



Technology and Innovation for Sustainable Development: regional experiences to promote youth employment and address inequality



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Regional Commissions during the High Level Political Forum**

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Background Note*

1- Overview

The global economy and society are increasingly immersed in the digital world, which is defined by the convergence of technologies —such as artificial intelligence, blockchain, data analytics, IoT, robotics and high-speed networks— that is shaping new ecosystems built on the infrastructure and innovations of the digital revolution. The speed of change resulting from exponential technologies, the extent to which digitalization is permeating all economic and social activities, and its capacity to transform production, management and governance systems, add opportunities and uncertainties to the development dynamics.¹

In 2015, when the world signed up to the most ambitious development agenda ever agreed – the 2030 Agenda for Sustainable Development – technology and innovation were heralded as a key means of implementation. Various UN initiatives -i.a. the Science and Technology Forum and the Technology Facilitation Mechanism- are already leveraging on their potential for transformative action across many SDGs.

Indeed, technologies are already playing a part in improving health, providing economic opportunities and addressing climate change. Digital technologies such as mobile phones and the internet have also created an era where ideas, knowledge and data flow more freely than ever before; enabling the technologically savvy millennial generation opportunities to access knowledge and engage in political debate.

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The new technologies have the potential to raise income levels and improve the quality of life for all people. However, the wave of optimism surrounding the transformative potential of technology has been tempered by increasing concerns about the potential negative impacts. For instance, if the economic benefits are more concentrated among a small group, the increasing inequality can lead to political polarization and social unrest.

One of the primary concerns - particularly relevant to the world's burgeoning youth population - is the future of work. It is inevitable that jobs are going to be impacted as artificial intelligence automates a variety of tasks and unleashes new levels of productivity. Developing countries face a peculiar challenge. With the onset of the Fourth Industrial Revolution, many countries are threatened with job losses even as they struggle to provide formal employment for a large and young workforce. For example, the majority of Africa's workforce are trapped in the informal economy and the rural sector with low productivity, low incomes and low social protection coverage.

At the same time advances in technology can also create new jobs. The artificial intelligence (AI) revolution will transform many jobs whereby workers can spend more time on creative, collaborative, and complex problem-solving tasks that machine automation is not well suited to handle.

While the scale and pace of frontier technological adoption and diffusion are still unknown, it would be prudent for governments to develop a workforce fit for a fourth industrial revolution future. Businesses and governments need to adapt to the changing nature of work by focusing on training people for the jobs of tomorrow. For the next generation workforce, it will be critical to place emphasis on entrepreneurship training to develop job creators as well as job seekers, adult education, life-long learning, and reskilling to deal with current and future technological transitions. This will require an innovative policy response, including in education and the development of curricula, to ensure that contents stay relevant.

2- Challenges and opportunities for harnessing technology and innovation for sustainable development:

a. Sustained and inclusive economic growth, including employment generation for the youth.

Technology is fundamental to sustain economic growth. History has shown that technology and successive industrial revolutions have had huge impacts on economic growth.

However, there are increasing concerns about the impact of technology on jobs. It is important to note that ultimately decisions on the adoption of technologies often hinge on cost-benefits analysis. In short, the nature of technological displacement of labour is about how fast rather than whether it will happen. Market mechanisms will dictate that start-ups, small and medium-sized enterprises, corporations and industries, choose the most cost-effective method of production.



Although the prevailing narrative is that more and more jobs will be lost to machines, it is also a distinct possibility that, in the future, humans and machines work together. In addition, history has told that we may have yet to imagine the industries of the future and the new jobs that economies will demand.

Technological change and in particular digitisation is an engine of productivity and economic growth and creates substantial economic, social and political benefits.² For example, a 10 per cent increase in broadband penetration in lower-middle-income countries results in a commensurate increase of 1.38 per cent in the gross domestic product (GDP).³ There are many possibilities for developing content and mobile applications on broadband networks in developing and transition economies for transforming and improving people's living conditions. General taxation of the mobile ecosystem is expected to rise to \$480 billion by 2020 in Africa alone, creating an additional 3 million new jobs, and bringing the total number of jobs in the mobile ecosystem to more than 20 million by 2020 (ECA 2018).

Digitisation contributes to incremental economic growth and has a proven impact on reducing unemployment, improving quality of life, and boosting citizens' access to public services. Countries at the most advanced stage of digitisation derive 20% more economic benefits than those at the initial stage, and it contributes positively to job creation, with a 10% increase in digitisation reducing the unemployment rate by 0.84%. It is evident that 90% of new jobs are going to be in areas that either are related to digital technologies or involve the use of digital technologies. In countries like Ghana, Kenya and Nigeria, where digital transformation is going at a fast pace, artificial intelligence is a disruptive technology. In addition, the AI is expected to grow by 33% over the next five years, with most use cases aimed at improving the customer experience, particularly in the government, retail, utilities & consumer sectors and transports. However, in scaling-up the potential effect of technology on employment generation, there is a need to interrogate systemic links between the quality of institutions, economic policies, economic growth, and employment creation in the context of technology and innovation. Specifically, re-focusing economic policies on per capita real GDP growth as opposed to aggregate growth may yield employment dividends. But this is contingent upon well-targeted employment interventions and adoption of user-friendly technologies to cater for the unemployed youth both in rural and urban areas.

In many cases, innovation and entrepreneurship policies and programmes are starting to produce results. For example, Lebanon ranked first worldwide for entrepreneurship impact on innovation and eighth worldwide for total early stage entrepreneurial activity.⁴ Similarly, in 2016, the Egyptian Ministry of Communications and Information Technology launched the 'Next tech leaders' programme, from which 5,000 people have already graduated. Similar initiatives taking place in Jordan, Saudi Arabia and the United Arab Emirates ultimately will lead to an increasingly skilled workforce starting and working in new competitive enterprises.



b. Reducing inequality and promoting social development.

The relationship between technology and inequality is multifaceted.⁵ Technology has brought equality dividends by enabling productive transformation and rapid economic growth in Asia. Technologies, notably ICT, have brought improved access to basic services such as finance.

As an example, Aadhaar technology has enabled the financial inclusion of 1.2 billion people in India. The Aadhaar programme in India is a Government-led, technology-based financial inclusion system. The system includes a unique identification number (based on biometric and demographic data) linked to a mobile phone number, a low-cost bank account, and an open mobile platform. The combination of those elements enabled public and private banks to establish an open and interoperable low-cost payment system that is accessible to everyone with a bank account and a mobile phone. More than 338.6 million beneficiaries have now received direct benefit transfers, saving the Government \$7.51 billion over three years.⁶

On average, Africa has the second highest inequality level globally, after Latin America and the Caribbean. There is considerable global evidence that progress on poverty reduction is hampered by high levels of income inequality within countries. Economic growth delivers less poverty reduction when initial inequality is high. To reduce poverty rapidly, we need to keep inequality in check.

The sustained economic growth over the last 15 years has demonstrated that much of Africa's recent good growth performance is due to factor accumulation, not to growth in total factor productivity.⁷ This has created new possibilities and challenges, including the challenge of a widening gap, relative to advances in technology and the needs of the economy in skills and expertise. Inadequate skills, including under-supply of required skills, is becoming as important a constraint on further growth of the continent. In order to adapt, thrive and innovate, it is important to be aware of these evolutionary technologies and trends and understand the opportunities or threats they might present to organisations, people's careers and to society as a whole. This means that technological advancements affect the way people work, learn and interact in society. This further illustrates the impact of technology both in employment generation on the one hand with the proliferation of for example mobile phone and digital technology application, and adverse effects with the advancement of technologies and emergence of new technologies such as artificial intelligence in replacing humans thereby reducing labour force.

c. Greening the economy.

Evidence around the world shows that technologies are critical for achieving the transition to low-carbon and green economies across the world. It is also documented that low-carbon policies or decarbonisation results in gaining job creation at least in the short run while the longer-term picture needs to be examined in the context of the broader societal benefits and long-term impact to the three dimensions of sustainable development – social, economic and environmental. In this context, the digital economy and decarbonisation have contributions although at different levels in enhancing local development, creating job and social cohesion.



In Africa, a number of key issues confront policy-makers in addressing the challenges posed by the current wave of technological changes (e.g. digitalization, automation, artificial intelligence), which need to be considered in terms of the educational curriculum to match the skills needed in the context of the future digital economy, limited services and weak infrastructures (including energy, ICT and transport), underinvestment in research and development, inadequate business and market sophistication, lack of access to capital, etc.

Arab countries have recognized their capacity to harness solar, wind and hydropower, and have begun to invest in those technologies. To reduce their carbon footprints, many are investigating cleaner and more efficient energy supply chains. The countries of the Gulf Cooperation Council (GCC) have agreed on the importance of diversifying their economies beyond oil and gas and are demonstrating global leadership in embracing clean energy technologies.

In the UNECE region, in the context of the Pan-European Strategic Framework for Greening the Economy and the Batumi Initiative for the Green Economy 2016-2030, Member States of the Pan-European region have committed to a coordinated approach to a green and inclusive economy and to investing in human capital to increase green and decent jobs.

3- Policy priorities

While there are question marks over the scale and pace of the frontier technological transition, it would be prudent for governments to be prepared, and to put effective policies in place. This section discusses five key policy areas that could form the backbone of a next generation technology policy.

a. Inclusive ICT infrastructure

A prerequisite for the development and application of frontier technologies is the availability of reliable, resilient and affordable mobile and broadband networks. Therefore, addressing the digital divide and building infrastructure are development imperatives.

Even if middle-income and to some extent low-income countries are not at the forefront of developing frontier technologies, equalizing opportunities embedded in the possibility of buying such technology or adapting parts of it to local circumstances could be lost if digital infrastructure deficits persist. In this regard, a continued focus on bridging the digital divide – particularly “last mile” connectivity – should be a policy priority so as not to fuel a new frontier technology divide.

While enhancing infrastructure in the context of universal access is a necessary factor to address the digital divide, there is also a need to counterbalance hard infrastructure policies, making them more efficient and tackling the problems of marginal areas or groups and reaching the bottom millions to ensure inclusive information / knowledge societies.

b. Developing a workforce fit for rapid technological change

While the scale and pace of frontier technological adoption and diffusion are still unknown, it would be prudent for governments to develop a workforce fit for a Fourth Industrial Revolution future. Some directions to consider include: a greater emphasis on entrepreneurship training to develop job creators as well as job seekers, adult education, life-long learning, and reskilling to deal



with current and future technological transitions. Education must also instill new expectations about work and the marketplace for jobs.

This will require innovative education policies such as those promoted by the Government of Singapore. One such policy offers adults personal accounts which they can use to buy training, and another uses tax incentives to encourage firms to invest more in their lower paid workers. In addition, governments could strengthen social protection systems to protect the workers that are vulnerable to losing their jobs. Such forward-thinking policies could support a strategy to facilitate redeployment, not unemployment.

Another good practice example is the Bolashak International Scholarship programme in Kazakhstan, a scholarship awarded to high-performing students to study at leading universities overseas, provided they return to Kazakhstan to work for at least five years. Since its launch in 1993, more than 10,000 students have benefited from it.

One way to reduce income inequality is to reduce the share of vulnerable employment in total employment through productive and decent employment. Specifically, improving the quality of education and linking education reforms to the capacity to deploy technology to meet the requirements of labour markets are crucial aspects of promoting social mobility out of poverty and inequality. In order to produce a workforce that is fit for rapid technological change, there is a need to link skills production and profiles to the requirements of a modern labour market taking into account the differentiated gender dimensions of technical change. Innovation and knowledge transfer are crucial drivers of technological change and by implication a competitive labour force. Different skills will be required in the short term as the trend toward greater automation will displace some of the often low-skilled laborers who perform simple, repetitive tasks. On the other hand, the growing use of software, connectivity, and analytics will increase the demand for employees with competencies in software development and IT technologies, such as mechatronics experts with software skills. This competency transformation will be one of the key challenges ahead.

It is important to analyse the long-term impact on the workforce and conduct strategic workforce planning. To this end, strategies to adapt role, recruiting, and vocational training to prepare the workforce with the additional IT skills that will be required for the 4th industrial revolution is essential. As such adapting school curricula, training and university programs and strengthening entrepreneurial approaches to increase the IT-related skills and innovation abilities of the workforce are of paramount importance.

c. Innovative regulatory frameworks

Responsive and adaptive regulation

To avoid hindering the development of frontier technologies' application for sustainable development, regulatory processes need to become responsive and adaptive. However, enabling regulation for innovation is difficult to formulate and as such, innovations in regulation processes are urgently required. The Fintech Supervisory Sandbox, launched by the Hong Kong Monetary Authority in 2016, is an example of this, allowing banks and their partnering tech firms to conduct pilot trials of their FinTech initiatives without the need to achieve full compliance with supervisory



requirements in early-stage development. This arrangement enables banks and tech firms to gather data and user feedback so that they can make refinements to their new initiatives, thereby expediting the launch of new technology products, and reducing development costs.

Effective regulation should allow innovation to flourish while still safeguarding society and the environment. Balancing these demands will be an important government agenda as frontier technologies evolve, and one that will require sharing effective practices and innovative approaches between governments. Responsive and adaptive regulation may provide a solution. It emphasizes that policy needs to support the development of frontier technologies while also allowing for faster responses to ensure that the public aren't exploited and that new dangers are averted.

Setting standards and principals on ethics

Governments have already begun to tackle the ethical issues relating to frontier technologies. For example, in Germany, the Federal Government has proposed rules for decision-making to promote ethical behaviour by systems guiding crash scenarios for driverless cars. These rules prioritize human life above property damage and do not discriminate between human lives. Although industry is driving advances in frontier technology, governments must play a key role in ethical and governance considerations. Member States consensus on standards and ethical principles for technological advancements will be critical to ensure that technological transitions are well-managed.

As rapid technological change allows for faster response to customer needs, enhancing flexibility, productivity, and quality of the production process, it will lay the foundation for the adoption of new business models, production processes, and other innovations. This will enable a new level of mass customization as more industrial producers invest in Industry 4.0 technologies to enhance and customize their offers. To this end, there is a need for new innovation regulatory frameworks as new standards and procedures could be developed to enhance integration, functionality, etc.

d. Incentivizing responsible technology development in the private sector

Shared value

As the predominant investor in frontier technologies, the private sector will shape how they impact the economy, society and the environment. However, to create positive impact on these three dimensions of sustainable development, corporations need to move beyond the concept of corporate social responsibility and redefine their objective, and associated measures of success, as creating “shared value”.⁸ Shared value is not corporate social responsibility. It measures value across the three dimensions of sustainable development at the core of business strategy. To further promote shared value, policymakers need to create the right incentives, so these values move from corporate social responsibility departments to the boardrooms.

Typical measures can be subsidies or tax incentives for the development of products by the private sector which bring substantial societal or environmental benefits, especially those related to the Sustainable Development Goals.



Engaging the technology giants

Leading technology companies could be important partners for addressing the Sustainable Development Goals. For instance, Microsoft's A Cloud for Global Good has brought tangible benefits to developing countries.⁹ Efforts by leading global technology companies to make frontier technologies publicly available and transparent would enable developing countries to learn about the latest developments and identify solutions to social and environmental issues.¹⁰ An important example in this respect is the Partnership on Artificial Intelligence to Benefit People and Society¹¹ founded by Amazon, Apple, DeepMind, Facebook, Google, IBM and Microsoft in 2016. The partnership states that its goals are to study and formulate best practices on the development, testing, and fielding of artificial intelligence technologies, advancing the public's understanding of artificial intelligence, to serve as an open platform for discussion and engagement about artificial intelligence, and its influences on people and society, and identify and foster aspirational efforts in artificial intelligence for socially beneficial purposes.

On the other hand, many technology companies dominate their respective sectors. This may restrain effective market competition and lead to winner-take-all market outcomes. While the important role of the private sector in sustainable development has been well noted, government's need to put effective policies in place to manage any potential conflicts between corporate objectives of maximizing shareholder wealth, and potentially negative social and environmental impacts.

Responsible technology development faces a number of legal and technological challenges involving such issues as IPR and knowledge management, data traffic and storage, employment law, licensing models, liabilities, foreign trade laws and export controls, etc. that need proper incentive models to encourage innovation and responsible technology development by the private sector.

e. Government as market shaper and adopter of frontier technologies

Public sector innovation skills

It will be critical for government and public-sector workers to develop innovation skills if countries are to meet the diverse range of goals set out in the Sustainable Development Goal.¹² Governments will need to support an agile, forward-thinking and technologically skilled civil service to respond to a rapidly changing world and the opportunities frontier technologies present. While caricatures of public servants that depict them as hostile to innovation are out of date, public organizations continue to need skills and better processes if they are to resist the tendency of inertia.¹³ The Government of Singapore's Digital Services Team provides an example of an initiative by a government that has focused on bringing in non-traditional civil service skills. The team of software developers, user experience designers and architects build digital services using an agile project management method that emphasizes small changes to services based on feedback from user testing and research. There are also a large number of public sector innovation activities in the UNECE region, including a public sector innovation scoreboard and public sector awards¹⁴.

Government as a market maker and shaper



The private sector has been the prime investor in frontier technologies. However, increasingly, governments in the Asia-Pacific region are establishing dedicated agencies to help realize the transformative potential of frontier technologies. One such agency is Singapore's SGInnovate,¹⁵ which was launched in November 2016 as the venture capital arm of Singapore's Infocomm Development Authority.¹⁶

4- The role of regional cooperation

a. Best practices at the regional level and initiatives by the Regional Commissions.

Cross-government cooperation; inter-governmental knowledge-sharing and consensus-building; as well as honest, open and regular discussion with civil society and the private sector, specifically technology developers will be critical to ensure that frontier technologies have a positive impact on sustainable development.

Asia and the Pacific

The Asia-Pacific is a leading region in the development of frontier technologies and is forecast to be a prominent market of the future. Governments in the region have also been at the forefront of innovative policymaking on this agenda. This prominent position means governments in the region have the opportunity to shape the role and scope of frontier technologies.

ESCAP has been supporting member States to navigate the Fourth Industrial Revolution future that we face through several modalities. In a think tank role, ESCAP has published reports outlining the policy responses from member States in the region and developed policy frameworks applicable to the wider region.¹⁷ ESCAP also has been providing hands-on policy advice and technical support to countries developing frontier technology and fourth industrial strategies.¹⁸ And finally, ESCAP has made “the 2030 Agenda for Sustainable Development and the future of technology” a key agenda item on its intergovernmental platform on STI to foster knowledge sharing and collective action.

Africa

ECA plays a pivotal role in advancing STI as means of implementing SDGs across the African continent. It played a key role in supporting the development of the AU's Sciences, Technology and Innovation Strategy for Africa (STISA) 2014, which helps in restructuring national STI policy development in the context of SDG and Agenda 2063. As a result, today, half of African countries have adopted STI policies in alignment with the Sustainable Development Goals and the Science, Technology and Innovation Strategy for Africa 2024 (STISA). Countries such as Kenya, South Africa, Morocco and Tunisia, which rank high on STI indicators in Africa, invest a relatively higher share of their GDP in research and development and also provide incentives for private sector involvement in the funding and carrying out of R&D. These countries also effectively implement strategies to strengthen their innovation systems by establishing dedicated Agencies specifically for that purpose



ECA helps countries to strengthen national STI policy monitoring agencies to improve both collection of STI statistics and conduct of surveys on progress in the implementation of national STI policies and strategies. Such surveys based on improved statistics are helping STI agencies formula best recommendations both at REC and country levels on best ways of increasing STI readiness as a means of implementing a number of SDGs.

ECA continue to support the growth in the use of ICT, develop and strengthen institutional capacity and make the link with the private sector, including by providing spaces for exchange and promotion of knowledge through multi-stakeholder platforms and a series of regional face-to-face meetings. ECA hold annual Africa World Summit on the Information Society (WSIS) regional Review to strengthen the regional perspective of the implementation of the WSIS Action Lines and alignment of the WSIS and SDG processes as well as Senior Expert Dialogue on STI.

Latin America and the Caribbean

At the regional level, two initiatives fostered by ECLAC have proved to be successful:

The regional digital agenda eLAC which started in 2005 and has been renewed periodically to cover at least the 2018-2020 period. This multi stakeholder regional body, whose technical secretariat is held by ECLAC, is integrated by 23 countries (17 from Latin America and 6 from the Caribbean) and representatives of IT industries, academic institutions and civil society. The eLAC has fostered the design of digital agendas in 17 countries and provided a platform for regional political dialogues and for sharing best practices, research methodologies and results, and statistical data. The eLAC 2020 digital agenda includes the fields of infrastructure, economic transformation, government, inclusion and skills, regional market, emerging technologies and governance.

The 2015 proposal to advance towards a regional digital market, which has been well received by the eLAC countries, as well as by subregional integration schemes, such as the Pacific Alliance (Chile, Colombia, Mexico and Peru) and the Andean Community of Nations (Bolivia, Colombia, Ecuador y Peru).

Arab region

ESCWA's main areas of work on technology are related to e-government, natural resource management, including green technologies, internet governance and the governance and challenges related to the adoption of frontier technologies. To be able to implement its responsibilities in the above areas and support Member States and public and private organizations to further the STI agenda, ESCWA has a division dedicated to Technology for Development, and established a specialized regional Technology Centre in 2010.

ESCWA dedicated the thirtieth session of its Commission, held from 25 to 28 June 2018, to the theme of "Technology for Development". The representatives of the member States of ESCWA assembled in Beirut to reaffirm the countries commitment to harnessing technology and innovation in the service of inclusive and sustainable development in the Arab region, with an emphasis on youth and employment¹⁹.

UNECE region

UNECE carries out Innovation for Sustainable Development Reviews, analysing innovation policies and their alignment with national sustainable development priorities and supporting



peer review and policy learning. Similarly, the “United for Smart Sustainable Cities” initiative, launched by UNECE with ITU, provides an international platform for knowledge sharing and partnership building, taking advantage of the crucial role of cities as testing ground for innovation and sustainable development policies.

5- Conclusion

This document highlights policy areas that could form the basis of a next generation technology policy fit for rapid technological change. Creating an enabling environment for frontier technologies to positively impact economy, society and environment, and to reduce current and potential inequalities should be a fundamental principle of future technology policy if it is to effectively support the Sustainable Development Goals.

The impacts of frontier technologies are far from pre-ordained. However, frontier technological breakthroughs require us to think differently about how we have traditionally formulated technology policy. When developing policy on this agenda, it is important to note that concerns regarding the economic implications of emerging technologies are nothing new. Textile workers destroying looms in nineteenth century England for fear of losing their jobs, to robots displacing workers on assembly lines, are just two examples from past industrial revolutions. In this regard we need to listen to historians, not just futurists. It will be critical to learn from the past as we shape the future of frontier technologies.

Many countries are developing specific frontier technology policies and Fourth Industrial Revolution strategies. However, these efforts are mostly in their infancy. To support countries to prepare, the evaluation of the impact of these experimental strategies should be a policy priority to establish what works and equally importantly, what does not. Through these activities, best practice next generation technology frameworks can be developed.

To maximize the potential of youth, countries need to develop national capacities and access to technologies and innovation to promote entrepreneurship and employment among the youth. It is necessary to ensure that innovative regulatory frameworks also involve the “soft skills” required including curriculum development in all levels of education; technical and vocational training; soft skill development of “problem solving” and teamwork techniques using the innovative technology; research and development in both products and processes.

In addition, it will be essential to advance towards the SDGs following a strategy of environmental big push. Only economic diversification towards knowledge-intensive industries based on environmentally sustainable technologies will create the conditions for employment growth, inequality reduction and climate change adaptation in an uncertain world. The implementation of this proposal demands action at different levels: industrial and social policies at the national level; regional economic integration and political coordination, and the creation of global public goods as postulated by the 2030 Agenda for Sustainable Development.²⁰

¹ ECLAC, Data, Algorithms and Policies, Redefining the Digital World, 2018



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- ² Booz & Co (2012). “Maximising the Impact of Digitization.” available at http://www.booz.com/media/uploads/BoozCo_Maximising-the-Impact-of-Digitisation.pdf
- ³ ECA (2018) citing Silja Baller, Soumitra Dutta, and Bruno Lanvin, eds, The Global Information Technology Report 2016: Innovating in the Digital Economy (Davos, Switzerland, World Economic Forum, 2016), available at: http://www3.weforum.org/docs/GITR2016/WEF_GITR_Full_Report.pdf.
- ⁴ The Global Entrepreneurship Monitor (GEM) 2016/2017 Global Report.
- ⁵ Inequality in Asia and the Pacific in the Era of the 2030 Agenda for Sustainable Development (United Nations publication, Sales No. E.18.II.F.13).
- ⁶ Shri Sanjay Kumar Vyas, Additional Director, Ministry of Electronics and Information Technology, India, “New innovation approaches to support the implementation of Sustainable Development Goals” Statement at the Twentieth session of the United Nations Commission of Science and Technology for Development, 10 May 2017. Available from <http://pmindiaun.org/pages.php?id=1467>.
- ⁷ ECA (2018) Skills, technology and the African transformation agenda: massive open online courses to the rescue?
- ⁸ Michael Porter and Mark Kramer, “Creating shared value”, Harvard Business Review (January-February 2011) pp. 62-77.
- ⁹ For instance, to respond a 7.8 magnitude earthquake in Nepal in 2015, Microsoft and the United Nations Development Programme (UNDP) built a cloud-based application which allowed reconstruction crews to record precise coordinates and measurements for each building prior to demolition. The application was also used to manage daily cash payments to thousands of local workers, many of whom were clearing debris.
- ¹⁰ In 2017, the United Nations Children’s Fund (UNICEF) joined the partnership, see https://www.unicef.org/media/media_95995.html. Available from UNICEF (www.unicef.org)
- ¹¹ Available from Partnership on AI, <https://www.partnershiponai.org/>.
- ¹² Harnessing Science, Technology and Innovation for Inclusive and Sustainable Development in Asia and the Pacific (United Nations publication, Sales No. E.16.II.F.12).
- ¹³ Geoff Mulgan, “Design in public and social innovation: what works and what could work better” (Nesta, January 2014). Available from https://media.nesta.org.uk/documents/design_in_public_and_social_innovation.pdf.
- ¹⁴ UNECE (2018), Innovation in the public sector, New York-Geneva.
- ¹⁵ See <https://www.opengovasia.com/>.
- ¹⁶ See <https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=21766070>.
- ¹⁷ “Report on Artificial Intelligence and Broadband Divide: State of ICT connectivity in Asia and the Pacific 2017”, ESCAP, November 2017
- ¹⁸ : “Report on Frontier technologies for sustainable development in Asia and the Pacific”, ESCAP, May 2018
- ¹⁹ ESCWA, “Technology for Sustainable Development: Creating decent jobs and empowering youth in Arab countries”, ESCWA, May 2018.
- ²⁰ . ECLAC, The Inefficiency of Inequality, 2018.