Key Messages

EMnet Working Group on Green Economy in Emerging Markets

Accelerating the Green Energy Transition in Times of Crisis

The recent crises and economic shocks, exacerbated by the war in Ukraine, have had far-reaching impacts on the global energy system, disrupting supply and demand patterns across the world at a time when it is far from achieving its shared energy and climate goals. A renewed focus on energy security and shortages in the supply of essential commodities for green technologies are putting pressure on economies globally. Companies and investors now face a complex situation, with urgent short-term energy security needs, not necessarily aligned with longer-term goals for a green transition. Lasting solutions to today’s crisis lie in speeding up clean energy transitions via greater investment in efficiency, clean electricity and a range of clean fuels, at a time where – according to the IEA’s Net Zero by 2050 Roadmap – they remain far short of the levels required to meet rising demand for energy services in a sustainable way. Investment in the transition across emerging and developing economies will need to grow seven-fold, from USD 150 billion in 2020 to over USD 1 trillion a year by the end of the decade to keep the world on track to a 1.5°C pathway. While IEA analysis suggests that world energy investment is set to rise over 8% in 2022 to reach a total of USD 2.4 trillion, well above pre-COVID levels, almost half of the additional USD 200 billion in capital investment in 2022 is likely to be eaten up by higher costs due to inflation, rather than bringing additional energy supply capacity. Cost pressures are most visible in fuel supply but affect clean energy technologies too: the cost of solar panels and wind turbines are up by between 10% and 20% since 2020, after years of declining costs.

Rising costs and energy security concerns are weighing on efforts towards the energy transition

Prior to the war in Ukraine, global trends were already showing limited progress towards the green transition. Globally, despite pledges made towards the net-zero transition, most of the commitments made by countries and industries following the COP25 were not backed by sufficient financial resources or clear execution plans. Recent OECD and IEA data shows that overall government support for fossil fuels in 51 countries worldwide almost doubled to 697.2 USD billion in 2021, from 362.4 USD billion in 2020, as energy prices rose with the rebound of the global economy following the COVID-19 crisis. Worldwide coal consumption rebounded by about 6% in 2021 as the global economy recovered rapidly from the pandemic. This trend is set to continue. Following the invasion of Ukraine, global coal demand is set to keep rising slightly in 2022, taking it back to the record level it reached nearly a decade ago. Developing economies that import considerable quantities of fossil fuels from Russia are at risk of surging inflation and recession and likely to resort to coal to mitigate the shock. In Asia a 10% rise in investment in coal supply in 2021 is likely to be continued in 2022. These increases illustrate that developed and emerging economies, despite their investments in the energy transition, were not sufficiently prepared for a crisis affecting energy security, sovereignty and affordability.

The war in Ukraine has disrupted energy supplies, increased consumption subsidies, and affected the cost of natural resources. Consumption subsidies are anticipated to rise even further in 2022 due to higher fuel prices and energy use. The burden of disruptions in the energy sector means the total energy bill paid by the world’s consumers is likely to top USD 10 trillion for the first time in 2022, particularly affecting the poorest parts of society. The energy crisis has also exacerbated the current food crisis, due to spillover effects on food supply chains via rising energy bills and soaring fertiliser prices. The war in Ukraine is also impacting inputs for net-zero technologies (including wind turbines, solar panels or electric vehicles) such as copper, nickel and silicon which were supplied by Russia. The prices for these critical minerals have reached unprecedented highs since the beginning of the 2010s, due to rising demand for cleaner energies and disrupted supply chains. As a direct impact there has
been a reversal of a clear trend towards progressively lower costs of clean energy technologies. This in turn has a knock-on effect on other green industries as seen with the Chinese car company NIO, which increased the price of its electric sports utility vehicle due to higher raw material costs. Despite this, renewable energy remains the cheapest option for new power generation across many countries. According to IRENA, given the current high fossil fuel prices, the renewable power added in 2021 saves around USD 55 billion from global energy generation costs in 2022. This crisis presents an opportunity to rethink and secure supply chains for these key minerals. A report by the IEA underlines the progresses made on technologies such as photovoltaics, especially by China, with steps taken all along global supply chains to shape emerging markets for batteries, low-emissions hydrogen, and other technologies.

**Investing in emerging economies is essential to boost energy transitions and energy security**

**Investments in clean energies remains essential to the net-zero transition in emerging markets.** Accelerating the clean energy transition in the medium-term will require substantial public and private investment, including FDI which currently accounts for 30% of global new investments in renewable energy. The extent to which FDI contributes to financing clean energy will depend on the market and regulatory environment as well as specific policies designed to promote low-carbon investments. In Southeast Asia alone, to meet the region’s climate goals, total energy investment would need to reach USD 190 billion a year by 2030, up from around USD 70 billion a year between 2016 and 2020. The region could play a major role globally in stabilising the supply disruptions as Indonesia and the Philippines are the two largest nickel producers in the world; Myanmar accounts for 13% of global rare earth production; and Southeast Asia provides 6% of the world’s bauxite. Similarly, Africa, which benefits from 60% of the best solar resources worldwide, currently holds only 1% of solar PV capacity. For Africa to attain its energy and climate goals, energy investments should go over USD 190 billion each year from 2026 to 2030, with two-thirds going to clean energy. There are encouraging efforts in solar energy with countries including Morocco, Ethiopia or Kenya making significant investments and Djibouti aiming to be the first in the continent to reach 100 per cent renewables.

**Investment in the green transition is not reaching emerging markets at the scale and speed required.** Clean energy investments have been on the rise for the past decades, however efforts remain concentrated in advanced economies and China, while stagnating in emerging economies since 2015. More than 80% of sales of electric vehicles are concentrated in China and Europe; more than 90% of global spending on car recharging infrastructure is in China, Europe, and the United States. As noted in the EMnet's Business Insights on Emerging Markets 2022, public funds play a key role in energy investments, in a context of high debt and worsening economic situation reducing government’s ability to invest further. In this context, the pledge by advanced countries to mobilise USD 100 billion annually for climate mitigation and adaptation in emerging economies by 2020 was not reached, with a financing gap of USD 16.7 billion. Sustainable debt issuances reached more than USD 1.7 trillion in 2021, with green bonds being used to finance renewables and low-carbon buildings and transport. Though these instruments are increasingly used across emerging markets to access capital, the absolute values remain low compared to advanced economies. Finally, despite the positive policy signals for clean energy investment, oil and gas companies in emerging markets have continued to benefit from the increased prices, while risks on margins for energy suppliers are rising due to growing costs of financing and raw materials.

**The green transition will require new models to accelerate efforts.** To respond to the current supply chain crisis, adopting principles from the circular economy to rethink the way supply chains are currently designed would lead to promotion of resilience, support local value creation, and enable a more sustainable and inclusive model. Moving forward with the transition and finding solutions
adapted to emerging markets also requires relying on new technologies and developing innovative solutions. According to the IEA, without a significant increase in energy innovation spending, climate goals and long-run economic prospects are at risk. Cross-sectoral collaboration and partnerships with education systems and startups are essential for the emergence of such innovative tools and need to be furthered. The IEA underlines the crucial role startups could play in providing solutions to the challenges we face, as new firms are often vehicles for disruptive technologies to enter the market. However, signs of an “entrepreneurship gap” in the energy field call for more support from both governments and multinationals. Finally, as countries are finding solutions both to the energy crisis and green transition, making sure that the investments made are inclusive and reach projects across emerging markets is crucial. Fintechs and initiatives driving digital and financial inclusion have the potential to channel such investments.

Circular Transition and Supply Chain Disruptions

The global demand for raw materials has grown over the past decades. Between 2015 and 2021, the global economy consumed half a trillion tonnes of virgin materials. According to OECD projections, global material use will further increase and more than double between 2018 and 2060, without further policy action. To reduce material consumption and offset the resulting environmental pressures, more stringent resource efficiency and circular economy policies are needed all along the value chain. Supply chain disruptions since the beginning of the COVID-19 crisis and the war in Ukraine have put companies under pressure. In a survey conducted by The Economist on the Business Costs of Supply Chain Disruption, 2/3 of respondents report revenue losses of between 6 and 20%. Similarly, in 2021 only, companies lost on average $184 million due to supply chain disruptions. The transition to circular models also presents an opportunity to redesign more cohesive value chains.

Circular economic models hold great potential for global economic growth. It is estimated that the circular transition could generate $4.5 trillion by 2030. In Latin America alone, the application of circular economy principles could generate 4.8 million net jobs by 2030. Adopting such a strategy also creates long-term value for stakeholders (customers, investors, communities, partners, etc.), cost reductions, increased sales, and regulatory compliance. Some sectors in particular, such as healthcare, responsible for around 5% of global emissions, can considerably reduce their footprint by adopting some circular principles. However, to achieve this, there is a need to move from a project-by-project to an all-of-industry approach. Multinational companies can play a fundamental role in accelerating the circular transition, leveraging new and digital technologies, enabling and scaling efforts by local SMEs. A recent report by Bain shows that supply chain executives plan to double the share of revenue from circular products and services by 2030. Danone for example aims to make 100% of its packaging reusable by 2025 and design products to eliminate waste. In Malaysia, 10 consumer goods companies set up the Malaysian Recycling Alliance in January 2021 with the aim to take the lead on extended produce responsibility in the country. Circularity involves the implementation of new business models such as sharing economy platforms. However, several obstacles have been identified including difficulty to apply circularity across business functions and most importantly lack of a coherent ecosystem of suppliers, industry consortia, technology and data partners, NGOs, and regulators.

Transitioning to circular models, particularly in emerging markets, calls for enhanced investments in recycling infrastructure to scale up. According to the Ellen MacArthur Foundation, the annual issuance of corporate and sovereign bonds with a circular economy focus increased 5-fold between December 2019 and December 2021, with at least 40 bonds issued in the last three years. Initiatives such as the launch of a circular economy public equity fund by BlackRock in 2019 supports investments in publicly listed companies contributing to the transition to a circular economy. The fund raised almost USD 1 billion in its first year, from just USD 20 million seed funding in October 2019. As of July 2021,
BlackRock’s circular economy fund has grown to more than USD 2 billion assets under management. More investments in circular economy are crucial as currently, the global economy is only 8.6% circular, meaning that only 8.6% of the 100 billion tonnes of minerals, fossil fuels, metals and biomass that enter the global economy is reused annually. As European countries seek alternative energy sources including solar-based technologies, there is a new imperative to reshuffle production chains. The shift towards diversification of suppliers and locations, to decrease dependence, if sustained over time can be an opportunity. For example, some manufacturers are looking at business models which would establish reverse supply chains across borders to collect end-of-life products and reinject reusable components back into the production process. However, adapted trade policies need to be in place to do so, noting the opportunity for regional policies such as the African Continental Free Trade Area (AfCFTA) which aims to strengthen regional trade.

**Partnerships for Innovation towards the Energy Transition**

**New technologies and digital innovation can play a key role in support of the energy transition.** The IEA underlines the essential role played by start-ups with disruptive technologies in the response to the current energy crisis. The agency calls for more support and financing through state measures and programmes designed to help them grow. Indeed, the recent crises have led businesses to delay new R&D projects, however, encouragingly, surveys during 2021 of corporate R&D spending intentions for 2022 showed plans for growth after two years of stagnation, including in the heavy industry with budgets from the steel, iron and cement sectors responding actively to the decarbonisation challenges. Managing data is also a priority for the energy transition as the decarbonisation and decentralisation of our energy systems requires the transfer of data, and thus the use of safe networks and platforms for exchange between parties. Finally, fintechs are integrating climate-related features, supported by networks such as the Green Digital Finance Alliance, launched by Ant Financial Services and UNEP, which leverage digital technologies & innovations to enhance financing for sustainable development. An initiative in pilot phase backed by the Alliance currently looks at the aggregation of small amounts of cash from millions of digital wallets in Bangladesh to create a mega-fund to finance low-carbon infrastructures. Beyond start-ups, the UK-IEA Product Efficiency Call to Action has the ambition to set countries on a trajectory to double the efficiency of key products sold globally by 2030 – motors, air conditioners, refrigerators, lighting – which together currently account for over 40% of global electricity consumption. The Super-Efficient Equipment and Appliance Deployment (SEAD) initiative supported by several emerging countries will work on regional requirements to increase efficiency.

**Cross-sectoral collaboration, multi-stakeholder partnerships and innovative startups can play a critical role in supporting, deploying, and scaling new technologies, driving innovation for the energy transition, and developing solutions adapted to the emerging markets context.** Innovative solutions have emerged, however importing them to developing economies remains a challenge, due to lack of frameworks for investment and capacity building in those regions. Partnerships can create an enabling environment for innovation in emerging economies. The Digital Energy Facility, financed by the European Union and implemented by the French Development Agency, supports the modernisation of the energy sector in Sub-Saharan Africa. The Italian Ministry of Ecological Transition with the International Energy Agency (IEA) and the United Nations Environment Programme (UNEP) launched an initiative to step up global climate action and uptake of clean energy models: the Digital Demand-Driven Electricity Networks Initiative (3DEN), at the Pre-COP 26 in Milan. 3DEN aims to support countries to accelerate progress on power system modernisation and effective utilisation of distributed energy resources through policy, regulation, technology, and investment guidance. The private sector can be a key partner, and drive efforts, like Eni’s collaboration with IRENA to promote renewable energy and accelerate the energy transition, particularly in fossil fuel exporting countries.
Investing in an Inclusive Low-Carbon Transition

A sustainable low-carbon transition requires inclusive plans and frameworks adapted to emerging economies. This means ensuring a transition suited to the state of development of emerging countries, many of whom are building their industry. The IEA, in its latest World Energy Employment report, argues the transition should take into account the situation of thousands of workers in emerging markets who are often part-time or informal workers. New energy projects are the major driver of employment, with around 65% of energy workers employed to build and deploy new solar plants, so ensuring they provide quality jobs is essential, as well as training the youth and entrepreneurs to be part of that transition and integrate it across value chains. The OECD Development Centre’s Inclusive and Equitable Framework for a Just Low-Carbon Transition in Resource-Rich Developing Countries assists policy makers in designing comprehensive strategies to advance the low-carbon transition, while accounting for potential adverse impacts on workers and communities.

Financing solutions adapted to emerging markets will be key to driving the necessary investment. The OECD Clean Energy Finance and Investment Mobilisation (CEFIM) has developed a Framework for Industry’s net-zero Transition which aims to assist countries to accelerate the transition to net-zero by understanding their strategic priorities, outlining robust clean energy investment patterns and affordable financing solutions. These include leveraging blended finance to reach the USD 1 trillion a year in clean energy investment needed across emerging economies by the end of the decade. Based on the blended finance framework developed by the OECD, the CEFIM aims to understand barriers to investment in clean energy specific to emerging economies (such as connections to transmission lines, constraints on new technologies, etc.) and look at financial instruments which can be deployed as part of a wider strategy to avoid relying on scarce public resources and derisk investments. The CEFIM is also supporting countries and their financial institutions to act on finance priorities, for example in India, working with stakeholders on identifying actions to mobilise more capital for offshore wind energy or green hydrogen and energy efficiency focused on SMEs.

Digital financial services can help advancing low-carbon transitions while supporting development of rural and low-income households. As noted in a recent report by the Alliance for Financial Inclusion, financial inclusion can help vulnerable groups obtain the instruments they need to better manage risk. As an example, building on the success of mobile money in Africa, the Kenyan company, M-KOPA, break the rural electricity barrier by providing solar home systems that consumers can purchase with mobile money service micropayments through the mobile money service M-Pesa. Affordable solar technology compensates for energy grid deficiencies, allowing remote households to produce energy independently. Such initiatives show how integrating fintech with renewables can combine cleaner energy expansion and other development needs. Fintech instruments also come in action to help those in needs, particularly after natural disasters, via the use of government-to-person payments via mobile money for example, which happens to be more affordable, rapid, and flexible.

Inclusive green finance and digital financial services present opportunities but are yet to be fully developed. The underlying infrastructure and platforms adapted to emerging markets remain at a nascent stage. The Alliance for Financial Inclusion, notes that solutions like digital carbon credit trading or blockchain applications to green bonds are built on financial markets common only in advanced economies. Furthermore, these solutions are not suited for MSMEs which struggle to seize these opportunities due to their small scale. Finally, a critical issue to be addressed across emerging markets is the lack of adequate skills to harness and develop further solutions. Partnerships between education institutions (universities, vocational centres) and the private sector to design specific trainings on “green digital skills” would help support inclusive low-carbon transitions.
The current crisis has compelled the private sector to respond to both the energy security imperatives and the adherence to climate change targets. To drive investment in the green transition even in times of crisis, companies point to the emergence of sustainable financial tools, including bonds and blended finance instruments, which are helping to address specific infrastructure needs in emerging markets, however they also flag remaining policy barriers.

According to participants, the green transition will go hand-in-hand with the technology transition. Firms emphasise the need to enhance capacity-building and upskill the local workforces, as well as increase multistakeholder coalitions and alliances to reach their mitigation and adaptation goals and deploy digital tools widely.

EMnet participants agree on the necessity to accelerate investments in the green transition

The current crises are forcing emerging markets to work on new energy plans, to be more independent, but challenges are hindering progress. According to EMnet participants, the current energy crisis is leading emerging markets to focus on the availability of renewable resources within their regions. The transition to renewables gives many emerging markets the opportunity to move from being passive actors of the transition, with some focused on providing key commodities for components of technologies, to more active participants, becoming technology producers for renewables and alternative clean energies. To achieve such changes, regulations and policies, such as faster permitting and regulatory stability, should be adapted to avoid the pitfalls of resource nationalism in raw materials, particularly in a context where global supply chains are highly vulnerable to geopolitical risks due to the strategic competition over green energy. If regulations and policies aren’t adaptive, the big shift towards a decentralised and decarbonised energy system risks being destabilised. Successful examples of public-private partnerships are illustrative of how the private sector can help governments in their transition plans: in Bogotá, the electrification of public transport required innovative models based on public-private partnerships, in which the company Enel X brought 900 e-buses and four electro-terminals to the local transport system, contributing to the city’s decarbonisation plan. However, factors hindering this transition include: (i) high commodity prices driving costs higher, (ii) high interest rates, driving the cost of energy (LCOE) higher and making it difficult to raise necessary capital; (iii) high currency exchange rate, preventing domestic organisations to purchase and pay in dollars.

National policies can help emerging markets attract investments for the green energy transition. There is still a need for instruments and frameworks, which can provide long-term remuneration and security for investors in emerging markets. To enable access to better information on financing costs for energy projects, the IEA and several partners launched the Cost of Capital Observatory, which will be regularly updated with new data and analysis to identify and address risks that would impede vital investment flows to emerging economies. For EMnet participants, solutions to attract the necessary investments must include long-term stable policies, with visibility above ten years, and official roadmaps with clear targets (in terms of capacity, percentage of renewables, etc.). They see potential in market-based mechanisms such as carbon price and allocation of resources to the most scalable, cost and environmentally efficient technologies, adopting a level playing field approach among technologies. Public consultation with key industry players can further drive investment and enable large-scale renewables projects. Plans such as Invirtamos en Chile (Invest in Chile) are a good starting point to enhance public-private collaboration, with its working groups in sectors such as Construction,
Energy, Transports and Mining, aiming to create a set of measures that can reduce the number of stalled construction projects and create favourable conditions for new projects.

**More focus on the planning stage of infrastructure development can increase the pool of “bankable projects”**. Participants advise policymakers to invest in the preparation of infrastructure projects, especially on evaluation and permitting, estimating that this phase can require from 24 months to 10 years of planning. This step also includes adding contractual guarantees and requirements to attract credit capital; feasibility studies; and environmental and social impact studies to shorten execution of processes. Finally, the planning step of green infrastructures should include a special focus on human rights to address operational, litigation, and reputational costs of renewables appropriately and thus drive community support for the projects.

**New and existing financial instruments can help to finance projects in the emerging markets**. Firms point at the attractiveness of the bond market to drive investment in infrastructure at scale. Due to their flexibility and their transparent KPIs, bonds, in particular sustainability-linked bonds, are considered as a credible tool for investors. Blended finance tools have also proven effective to overcome country- or project-specific risks or market constraints, when raising capital. Participants call for also favouring more innovative smaller scale projects which need lower investments and have a more localised impact on beneficiaries, working with more non-traditional partners such as Fintech companies, impact investors, the donor community, and philanthropists. Firms see potential in carbon offsets, already adopted by many companies to neutralise their residual emissions, and generated through investments in emissions reduction or removal projects. Participants note the danger of greenwashing, and the benefits of working with experienced institutions engaged in the transition from fossil fuels to clean energy, and ensure that offsets are embedded with sound and robust corporate decarbonisation strategies, based on science and emissions reduction pathways.

As part of the solution, the Government of Egypt will present at COP27 the Sharm El-Sheikh Guidebook for Just Financing, with the ambition to go beyond partnerships and rely on the existing climate finance architecture to achieve net-zero targets. It aims to draw a robust governance system for climate finance through its policy-finance technical nexus, while mapping the responsibilities of each key stakeholder and bridging the information gap which still prevails, as well as addressing impact on specific groups such as women. According to EMnet members, inclusive financing also calls for rethinking traditional ESG scoring methodologies, as the traditional KPIs used tend to favour countries with lower risk-levels and push investors to finance projects there instead of countries with the greatest needs. Using adequate data and correctly assessing which governments can reform to achieve the SDGs will allow for greater impact. This growth in “impact investing” will need a stringent design to determine the underlying use of proceeds and verify expected outcomes. Finally, EMnet participants emphasise the need for multilateral development banks (MDBs) and development finance institutions (DFIs) to lead the financing of large infrastructure plans.

**Innovation is the key to an inclusive green energy transition**

EMnet participants reaffirm that green and digital transformations go hand-in-hand, and that technology can play a key role helping reduce global emissions between 15 and 35% by 2030. Reaching this target will require investments in technologies and research around new energy solutions, which will allow industries cut down their emissions of greenhouse gases and other pollutant or radioactive substances. Companies have been working in this direction, exploring new areas such as magnetically-confined fusion. Participants underline the opportunities for innovation brought by startups and the importance for multinationals to support this ecosystem. This is the case of Telefonica and its Wayra programme, helping startups to scale and bring innovation to their customers, including climate-change related. Iberdrola set up the Global Smart Grids Innovation Hub, working with the academia,
suppliers and technology centres, to accelerate the decarbonisation through digital electricity grids, with the aim to double the number of smart grid innovation projects.

In this context, a sound regulatory and legal framework is necessary to encourage collaborations and mobilise resources. Furthermore, the IEA, in its report Tracking Clean Energy Innovation in the Business Sector: An Overview, presents different approaches to tracking clean energy innovation to guide policymakers on how to coordinate more effectively with the private sector. EMnet participants note that efforts should be concentrated on both mitigation and adaptation targets, i.e. how can digital and communication technologies be used in case of disasters or extreme events, to help populations and communities recover quickly. To do so, they call for rethinking digital innovation as a transversal instrument working across sectors and promoting partnerships, in order to reduce technology costs while at the same time reshaping processes and governance to lead the energy transition. Open collaboration between suppliers, industries, governments and the civil society, for example through working groups across different ministries and industries within a country or region, could assess impact of projects on several dimensions, and foster public-private partnerships for innovation.

Capacity building to enhance skills is important to deploy innovative green technologies in emerging markets. Indeed, deploying technologies means all actors, including workforce and public administration, have the adequate skills to adopt them. Eni, in partnership with IRENA, is promoting capacity building for civil servants on how to support the integration of the African continent into the global value chains for sustainable biofuel. They aim at strengthening the competences and skills of national African institutions involved in the biofuels sector through theoretical lessons, analysis of case studies and on-site visits, to understand the industrial environment and acquire the knowledge related to the bio-based production processes and agribusiness system. However, participants underline that capacity-building requires a long-term strategy partnering with the academia and involving education systems and the private sector. For example, Tata Steel Foundation developed the Green School programme, which contributes to spreading awareness around climate change and resource management in schools in remote areas, where the firm operates. Leading an inclusive transition requires adopting a gender-lens, especially when thinking about energy jobs where women are lacking. Neoenergia launched in Brazil, the Escola de Eletricistas programme, to promote women enrollment in electricity course studies. The programme certified 258 women in 2021, 69% of whom joined Iberdrola’s workforce and was recognised by UN WeEmpower as a good practice.

SMEs also need special support from the business community to adopt technologies and accelerate the green transition. AeTrade Group, in partnership with the United Nations Development Programme (UNDP), developed a platform to enhance MSMEs’ access to digital marketing and the African market under the AfCFTA. The Sokokuu e-commerce platform will be deployed across the continent to specifically boost exports, visibility and sales for women- and youth-owned enterprises. In parallel, AeTrade will work on digital capacity building of SMEs and access to business information on markets across the continent and globally, in collaboration with public and private entities. Similarly, Bayer Crop Science is targeting specific small entrepreneurs through their 100 million farmers programme, and Better Life Farming initiative to improve knowledge and yields, to increase production and resilience to climate change. This includes access to technology and data for precision farming and using fewer chemicals. However, the success of such initiatives requires good access to internet, smartphones, and basic technologies, which in turn depends on speedy and wide deployment.

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