

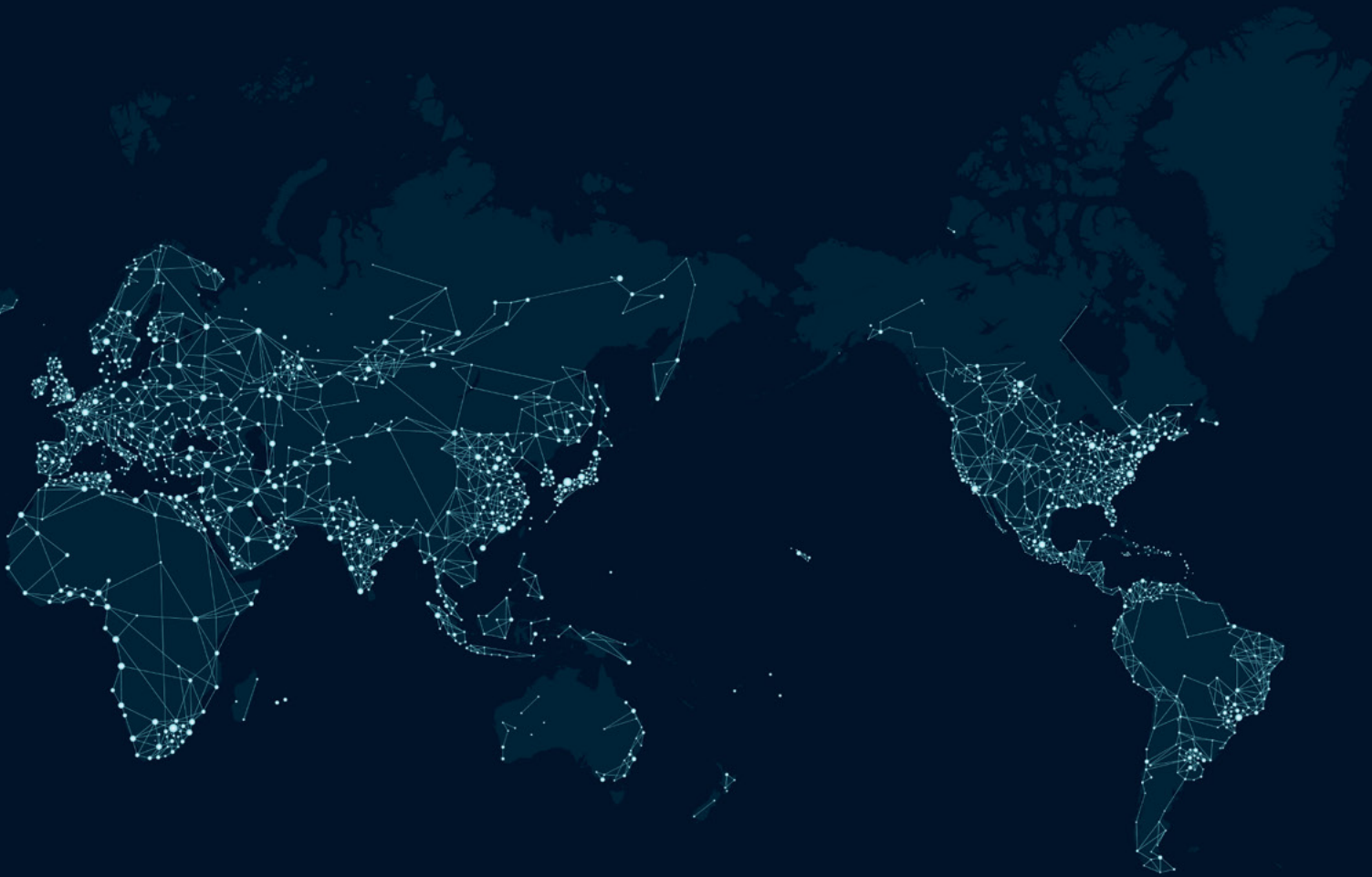
Global Future Council on
the Future of Job Creation



Leveraging Technology Investment for Good Job Creation in Middle-Income Countries

BRIEFING PAPER

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Introduction

This paper highlights the importance of creating good-quality economic opportunities in middle-income countries. It makes the case that harnessing the opportunities of frontier and emerging technologies is a pivotal investment opportunity. It also argues that digital transformation strategies should not be separate from job creation strategies, calling for a whole-of-government approach in collaboration with social partners. The paper concludes by providing examples of where innovative use of technology has led to good job creation in middle-income countries.

This paper marks the concluding milestone of the [Global Future Council on Job Creation](#), building on its previous briefing paper, [Key Issues Shaping and Driving Global Job Creation](#).

The Council is part of the World Economic Forum's [Jobs Initiative](#), which promotes quality employment opportunities for all. This effort addresses the challenges posed by ongoing labour market disruptions and emerging industry talent needs.



The jobs challenge for middle-income countries

In 2023, the global jobs gap reached [nearly 435 million](#). While unemployment rates have fallen to their lowest levels since the COVID-19 pandemic, low- and middle-income countries continue to experience notably [low labour force participation](#). This is particularly the case for women, whose [labour force participation rate is generally lower in middle-income countries](#) than in the poorest or richest countries. At the same time, the [working-age population is increasing](#) in many of these countries.

Without concerted job creation efforts, the burgeoning population may face a shortage of economic opportunities, posing challenges to stability and prosperity. Additionally, many middle-

income countries face slower economic growth than countries at other levels, despite contributing [40% to global economic output](#), leaving many countries with [job stagnation](#). This is often referred to as the middle-income trap.

Addressing these trends requires a strong focus on creating high-quality economic opportunities, supported by partnerships from high-income countries. Expanded economic opportunity worldwide strengthens global security in the face of geopolitical challenges, fosters emerging markets, and supports a transition towards sustainable, green growth and raising living standards. Collaborative approaches across sectors and borders are essential to bridge these gaps.



Risks and opportunities of emerging and frontier technologies for middle-income countries

In assessing opportunities and risks for labour markets, one trend holds particular significance: the rapid development and adoption of emerging and frontier technologies. The pace of technology development is [faster than ever](#), particularly in the field of artificial intelligence (AI), which has rapidly [expanded over the past two decades](#).

Recent innovations, such as generative AI, are poised to have a [large-scale impact](#) on the global workforce, likely augmenting rather than replacing jobs. However, less developed countries are [facing challenges](#) in leveraging these emerging technologies. Poor telecommunications and digital infrastructure mean that technological advancements are often hard to absorb, while weak labour market institutions make it difficult to adapt to change and prevent growing inequalities. This can prevent some less-equipped countries from engaging proactively with emerging technologies.

The International Telecommunication Union (ITU) finds that only [half of the world's economies](#) have implemented a cross-sectoral digital policy or strategy. Yet, failure to take a proactive approach to technology development and dissemination risks [deepening inequalities between countries](#), particularly in economies that lack diversification. Innovative use of technology can enable countries to leapfrog certain development stages, addressing complex issues such as building resilient supply chains and preparing for the green transition.

Conversely, where countries have implemented a digital or technology strategy, it is often separate from a job creation strategy. As a result, growth driven by technology adoption may not necessarily be job-creating and may even cause job displacement, [local inequality and resource depletion](#). To avoid these pitfalls, technology development and deployment must be integrated with job creation efforts.



How technology can support good job creation in middle-income countries: Three key investment areas

In this context, the Global Future Council on Job Creation set out to explore a critical question: Which investments can boost the creation of good jobs in middle-income countries amid the rapid proliferation of emerging technologies?

The Council drew on the latest insights on job creation to answer this question and identified three broad investment areas: instigating structural transformation, promoting agency and awareness, and creating resilience.

Structural transformation involves driving demand for work and establishing the right conditions for enterprises to prosper. Enhancing agency and awareness means building individuals'

capacity to realize their potential while creating a talent pipeline for emerging roles. Strengthening resilience focuses on developing systems that support sustainability and stability amid shocks and changes.

This model serves to move away from a purely investment-focused approach to one of [infusion and innovation](#), emphasizing local capacity building and long-term growth.

These three broad areas of action can each be broken down into five distinct areas of focus, encompassing both foundational and innovative approaches to boosting job creation. The actions are interlinked, amplifying each other's impact.



Structural transformation

Stimulating demand and creating the conditions for businesses to thrive



Agency and awareness

Increasing capacity for individuals to fulfil their potential



Resilience

Protecting workers against shocks and changes

Job creation as an explicit goal

Adequate funding and multistakeholder partnerships

Hard infrastructure	Upskilling, reskilling and newskilling	Formalization
Data infrastructure	Clear pathways to work	Social dialogue
Favourable business environment	Employer-employee matching	Social safety nets
Policies and mechanisms for collaboration	Business to business learning	Portable benefits
Strong education institutions	Access to digital and technological devices and tools	Good work agendas from the private sector

To make decisions that result in good job creation and evaluate outcomes, good job creation needs to be set as an explicit goal rather than a secondary objective or a positive externality. Furthermore, sufficient funding and multistakeholder partnerships are principles for sustaining progress.

The sections below provide details about each of the key actions, drawing on examples of where technology can play a role in driving good job creation.



Structural transformation

Hard infrastructure refers to the physical structures and facilities that are essential for the functioning of an economy. In particular, information and communications infrastructure is key to [increasing countries' "readiness"](#) to take advantage of technologies, enabling them to leapfrog previous innovations and improve productivity and livelihoods. For example, the Digital India campaign developed digital infrastructure that connected rural areas with high-speed internet networks, enabling digital payments and resulting in an [unprecedented surge](#) in the digital economy.

Robust infrastructure also enables countries to benefit from AI. Research from the [World Bank](#) shows that middle-income countries have disproportionately high adoption of generative AI relative to their economic scale, contributing to more than 50% of global traffic, but that poor digital infrastructure causes disruption to online traffic patterns that can prevent users in these countries from harnessing its full potential.

Data infrastructure refers to the systems and technologies needed to manage data. It facilitates decision-making and harnesses AI opportunities in different countries. In recent years, many countries have been able to leverage data to create data-informed job strategies, such as Singapore's [SkillsFuture Program](#). But this is often a challenge in many middle-income countries due to limited resources. Governments can support creating a robust national data infrastructure by setting up dedicated data observatories that include blue-collar, white-collar and informal local jobs; countries with more advanced data capabilities can assist nations to enhance their data capabilities.

A favourable business environment is crucial for attracting investment, spurring innovation, fostering competition and contributing to economic growth. A key enabler for creating a favourable

business environment is reducing red tape, as well as implementing transparency and anti-corruption measures to encourage investment and create long-term policy certainty. For example, Estonia's support for innovation and creation of a favourable regulatory environment led to a flourishing tech sector and startup ecosystem, with companies such as Bolt, Wise and Skype originating in Estonia, [driving growth and economic impact](#).

Policies and mechanisms for collaboration are necessary for realizing the inter- or intra-regional trade and investment opportunities that a favourable business environment enables, opening access to wider markets and creating spillovers that can create jobs. However, much of international trade [relies heavily](#) on paper-based transactions, creating inefficiencies and stifling the inclusion of small and medium-sized enterprises (SMEs). Technology can [improve the efficiency, security and transparency](#) of trade opportunities by harmonizing systems and policies, increasing collaboration between regulators and developers, and promoting equality and access.

Strong education institutions are vital for the job-creating growth of societies and economies, as they provide foundational preparation for the future workforce. The problem-solving skills learned at an early age form the basis of more specialized skills needed for a knowledge-based economy, supporting industry diversification. Digital tools can enhance this acquisition of skills. For example, Kenya's Digital Literacy Programme set out to introduce primary schools to digital technology and communication and provide schools with ICT infrastructure. [As a result](#), a range of jobs was created in ICT support centres in participating counties, absenteeism was reduced as students became inspired to pursue technology-related careers and Kenya's global profile was raised as an ICT hub.



Agency and awareness

Upskilling, reskilling and new-skilling activities are essential for raising the floor of the local skills base amid high labour market churn. Rather than being a one-off, upskilling should be a continuous effort, supported by a mindset of lifelong learning. [Critical human-centric skills](#) can help workers remain adaptable to the introduction of new technologies and [standardized skills accreditations](#) and taxonomies can ensure skills meet business demands. Technologies themselves can support upskilling. For example, one study by the International Finance Corporation showed that [one job is created for every 30 learners trained online](#) in Egypt, India, Mexico and Nigeria.

Clear pathways to work help ensure that upskilling efforts result in labour market participation. This can be best achieved through dedicated training institutes sponsored by the public and private sectors, or through apprenticeships. Digital platforms and tools can ease the apprenticeship process through learning management systems to monitor progress and provide real-time feedback and credentialing systems to reduce administrative overhead.

Work opportunity matching helps to connect workers with jobs. Job-search assistance can connect the demand for skills with the supply of talent in the labour market, particularly for web-based work, which is [rapidly rising](#) in middle-income countries. For example, X-Giants International, in collaboration with Yihaozhichang and Alipay, [launched](#) Job Machine I – a Chinese employment service that supports the swift matching of workers in rural areas to short-term employment opportunities in cities, employing facial recognition technology

and bypassing the need for a resume. While this approach can decentralize economic opportunity and revitalize rural areas, measures should be put in place to mitigate privacy concerns, algorithm bias, data security and other legal and ethical issues.

Business-to-business learning is a cornerstone component for business expansion, particularly for SMEs. As a lack of information can prevent SMEs from remaining competitive and succeeding, creating linkages with more established companies can support SMEs to adopt practices to satisfy the standards in line with market needs. For example, social innovator RECODE partnered with Microsoft and Accenture to develop a curriculum that [equips vulnerable youths with AI skills](#) to democratize generative AI education in Rio de Janeiro's favelas.

Access to digital and technological devices and tools is increasingly an indispensable aspect of job creation. The growing widespread availability of mobile phones has been transformative in driving change in middle-income countries. The use of mobile payment technology has been shown to [support entrepreneurial growth](#) by being safer for entrepreneurs than cash, and in particular supporting [female entrepreneurship](#). It has also supported the growth of the platform economy in middle-income countries such as the Philippines, where [estimates place the number of platform workers at 1.5 million](#). This can address unemployment and underemployment, drive economic activity, and support and supplement the livelihoods of those who may lack traditional job options or prefer more independent, flexible work in rapidly urbanizing middle-income economies.



Resilience

Formalization responds to the high instances of economic activities that are insufficiently covered by formal arrangements. It can include the promotion of formal work contracts, taxation, and regulation of working conditions and wages, including through collective bargaining. This is particularly important for women, who are [less likely to work in formal employment](#) and are often paid less than men. Formalization can provide security, protection and stability and promote inclusivity and equity for workers in the age of technology.

Social dialogue can create an enabling environment for sustainable enterprises, ensuring fair wages and good working conditions. Collective bargaining – negotiations between employers and worker representatives to agree on terms of employment – can reduce inequality by raising

wages and benefits more for low-wage earners than those with higher pay. Social dialogue is particularly important in the age of technology, [addressing potential job losses caused by AI](#), ethical uses of technology and technology-driven inequality.

Social safety nets enhance labour market resilience by setting minimum standards for pay and protections, including income support during times of job transitions. By protecting individuals and families during challenging times, these safety nets contribute to a more adaptable, inclusive, and stable labour market, ultimately fostering sustainable economic growth. For example, a [2022 bill in Chile](#) incorporated platform workers into the government's healthcare and pension scheme and introduced both minimum earnings and maximum hours requirements.

Portable benefits are work-related benefits that are not tied to a single employer but instead travel with the worker as they move between jobs, employers, or even different types of work arrangements. With workers changing jobs at a higher frequency, portable benefits can help workers carry their benefits over when they change jobs or work in multiple positions, and can also [support independent and platform work](#).

Good work agendas from the private sector can accelerate job quality outcomes and lead to a more equitable and robust workforce that is resilient to changes caused by technology. For example, the [Good Work Alliance](#) mobilizes a group of forward-looking companies to

benchmark, promote and partner for good work, as well as showcase success stories. [Good Work Frameworks](#) can bring together a common understanding of job quality and commitments from C-suite leaders can inspire change across industries.

Each of these steps represents vital actions to create a good jobs ecosystem by leveraging and responding to the mass adoption of emerging and frontier technologies.

The final section of this briefing paper examines innovative examples of how these actions can come together to drive good job creation through investments in technology.



Innovative examples of countries driving good job creation with technology

Investing in physical infrastructure to build a semiconductor industry

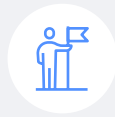
Semiconductor manufacturing is estimated to become a [\\$1 trillion](#) industry by 2030, and many middle-income countries are poised to benefit greatly from this boom. Africa, for example, contains [around one-third](#) of the critical minerals necessary for semiconductor manufacturing. Establishing a

strong semiconductor ecosystem would not only provide local jobs for STEM graduates, but also provide downstream economic opportunities, contributing to a resilient global supply chain that benefits both the local economy and its international partners.

Several actions are key to driving good job creation through technology infrastructure investment, including:



Structural transformation: investing in electricity, power grids, manufacturing plants and other necessary hard infrastructure; fostering a consistent and predictable political and business environment to attract investment and facilitate knowledge exchange from global players. To maximize local gains, overall internet connectivity and bandwidth for the population should not be compromised, but enhanced.



Agency and awareness: forging investment agreements (such as [Kenya's agreement with the United States](#)), fostering collaborations between research centres, local universities and established firms, building a robust supply of talent with [chip manufacturing skills](#) and applying appropriate [industrial policy](#) to reap the benefits of local job creation and economic growth.



Resilience: As jobs in the semiconductor industry have been found [in some cases](#) to have low pay and unsafe conditions, governments and businesses would need to take steps to ensure job quality to protect workers and make the industry more sustainable, including implementing a good work agenda and supporting collective bargaining.

Investing in technology to promote the green transition

Investing in technology to drive the green transition offers a dual advantage: it supports economic growth while addressing environmental challenges. By fostering innovations in renewable energy and eco-friendly products, such investments create new industries, jobs and market opportunities, particularly in regions that need them most. At the same time, they reduce carbon emissions and promote resource efficiency, ensuring a healthier planet for future generations.

For example, technology and financial services company [M-Kopa](#) in Kenya leverages solar technology to provide affordable, off-grid electricity to rural households, improving access to energy while reducing reliance on costly and polluting fuels. By expanding solar infrastructure, M-Kopa also focuses on creating jobs across distribution, installation and customer service, fostering economic opportunities in underserved communities.

Several actions are key to driving good job creation through investment in green transition technology, including:



Structural transformation: Investing in solar technology and systems that include lights, as well as radios and phone chargers for off-grid households; investing in IoT technology to enable remote monitoring and control; green trade agreements, tax incentives and financing tools that reduce costs for clean energies.



Agency and awareness: Investing in green skills ([defined](#) by the United Nations Framework Convention on Climate Change as technical knowledge, expertise and abilities that enable the effective use of green technologies and processes in professional settings); apprenticeships to bridge green skills initiatives with employment opportunities.



Resilience: Social dialogue to include workers in the process of transition and employment guarantees in green development projects; wage subsidies and income support throughout the transition; risks mapping to understand risks of mitigation action (see: [Economic Equity Framework](#)).

Investing in technology to upgrade a traditional sector – agriculture

Agriculture is a dominant sector in many middle-income countries and contributes a significant amount to GDP, [particularly in Africa](#). However, agriculture is a fragile and volatile sector due to weather and climate dependency, the outbreak of pests and diseases, price fluctuations and long production cycles. This makes countries that are dependent on agriculture highly vulnerable to both natural and market-driven shocks. New innovations in technology can help reduce sector vulnerability and provide new opportunities. For

example, Benin has around 200,000 smallholder cashew farmers, contributing 15% of national export earnings, making the cashew industry a key economic priority for Benin. However, a lack of data on cashew cultivation hampers decision-making to boost production. Using advanced satellite imagery, deep learning algorithms, and ground datasets, researchers created the first national map of cashew plantations in Benin, [causing cashew cultivation to nearly double](#) between 2015 and 2021.

Several actions are key to driving good job creation through upgrading the agricultural sector with technology, including:



Structural transformation: Investing in GPS-guided machinery, drones, sensors and IoT devices to monitor soil conditions; investing in big data and AI to analyse weather patterns; investing in automated machinery, such as harvesters and seeders.



Agency and awareness: Creating public-private partnerships and unlocking funding for agricultural innovation centres; increasing access to and accessibility of mobile apps, SMS services and e-wallets to track market information, view weather forecasts and access financial services; promoting digital skills.



Resilience: Financial support such as subsidies and low-interest loans for workers to purchase or lease agricultural technology; regulations to prevent unfair pricing or restrictive agreements by oligopsonistic agri-tech companies; targeted programmes to ensure access to tech resources for marginalized groups.

Applying digital tools to build a digital jobs economy

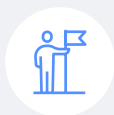
Technology has been instrumental in supporting the expansion of a global digital jobs economy, where platforms operate seamlessly across borders, linking workers in middle-income countries with clients and employers worldwide. Platforms like Turing from India and Workana from Argentina make it possible for skilled individuals to offer their services internationally, with digital tools enabling everything from

remote collaboration to secure payment processing. This cross-border capability not only [increases employment opportunities](#) for workers in middle-income countries, but also fosters a more inclusive global labour market, allowing talent to participate in the digital economy regardless of geographic location. This brings both local and global opportunities, an example of [glocalization](#).

Several actions are key to driving good job creation through the digital economy, including:



Structural transformation: Investing in suitable information and communications infrastructure as well as high-speed internet; building a robust data infrastructure that can facilitate interoperability between platforms across borders.



Agency and awareness: Increasing access to technological devices and offering training in digital skills, as well as essential soft skills like [virtual intelligence](#). Increasing awareness about tax legislation to enable workers to work remotely.



Resilience: Creating agreements with unions to avoid deteriorating working conditions; incorporating systems to manage wage fairness in light of wage differentials between countries.

Conclusion

Good job creation must remain a priority, especially as evolving trends reshape economies and labour markets. This briefing paper highlights three key pillars of action that can drive the creation of quality jobs, ensuring economic growth that is both inclusive and sustainable. Central to this effort is the transformative role of

technology, which can be leveraged to build a robust good jobs economy while preparing societies to thrive in the intelligent age. By aligning job creation strategies with technological advancements, countries can foster resilience and opportunity in a rapidly changing world.



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The Global Future Council on the Future of Job Creation examines the global trends that are presenting challenges and opportunities

for labour markets in advanced and emerging economies over the coming decade, and explores how investments and incentives can prioritize good quality job creation in the local and global marketplace at scale.



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