Developing Nations in the 21st Century

Transformations, Challenges, and Pathways to Sustainable Growth

Abstract

Developing nations in the 21st century have undergone profound changes amid accelerating globalization, technological advances, and evolving policy paradigms. This paper provides a comprehensive analysis of the transformations and challenges facing developing countries – with a special focus on Africa – and outlines pathways to sustainable and inclusive growth. We review **economic transformation** trends, highlighting both robust growth and persistent structural weaknesses, and examine **societal development** progress in areas such as education, health, and poverty reduction. We explore how many low- and middle-income countries are **leapfrogging technologically**, adopting digital innovations to overcome infrastructure gaps, and we assess efforts at **structural modernization** through industrial policy and diversification. Key thematic sections analyze **demographic dynamics** (e.g. rapid population growth and urbanization), **industrial policy and structural change** (including the return of industrial strategies and the risk of premature deindustrialization), **digital transformation** (mobile technology, internet access, and innovation), **urbanization** (the rise of mega-cities and urban challenges), **climate and sustainability constraints** (climate change impacts and green growth imperatives), **human capital development** (education and health systems outcomes), and **financial inclusion** (the expansion of banking, mobile money, and poverty reduction strategies). Across these themes, regional nuances are emphasized – particularly Africa's trajectory, which features the world's fastest population growth and some of its toughest development hurdles. Drawing on global data sets, academic literature, and development policy frameworks (from the *Millennium Development Goals* to the *Sustainable Development Goals* and Africa's Agenda 2063), we ground the analysis in evidence. We find that while the 21st century has seen **remarkable progress** – such as a dramatic fall in extreme poverty globally and improvements in health and education – developing nations continue to face **multidimensional challenges** including incomplete economic structural transformation, climate vulnerabilities, governance and institutional capacity gaps, and rising inequality. The paper concludes with future projections and policy pathways for sustainable and inclusive development. These include harnessing the demographic dividend through investments in education and jobs, promoting industrial diversification and digital innovation, strengthening institutions and governance, expanding social protection and financial inclusion, and securing climate resilience. Achieving sustainable

growth will require integrated strategies and global cooperation, but with the right policies, developing regions – especially Africa – can make decisive strides toward inclusive prosperity in the coming decades.

Introduction

The turn of the 21st century marked a pivotal era for developing nations. After decades of mixed development outcomes in the 20th century, the new century began with renewed optimism fueled by globalization, technological diffusion, and international development initiatives. The launch of the **Millennium Development Goals (MDGs)** in 2000 galvanized global efforts toward reducing poverty, improving health and education, and spurring development. Over the past two decades, many developing countries have experienced **rapid economic growth** and social progress, fundamentally transforming their economies and societies. At the same time, deep-seated challenges and new constraints – from persistent inequality and fragile institutions to climate change – have become more apparent. This paper examines the broad trajectory of developing nations in the 21st century, analyzing the transformations achieved, the ongoing challenges, and the potential pathways to **sustainable and inclusive growth**.

Crucially, we pay **special attention to Africa**, a continent of 1.4 billion people that encapsulates both the hopes and hurdles of 21st-century development. Africa has been home to some of the fastest growing economies in recent years and has a young, rapidly expanding population, yet it also accounts for a large share of the world's extreme poor and faces structural constraints. The analysis, however, is global in scope – encompassing Asia, Latin America, and other parts of the developing world – to compare regional experiences and highlight Africa's unique context within that global landscape.

The paper is structured as follows. First, we provide a brief **literature review** of development economics perspectives relevant to 21st-century challenges, from classical theories of structural transformation to contemporary research on institutions and innovation. Next, we present an **overview of macro and micro development trends** since 2000, including economic growth patterns, poverty reduction, and changes in development policy approaches. We then delve into key **thematic sections** that shape development outcomes today: (1) **Demographic dynamics**, examining population growth, age structure, and implications for a demographic dividend; (2) **Economic transformation and industrial policy**, analyzing structural change, industrialization (or the lack thereof), and strategies for modernization; (3) **Technological leapfrogging and digital transformation**, assessing how developing countries are adopting new technologies and the digital economy; (4) **Urbanization and urban development**, evaluating the rapid growth of

cities and the opportunities and challenges they bring; (5) **Climate change and sustainability**, discussing environmental constraints on development and the need for climate adaptation and green growth; (6) **Education and health systems**, reviewing progress and gaps in human capital development; and (7) **Financial inclusion and poverty reduction strategies**, exploring the expansion of financial services, microfinance, and social policies aimed at lifting people out of poverty.

Throughout these sections, we incorporate **regional differentiation** – noting, for example, how East Asia's industrial boom contrasts with deindustrialization risks in parts of Africa, or how Latin America's urbanization and inequality dynamics differ from South Asia's. We also consider **institutional capacity** and governance in each thematic area, recognizing that effective institutions are a cross-cutting prerequisite for development success. The paper draws on *up-to-date data and evidence* from global datasets (e.g. World Bank, UN agencies) and policy reports, ensuring the analysis reflects the current state of development.

Finally, we provide a **conclusion** with forward-looking insights. We discuss future projections – such as population and economic forecasts to 2030 or 2050 – and articulate policy pathways for achieving sustainable, inclusive development. These pathways align with international frameworks like the **Sustainable Development Goals (SDGs)** and Africa's **Agenda 2063**, emphasizing strategies like investing in human capital, fostering innovation and industrial diversification, strengthening governance, and mobilizing financing for development. The conclusion underscores that while developing nations have made enormous strides in the early 21st century, concerted policy action and global cooperation are needed to overcome the remaining challenges and ensure that growth is both **sustainable (environmentally and fiscally)** and **inclusive** (benefiting all segments of society).

Literature Review

Development economics offers a rich body of theory and evidence to contextualize the transformations of the 21st century. Classical economists like Arthur Lewis (1954) emphasized **structural change** – the reallocation of labor from traditional agriculture to modern industry – as the engine of development. Walt Rostow's mid-20th-century "stages of growth" model similarly envisaged poor countries industrializing to achieve "take-off." By the late 20th century, however, many developing nations had struggled to industrialize as expected, leading to new theories that stressed **institutions**, human capital, and technology. For instance, institutionalists such as Douglass North and more recently Acemoglu and Robinson (2012) argue that inclusive political and economic institutions are fundamental to long-run development, explaining divergent outcomes between nations. This institutional perspective is particularly relevant in the context of governance challenges faced by many developing countries (e.g. corruption, weak state capacity, conflict).

In the 1980s and 1990s, the prevailing policy prescription – often termed the **"Washington Consensus"** – emphasized free markets, privatization, and reducing the role of the state. Some successes (like in East Asia) and failures (like stagnation in parts of Africa and Latin America) of that era prompted re-evaluation. By the 21st century, there has been a cautious **revival of industrial policy** and a recognition that governments can play a proactive role in guiding development, provided policies are well-designed. This shift is evidenced by the "return of industrial policy" globally in recent years [1][2]. Scholars such as Dani Rodrik have highlighted phenomena like *premature deindustrialization* – where countries start losing manufacturing share at much lower income levels than early industrializers did – especially in parts of Africa and Latin America. Such insights underscore that new strategies might be needed for structural transformation in the 21st century, possibly leveraging modern services or technology sectors in addition to manufacturing [2].

Another major shift in development economics has been the rise of **micro-level empirical approaches**. Since the late 1990s, researchers have increasingly used randomized controlled trials (RCTs) and other rigorous evaluations to test which interventions work for reducing poverty at the micro scale. The "randomista" movement, led by scholars like Abhijit Banerjee, Esther Duflo, and Michael Kremer (Nobel laureates in 2019), has fundamentally changed how

development policies are assessed. These researchers pioneered field experiments to measure the impact of interventions – from providing textbooks in schools to supplying microcredit – on outcomes. This approach has generated valuable insights: for example, studies found that **microfinance** has only modest effects on poverty – not the dramatic transformative impact once hoped [3] – and that some education interventions (like targeted scholarships) can significantly boost student attendance [3]. By using RCTs, development economics shifted focus toward "what works" at the grassroots level, complementing the big-picture macroeconomic analyses. However, critics argue that an exclusive focus on small interventions may overlook systemic issues – as one commentator put it, an emphasis on "lots of little solutions" can ignore the need for structural change [4]. Nonetheless, the integration of micro-level evidence has led to more effective program design in areas like health, education, and financial inclusion, informing initiatives such as conditional cash transfers and community health programs.

The literature also increasingly integrates **sustainable development** and climate considerations. Classical development theory largely assumed an unconstrained environment, but modern research recognizes that climate change imposes new risks on developing countries. Concepts like *inclusive green growth* and *climate resilience* now feature prominently in development discourse (e.g. the World Bank's Inclusive Green Growth report, 2012). Scholars and practitioners emphasize that growth must be environmentally sustainable to be viable in the long term, aligning with the concept of **sustainable development** introduced by the Brundtland Commission and now embodied in the SDGs.

Finally, development thinking has embraced the importance of **governance, peace, and capacity** – often under the umbrella of building "resilient institutions" or what some call the development of an effective *"developmental state."* The developmental state literature, originating from analysis of East Asian economies, has been revisited to consider how 21st-century states can foster development in a globalized, technology-driven context [5]. Key tenets include strong state capacity, a meritocratic bureaucracy, and close coordination between public and private sectors to execute development plans. While not all developing countries can replicate the experience of South Korea or Singapore, elements such as anti-corruption measures, improved public financial management, and decentralized governance reforms are widely seen as necessary for achieving development outcomes.

In summary, contemporary development literature provides a nuanced understanding that successful development in the 21st century likely requires a **holistic approach**: sound macroeconomic management and trade integration, proactive but prudent industrial and innovation policies, investments in human capital and health, strong institutions and governance, attention to environmental sustainability, and data-driven program evaluation at the micro level. This multi-faceted perspective sets the stage for analyzing the actual trends and policies observed in developing nations over the past two decades, which we turn to next.

Global Development Trends in the 21st Century

Macroeconomic Progress and Poverty Reduction

The first two decades of the 21st century witnessed substantial macroeconomic growth across much of the developing world. **Emerging economies** became major engines of global growth, shifting the global economic balance. Notably, the BRICS countries (Brazil, Russia, India, China, and South Africa) together now account for a similar, if not greater, share of world output than the long-dominant G7 industrialized nations. By 2023, the BRICS contributed slightly over 31% of global GDP (in purchasing power parity terms) compared to about 30% for the G7, and their share is expected to exceed 50% by 2030 [6]. This dramatic rise of the **Global South** – led by China (now the world's second-largest economy) and India – means developing countries are no longer mere spectators in the world economy, but key participants shaping global trends.

Overall, **economic growth in developing regions outpaced that of advanced economies** in the early 21st century. For example, throughout the 2000–2019 period, *Africa's average GDP growth rate was second only to developing Asia's* [7]. Sub-Saharan Africa grew at roughly 4–5% per year on average during the 2000s, buoyed in part by a commodity boom and improved macroeconomic management, while emerging Asia (led by China, India, and Southeast Asia) grew even faster. Latin America and the Middle East experienced more moderate growth, with some volatility due to commodity price swings and political cycles. This broad-based growth led to **significant improvements in incomes**: dozens of countries moved from low-income to middle-income status. Moreover, the share of the world's population living in extreme poverty (defined as living on less than $1.90 a day) fell markedly. The last 30 years have seen *dramatic reductions in global poverty*, largely driven by growth in developing countries [8]. By 2015, the global extreme poverty rate had dropped to around 10% (about 729 million people) – far below the ~30% rate in 1990 – exceeding the MDG target of halving poverty[8].

This *poverty reduction* success story was dominated by Asia. China, in particular, lifted hundreds of millions out of extreme poverty through rapid industrialization and sustained growth; by official counts, China declared it had eliminated extreme poverty by 2020 [9]. India also saw large declines in poverty: its poverty rate fell to an estimated 6% (about 77 million people) by 2019, before a temporary uptick due to COVID-19, and India is on track to essentially eliminate

extreme poverty by 2030 as well [9]. The positive trends were not limited to Asia – regions like Latin America made gains in the 2000s, aided by economic growth and social policies, and parts of the Middle East and North Africa benefited from oil-fueled income gains or diversification efforts.

However, these aggregate achievements mask **regional disparities and emerging challenges**. Since around 2015, progress in poverty reduction has slowed in some regions and stalled or even reversed in others [10]. Latin America, for instance, saw poverty rates decline in the early 2000s but then rise again after 2015 amid economic stagnation and crises [10]. The most worrying case is **sub-Saharan Africa**, where extreme poverty has actually risen in absolute terms. Africa's population growth has outpaced poverty reduction, and economic growth, while positive, has often been too slow or uneven to reduce poverty headcounts. As a result, *Africa has become the epicenter of global extreme poverty*: in 1990, most of the world's poor lived in East and South Asia, but today the majority live in Africa [11]. Projections suggest that by 2030, **9 out of 10 of the countries with the largest poverty numbers will be in Africa**, and Nigeria will likely have the world's most people in extreme poverty, surpassing India [11][12]. In fact, Nigeria already overtook India as the country with the largest number of extreme poor around 2019 (though India briefly regained that grim title during the pandemic) [12]. This geographic shift means global poverty is increasingly concentrated in a subset of countries that are often characterized by conflict or fragility. By 2030, about **60% of the world's poor are projected to live in fragile and conflict-affected states**, which poses special challenges for poverty eradication efforts [13].

These patterns underline a critical point: while **macro-level growth** is necessary for poverty reduction, it is not sufficient everywhere. Many African economies grew in the 2000s but did not see commensurate drops in poverty due to high inequality, jobless growth in some sectors, and rapid population increases diluting per capita gains [10]. Additionally, countries with weak governance or those affected by civil strife have struggled to translate growth into broad welfare improvements. For example, the *fragile states* in the Sahel, Horn of Africa, and parts of the Middle East have seen poverty persist or worsen amidst conflict.

Another notable macro trend is the shift in the composition of growth. In East Asia, growth has been driven by manufacturing and exports (a classic development pattern), whereas in many low-

income countries, growth in the 21st century has been fueled by **commodity exports, services, and consumption** rather than a manufacturing boom. This has raised concerns about the sustainability and inclusiveness of growth. A striking figure is that *83% of African countries are commodity-dependent*, relying on raw materials for the bulk of export earnings [14][15]. This makes them vulnerable to commodity price shocks and suggests limited progress in economic diversification. Indeed, UNCTAD (2022) notes that Africa's lack of structural transformation – evident in the high commodity dependence – has constrained its development despite respectable GDP growth [14].

In summary, the early 21st century has been a period of **robust economic expansion** for much of the developing world, contributing to unprecedented declines in global poverty. Yet, the benefits of this growth have been unevenly distributed across regions and within countries. The macroeconomic landscape is now one where emerging economies play a central role, global poverty is largely an African problem in the making, and structural economic vulnerabilities (like commodity dependence) remain prevalent. These realities set the stage for the more granular thematic explorations that follow, as we seek to understand the drivers behind these trends and the challenges that could shape the next decades.

Micro-Level Developments and Policy Innovation

Parallel to these macro trends, the 21st century has seen important **micro-level developments** in how we approach and achieve development outcomes. One key aspect has been the innovation in **development policy frameworks** and the emphasis on targeted interventions. The era of the MDGs (2000–2015) and now the SDGs (2015–2030) created global consensus on specific goals – from reducing child mortality to expanding education – which in turn spurred myriad programs at the local and national level. Many developing countries implemented poverty reduction strategy papers (PRSPs) or national development plans aligning with these goals, often supported by international donors.

At the same time, as noted in the literature review, there has been an empirical revolution in assessing **what works** in development. Governments and NGOs increasingly utilize evidence from pilot programs and experiments. This has led to the scaling up of effective micro-level interventions. For example, **cash transfer programs** – giving stipends to poor households,

sometimes conditional on actions like children attending school – were rare two decades ago but are now common in Latin America, Africa, and Asia, thanks in part to evidence of their success in reducing poverty and improving human capital. Brazil's Bolsa Família and Mexico's Oportunidades (Prospera) were early models that demonstrated positive impacts and inspired similar programs worldwide.

Another micro-level trend is the spread of **microfinance and financial inclusion initiatives**. Starting with institutions like the Grameen Bank in the 1980s, microcredit for the poor expanded globally in the 2000s. By the 2010s, however, evaluations tempered initial enthusiasm, finding that microcredit yields *modest average benefits* and is not a panacea for poverty [3]. This has led to a diversification of approaches: rather than just small loans, there's now focus on broader financial services for the poor, such as savings accounts, insurance, and **mobile money** (discussed in a later section). The Global Findex data show that account ownership (including mobile accounts) in developing countries has surged – a testament to effective inclusion policies and technology uptake.

We also see communities and local actors taking development into their own hands. **Community-driven development** (CDD) programs, which give local groups control over small infrastructure and service projects, have gained popularity. These programs, implemented in countries from Indonesia to Nigeria, are grounded in the idea that empowering communities can improve project relevance and accountability. Evaluations of CDD have shown mixed but often positive outcomes in terms of infrastructure built and social cohesion, although their long-term economic impact can vary.

Importantly, many of these micro-level efforts are increasingly interlinked with **technological advancements**. The rise of digital technology has enabled more efficient service delivery – for instance, digitizing cash transfers to go directly into beneficiaries' mobile wallets, reducing leakages and corruption. It has also facilitated better data collection for tracking progress at the micro level (e.g. using mobile surveys or biometrics to monitor health interventions). We will delve deeper into technology in a dedicated section, but it is worth noting here that the micro and macro aspects of development are connected: a country's macroeconomic growth provides the resources that can fund micro interventions, while successful micro-level programs (like

widespread immunization or education improvements) build human capital that contributes to macroeconomic growth.

In the realm of **policy innovation**, the 21st century has seen developing countries increasingly adapt and tailor policies to their contexts, rather than one-size-fits-all solutions. For example, "South-South" knowledge exchange has grown – Brazil advising African countries on tropical agriculture, or China sharing infrastructure development experience through the Belt and Road Initiative. Regional cooperation frameworks have also been established to address common challenges at a more granular level (e.g. the African Union's initiatives on public health, or small island states collaborating on climate adaptation).

Lastly, the micro perspective reminds us of the human development lens championed by thinkers like Amartya Sen. Progress is not measured only in GDP, but in individuals' **capabilities and well-being**. In that respect, there have been notable improvements: global literacy and school enrollment are up, child mortality is down, and life expectancy has risen (as we detail later). However, quality issues have emerged as the new frontier – for instance, many children are in school but not learning effectively, and many people have access to clinics but still lack quality healthcare. Thus, policymakers are increasingly focused not just on coverage of services, but on **quality and outcomes at the micro level** (e.g. learning outcomes, patient health outcomes).

In sum, the early 21st century in the developing world has been characterized by **experimentation and scaling of development solutions at the micro level**, supported by global goal-setting and better evidence. This has led to more people than ever receiving basic education, healthcare, and financial services, contributing to improved human development indicators. Yet challenges such as ensuring program quality, reaching the most marginalized populations, and maintaining adequate funding and capacity persist. The following thematic sections will explore these issues in context, starting with the fundamental driver of many trends: demographics.

Demographic Dynamics in Developing Nations

Demographics are a foundational force in development, and developing nations in the 21st century are experiencing demographic shifts on an unprecedented scale. In general, most low- and middle-income countries have much **younger and faster-growing populations** than high-income countries. However, there is significant variation across regions, and these differences have major implications for economic opportunities and social services.

Population growth in the developing world remains well above that of developed countries, though it has slowed in many regions compared to mid-20th-century rates. The world's population surpassed 8 billion in 2022, with the bulk of recent growth occurring in Asia and Africa. Notably, **Africa's population is booming**: the continent's population has roughly doubled since 2000 and is on track to double again by 2050. Africa had about 811 million people in 2000; it has around 1.4 billion today, and the UN projects about 2.5 billion by 2050. This represents by far the fastest growth of any major region – Africa is the only region expected to continue growing strongly through the end of the 21st century. In contrast, East Asia's population growth has stalled (with China even beginning to decline), Europe and Japan are shrinking demographically, and Latin America's growth has slowed markedly with fertility now near replacement level in many countries.

The **youthfulness** of developing regions stands in contrast to the aging populations of Europe, North America, and East Asia. The median age in Africa is around 19 years – compare that to about 30 in Asia, 32 in Latin America, and nearly 43 in Europe. Many African and some South Asian countries have a **youth bulge**, meaning a very high proportion of their population is below 25. For example, over 60% of Africa's population is under 25 years old [16]. This presents both opportunities and challenges. On one hand, a large youth cohort can, with proper education and job creation, yield a **demographic dividend** – a boost to economic growth as a higher share of people enter the workforce and drive productivity. East Asian economies famously benefited from such a demographic dividend in the latter half of the 20th century. African leaders and policymakers today speak of harnessing their demographic dividend in the coming decades. By 2050, *one in three young people (ages 15–24) in the world will be African*, and one in four of all people aged 25–34 will be African[16]. This signifies a huge potential labor force and market.

On the other hand, if jobs and opportunities do not keep pace, a large unemployed or underemployed youth population can lead to discontent and instability. The risk of a "demographic bomb" exists if economies cannot absorb the growing labor force. Already, youth unemployment rates are high in many developing countries, and frustration has sometimes manifested in protests or even migration pressures. As noted in one report, if the demographic dividend is not harnessed through education and employment, it "can become a liability leading to social unrest" [16]. Thus, **institutional capacity and policy choices** will determine whether youthful demographics translate into growth or strife.

Another key demographic trend is **urbanization**, which we will address more fully in a dedicated section. But in brief, developing countries are urbanizing rapidly: millions of young people are moving from rural villages to cities each year in search of better livelihoods. This urban influx is part of the demographic story – for instance, Africa's urban population is growing at about 3.5% per year, faster than any other region [17]. Between 2000 and 2020, the urban share of population in many African countries jumped significantly (e.g. Nigeria's urbanization went from 35% to 52% in two decades) [18]. By mid-century, **cities in the developing world will absorb over 2 billion more people**, accounting for 95% of global urban growth, with African cities taking a lion's share of that increase [19]. This has huge implications for housing, infrastructure, and services.

In contrast to Africa's youthful growth, some other developing regions are experiencing **demographic transitions** toward lower fertility and aging. Many countries in East Asia (like China, Thailand) and even some in Latin America (like Brazil) now have fertility rates around or below replacement (approximately 2.1 children per woman). China's fertility decline, hastened by the one-child policy (now ended), means China is aging rapidly – it will have an older age profile than the U.S. by 2050. Some countries, such as those in Eastern Europe or the former Soviet Union (sometimes classified as "developing" in a broad sense), have even seen population declines due to low fertility and emigration.

South Asia sits somewhere in between: India's population is still growing and just overtook China as the world's largest, but its fertility has fallen to near replacement level and population growth is slowing. India enjoys a demographic dividend for now – its working-age population is

rising – but it is projected to start aging later in the century. Other South Asian countries like Pakistan have higher fertility and will continue growing longer.

Middle Eastern countries often have youthful populations as well (though some, like Iran, have sharply reduced fertility in recent decades). In these countries, the challenge of providing jobs for youth is similarly pressing, compounded in some cases by gender norms that limit female workforce participation, thereby not fully utilizing the human capital.

One cannot discuss demographics without noting **dependency ratios** – the ratio of dependents (young and old) to working-age people. In much of Africa, dependency ratios have been very high (lots of children per working adult), but as fertility slowly declines, these ratios will improve, offering the window for a demographic dividend. In East Asia, dependency ratios were very favorable around 1990–2010 (few dependents per worker), aiding economic growth, but as populations age, elderly dependents are rising. Latin America is still in a relatively favorable stage but will begin to age in coming decades. These differences imply that strategies will vary: some developing countries need to focus on education and job creation for swelling youth cohorts, while others (like China or Thailand) are now also concerned with pensions and elderly care – issues previously thought of as "rich country problems."

Another facet of demographics is **migration**. Developing nations experience both internal migration (mainly rural-to-urban) and international migration. Internationally, migration flows often involve people moving from lower-income to higher-income countries (e.g. from South Asia to the Gulf states, or from Africa to Europe), but also significantly between developing countries themselves (South-South migration is large, such as Venezuelans moving to Colombia and other Latin neighbors). Remittances sent back by migrants have become a huge financial resource for many developing economies – in some cases exceeding foreign aid or investment inflows. For example, remittances make up around 10-30% of GDP in countries like Nepal, Haiti, and Somalia, providing lifelines to households and impacting local development.

Lastly, **demographic challenges** such as managing youth bulges or urban crowding also intersect with other issues like security and climate. A young age structure has been statistically linked to higher risks of conflict in some political science research (though this is mediated by

many factors). Additionally, rapid population growth in climate-vulnerable regions (e.g. the Sahel) can exacerbate strains on water and food, potentially fueling displacement or conflict.

In conclusion, the **demographic picture** of the developing world in the 21st century is one of dynamic change and divergence: Africa's population is rapidly expanding and very young, Asia's growth is slowing with some countries aging, and Latin America stands between those extremes. These trends carry significant implications for development policy. Countries with youthful, growing populations must invest heavily in **education, skills, and job creation** to capitalize on their human potential [20][21]. As noted in an OECD-African Union analysis, Africa's working-age population will double by 2050 and the number of Africans with secondary or tertiary education will more than double by 2040; if equipped with the right skills, this *"youth talent pool could greatly boost growth"* [20]. Conversely, without such investment, the demographic dividend could be squandered. Meanwhile, countries experiencing fertility decline need to adapt to aging (e.g. strengthening social protection systems). In all cases, aligning development strategies with demographic realities is crucial – which is why we now turn to how economies are transforming (or not) to provide opportunities for their changing populations.

Structural Transformation and Industrial Policy

A core aspect of economic development is **structural transformation**: the shift of labor and output from low-productivity sectors (like traditional agriculture) to higher-productivity sectors (like manufacturing and modern services). Historically, virtually all countries that became prosperous underwent such a transformation, often driven by **industrialization** – the growth of manufacturing and industrial exports. In the 21st century, the landscape of structural transformation in developing nations is mixed and evolving. Some countries (especially in Asia) have continued along the traditional industrialization path, while others (notably in Africa and parts of Latin America) have experienced stalled or **atypical structural changes**.

East and Southeast Asia have largely exemplified successful structural transformation in recent decades. China is the foremost example: from 2000 to 2020, China moved tens of millions of workers from farms to factories, becoming the "world's workshop" and driving its urbanization and income growth. Countries like Vietnam and Bangladesh followed similar export-oriented industrialization strategies, focusing on manufacturing sectors such as apparel, electronics, and machinery for global markets. This industrial growth has been key to their rapid economic rise and poverty reduction.

In contrast, many **African economies and some Latin American economies have not industrialized to the same extent**. In sub-Saharan Africa, the share of manufacturing in GDP and employment has remained low (often below 15%) and in some cases even declined, a phenomenon termed **"premature deindustrialization."** Essentially, some countries are seeing the relative importance of industry shrink at incomes levels far below what earlier industrializers had – they are transitioning directly to service-based economies without a strong manufacturing phase. For example, countries like Ghana or Kenya today have larger service sectors (commerce, telecom, finance, etc.) but relatively small industrial bases. While services can also drive productivity, concern arises that skipping manufacturing could limit job creation for low-skilled workers and export competitiveness, since services are often less tradeable (though this is changing with technology).

Several factors contribute to this pattern. Globalization and technological progress have made manufacturing very competitive – a few efficient producers (like East Asian countries) dominate,

leaving less room for latecomers. Automation means manufacturing now can be more capital-intensive, reducing the labor-cost advantage that new entrants might have. Trade liberalization without supportive industrial policies in some regions led to the collapse of nascent industries under competition from imports. Additionally, the commodity booms experienced by many African and Latin American countries (oil, minerals, etc.) led to a focus on extractive industries at the expense of manufacturing diversification – a version of the "resource curse." As mentioned earlier, **83% of African countries remain commodity export dependent** [14], reflecting limited diversification into manufacturing or complex services.

In response to these challenges, there has been a notable rethinking of **industrial policy** in the 21st century. After being eschewed under neoliberal prescriptions, industrial policy is making a comeback in both developing and advanced economies [1]. Policymakers are asking: how can we stimulate industries that create jobs and add value? In many developing countries, this has meant revisiting strategies like creating **special economic zones (SEZs)** to attract manufacturing investment, providing targeted subsidies or tax breaks for priority sectors, investing in infrastructure (power, ports) to reduce business costs, and leveraging trade agreements to spur industrial exports.

For example, Ethiopia in the 2010s actively pursued industrial parks and attracted foreign textile and apparel firms, aiming to replicate a bit of Asia's path. Rwanda and Senegal have launched initiatives to promote local manufacturing of certain goods. India's "Make in India" campaign and Indonesia's push for downstream mineral processing are other instances of renewed industrial policy focus. Even African regional bodies emphasize industrialization; the African Union's Agenda 2063 envisions **industrialization and value addition** as keys to economic transformation.

However, executing successful industrial policy requires capacity and sound governance. There are cautionary tales of failed or *misdirected industrial projects* that became white elephants or magnets for corruption. The debate in economics continues: some experts stress that only by nurturing industries can developing nations achieve high-income status (citing East Asia's example), while others warn that government-led efforts often fail and that modern services and agriculture should not be neglected.

One important dimension is the role of **trade and globalization**. Many developing countries have benefited from integrating into global value chains (GVCs) – for instance, a country might specialize in assembling electronics or manufacturing auto parts as part of a multinational supply chain. This integration can accelerate industrial learning. Yet, Africa and poorer regions have been less integrated into manufacturing GVCs (aside from a few cases like automobile assembly in Morocco or electronics in Vietnam outside Africa). To address this, initiatives like the **African Continental Free Trade Area (AfCFTA)**, established in 2018, aim to boost regional trade and industrial development. AfCFTA creates a single market across 54 African countries, which is expected to enable economies of scale, foster competitive industries, and build regional value chains by reducing trade barriers [22]. If effectively implemented, AfCFTA could be a "game changer" for Africa's structural transformation, helping move the continent from exporter of raw commodities toward producer of finished goods [22].

It's also worth noting the **modern services sector** as a component of structural change. Some economists argue that today's developing countries can harness high-productivity services (such as IT services, finance, tourism, creative industries) as an alternative engine of growth. India, for example, leapfrogged to a service-led economy – its IT and business process outsourcing sector is world-class and a major export earner. Similarly, small countries like Mauritius transformed from sugar-based economies to service hubs (tourism, finance). While services have historically been seen as non-tradable and low-productivity, technology is changing that: now services like software development or online freelancing can be exported, and even local services like retail can see productivity gains through modernization (e.g. mobile banking in Kenya revolutionizing finance). Thus, **technological leapfrogging** (discussed in the next section) ties into structural transformation – digital technology can enable new industries or improve efficiency in existing sectors, potentially giving late-developers an edge in certain niches (for example, Africa's growing fintech industry).

Finally, structural transformation is closely linked to **employment and informality**. As economies develop, the expectation is that formal, wage-paying jobs expand in industry and modern services, absorbing workers from informal subsistence activities. In many developing countries, this transition has been sluggish. A large share of the workforce remains in **informal employment** – jobs without formal contracts or social protection, often in small-scale trade or

farming. For instance, an estimated **82% of African workers are in informal employment**, compared to 56% in Latin America and 73% in developing Asia [21]. Such high informality indicates that productive job creation in formal enterprises is lagging behind labor force growth. It reflects the structural issues: many workers are still in low-productivity occupations because better jobs are not available. The result is underemployment and persistently low incomes for many, even amid overall GDP growth.

To tackle this, countries need not only to grow but to **change the structure** of growth. This may include boosting agricultural productivity (so fewer people can produce more food, freeing others to work in industry/services), fostering small and medium enterprises, and investing in skills so that the workforce can meet the needs of modern industries. It also may require improving the business climate and infrastructure to encourage private-sector investment in labor-intensive industries.

In summation, the **state of structural transformation** in the 21st-century developing world is a patchwork. Some countries, especially in Asia, have continued to make strides in industrialization and structural shift, aligning with historical patterns of development. Others have struggled, experiencing growth without deep transformation – characterized by continued commodity dependence, low manufacturing base, and high informality. Recognizing these challenges, there is a resurgence of interest in **industrial policy and strategic government interventions** to jump-start or deepen structural change [1]. The success of these efforts will be pivotal in determining whether countries can climb the value chain, create quality jobs, and sustain growth. The next sections will examine complementary factors – like technology and urbanization – that interplay with structural transformation to shape development outcomes.

Digital Transformation and Technological Leapfrogging

Technology has always been a catalyst for development, and in the 21st century, the rapid spread of digital technologies has opened new avenues for leapfrogging traditional development stages. **Digital transformation** – encompassing the proliferation of mobile phones, the internet, and related innovations – has been particularly impactful in developing countries, where it often compensates for gaps in physical infrastructure. From mobile banking in Kenya to e-commerce in India and telemedicine in rural Indonesia, technology is enabling developing nations to bypass certain constraints and deliver services in novel ways. This section explores how technological leapfrogging is playing out, the opportunities it creates, and the digital divide challenges that persist.

One of the most iconic examples of leapfrogging is the **mobile phone revolution**. Developing countries entered the 21st century with very low telephone penetration (landlines were rare outside cities), but within two decades mobile connectivity became nearly ubiquitous. The number of mobile cellular subscriptions in low and middle-income countries skyrocketed, so much so that even many impoverished areas now have access to phone service. A visualization of mobile adoption across regions illustrates this dramatic rise: for instance, in sub-Saharan Africa there were only about 2 mobile subscriptions per 100 people in 2000, but by 2023 there were roughly 89 subscriptions per 100 people [23][24]. Other developing regions saw similar surges – South Asia went from virtually 0 to over 80 subscriptions per 100 people in the same period [25]. In some regions, the number of mobile subscriptions exceeds the population (over 100 per 100 people) because individuals may have multiple SIM cards or phones [23]. This mobile revolution happened *faster in developing countries* than the spread of virtually any prior technology, thanks to low-cost handsets and prepaid service models. It has allowed these countries to **skip the stage of laying extensive landline infrastructure**, effectively **leapfrogging** into the wireless era.

The implications of widespread mobile access are profound. Mobile phones have become tools for economic inclusion, allowing people to communicate, access information, and transact business in ways previously impossible in remote or underserved areas. Perhaps the most celebrated innovation building on mobile infrastructure is **mobile money**. Pioneered in Kenya with the M-Pesa service launched in 2007, mobile money lets users send and receive money, pay

bills, and store funds using simple mobile phone SMS technology, without needing a traditional bank account or internet connection. This innovation has since spread to many countries in Africa, Asia, and beyond. Today, *Sub-Saharan Africa is the global leader in mobile money*, accounting for the majority of mobile money users worldwide. By 2023, there were over 330 million active mobile money accounts in sub-Saharan Africa – more than half of all such accounts in the world [26][27]. That equates to roughly one mobile money account for every four people in the region [27]. The share of adults using mobile money has grown rapidly: from about 12% of adults in sub-Saharan Africa in 2014 to **33% by 2021** [28]. In some countries, the adoption is even higher – for example, Ghana and Uganda now have a majority of adults using mobile money services [29].

The impact of mobile money on **financial inclusion** is significant. In places where banks have limited reach, mobile money agents (local shops that facilitate cash-in/cash-out) have effectively provided banking services. Thanks in large part to mobile money, the overall financial account ownership in Africa jumped from around one-third of adults to over half within a decade, with nearly all of that increase coming from new mobile accounts rather than traditional bank accounts [30]. This has enabled the poor to save securely, receive remittances more easily, and make payments efficiently. Studies even suggest mobile money access has helped some households move out of extreme poverty by facilitating easier investment in businesses or enabling quick receipt of funds during hardships.

Beyond finance, **digital technologies** are transforming other sectors in developing countries. In agriculture, farmers use mobile phones to get market price information, weather forecasts, or advice (sometimes via SMS-based services or smartphone apps where internet is available), helping them improve yields and negotiate better prices. In education, e-learning platforms and remote teaching have started to supplement scarce teachers, though challenges like electricity and connectivity remain in rural areas. In health, telemedicine and mobile health (mHealth) applications allow community health workers to consult with doctors or keep digital health records; simple SMS reminders have been used to improve medication adherence or vaccination attendance.

Internet access is the next frontier of the digital divide. While mobile *voice* coverage is nearly universal, **mobile internet** usage lags behind, especially among the poor. As of 2023, only about

27% of sub-Saharan Africa's population was using mobile internet [31]. This indicates that a majority have basic phones or lack affordable data and digital literacy. Other regions have higher internet use – for example, around two-thirds of the world's population overall is online, but the rates in low-income countries are much lower [32][33]. Still, progress is steady: Africa's internet penetration rose from about 25% in 2019 to 38% in 2024, partly boosted by the pandemic necessitating online connectivity [32]. The pandemic indeed acted as a catalyst for digital adoption worldwide, as lockdowns forced services like schooling, commerce, and government functions to go online where possible.

To bridge the digital divide, both public and private sectors are taking action. Governments have started to invest in digital infrastructure (e.g. fiber optic backbones, 4G/5G spectrum allocation) and implement policies to reduce the cost of data and devices. International initiatives also support this; for instance, the Broadband Commission's Africa initiative aims to expand high-speed internet on the continent. Meanwhile, tech companies view developing regions as the next growth market – leading to projects like Alphabet's balloon internet (Project Loon) trials in Kenya or satellite internet services that could reach remote users.

Technological leapfrogging is not limited to digital communications. In energy, for example, many African and South Asian communities are leapfrogging from no electricity directly to **renewable energy solutions** like solar home systems, rather than extending a centralized grid. This decentralization is analogous to the mobile phone leapfrogging landlines. It addresses energy access more quickly and sustainably, and many entrepreneurs are active in this off-grid solar industry with pay-as-you-go financing (often paid via mobile money). This has clear synergy with climate goals – a theme we discuss later.

Another area is **biotechnology and healthcare** – some developing countries have rapidly adopted new vaccines and medical technologies (like drone delivery of medical supplies in Rwanda) without having fully developed older healthcare infrastructure, thus leapfrogging to modern solutions in limited ways.

It is important, however, to temper optimism with the reality of the **digital divide**. Within countries, access to technology can be very unequal: urban vs rural, rich vs poor, men vs women. For instance, in some societies, women are less likely to own mobile phones or use the internet

due to socio-cultural barriers, leading to a gender digital divide. Likewise, remote rural areas often lack network coverage or reliable power, limiting technology's reach. **Affordability** is a big issue – even if a 4G signal is available, many people find data costs prohibitive or smartphones too expensive, sticking to basic phones that only handle calls and SMS. According to GSMA and ITU data, even by mid-2020s, *only about 44% of sub-Saharan Africans have a unique mobile subscription and just 27% use mobile internet* [31], meaning a large majority still are offline. Poverty remains the defining barrier to digital inclusion [34].

Another concern is that technology, while enabling leapfrogging, can also disrupt labor markets. Automation and AI could threaten traditional pathways of job creation (e.g. manufacturing employs fewer people if robots are involved). There is worry that as developing nations try to industrialize, advanced technologies might reduce the labor absorption capacity of industry. On the other hand, digital platforms can create new livelihoods (such as gig economy jobs, online freelancing, ride-sharing drivers, etc.). Policymakers are thus challenged to maximize the upsides of tech while mitigating downsides like job displacement or data privacy issues.

In terms of **policy frameworks**, many developing countries have created digital economy strategies, e-government initiatives, and tech hubs. Innovation clusters from Nairobi's "Silicon Savannah" to Bangalore's IT parks are fostering local tech entrepreneurship. There is recognition that with the right ecosystem (skills, regulation, investment), developing nations can produce globally competitive tech innovations. One example is the fintech sector in Africa – companies like Kenya's M-Pesa or Nigeria's Flutterwave have become pioneers in mobile payments, now exporting their models to other regions.

In conclusion, **technological leapfrogging** is a defining feature of 21st-century development. Through widespread mobile telephony and expanding internet access, developing countries have found new ways to overcome traditional infrastructure gaps and deliver services. This digital leap has contributed to financial inclusion (via mobile money), improved information flow (benefiting farmers and entrepreneurs), and new opportunities for education and health service delivery. Yet, bridging the remaining digital divide is critical to ensure these benefits are broadly shared. The continued expansion of affordable connectivity, digital literacy, and innovative applications of technology will play a crucial role in determining how effectively developing

nations can solve persistent development challenges and accelerate growth in an inclusive manner.

Urbanization and Urban Development

As mentioned in the demographics section, the world is in the midst of an "urban century," and nowhere is this more evident than in the developing world. **Urbanization** – the movement of people from rural areas to cities and the growth of cities themselves – is transforming the social and economic landscape of Africa, Asia, and Latin America. In 2007, for the first time in history, the majority of the global population became urban. By 2050, it is projected that about two-thirds of people will live in cities, with *95% of the urban growth occurring in developing countries* [19]. Managing this rapid urban expansion is a critical challenge and opportunity for sustainable development.

Trends and Patterns: Developing regions are urbanizing at different speeds. **Africa** is the fastest-urbanizing continent currently. Its urban population is growing around 3.5% annually, doubling roughly every 20 years [17]. While Africa was only ~40% urban as of the early 2020s (meaning the majority still rural), that proportion is steadily rising; several countries have crossed the 50% urban mark in the past two decades [18]. By mid-century, it's expected that Africa will be approaching a predominantly urban society. **Asia** is also rapidly urbanizing, though East Asia (including China) already had large urban populations by 2000. China's urbanization, for example, jumped from roughly 36% in 2000 to 61% in 2020 – an extraordinary migration of hundreds of millions to cities in just a generation. South Asia (e.g. India, Pakistan) started more rural but is now seeing its own urban surge. **Latin America** historically urbanized earlier; it is already ~80% urban, comparable to Europe or North America. Thus Latin America's urban challenge is less about pace of urbanization and more about addressing entrenched urban issues like slums and congestion.

Urbanization is often correlated with economic development – cities are hubs of productivity, innovation, and services. Indeed, **cities generate a disproportionate share of GDP**. It's estimated that today, *80% of global GDP is generated in cities* [35]. Metropolitan areas offer firms and workers the benefits of agglomeration: larger labor pools, bigger markets, and faster information exchange. Many developing countries see their capital or largest city contribute a huge chunk of national GDP (for instance, metropolitan Bangkok for Thailand, or Lima for Peru). As such, urbanization can be a powerful engine for growth and poverty reduction if

managed well, since rural migrants often find better jobs and incomes in cities and can send remittances back home.

However, the **quality of urbanization** matters immensely. A worrying pattern in many developing countries has been the rise of **informal settlements (slums)** and inadequate urban infrastructure. The growth of cities has often outpaced the capacity of governments to plan and provide for housing, sanitation, transport, and other needs. According to UN-Habitat, around **60% to 70% of residents in large African cities live in slums** [36]. These slums are characterized by substandard housing, overcrowding, and lack of basic services like clean water and sanitation. Africa alone accounts for about a fifth of the world's slum dwellers [37]. In South Asia, massive slums like Dharavi in Mumbai or Orangi Town in Karachi house hundreds of thousands of people. Latin America, while highly urbanized, still has sprawling favelas and barriadas in cities like Rio de Janeiro or Caracas.

The prevalence of slums highlights the **inequality and exclusion** in many urban areas. Migrants arrive in cities seeking opportunity, but affordable formal housing is scarce, so they end up in self-built shacks on marginal lands (floodplains, steep hills, etc.) that are often risky. They may lack legal tenure, making them vulnerable to eviction. Public services often don't extend to these informal neighborhoods initially, leading to dire living conditions. These issues pose moral and public health challenges – for instance, lack of sanitation in slums contributes to disease spread, and lack of secure tenure can discourage residents from investing in home improvements.

Urban planning and governance are frequently playing catch-up. Many cities do not have up-to-date urban plans or enforce zoning effectively. The result can be chaotic sprawl with insufficient public space and transport. A telling statistic: in well-planned cities, about 30% or more of land is for roads and public spaces, but in many African cities only ~15-20% of land is allocated to streets [38]. For example, Accra has about 17% of land as roads, Arusha (Tanzania) only 15% [38]. This contributes to congestion and low connectivity, making movement difficult. Additionally, once informal layouts solidify, retrofitting infrastructure (roads, sewers) becomes much harder.

Urban transportation is a major challenge as cities grow. Many developing cities are grappling with traffic congestion, air pollution, and lack of public transit. Some are investing in solutions

like Bus Rapid Transit (BRT) systems (e.g. Bogotá's TransMilenio, Lagos' BRT), urban rail or metros (e.g. new metro lines in Cairo, Lagos, Mumbai, Hanoi), and better pedestrian infrastructure. Yet funding and maintaining mass transit is tough in lower-income settings, and often public transit lags far behind need.

Another issue is the **urbanization of poverty**. Historically, poverty was concentrated in rural areas, but as populations urbanize, so does poverty. Urban poverty comes with high living costs (rent, food) and often more precarious informal employment. Social safety nets in cities can be weaker if policy still assumes rural poverty. As of mid-2010s, a large share of the poor in Latin America were already urban. In Africa and Asia, urban poverty is rising in absolute terms, even if rural poverty remains higher in percentage terms. This complicates poverty reduction strategies, which must increasingly address slum upgrading, urban job creation, and urban service delivery.

At the same time, we see **positive examples** of urban development. Some cities have managed to significantly improve conditions in a few decades. For instance, many East Asian cities that were once teeming with slums (Seoul, Singapore, even Chinese cities) managed to invest in public housing and infrastructure as their economies grew, virtually eliminating slums. Their experiences show that with political will, investment, and community involvement, urban environments can be transformed – though context differs and those were often under more authoritarian regimes with capacity to enforce sweeping changes.

One encouraging trend is that **city governments and local leadership** are becoming more prominent actors in development. There's a growing network of city alliances (such as C40 for climate action, or the United Cities and Local Governments network) where mayors of developing cities share best practices in areas from resilience to finance. Decentralization in many countries has given cities more autonomy (and responsibility) for service provision. Success stories like Curitiba (Brazil) or Medellín (Colombia) are frequently cited for innovative urban planning (transit-oriented development, public space creation, crime reduction via urban design, etc.) which other cities aim to emulate.

Urbanization also interacts with **climate and sustainability**. Many developing coastal cities (Lagos, Dhaka, Manila) face climate risks like flooding and sea-level rise, while almost all cities

face the challenge of reducing carbon emissions as they grow (through cleaner transit, energy-efficient buildings, etc.). Rapid urban growth sometimes leads to environmental degradation – e.g. deforestation in peri-urban areas for fuel, or pollution of rivers with urban waste. Thus, sustainable urban planning is crucial. The concept of "*inclusive, safe, resilient and sustainable*" cities is enshrined in SDG Goal 11. Achieving it entails slum upgrading, expanding infrastructure (water, sanitation, electricity) to all, disaster risk reduction (since many slums are on risky sites), and planning for climate adaptation.

Housing policy is central to addressing slums and affordability. Some developing countries have attempted mass housing schemes or sites-and-services programs (providing land with basic services for people to build on). Others have worked on enabling housing finance for low-income families. There have been slum-upgrading initiatives that provide in-situ improvements (like paving alleys, adding street lights, water lines) rather than relocating communities. Each approach has pros and cons, and often a combination is needed.

In summary, **urbanization in developing nations** is a double-edged sword: it is driving growth and modernization, but also straining capacities and exacerbating inequalities if unmanaged. The trajectory of cities will significantly shape overall development outcomes. If cities can provide jobs, services, and a decent quality of life, they will lift millions from poverty and drive national progress. If they instead become hotspots of poverty, unemployment, and environmental hazard, they could undermine social stability and economic gains. The need for **forward-looking urban policy** – from investing in affordable housing and transit to strengthening municipal governance and finance – is paramount. The future of development is undeniably urban, and getting urbanization "right" is one of the grand challenges of the 21st century.

Climate Change and Environmental Sustainability

Climate change and environmental constraints pose existential challenges to developing nations in the 21st century. While industrialized countries historically emitted the bulk of greenhouse gases, developing countries are often the most vulnerable to the **impacts of climate change** – and their share of emissions is rising as they develop. Achieving sustainable growth now requires balancing development needs with environmental stewardship and climate resilience. This section examines how climate change is affecting developing regions (especially Africa), the concept of sustainable development in this context, and strategies being adopted to address these constraints.

Vulnerability to Climate Impacts: Developing nations, particularly the poorest, generally have **higher exposure and lower adaptive capacity** to climate change. Many of these countries are in tropical and subtropical regions already prone to climate variability (e.g. droughts, floods, hurricanes) which climate change is intensifying. Africa is widely considered one of the most vulnerable continents to climate change. It has large populations dependent on rain-fed agriculture, extensive arid and semi-arid areas at risk of desertification, and limited financial and technical capacity to adapt. According to the World Meteorological Organization, Africa already bears an increasingly heavy burden from climate extremes – *African countries are losing an estimated 2–5% of GDP annually due to climate-related impacts*, and some are spending up to 9% of their budgets on responding to climate disasters [39]. These are enormous costs for economies that can ill afford them. Additionally, *adaptation needs in sub-Saharan Africa are on the order of $30–50 billion per year over the next decade (2020s), roughly 2–3% of regional GDP*[39].

Specific impacts observed or projected include more frequent and severe **droughts** in parts of Africa (e.g. the Horn of Africa, Southern Africa) jeopardizing food security; **extreme floods** in others (as seen recently in Mozambique, Sudan, etc.) causing loss of lives and infrastructure [40][41]; rising temperatures affecting health and productivity (the continent's warming trend is slightly above the global average) [42]. By 2030, if adequate measures are not in place, up to *118 million extremely poor Africans could be exposed to intense droughts, floods, and heat* – a huge setback for poverty alleviation efforts [43]. Fragile and conflict-affected states are particularly at

risk, as climate stress can exacerbate tensions (for example, herder-farmer conflicts in the Sahel partly linked to resource scarcity from drought).

In South Asia, climate risks include stronger monsoons and flooding (like the devastating floods in Pakistan in 2022), glacial melt in the Himalayas affecting river flows, and heatwaves reaching unsurvivable levels in parts of India. Small island developing states (from the Pacific to the Caribbean) face sea-level rise that threatens their very existence and more intense cyclones. Latin America's concerns range from Amazon rainforest loss (which has global climate implications) to Andean glacier retreat, more hurricanes in Central America, and changes in rainfall affecting agriculture.

All this means that developing countries must incorporate **climate adaptation** into their development planning. Adaptation measures include building resilient infrastructure (e.g. flood defenses, climate-proofed roads and buildings), developing drought-tolerant crops and robust agricultural practices, improving water management, establishing early warning systems for extreme events, and strengthening social safety nets to cope with climate shocks. Yet financing adaptation is a huge challenge – the annual adaptation costs mentioned (tens of billions) far exceed the climate finance currently flowing to these countries. There is an ongoing debate and negotiation internationally about increasing support (the unmet pledge of $100B per year in climate finance from rich to poor countries, discussions of loss-and-damage funding, etc.).

Sustainable Development and Emissions: On the mitigation side, developing countries are in a bind: they need to grow and industrialize, which traditionally increases emissions, but globally we need to cut emissions to limit warming. Many developing nations point out that they have contributed little historically to the problem – for instance, *Africa is responsible for only ~3% of cumulative CO2 emissions – yet they are asked to curb future emissions for the global good*. Equity is a big concern here. However, many also recognize that pursuing a high-carbon growth path could be self-defeating, given their vulnerability and the falling costs of green technologies.

Indeed, there are opportunities for **green growth** or sustainable pathways. For example, rather than building a fossil-fuel-dependent energy system, some African countries are leaping to **renewable energy** (a parallel to leapfrogging in telecom). The continent has abundant solar resources – *about 60% of the world's best solar resources are in Africa* [44] – and also

significant wind, geothermal (in the Rift Valley), and hydro potential. Kenya already generates a majority of its electricity from renewables (geothermal, hydro, wind), and its President has committed to 100% renewable power by 2030 [44]. At the first Africa Climate Summit in 2023, initiatives were launched to accelerate renewables and green industries [44]. Similarly, countries like Morocco have invested heavily in solar (e.g. the Noor solar complex) and wind, becoming a regional clean energy leader. Such moves not only reduce future emissions but can also provide energy access to underserved areas (many off-grid solar solutions are expanding electricity in rural Africa).

Another sustainable development aspect is **preserving natural capital** – forests, wetlands, biodiversity – which are under pressure from development but are crucial for ecological balance and can provide services (like ecotourism or carbon credits). Programs like REDD+ (Reducing Emissions from Deforestation and Forest Degradation) try to channel funds to protect forests in countries like Brazil, DRC, and Indonesia, though with mixed success. Conservation efforts, when community-inclusive, can also support local livelihoods (e.g. sustainable forestry, agroforestry, etc.).

For developing cities, sustainability means designing for **low-carbon mobility** (public transit, non-motorized transport) and efficient buildings. Some cities are exploring electric bus fleets or bus rapid transit to cut pollution. Waste management improvements also reduce emissions (landfills emit methane). A co-benefit of many climate actions is improved public health (e.g. less air pollution from cleaner energy and transport).

The policy landscape: Internationally, the Paris Agreement (2015) established that all countries, including developing ones, undertake "nationally determined contributions" (NDCs) to reduce emissions, albeit with principles of common but differentiated responsibilities. Many developing countries have submitted NDCs with conditional targets (meaning they'll do more if they get finance/tech support). They often have dual goals: reduce emissions relative to business-as-usual, and achieve development objectives like energy access. For instance, India aims for major expansion of renewable power and has also championed a global solar alliance. Small island states and least-developed countries advocate strongly for limiting global temperature rise to 1.5°C, as anything more threatens their survival; they have moral authority but little leverage beyond appealing for global action.

Another concept gaining traction is **"climate-resilient development"** – integrating mitigation and adaptation with development. Essentially, every new infrastructure or policy should ideally be both lowering future emissions and resilient to climate impacts. For example, when building a new road network, plan it to avoid flood-prone zones and possibly use cooler paving materials; when expanding electricity, prioritize renewables and decentralized grids that are less vulnerable to storms.

Financial and institutional capacity constraints are the biggest hurdle for developing nations in this realm. Climate investments often require up-front capital that poor governments don't have. While there are international funds (Green Climate Fund, Adaptation Fund, etc.), access can be bureaucratic and volumes are insufficient. Innovative finance is needed: things like green bonds issued by emerging economies, blending public and private finance, tapping into carbon markets, etc. Some countries are calling for debt relief swaps (debt forgiveness in exchange for climate action investments) given that many face debt distress and climate shocks compound their fiscal troubles.

Finally, climate change is not just an environmental issue for these countries; it's a **development issue**. It directly affects agriculture (food security), water availability, health outcomes (e.g. spread of diseases like malaria or dengue to new areas), migration (climate refugees moving after disasters or gradual degradation), and even education (children pulled from school if livelihoods are hit by climate shocks). It can also strain **institutional capacity** – governments find themselves constantly in disaster response mode, diverting resources from long-term development. For example, Mozambique was hit by back-to-back cyclones in 2019 which wiped out infrastructure and livelihoods, requiring massive relief efforts.

In sum, **climate change adds a daunting layer of complexity** to the development path of 21st-century developing nations. It demands that development be rethought in a sustainable, low-carbon, and resilient manner. Encouragingly, many developing countries are showing leadership – from robust renewable energy targets to championing global climate justice. The concept of *"inclusive green growth"* encapsulates the idea that economic growth and environmental protection can go hand in hand, ensuring that development today does not compromise the welfare of future generations. Achieving this will require unprecedented levels of innovation, financing, and global cooperation, given that time is short to avert the worst climate scenarios.

The next sections will consider other social dimensions – education, health, inclusion – which themselves will be influenced by and can influence how countries handle sustainability challenges.

Human Capital: Education and Health Systems

Investments in **education and health** are fundamental to development, as they build the human capital that fuels economic growth and improves well-being. In the 21st century, developing nations have made substantial progress in these areas, yet challenges of quality and equity remain. This section examines the strides made in education and health outcomes, the gaps that persist (especially in regions like Africa), and the strategies being employed to strengthen these critical systems.

Education Trends and Challenges

Education expansion has been one of the clear success stories of the past few decades. Through concerted efforts – often under the MDG and SDG frameworks – access to education has dramatically increased in most developing countries:

- **Primary education**: Enrollment is now nearly universal in many parts of the world. The developing world saw primary net enrollment rise from about 83% in 2000 to 91% in 2015 [45], thanks to campaigns for universal primary education and abolition of school fees in numerous countries. The number of out-of-school primary-aged children globally was roughly halved, dropping from around 100 million in 2000 to about 57 million by 2015 [46]. Sub-Saharan Africa, which lagged the most, made notable gains – its net primary enrollment climbed from just over 50% in 1990 to around 78% by the early 2010s [47]. In absolute terms, African primary school attendance more than doubled (from 62 million to 149 million children) over that period [48]. This is a remarkable accomplishment, reflecting the building of new schools, hiring of teachers, and initiatives like free school meal programs to boost attendance.
- **Secondary education**: After focusing on primary, attention has shifted to secondary schooling. Secondary enrollment and completion have improved, though less uniformly. Many developing countries now have majority enrollment in lower secondary (middle school level), but upper secondary (high school) completion still trails. There is also greater divergence here: middle-income countries in East Asia or Latin America approach near-universal secondary education, whereas low-income countries, especially in Africa, still have less than half of youth attending secondary school. Gender gaps in

secondary have closed in many places (girls often now enroll as much as or even more than boys in parts of Asia and Latin America), but in some African and South Asian contexts girls still face barriers.

- **Tertiary education**: University and college enrollment has also expanded as economies require more skilled labor. Countries like China and India have built many new universities and technical institutes, leading to explosive growth in graduates (China now graduates millions of engineers and other professionals annually). However, tertiary access remains very limited in poorer countries – often under 10% of young people in low-income countries go to college, versus over 50-60% in advanced economies. There's also the issue of "brain drain," where the limited number of highly educated individuals emigrate for better opportunities, something African countries in particular experience with medical professionals and academics leaving for Europe/North America.

Despite these expansions in **quantity**, the biggest concern today is **quality of education**. Learning outcomes in many developing countries are alarmingly low. International assessments and research reveal that many children who have attended school for years still lack basic literacy and numeracy. For instance, there are statistics on "learning poverty" – the World Bank estimates a majority of 10-year-olds in low-income countries cannot read and understand a simple story (an indicator of functional literacy). Factors contributing to this include high pupil-teacher ratios, poorly trained or absent teachers, lack of teaching materials, and instruction in a language not spoken at home.

Moreover, as systems expanded rapidly, maintaining quality proved difficult. In some countries, an entire "lost generation" from the 1990s or 2000s might have gone through school but learned very little, due to under-resourced systems. Addressing this requires reforms focusing on teacher recruitment and training, curriculum relevance, mother-tongue instruction in early grades, better monitoring of learning, and perhaps extending instructional time.

Another challenge is **education inequality**. Within countries, urban students tend to have better access to quality schools than rural students; children from wealthier families or certain ethnic groups often outperform marginalized groups. Girls' education has improved greatly – the global gender gap in youth literacy has virtually closed (youth literacy rose from 83% in 1990 to 91% in 2015, with the male-female gap narrowing) [49]. Yet in some conservative or fragile contexts,

girls still face hurdles (early marriage, cultural norms). At higher levels like STEM fields in tertiary education, women remain underrepresented in many places.

Education policy innovations in developing countries include conditional cash transfers to keep kids in school (e.g. PROGRESA/Oportunidades in Mexico famously boosted enrollment among the poor by paying families for attendance), free school uniforms or menstrual hygiene products to reduce dropouts, community schooling for remote areas, and non-formal education programs for out-of-school youth. Some countries have been experimenting with ed-tech (from radio instruction to tablets) to improve learning, though evidence on these is mixed and often tech must complement, not replace, good teaching.

The COVID-19 pandemic dealt a severe blow to education globally, with school closures in 2020-2021 disrupting learning for millions, particularly in countries less able to pivot to remote learning. Many students, especially the poorest, lost months or even years of schooling and some may never return, exacerbating inequality. Recovery and catch-up programs are now crucial to mitigate the long-term damage from this "education shock."

Health Improvements and Systems

Health outcomes in developing nations have shown impressive gains over the past few decades. Key health indicators illustrate this progress:

- **Life expectancy** has risen significantly. In low-income countries (many in Africa), life expectancy at birth improved from around 50 years in 2000 to the low 60s by 2019 [50]. Specifically, in the WHO African region, life expectancy increased from ~52.7 years in 2000 to ~64.5 years in 2019 [50] – an increase of nearly 12 years in two decades. This reflects better child survival, reduction in infectious disease deaths, and improvements in health services. Globally, life expectancy reached 71 years by 2020, up from 58 in 1970 and 66 in 2000 [51]. However, Africa's life expectancy (around 64) is still more than a decade lower than any other region [52], highlighting remaining disparities [53].
- **Child mortality** has plummeted. The global under-5 mortality rate fell by about 60% since 1990 – from 93 deaths per 1,000 live births in 1990 to 37 per 1,000 in 2020[54]. This translates to millions of children's lives saved each year due to immunizations, malaria prevention, better nutrition, and maternal/newborn health services. In 1990, 12.6

million children under 5 died; by 2020 that number was about 5 million [54]. All regions saw declines, though sub-Saharan Africa remains the highest: U5MR in Africa is about 74 per 1,000 as of 2020, which is **14 times higher** than the rate in high-income regions [55]. Africa and South Asia together account for over 80% of under-5 deaths [56]. Notably, half of all under-5 deaths in 2020 occurred in just five countries (Nigeria, India, Pakistan, DRC, and Ethiopia) [56], with Nigeria and India alone making up about a third. That said, African countries have made dramatic progress too – e.g. Niger cut its child mortality by more than half since 1990 through community health and child survival programs, and even a very poor country like Liberia saw U5MR drop from ~240 in 1990 to ~80 by 2020.

- **Maternal mortality** also declined, though less uniformly. Maternal deaths worldwide fell by around 38% between 2000 and 2017 (from 451 to 211 per 100,000 live births, per WHO data), but the reductions were uneven. Many African countries still have high maternal mortality ratios (MMR > 500). Causes include hemorrhage, infection, eclampsia – largely preventable with proper obstetric care. Improving maternal health has been slower, tied to health system strength and access to skilled birth attendants.
- **Disease control:** Vaccination campaigns have led to eradication or drastic reduction of many infectious diseases. Polio is on the verge of eradication (down to just a few cases in Pakistan/Afghanistan in recent years). Measles deaths fell significantly with vaccination (though recent outbreaks due to lapses in immunization remind of continued vigilance needed). Malaria, a major killer in Africa, has seen mortality decline with widespread use of insecticide-treated nets and new treatments, though progress plateaued recently and climate change may expand malaria zones. HIV/AIDS, which hit Africa hard in the 1990s, is now much better managed due to the massive rollout of antiretroviral therapy: AIDS-related deaths in Africa have dropped, and HIV incidence globally declined ~39% from 2010 to 2020 [57]. However, about two-thirds of people living with HIV are in Africa, and sustaining treatment coverage is an ongoing effort [57]. Tuberculosis remains a challenge, especially with drug-resistant TB emerging, though TB deaths have slowly fallen too.
- **Nutrition and health**: Undernutrition has decreased (stunting rates among children fell in most regions), but some countries still have high levels of chronic undernourishment.

At the same time, we see the rise of **non-communicable diseases (NCDs)** in developing countries as lifestyles change – more diabetes, heart disease, etc., sometimes coexisting with infectious disease burdens.

Improvements in health outcomes are attributable to **strengthened health systems and international support** through initiatives like the Global Fund (for AIDS, TB, Malaria), Gavi (for vaccines), and others. Many countries implemented community-based healthcare, expanded clinics, and improved access to essential medicines. For example, Ethiopia trained and deployed tens of thousands of Health Extension Workers to deliver primary care in rural areas, contributing to its big gains in child and maternal health.

Yet, health systems in many developing nations remain **fragile and under-resourced**. They often face shortages of healthcare workers, with ratios of doctors or nurses per population far below developed country levels. Rural and poor areas frequently lack adequate services. Out-of-pocket health costs push many households into poverty; achieving **universal health coverage (UHC)** is still aspirational in many places. Some countries have introduced health insurance schemes or free care for certain services (e.g. free maternal care in Ghana, community health insurance in Rwanda) to improve access and financial protection, but coverage is incomplete.

Quality of care is another pressing issue. Studies have found that even when people can see a provider, the quality (diagnosis accuracy, adherence to clinical guidelines) is often low. Initiatives to improve quality – better training, supervision, regulation of private sector, etc. – are needed to ensure that access translates to actual health outcomes.

There are also **health inequities**: within countries, the wealthy and urban dwellers typically enjoy far better health outcomes than the poor and rural. For example, a child in a poor rural household in sub-Saharan Africa is much more likely to die before age 5 than one in an urban affluent household. Bridging these gaps is part of the SDG agenda (leave no one behind).

Emerging health challenges include dealing with pandemics (as COVID-19 starkly demonstrated). While Africa was not hit as badly by COVID in terms of reported mortality as some feared (possibly due to a younger population and quick action in some cases), the pandemic still stressed health systems and diverted resources, as well as causing secondary impacts (e.g. routine immunizations and TB treatments were disrupted, potentially leading to

future health setbacks). Strengthening health security (disease surveillance, laboratory capacity, emergency response) is now a higher priority.

Another concern is the **double burden of disease**: many developing nations must combat infectious diseases and undernutrition at the same time as rising NCDs and obesity in parts of the population. This requires a broad approach to health – improving sanitation and infection control while also promoting healthy diets, exercise, and addressing determinants of NCDs.

Human capital development is ultimately a synergy of education and health – healthy, educated individuals are more productive and can contribute more to society. Recognizing this, some policies take an integrated approach (e.g. early childhood development programs that provide nutrition, health, and early learning). Countries like Bangladesh achieved significant gains in both education and health through community-based programs (like BRAC's initiatives, etc.), showing that even low-income settings can make big strides with the right interventions.

In summary, **education and health systems in developing countries have expanded and improved, leading to tangible human development gains**: more children in school, more children surviving to adulthood, and people living longer, healthier lives than in the past. However, **quality and equity** are the watchwords for the next stage. The focus is shifting from just access to ensuring students actually learn and patients receive good care. As countries develop, investing in human capital becomes ever more critical to sustaining economic growth (as argued by economists and encapsulated in the World Bank's Human Capital Index). The pandemic setbacks and continuing resource gaps mean progress is not guaranteed; it will require sustained political commitment and smart resource allocation to strengthen these systems. If successful, these investments in people will pay dividends in all other facets of development, from productivity to civic participation.

Financial Inclusion and Poverty Reduction Strategies

Eradicating extreme poverty and boosting shared prosperity are primary goals for developing countries and the international community. Besides the macroeconomic growth drivers discussed earlier, targeted **poverty reduction strategies** and improving **financial inclusion** have been pivotal in lifting individuals and communities out of poverty. This section examines how developing nations are implementing such strategies – including social safety nets, microfinance, and digital finance – and the impact they are having on poverty alleviation.

Financial Inclusion Revolution

Financial inclusion refers to ensuring that individuals and businesses have access to useful and affordable financial services – transactions, payments, savings, credit, insurance – delivered in a responsible and sustainable way. Traditionally, large swaths of the poor in developing countries were "unbanked," operating entirely in the cash economy and often unable to save securely, borrow formally, or insure against risks. Over the last two decades, there has been a concerted push to expand financial services to the poor, with significant success largely due to innovations like **microfinance and mobile money**.

In the 2000s, **microfinance institutions (MFIs)** proliferated. Pioneered in South Asia (e.g. Grameen Bank in Bangladesh) and Latin America, microcredit programs extended small loans (mostly to women) to start or expand tiny enterprises. By the 2010s, microfinance had a global reach, from village banks in West Africa to micro-lenders in urban Latin America. However, as mentioned earlier, research has shown that microcredit's effects on income can be positive but modest on average[3]. It's not a silver bullet for mass poverty reduction; many borrowers use loans for consumption or to smooth income rather than to launch thriving businesses. Consequently, microfinance models have evolved to provide not just credit but also savings and other services. For instance, many MFIs began offering **micro-savings** accounts, acknowledging that the poor need secure places to save as much as credit. Others offer **micro-insurance** (for health, crops, life) to protect against shocks.

The biggest game-changer in financial inclusion has been the rise of **mobile money and digital finance**. As detailed in the technology section, mobile money services allow people to conduct

financial transactions using basic mobile phones. This has enormously expanded financial access in places with limited bank branch networks. By allowing **mobile account ownership**, it effectively gives millions their first "bank account." As of 2022, *about 40% of adults in sub-Saharan Africa had a mobile money account*, up from 27% just three years earlier [58][59]. According to the World Bank's Global Findex 2021 data, 58% of adults in sub-Saharan Africa had either a financial institution account or a mobile money account – up from 34% a decade prior [60]. This rapid rise is largely attributed to mobile money uptake in countries like Kenya (where over 80% use mobile money), Ghana, Senegal, Tanzania, Uganda, and others. In many of these, more adults have mobile accounts than traditional bank accounts.

Financial inclusion has tangible benefits for poverty reduction: it enables safer saving (protecting money from theft or loss), easier receipt of remittances (which many families rely on), and more efficient payment for services. For example, small farmers can receive crop payments through mobile money rather than waiting for cash; households can receive government cash transfer payments directly to their phone wallets; and entrepreneurs can make transactions without traveling long distances with physical cash. Studies have found that in Kenya, the spread of mobile money lifted an estimated 194,000 households (2% of households) out of extreme poverty by improving financial resilience and enabling occupational shifts, particularly for women (Suri & Jack, 2016). These services reduce transaction costs and integrate the poor into the formal economy, where they can start building credit histories and accessing broader opportunities.

Governments are leveraging digital finance for **social protection programs** too. For instance, during the COVID-19 pandemic, countries with digital payment infrastructure (like India's Aadhaar-linked bank accounts or Kenya's mobile money network) were able to more quickly disburse emergency cash assistance to citizens, helping cushion the economic blow.

Poverty Reduction Strategies and Social Safety Nets

Beyond financial inclusion, direct **poverty reduction strategies** have expanded significantly across the developing world:

- **Conditional and Unconditional Cash Transfers:** Many countries have implemented cash transfer programs to support poor households. Conditional Cash Transfers (CCTs)

require certain actions (like children's school attendance or clinic visits) – exemplified by Latin American programs such as Brazil's Bolsa Família and Mexico's Prospera. These have proven effective in reducing short-term poverty and improving human capital (education, health indicators) [61][46]. Unconditional cash transfers, without specific requirements, have also gained traction, especially in Africa. Countries like Kenya, Zambia, and Malawi have social cash transfer schemes for vulnerable groups (the elderly, orphans, extremely poor families). The evidence shows cash transfers generally lead to increased food consumption, better nutrition, and sometimes investment in productive assets, without significant misuse. They are now a staple of social protection systems in over 100 countries.

- **Public Works and Employment Programs:** Some nations use public works as a safety net – offering guaranteed employment at a basic wage to the poor during slack seasons or after shocks. India's Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is a prominent example, legally guaranteeing rural households up to 100 days of paid work annually on infrastructure projects. This has helped reduce poverty and distress migration in some areas by providing a fallback income source. Similar programs exist in Ethiopia (the Productive Safety Net Programme), in Bangladesh and elsewhere, often with a focus on building community assets.
- **Agricultural and Rural Development Initiatives:** Because poverty in many developing countries is concentrated among smallholder farmers, programs targeting agriculture can be poverty-reducing. These include subsidized seeds/fertilizers (e.g. Malawi's input subsidy program), training and extension services, or farm credit schemes. Some governments also support farmer cooperatives or guarantee minimum prices for crops to stabilize incomes.
- **Education and Health Fee Waivers:** To address the poverty trap of low human capital, numerous countries have abolished school fees for primary education (leading to surges in enrollment in the 2000s in Africa and South Asia). Similarly, some have removed user fees for basic healthcare or for specific services like maternal deliveries. These policies prevent the poor from being excluded from services and reduce catastrophic out-of-pocket spending. However, they require compensatory funding to schools and clinics to maintain service quality.

- **Community-Driven Development (CDD):** As touched on, CDD approaches give communities grants to invest in local priorities (water, sanitation, schools, etc.). This not only improves infrastructure in poor villages but can empower communities and improve governance. The World Bank and other donors have supported many such programs (e.g. Indonesia's PNPM, now the Village Fund program, or Nigeria's Community and Social Development Project).
- **Women's empowerment and family planning:** Given that poverty is closely tied to large family sizes and women's disempowerment in many contexts, efforts to expand family planning and reproductive health services contribute to poverty reduction. Lowering unwanted fertility can improve mother and child health and increase household savings. Additionally, programs that support women's income generation (like self-help groups in India or microcredit targeting women) can alleviate poverty and have multiplier effects on family welfare.

The effectiveness of these strategies often depends on **good implementation and governance**. Targeting can be tricky – ensuring the benefits reach the truly needy and are not captured by local elites. Some countries use proxy means tests, community wealth rankings, or modern data (social registries) to identify beneficiaries. Technology is also aiding here: biometric identification and digital payments reduce leakage and corruption in transfer programs. For example, India's use of the Aadhaar biometric ID linked to bank accounts for subsidy transfers has reportedly saved billions by cutting out "ghost" beneficiaries.

Moreover, there's an increasing recognition of the importance of **fragile and conflict-affected states** in the poverty fight. As earlier noted, a large share of the world's poor now live in such environments [13]. Standard poverty programs are hard to implement where governance is weak or conflict ongoing. In these cases, humanitarian assistance and building basic state capacity take precedence, but there is also experimentation with things like cash transfers in refugee camps or using mobile money to get aid to conflict zones.

One striking emerging tool for extreme poverty is the concept of a **"Graduation approach"**, pioneered by BRAC in Bangladesh and now trialed in many countries. It's a multi-faceted program providing ultra-poor households with a productive asset (e.g. livestock), training, temporary cash stipend, savings facilitation, and health support – aiming to "graduate" them into

sustainable livelihoods over a couple of years. Evaluations across several countries found positive long-term impacts on consumption and assets for many participants. This kind of intensive program is costlier, but can be effective for the very poorest who might not benefit from broad-based growth or lighter-touch interventions.

In terms of overall impact, the combination of robust economic growth (especially in Asia) and these targeted interventions has led to a steep decline in global poverty since 1990. However, as stressed, *Africa has become the last frontier for extreme poverty* [10][11]. Projections indicate that without drastic measures, hundreds of millions in Africa will remain in extreme poverty by 2030 [62][63]. That has led to calls for an **acceleration of efforts**: more financing (domestic and international) for social protection, more effective poverty programs, tackling fragility, and ensuring growth is inclusive (e.g. through job creation, progressive taxation, reducing inequality). The SDG Target 1.1 of eradicating extreme poverty by 2030 is off-track – globally, especially after COVID, we are not on pace to meet it [64]. In Africa, current trajectories suggest around 23% of people may still be in extreme poverty by 2030 [65].

Finally, **financial inclusion** ties back into poverty reduction as a facilitator. For example, having a secure savings account can help a poor family accumulate funds to invest in a business or cope with a bad harvest without falling into debt. Access to credit can enable entrepreneurship or help maintain consumption in lean times. Insurance can prevent a health shock from impoverishing a household. Thus, the push for financial inclusion (driven by mobile technology and microfinance) is part and parcel of poverty strategy – it equips the poor with tools to manage their finances and build assets. The fact that now *over half of adults in the developing world have some form of financial account* (bank or mobile) is a major transformation from two decades ago[30]. As this continues to improve – and as digital financial services expand to offer credit scores, micro-loans via mobile, etc. – the hope is that the poor will have greater agency to improve their economic situation.

In summary, **poverty reduction in the 21st century** has embraced both broad-based growth and targeted inclusion measures. The success in reducing poverty in Asia shows what's possible when growth is combined with investments in people and safety nets. The slower progress in Africa highlights that challenges like high population growth, conflict, and limited fiscal space for safety nets need addressing. Continued innovation in social policy (e.g. universal basic

income pilots, improved targeting through big data, etc.) and strong political commitment to poverty alleviation will be key. Encouragingly, most developing countries now have some form of social protection system in place, which was not the case 30 years ago. Strengthening and scaling these systems, while creating an enabling environment for inclusive economic growth, will determine if we can indeed end extreme poverty in the coming generation.

Governance and Institutional Capacity

Underlying all aspects of development is the role of **governance and institutions**. Effective, inclusive institutions and good governance practices are often the "X factor" that explains why some countries succeed in implementing development policies while others lag. In the 21st century, developing nations have seen both encouraging trends (e.g. the spread of democratization and improvements in public sector capacity in some regions) and worrying setbacks (e.g. state fragility, corruption, conflict resurgence in others). This section explores how institutional capacity and governance issues influence development trajectories, with a focus on Africa's experience as well as general trends.

Democratization and Political Governance: In the late 20th century, many developing countries transitioned from authoritarian regimes to more democratic governance. Latin America, parts of Asia, and Africa in the 1990s underwent democratic openings. Democracies, with all their imperfections, tend on average to have lower levels of corruption and better development outcomes in the long run (as citizens can hold leaders accountable) [66][67]. By the 2010s, dozens of developing countries held regular multiparty elections. This was a positive step for governance, accompanied in many cases by greater freedom of the press and civil society participation.

However, the 2010s also saw some **democratic backsliding and governance challenges**. A few countries shifted back toward authoritarianism or experienced coups (e.g. a spate of military coups in West Africa recently in Mali, Guinea, Burkina Faso, and Niger overturned elected governments). Other countries have democracies in name but weak institutions in practice, leading to patronage politics and instability.

Conflict and Fragility: The presence or absence of peace and stability is a fundamental governance issue. While many conflicts of the late 20th century (e.g. large civil wars in Mozambique, Cambodia, Central America) ended, new conflicts and instability have emerged or persisted: ongoing wars in parts of the Middle East (Syria, Yemen), insurgencies and terrorism in the Sahel and Horn of Africa, persistent conflict in Afghanistan, etc. These conflict-affected states often see development reversals – infrastructure destruction, loss of human capital, and capital flight. They also become havens of poverty; as noted, a significant portion of the world's

poor will live in fragile states by 2030 [13]. Conflict correlates with weak institutions that cannot manage grievances or distribute resources fairly.

For example, **Africa's development has been hampered in regions by instability**: the Great Lakes region, parts of West Africa, and currently the Sahel zone face coups and insurgencies that disrupt governance and economic activity [68][69]. External factors (e.g. extremist groups, foreign interventions, climate stress exacerbating conflicts over resources) compound internal governance failures. The resurgence of coups in Africa has been linked to frustration with corrupt or ineffective elected governments and the meddling of external actors (e.g. mercenaries, foreign powers) [68][69]. These developments threaten the gains made and highlight that building **legitimate, capable states** remains a work in progress.

Corruption and Accountability: Corruption – the abuse of public power for private gain – is a significant governance issue in many developing countries. It diverts resources, undermines public trust, and deters investment. There is wide variation: some countries (like Rwanda or Botswana) have relatively low corruption levels (on par with some developed countries in rankings), whereas others (like South Sudan, Venezuela) rank among the most corrupt on Transparency International's index [70][71]. Anti-corruption efforts have become a focus: many countries have created anti-corruption commissions, strengthened audit institutions, and embraced e-governance to reduce opportunities for graft. Technology, such as digital procurement or biometric IDs for civil servants, has helped in some contexts by increasing transparency.

However, corruption often adapts and persists where checks and balances are weak. **Democracy without strong institutions can still yield corruption** if political finance is opaque or if ruling elites capture the system. In some cases, development partners have tied aid to governance reforms or supported civil society and media to play watchdog roles. For example, citizen-led initiatives and investigative journalism have exposed corruption scandals, leading to some high-profile prosecutions (like in Brazil's "Lava Jato" case or revelations of misuse of funds in certain African countries). Still, ordinary people in many places report paying bribes for services or facing nepotism in hiring – indicating everyday governance deficits.

Decentralization and Local Governance: Many developing countries have decentralized power to local governments, aiming to bring decision-making closer to citizens and improve service delivery. Decentralization can enhance accountability if local officials are more directly answerable to their communities. It also allows experimentation and tailored solutions. For instance, in India, empowering local village councils (Panchayati Raj) including reserving seats for women has had positive effects on local resource allocation and women's participation in governance. Similarly, cities given more autonomy can innovate in urban management.

But decentralization also faces challenges: local governments need adequate resources and capacity. In some cases, decentralization without funding (unfunded mandates) leaves local authorities ill-equipped. Additionally, local elites can capture power if broader accountability mechanisms are weak. Overall though, building strong **institutions at all levels** – national, provincial, local – is critical for implementing development programs effectively.

Rule of Law and Justice: A functioning legal system – police, courts, property rights enforcement – is another cornerstone of development. Many developing countries have undertaken judicial reforms, for example, to clear backlogs or set up special courts for commercial cases to reassure investors. Some have introduced alternative dispute resolution or community justice to make justice more accessible. Nonetheless, in numerous places, the rule of law is undermined by political interference in courts, lack of capacity, or bias against marginalized groups. Improving the rule of law boosts development by protecting rights, resolving disputes fairly, and combatting crime.

Notably, **property rights and land governance** are major issues in agrarian societies. Lack of clear land titles can deter investment and cause conflicts. Programs to formalize land rights (like land titling in Latin America or Africa) have had mixed results – sometimes increasing security, but other times not benefiting the most vulnerable (e.g. men getting titles over women farmers, or elites grabbing land). Customary systems still dominate in parts of Africa, which can be harmonious but also might discriminate (e.g. against women inheriting land).

Institutional Capacity Building: Many developing countries have put effort into strengthening state capacity – training civil servants, improving public financial management, and using technology for efficiency. For example, the spread of integrated financial management systems

has improved budgeting transparency; revenue authorities have modernized tax collection (with some countries vastly increasing domestic revenue in recent years, although Africa still falls short of the AU's 20% tax-to-GDP target for many states). However, as [45] noted, Africa managed only about 31% of its targeted tax-to-GDP ratio by 2021 versus a goal of 63%, indicating a large gap in domestic resource mobilization [72][73].

International initiatives like the **African Peer Review Mechanism (APRM)** encourage countries to self-assess and improve governance, though their impact is debated [74]. There's also a trend toward **open government** – making data public (e.g. budgets, procurement) to enable citizen oversight.

External Debt and Economic Governance: Governance extends to how countries manage their economies. After many received debt relief in the 2000s (e.g. HIPC initiative), some developing countries have again accumulated high public debt. Weak fiscal governance, combined with shocks like commodity price drops or COVID-19, pushed debt levels up. For instance, *Africa's public debt grew 183% from 2010 to 2022 – four times faster than its GDP growth* [75][76], leading to about 24 countries having debt-to-GDP ratios above 60% [77]. High debt can crowd out social spending and lead to crises that derail development. Sound public financial management and anti-debt-corruption measures (since some debts were linked to questionable projects) are critical to maintain sustainability.

Inclusive Governance: There's an increasing focus on ensuring governance is inclusive of all groups – ethnically, regionally, gender-wise. Countries that marginalize certain groups often face unrest. Some have implemented power-sharing or autonomy arrangements to accommodate diversity (e.g. devolving power in ethnically diverse countries to ease tensions). Women's representation in government has improved in many developing nations; countries like Rwanda or Bolivia have some of the highest female parliamentary representation globally (over 50%), due to quota systems. This can influence policy priorities (more focus on social issues, for example).

Regional Institutions and Peer Learning: Developing countries increasingly work together on governance improvements. The African Union and sub-regional bodies (ECOWAS, etc.) have charters on democracy and may sanction unconstitutional changes of power (ECOWAS has

intervened against coups, albeit with mixed success). There's also South-South learning – e.g. one country's civil service reform informing another's.

In conclusion, **governance and institutional quality** remain perhaps the most significant differentiator in development outcomes. Effective institutions ensure that resources (whether domestic or aid) are used properly, policies are implemented, and citizens' needs are met. Conversely, poor governance can stymie development even when resources are available. The 21st century has seen many developing countries strengthen institutions, but also highlighted how fragile progress can be if not consolidated. Building robust, accountable, and inclusive institutions is a long-term endeavor – often taking generations – but it is indispensable for achieving and sustaining all other development gains. The final section will tie together these thematic insights and discuss the future outlook and policy pathways for developing nations.

Conclusion and Policy Pathways to Sustainable and Inclusive Development

Developing nations have undergone profound transformations in the first quarter of the 21st century. They have, as a whole, achieved strong economic growth, significantly reduced poverty, and improved human development indicators. Technological adoption has been rapid, societies have become more connected and urbanized, and many countries have established more robust policy frameworks and institutions than in the past. The narrative of the "Third World" as stagnant has been firmly dispelled by the dynamism seen across Asia, parts of Latin America, and portions of Africa.

Yet, the analysis in this paper also makes clear that **critical challenges remain** on the path to sustainable and inclusive development. Foremost among these are the unfinished tasks of structural economic transformation (especially in Africa), the need to address severe inequalities (between regions, classes, genders), the mounting threat of climate change and environmental degradation, and the imperative of strengthening governance and peace in states troubled by fragility or conflict. The COVID-19 pandemic and global shocks like the war in Ukraine (which spiked food and fuel prices) have provided stark reminders of vulnerabilities and the risk of development reversals. With only a few years left to 2030, the world is *not on track to meet the Sustainable Development Goals* – nearly half of SDG targets are off-course, and some are even backsliding [78][79]. For example, SDG1 (eradicating extreme poverty) will be missed without drastic acceleration [64], and in Africa fewer than 10% of countries are on target for many SDGs [80].

Looking ahead, what are the **future projections** and what **policy pathways** can ensure that developing nations achieve sustainable and inclusive development across regions?

Future Projections: - **Demographics:** The population of developing countries will continue to grow, with Africa becoming the demographic center of gravity by late 21st century. This "African century" of population means global poverty, markets, and labor force growth will hinge on Africa. If Africa can educate and employ its youth, it could become a major engine of growth; if not, high unemployment and migration pressures will result. Meanwhile, some Asian and Latin nations will age, creating new challenges of their own. - **Economic Outlook:**

Emerging economies are projected to comprise an ever-larger share of global GDP, potentially over half by 2030 as noted (with BRICS and others outpacing G7) [6]. This suggests a multipolar global economy. However, growth rates may moderate as easy gains from factor accumulation are exhausted; the onus will be on productivity improvements through innovation, human capital, and better institutions. Regions like South Asia and parts of Africa have potential for faster growth if reforms are made (a "demographic dividend" scenario), whereas parts of Latin America and Middle East need to break out of middle-income stagnation by tackling structural issues (diversification, governance). - **Technology:** The digital revolution will deepen. By 2030, we can expect most of the world's population, even in low-income countries, to have internet access (via smartphones or other devices) if current trends hold. This connectivity can democratize information and services – e.g. most farmers might use some digital tool for farming advice or market access. AI and automation will also become more prevalent; developing countries must adapt by upskilling workers and focusing on tasks that complement rather than compete with machines. There's a risk that automation in manufacturing could limit job creation in that sector – making industrialization less labor-intensive than it was for East Asia. This underscores the need for developing countries to invest in **education for the future** (digital skills, etc.) and perhaps to shift towards service-based and knowledge-based economies where possible. - **Climate Change:** Unfortunately, many impacts of climate change (like more extreme weather) are locked in for coming decades due to past emissions. By 2050, parts of the Sahel could be significantly hotter and drier, coastal cities will face regular flooding, and some small island states might become uninhabitable without massive adaptation. On the mitigation side, the trajectory depends on global action – if the world honors the Paris Agreement, we might limit warming to ~1.5-2°C; if not, developing countries will face far worse scenarios (4°C world by 2100 would be catastrophic for them). Thus, a sustainable pathway requires aggressive climate action now. Encouraging is the plunging cost of renewables and batteries, which gives hope that developing countries can bypass fossil-fuel-heavy development. By 2030, renewable energy could dominate new power installations in many countries due to economics alone, as is already the case in some places.

Policy Pathways: To navigate these projections toward positive outcomes, several strategic pathways emerge:

1. **Investing in People – the Foundation of Growth:** First and foremost, developing nations must double down on human capital investment. This means not only ensuring **universal access to quality education and healthcare**, but improving the quality drastically. Policies should focus on early childhood development (since nutrition and cognitive stimulation in the early years yield lifelong dividends), foundational learning in primary schools (so every child achieves basic literacy/numeracy by age 10, addressing the "learning poverty" crisis), and relevant skills training for youth (so that secondary and tertiary education align with market needs in the digital and globalized economy). Health systems need continued strengthening to provide universal health coverage, including preventive and primary care. The returns to these investments are high: healthier, better-educated citizens are more productive, innovative, and capable of driving development. As one analysis suggested, *equipping all African children with basic skills could multiply Africa's GDP 22-fold by the end of the century* [81]. While that is an illustrative figure, it captures the transformative power of human capital.

2. **Economic Diversification and Quality Growth:** Countries that remain dependent on a narrow base of commodities or low-value activities must pursue diversification and **structural transformation**. This can be through promoting manufacturing where feasible, but also high-value agriculture and services. **Industrial policy** should be smart and evidence-based – supporting industries with comparative advantage, facilitating access to technology, and improving infrastructure and ease of doing business to attract investment. The "return of industrial policy" globally (even advanced economies now supporting industries like green tech) provides policy space for developing nations to also be strategic [1]. Regional integration (like AfCFTA in Africa) can help by creating larger markets that make new industries viable [22]. Governments should also focus on boosting **productivity** in the massive informal sector – e.g. helping small enterprises grow, improving agricultural yields via extension services, and simplifying regulatory environments so businesses can formalize and scale up. Quality growth is growth that creates decent jobs and adds value; achieving this may require persistent effort in improving education, infrastructure, energy access, and governance to create an environment conducive to entrepreneurship and investment.

3. **Harnessing Technology and Innovation:** Building on the digital gains, developing countries should adopt policies to foster **innovation ecosystems**. This includes investing in digital infrastructure (universal internet access as a goal, perhaps treating internet like a basic utility), promoting tech startups (through incubators, access to finance, connections to global markets), and leveraging technology in traditional sectors (like precision agriculture, tele-education, e-health). E-government should be expanded to improve public service delivery and reduce corruption through transparency. Countries like India have shown how digital ID and mobile platforms can transform service delivery – others can adapt those lessons. Moreover, embracing the ongoing Fourth Industrial Revolution (AI, IoT, biotech) with a proactive strategy – such as training youth in STEM, encouraging foreign and local investment in tech sectors – can position developing countries not just as technology consumers but also contributors (for example, Kenya and Nigeria have become known for fintech innovation, and India is a global IT service hub).

4. **Strengthening Institutions and Governance:** As extensively discussed, without capable and accountable institutions, other reforms often flounder. Thus, governance improvements are a cross-cutting pathway. Key measures include: enhancing public financial management (so that increased tax revenues – needed for development spending – are collected and well-used); bolstering anti-corruption agencies and judicial independence to enforce rule of law; decentralizing appropriately and empowering local governments with capacity and resources; and nurturing democratic governance and respect for human rights, which helps ensure inclusive decision-making. In conflict-affected areas, investing in peacebuilding, justice, and inclusion of marginalized groups is paramount – development cannot thrive without security and social cohesion. International support can assist governance reforms through conditional aid, technical assistance, and peer pressure (such as APRM or other review mechanisms). However, domestic political will and leadership matter most – a determined leadership that prioritizes development and integrity (like Rwanda post-1994, or Singapore in earlier decades) can dramatically change a country's trajectory. Cultivating a **meritocratic, service-oriented civil service** is an often unsung but vital task.

5. **Social Protection and Inclusion:** To ensure development is inclusive, countries should build out **comprehensive social safety nets** that protect the vulnerable from shocks and help break intergenerational poverty. By 2030, ideally every developing nation would have in place: cash transfer programs for the extreme poor, child benefits to ensure all children have adequate nutrition and can attend school, insurance or pension schemes to prevent destitution in old age or disability, and emergency assistance mechanisms for times of crisis (like pandemics or natural disasters). These programs not only alleviate poverty directly but can also improve human capital (as healthier, better-fed, and educated people are more productive) and social stability. The trend is already toward expansion of such systems; the challenge is financing and targeting them well. Innovative financing (like reallocating regressive subsidies, e.g. phasing out fuel subsidies and using savings for targeted transfers) can help.

6. **Climate Action and Environmental Management:** Sustainable development demands integrating climate and environmental considerations into all planning. Developing nations should develop and implement **Climate-Resilient Development Plans**. Adaptation should be mainstreamed: new infrastructure must be climate-proof, agriculture policy should promote climate-smart techniques, urban planning should account for rising risks (building codes, zoning for flood zones, etc.). Simultaneously, pursuing a **low-carbon growth path** is in their interest and the world's. This means capitalizing on renewables (many African and Asian countries can leapfrog to solar/wind and not lock into coal; indeed, solar farms and off-grid solar are already booming in some places), improving energy efficiency, and protecting forests and ecosystems which act as carbon sinks and buffers (like mangroves protecting coasts). Many developing countries have set ambitious targets – e.g. several aim for 50%+ renewable electricity by 2030, and some, like Kenya, aim for 100% [44]. Achieving these will require investment – where global climate finance is essential. Thus, a key pathway is also **global partnerships**: developed countries and international institutions must increase support (financial transfers, technology sharing) for developing nations' climate efforts, as promised in agreements. Sustainable pathways will also involve things like sustainable urban design (mass transit to cut emissions and pollution), circular economy approaches in industry (reducing waste), and safeguarding water resources and biodiversity (since those are

critical for long-term livelihoods). Some developing nations, like Costa Rica, have been role models in green policies (e.g. reforestation, ecotourism, renewable energy) – sharing and scaling such models will be beneficial.

7. **Regional and South-South Cooperation:** Developing countries can often find solutions together. Regional integration has been mentioned for trade, but it also applies to infrastructure (power pools, transport corridors), health (joint disease surveillance as with Africa CDC), and education (academic exchanges, regional centers of excellence). *South-South cooperation* has grown – e.g. Brazil sharing tropical agriculture expertise with Africa, or China investing in infrastructure across Asia/Africa (though the latter comes with debt concerns, so needs balancing). Continued and deepened cooperation can help spread best practices and pool resources on big projects (like pan-African rail or a Latin American renewable energy grid). It also provides a platform to amplify developing countries' voices on the global stage – for instance, African and Pacific nations have been influential in climate negotiations by moral suasion, and BRICS as a bloc have initiated new institutions like the New Development Bank.

In particular, Africa's trajectory – given its emphasis in this paper – will likely define the story of development in the 21st century. Africa stands at a crossroads: it has immense potential with its youth, natural resources, and room for growth, but also faces steep hurdles in poverty, governance, and climate vulnerability. The coming decades' policies will determine if the narrative is "Africa Rising" – fulfilling the promise of being the next growth pole – or if it remains one of missed opportunities and crises. The special focus areas for Africa include accelerating structural transformation (e.g. via AfCFTA to boost manufacturing and intra-African trade), massively scaling up education and vocational training (to create a skilled workforce for the 21st-century jobs), drastically improving power supply (including off-grid renewable solutions for the 600 million Africans still without electricity), and resolving conflicts while nurturing democratic governance and respect for diversity. Encouraging is the continent's commitment to long-term agendas like **Agenda 2063**, which envision an integrated, prosperous, and peaceful Africa, driven by its own citizens [82][83]. Achieving such vision will require sticking to these development pathways and adapting as needed with the evolving global context.

In conclusion, the journey of developing nations in the 21st century so far has been one of **significant progress tempered by significant challenges**. There is no one-size-fits-all path – each country must chart its course based on its unique context, learning from others but tailoring solutions locally. However, the overarching goals are shared: *to attain economic prosperity that is widely shared among the population; to ensure social development so that all people have access to basic needs and opportunities; and to do so in a way that is environmentally sustainable and resilient for future generations*. The policy pathways outlined – investing in human capital, fostering inclusive and sustainable growth, leveraging technology, strengthening institutions, expanding safety nets, and cooperating regionally and globally – provide a comprehensive approach to reach those goals.

The challenges are undeniably vast, from climate change to inequality to potential global economic headwinds. But the potential for positive change is also unprecedented – never before have we had so many tools, so much knowledge, and such global interconnectedness to tackle these issues. As developing nations implement these strategies, supported by constructive international partnerships, there is cautious optimism that the coming decades can usher in an era where extreme poverty is eliminated, where economies grow in a clean and equitable way, and where all regions, including Africa, fulfill their promise as integral parts of a stable and thriving world. The 21st century can indeed be, as some have termed it, the century where the "Global South" truly rises – not only in economic stature but in achieving **sustainable and inclusive development** for all their people.

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