid-career workers have equal access to green job opportunities, or are they more targeted at younger workers?

Section 4: Decent Work and Inequality (20 minutes)
- As work changes, what does "decent work" mean to you now compared to when you started your career?
- Have you or your colleagues' faced challenges related to fair pay, job security,

discrimination, or workplace rights due to digitalization or the green transition?
- Do you feel that mid-career workers are more or less vulnerable to workplace inequalities compared to younger workers?
- What types of social protection or labor policies (e.g., training subsidies, unemployment benefits, pension security, maternity and paternity leave) would help ensure that mid-career workers do not fall behind during the transition?

Section 5: Future Expectations and Policy Recommendations (20 minutes)

- Thinking 10 years ahead, how do you see your career evolving in the face of green and digital transitions?
- What types of training, education, or career support would help mid-career workers stay competitive?
- How can governments, employers, and trade unions better support mid-career workers during these transitions?
- If you could design one policy or program to help mid-career workers thrive in the future of work, what would it be?

Closing (5 minutes)

- Any final thoughts or concerns about how green and digital transitions will affect mid-career workers?
- Thank participants and explain how the insights will be used.

Key Informant Interview (KII) Schedule – Country Focused

Theme: Green and Digital Transitions, Decent Work Interventions, Inequality, and the Future of Work in [Country Name]

Target Respondents: Government officials, private sector representatives, workers' representatives, development partners, MDBs, experts

Duration: 60-75 minutes

Section 1: Introduction and Background (5 minutes)

- Please introduce yourself and your current role.
- What is your organization's role in shaping or supporting policies and programs related to employment, decent work, climate action, and digital transformation?
- How do you see your work contributing to shaping the future of work in [Country Name]?

Section 2: National Context and Trends (10 minutes)

- How would you describe the current employment landscape in [Country Name]?
- What key economic, environmental, and technological trends are shaping work and employment opportunities in the country?
- What are the major concerns or opportunities related to the future of work that policymakers, businesses, and workers are discussing?

Section 3: Green Transition and Future of Work (10 minutes)

- How is [Country Name] navigating the green transition (e.g., climate policies, renewable energy, green industrial transformation)?
- Which sectors do you see as most affected, either through job loss or the creation of new green jobs?
- What policies or programs are being implemented to help workers transition into greener jobs, particularly in vulnerable sectors?
- How is the green transition affecting rural areas, informal workers, and marginalized communities in [Country Name]?

Section 4: Digital Transformation and Future of Work (10 minutes)

- How is digital transformation (automation, platform work, artificial intelligence) changing employment in [Country Name]?
- Which sectors are benefiting most from digitalization, and which sectors (or population groups) are falling behind?
- How effective are current digital skills programs and policies in preparing the workforce for future digital jobs?
- Are there specific groups (youth, women, informal workers, rural populations) who are being excluded from digital work opportunities?

Section 5: Inequality and Decent Work (10 minutes)

- What are the main drivers of inequality in the labor market in [Country Name]?
- How well are policies to promote decent work (fair pay, safe working conditions, social protection, rights at work) being implemented across sectors, including in the green and digital economies?
- What challenges do vulnerable groups (women, youth, persons with disabilities, and

informal workers) face in accessing decent work in green and digital sectors?
- Are there specific programs or initiatives that have been effective in reducing labor market inequalities?

Section 6: Institutional Coordination and Policy Responses (10 minutes)
- How well are government ministries, the private sector, workers' organizations, and development partners working together to address these transitions?
- Are there any multi-stakeholder platforms, dialogues, or partnerships that help coordinate policy responses to the green and digital transitions?
- What role do international partners (ILO, UNDP, World Bank, ADB) play in supporting the country's future of work agenda?

Section 7: Strategic Vision and Recommendations (10 minutes)
- Looking ahead 5-10 years, what is your vision for the future of work in [Country Name]?
- What are the top policy or programmatic priorities that would help [Country Name] prepare its workforce for the green and digital transitions?
- What are the biggest risks or blind spots that need more attention to ensure the future of work is inclusive and fair?
- What type of support or cooperation would you like to see from development partners and regional platforms?

Section 8: Closing and Final Insights (5 minutes)
- Is there anything we haven't covered that you think is essential to understanding how [Country Name] is preparing for the future of work?
- Are there any reports, case studies, or national initiatives you would recommend we review?
- Thank you for your time — your insights will help shape a strategic framework to support inclusive, green, and digital transitions in [Country Name].

Key Informant Interview (KII) Schedule – CAREC Focus

Theme: Green and Digital Transitions, Decent Work Interventions, Inequality, and the Future of Work in the CAREC Region

Target Respondents:

- Government officials (Ministries of Labor, Economy, Environment, Digital Development)
- Employers and business associations
- Workers' representatives (unions)
- Regional offices of MDBs (ADB, World Bank)
- Development partners (UNDP, ILO, etc.)
- Experts/researchers working on labor, environment, digital economy, and social policy

Total Duration: 60-75 minutes

Section 1: Introduction and Background (5 minutes)

- Please introduce yourself, your role, and how your work relates to employment, economic development, green transition, or digital transformation.
- What is your organization's involvement in policy development or program delivery in the CAREC region?
- How do you see your work contributing to shaping the future of work in the region?

Section 2: CAREC Regional Context and Trends (10 minutes)

- How would you describe the current labor market trends in your country/sector, particularly in relation to climate change, digital transformation, and economic diversification?
- What regional cooperation efforts within CAREC (or with other regional bodies) are influencing labor markets, green jobs, or the development of the digital economy?
- Are there specific regional challenges in aligning economic development, social inclusion, and environmental sustainability?

Section 3: Green Transition and the Future of Work (10 minutes)

- How is the green transition affecting jobs and industries in your country/sector?
- What types of green jobs are emerging, and in which sectors (energy, agriculture, transport, etc.)?
- How is your government, organization, or sector preparing workers and employers for these changes?
- Are there cross-border issues (e.g., water management, renewable energy trade) that are shaping the green transition in CAREC countries?

Section 4: Digital Transformation and the Future of Work (10 minutes)

- How is digital transformation affecting employment, work processes, and business models in your country/sector?
- Which sectors are seeing the fastest digital adoption, and where are the biggest digital divides?
- What national or regional programs exist to improve digital skills and digital inclusion, particularly for rural populations, women, and youth?
- How are CAREC cooperation mechanisms supporting digital economy development?

Section 5: Decent Work, Social Protection, and Inequality (10 minutes)

- What are the biggest inequality challenges related to employment in your country/sector (urban-rural divides, informal employment, gender gaps)?
- Are policies to promote decent work (fair pay, safe working conditions, rights at work, social protection) keeping pace with green and digital transitions?
- Which groups (youth, women, migrants, informal workers) are most at risk of exclusion from future work opportunities?
- Are there any promising regional initiatives or policy dialogues in CAREC that address inequality and decent work?

Section 6: Institutional Coordination and Regional Collaboration (10 minutes)

- How well are national ministries, employers, workers' groups, and development partners coordinating to address green and digital transitions and their impacts on work?
- What is the role of CAREC as a platform to promote policy learning, capacity building, or investment in green and digital jobs?
- Are there regional best practices (from CAREC or neighboring regions) that could be adapted to manage these transitions better?

Section 7: Future Vision and Strategic Recommendations (10 minutes)

- Looking ahead 5-10 years, what does a just and inclusive future of work look like for the CAREC region?
- What are the top 3 policy priorities to future-proof the workforce and ensure the green and digital transitions promote inclusive, decent work?
- What specific types of regional cooperation could help CAREC countries better manage the future of work challenges?
- What role do you see for multilateral development banks (ADB, World Bank) and development partners (ILO, UNDP) in supporting these priorities?

Section 8: Closing and Final Insights (5 minutes)

- Is there anything we have not covered that you consider essential for understanding how CAREC countries can navigate green and digital transitions while ensuring decent work and reducing inequalities?
- Are there specific reports, case studies, or initiatives you recommend we review?
- Thank you for your time. Your insights will directly inform a strategic framework for the CAREC region.

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