



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

MAKING THE 4TH INDUSTRIAL REVOLUTION WORK FOR ALL

DEVELOPMENT DIALOGUES
ON THE UNIDO 4IR STRATEGIC
FRAMEWORK 2021-2030

SUSTAINABLE
DEVELOPMENT
GOALS



INTRODUCING THE 4IR STRATEGIC FRAMEWORK

The UNIDO 4IR Strategic Framework aims to mainstream a digital, gender-responsive, sustainable transformation and scale up digital capabilities in its Member States. In this context, UNIDO continues to contribute to multi-stakeholder dialogue and partnerships in United Nations forums. UNIDO acknowledges the different levels of development and priorities in developing countries' implementation of the 4IR, aligning those to relevant industrial sectors and value chains, and aid in post-COVID activities in relation to regional development priorities. With the goal to achieve Sustainable Development Goal (SDG) 9—to build resilient infrastructure, promote sustainable industrialization and foster innovation—and ISID, the UNIDO 4IR Strategic Framework strives to enable everyone to address the challenges and reap the opportunities of the 4IR.

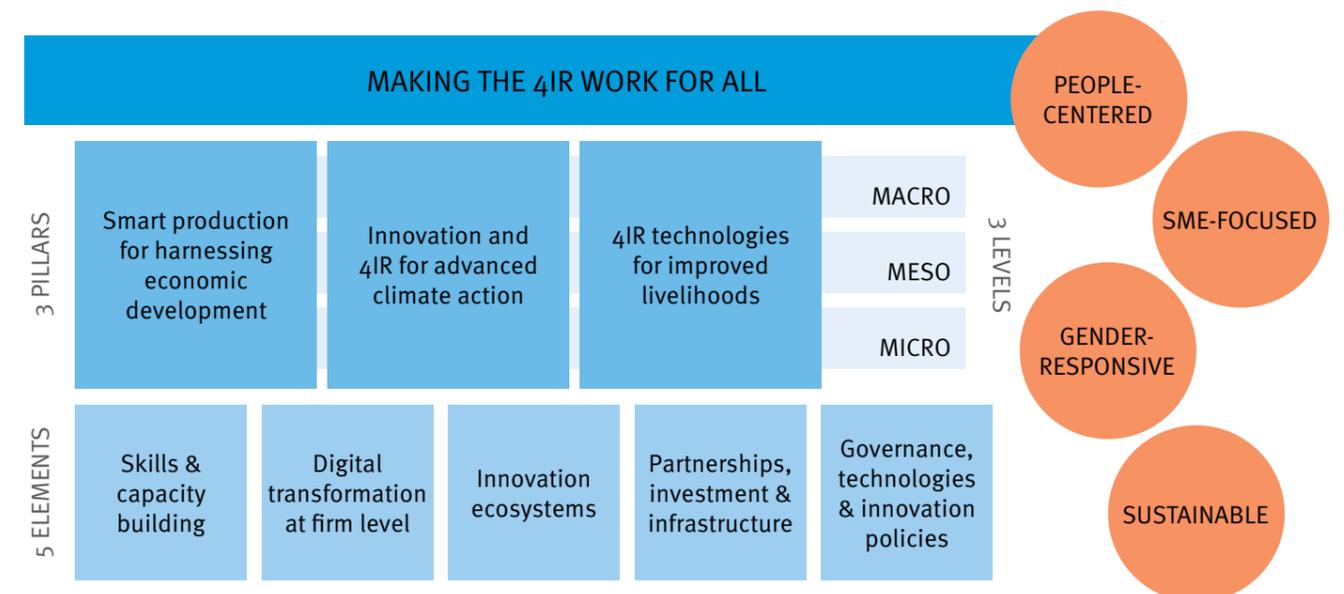
UNIDO advocates a people-centric approach to the 4IR, in which innovation and advanced technologies serve human welfare and environmental sustainability. Subsequently, UNIDO aims to support the positive effects of the 4IR and to mitigate the negative impacts of technology to prosperity, particularly to vulnerable groups such as women and youth. To resolve concerns of inequalities of vulnerable groups under-represented in science, technology, engineering and mathematics (STEM) sectors in the 4IR landscape, UNIDO's role is to be inclusive and to differentiate according to regional needs aligned with UNIDO's frameworks. The key elements to make the 4IR work for all include skills and capacity building, digital transformation at firm level, innovation ecosystems, partnerships, investment and infrastructure, governance, technologies and innovation policies.

BACKGROUND

The Fourth Industrial Revolution (4IR) is at the center of the digital transformation of societies. In the manufacturing and services sector, it is characterized by the convergence of advanced digital production technologies that include artificial intelligence, 3D printing, big data and robotics, with advances in energy storage, and energy generation transforming the global industrial landscape. This has led to the concept of achieving a smart society—learning as it works—with continuous optimization.

The Abu Dhabi Declaration, adopted at the eighteenth session of the United Nations Industrial Development Organization (UNIDO) General Conference in 2019, and the Fourth Industrial Revolution Conference Room paper briefing Member States in 2021, prompted attention to the emergence of frontier technologies. UNIDO's latest Medium-term Programme Framework (MTPF) responds to this call, identifying digital transformation and innovation as one of the three focus areas for UNIDO to advance inclusive and sustainable industrial development (ISID).

UNIDO STRATEGIC FRAMEWORK FOR 4IR 2021-2030



CONTEXT

Against this backdrop, UNIDO organized a first event in October 2021, the “Development Dialogue on the UNIDO strategic framework for fourth industrial revolution”, to brief its Member States on the status of the preparation of its 4IR Strategic Framework. This event was followed by four regional Development Dialogue sessions—one each for the Africa Group; the Group of Latin America and the Caribbean Countries; the Asia-Pacific and Arab Region; and the Eastern European Group and Western European and Others Group. Each regional Development Dialogue session consisted of a presentation and remarks on the development of the UNIDO 4IR Strategic Framework by UNIDO senior management. Regional stakeholders and Member States provided feedback. This was followed by presentations of perspectives from the field and interlinkages with other relevant strategies. Member States were again provided the opportunity for interactive discussion. All sessions were conducted in hybrid mode.

Recognizing the vast opportunities presented by the 4IR for developing countries, UNIDO organized other events on the topic in 2021. During the 9th Ministerial Conference of Least Developed Countries (LDCs), UNIDO held an event titled “Mainstreaming the 4IR in LDCs through Science, Technology and Innovation” to present a policy paper that makes the case for the rapid adoption of 4IR technologies by LDCs to achieve rapid economic growth as well as to meet their sustainable development and de-carbonization goals. The event invited distinguished speakers and experts to discuss how LDCs can accelerate their transition to the new industrial paradigm despite the many development challenges they endure and to suggest practical recommendations by which LDCs can initiate their 4IR journey. The topic of the 4IR was further discussed during the nineteenth session of the UNIDO General Conference in an event titled “The post-pandemic world will be digital: implications of the 4IR for developing countries”.

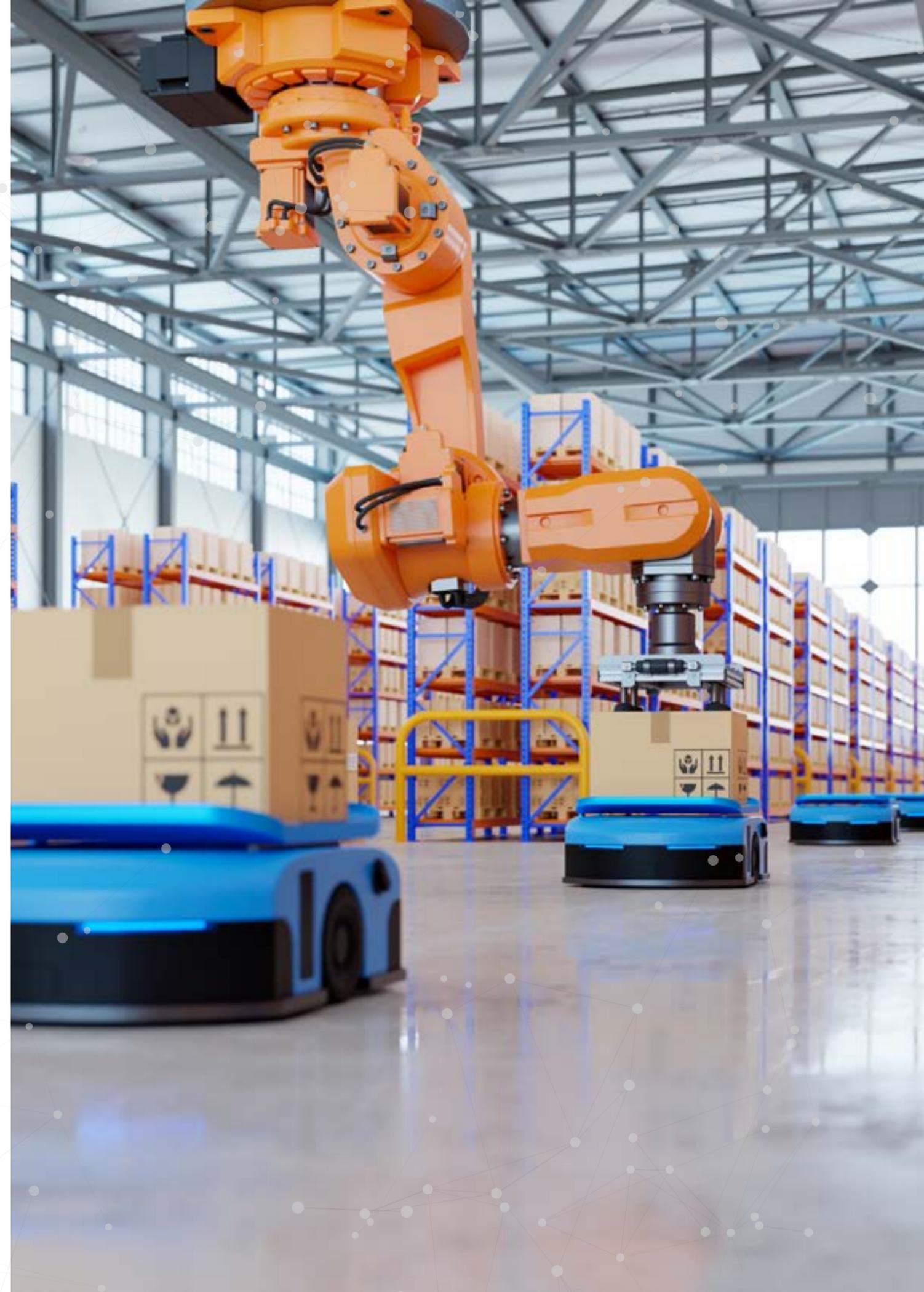
DEVELOPMENT DIALOGUES

Oct 7	UNIDO Member States
Oct 14	Latin America & the Caribbean
Oct 20	African Group
Oct 28	Asia-Pacific & Arab States
Nov 2	Eastern and Western Europe & other States

FEATURES

- » **UNIDO presentation**
- » **Stakeholder perspective** (from public and private representatives)
- » **Member States’ feedback**
- » **UNIDO field/ITPO perspective**
- » **Cross reference to other strategies** (e.g. gender mainstreaming, LDC, IDDA₃)
- » **Interactive discussion**

STRONG
INTERACTIVE
MODEL





REGIONAL PERSPECTIVES

LATIN AMERICA & THE CARIBBEAN

A World Economic Forum White Paper reports that large Latin American companies are aware of key Industry 4.0 concepts and the potential of 4IR technologies; a survey conducted in Brazil by the National Confederation of Industries in 2017 indicated a high level of awareness of Industry 4.0. This includes the 4IR transformation of the supply chain: 46.6% of surveyed executives chose high probability when asked whether 4IR technologies will improve relationships with suppliers through the real-time monitoring of orders and logistics via web services. Similarly, according to a study among C-level executives in Argentina, 76% of respondents answered that the evolution towards Industry 4.0 is part of the discussion within senior management. Among the key topics of interest, the executives mentioned smart manufacturing, real-time performance management and digital performance dashboards.

Blockchain technology, according to experts, holds great potential to improve production systems and supply chain monitoring, especially in Latin America and the Caribbean, where more smartphone penetration can facilitate the adoption of new technology. This 4IR technology, like others, directly affects the achievement of SDG 16 on peace, justice and strong institutions, all of which are vital conditions for the achievement of the 17 SDGs.

Stakeholders' perspective from the region

Mr. Benjamin Germany, General Manager, Center for Industry 4.0, Universidad de Concepción, Chile

Mr. Fernando Prada, Instituto Tecnológico de la Producción, Peru

During the Development Dialogue for the Group of Latin American and Caribbean Countries (GRULAC), the following issues were discussed:

- » Stakeholders highlighted the role of the 4IR in accelerating the transition to circular economy in the region, underlining UNIDO's role to help bridge the gap between the 4IR and circular economy.
- » Along these lines, the development of new methodologies on the identification of demand and services in the field of circular economy and promoting sustainability in small and medium-sized enterprises (SMEs) was also highlighted. The

example of Instituto Tecnológico de la Producción was presented as it provides technology services in SMEs aiming to facilitate technology transfer to increase productivity in Peru.

- » Furthermore, GRULAC member states noted that, with UNIDO's support, the analysis of challenges associated with frontier technologies are being considered, with the objective to promote decentralization—essential to countries in the region—and to support programmes that have been initiated for smaller companies.
- » The UNIDO 4IR Strategic Framework is adopted with the aim to partner with middle-income countries (MICs), for which a work plan of operationalization of the framework was presented to the forty-ninth session of the Industrial Development Board. In this context, a new digital communication and partnership platform for SDG 9 was presented and participants were invited to register (www.sdg9accelerator.org).
- » As part of the Hannover Messe national event, the Industrial Transformation Mexico underlined the relevance of the 4IR in the region. Academic institutions aim to facilitate labour market access through the reconfiguration of academic curricula to align with digital requirements of the industry.
- » Cross sector strategies presented included synergies between UNIDO's strategies on 4IR and MICs, with a focus on Latin America and the Caribbean region.
- » During the interactive discussion, Member States from GRULAC referred to the interconnection between SMEs and UNIDO's work to make 4IR work for all, highlighting the important role of women as entrepreneurs and asking UNIDO to strengthen its support in this regard.
- » It was asked how UNIDO can foster connections between countries, particularly between academic institutions working on innovation.
- » Interest was also expressed in the area of green hydrogen.

AFRICA

The 4IR has the potential to transform Africa's economy, increase its productivity, enhance its global trade, and improve the well-being of African citizens through innovation, digital skills, investment and infrastructure and digital cooperation. Unlocking the potential of the 4IR, Africa has valuable assets such as its young population, flexibility, resilience, and capacity for finding creative solutions to problems.

A relevant factor of the 4IR for Africa includes the development of a bio-economy, as economies are largely based on agricultural value chains, and its abundant biodiversity. With the acceleration of the 4IR on the continent, the technologies can support bio-economy development by increasing resilience to climate change and mitigating its impacts to achieve the SDGs and ISID.

Stakeholders' perspective from the region

Mr. Sama Mbang, Founder & Executive President, Digital Transformation Alliance, *Cameroon*

Mr. Isaac Bayoh, Technical Advisor, Ministry of Digital Economy, Telecommunications and Innovation, *Cote d'Ivoire*

Mr. Asfaw Abebe Eregnew, Director General of the Federal Small and Medium Manufacturing Industry Promotion Authority (FeMMIPA), *Ethiopia*

Mr. Samson Kimani, KenGen (Olkaria Geothermal Power Station), *Kenya*

During the Development Dialogue for the Africa Group, the following issues were discussed:

- » Stakeholders highlighted that the ongoing efforts of the Economic Community for Central African States, in cooperation with key stakeholders, aim to bridge the digital divide on the continent.
- » In line with the UNIDO 4IR Strategic Framework, capacity building tools have been provided for African youth to be equipped for the 4IR. For example, a center of technology, innovation and development, InnoTechLab, was created to focus on building skills in the areas of manufacturing, robotics, automation and logistics, smart cities, digital infrastructure and renewable energy.

- » Furthermore, UNIDO, in cooperation with the governments of Japan and Kenya, initiated KenGen, a project that contributes to the strengthening of capacity for operation and maintenance with Internet of Things in geothermal power stations based in Olkaria.
- » Notable partnerships exist within the African Group that aim to reduce the risks associated with the 4IR, relating to human labour, the unskilled workforce and inequality gap of youth and women which requires capacity building and policy interventions. One such partnership is ITPO Nigeria which provides an opportunity to make the 4IR work for all through, inter alia, the promotion of private sector partnerships, entrepreneurship and inclusivity.
- » Cross sector strategies presented include the Third Industrial Development Decade for Africa (IDDA III), which prioritizes the 4IR to help African nations, particularly LDCs with emerging challenges, capitalize on its opportunities. IDDA III is also in line with the Africa Union's Digital Transformation Strategy for Africa (2020–2030).
- » The relevance of the bio-economy for Africa was underscored as African economies are largely based on agriculture, providing opportunities for sustainable development. Developing rural businesses remains a key development strategy for the region and bio-economy can support this, with the help of 4IR technologies that can increase resilience to climate change and mitigate its impacts.
- » During the interactive discussion, Member States from the Africa Group inquired about how policies in African countries affected 4IR activities and how the private sector was engaged.
- » It was asked if UNIDO training programmes exist for youth and women regarding digitalization in African countries to promote economic empowerment.
- » The high number of woman-owned businesses in the informal sector was also noted, and how this sector can fit into the process was considered.





ASIA-PACIFIC & ARAB REGION

As countries in the Asia and Pacific region devote significant efforts to overcome the economic shock driven by COVID-19, there is increasing interest in seizing the crisis as an opportunity to modernize their industrial structure, improve sustainability and resilience, and ensure that benefits of the recovery are evenly distributed among all members of society.

To fully reap the benefits of 4IR, decisive and concerted policy action is needed in areas including workforce development, infrastructure development, innovation promotion and institutional reforms. Countries face a critical juncture given the pressing need to safeguard the environment and tackle elevated levels of inequality. Appropriate mechanisms are required to decarbonize industrial production while assigning a higher priority to the disadvantaged groups currently affected by structural inequality such as women, people with disabilities, indigenous people and ethnic minorities.

The transitional industrial development is highlighted as part of Indonesia's presidential initiative "Making Indonesia 4.0", under which the first Regional Conference on Industrial Development was convened in Bali, Indonesia, in 2018. The second edition of the Conference was held in Jakarta, Indonesia, from 10–11 November 2021—with the thematic focus on the promotion of Industry 4.0 to support micro, small and medium enterprises in the framework of COVID-19, which feeds into the G20 Summit to be held in Indonesia in 2022.

Stakeholders' perspective from the region

Mr. Dattatraya Navalgundkar, Director, C4i4 Lab, Government of *India*

Mr. Yan Sibarang Tandiele, Director International Industry Access, Ministry of Industry, *Indonesia*

Prof. Mostapha Bousmina, Director of Euromed University of Fes, *Morocco*

During the Development Dialogue for the Asia-Pacific and Arab region, the following issues were discussed:

- » Stakeholders highlighted that, in the scope of the paradigm shift, the adoption of 4IR technologies differ from country to country, particularly in MICs and LDCs.
- » The key areas to accelerate the 4IR were also highlighted, including the promotion of the field of STEM sectors, SMEs and start-ups.
- » Some Asia-Pacific countries are embarking on capacity building to empower change, digitalization consulting, developing, delivery and deploying solutions to accelerate digital adoption and to help academic institutions develop talent pools.
- » For example, Make in India and the Smart Advanced Manufacturing and Rapid Transformation Hub (SAMARTH) aims to accelerate innovation and adoption of the 4IR in the country.
- » It was stressed that the transition to the 4IR in the Arab region includes the absence of policies to enable its dissemination in the industrial sector and the lack of development of the paradigm shift. To combat the challenges, UNIDO fosters partnerships with key stakeholders which includes the Programme for Country Partnership (PCP) in Morocco and Egypt to support defining and consolidating a digital economy ecosystem by applying 4IR technologies and enhancing productivity skills.
- » Cross sector strategies presented include the interlinkages between the UNIDO 4IR Strategic Framework and UNIDO's flagship event Bridge for Cities, highlighting the importance of promoting 4IR at the city level and engaging in the development of smart cities.

EASTERN EUROPEAN GROUP, WESTERN EUROPEAN & OTHERS GROUP

According to a study published by the European Patent Office (EPO), Europe is leading within the 4IR technologies industry, with more patents relating to 4IR technologies originating in Europe (29% of all EPO patent fillings related to 4IR technologies in 2016) than anywhere else in the world.

Noting that the 4IR drastically modifies customer expectations, enables governments to collaborate closely with civil society and challenges privacy, the European Commission launched a strategy on digitizing the European industry in 2016.

Further recognizing the potential of 4IR technologies, a recent European Commission initiative, called Industry 5.0, was launched to place the well-being of workers at the center of the production process, using new technologies to provide prosperity beyond jobs and growth while respecting the production limits of the planet. It goes beyond producing goods and services for profit, shifting the focus from shareholder value to stakeholder value and reinforcing the role and the contribution of industry to society. Industry 5.0 complements the existing “Industry 4.0” approach by specifically putting research and innovation at the center of the transition to a sustainable, human-centric and resilient European industry.

Stakeholders' perspective from the region

Ms. Florensa Haxhi, Director General, Unit for Development Programs and Cooperation, Prime Minister's Office, *Albania*

Mr. Fariz Guliyev, Board Member, Innovation Agency, *Azerbaijan*

Dr. Susanne Bieller, General Secretary, International Federation of Robotics (IFR), *Germany*

During the Development Dialogue for the Eastern European Group (EEG) and Western European and Others Group (WEOG), the following issues were discussed:

- » Stakeholders briefed about advanced digital transformation in their countries, including both in the public and private sectors and in terms of growth and competitiveness.
- » For example, Albania has established a draft innovation and start-up programme, which includes the development of ecosystems for start-ups while fostering innovation in SMEs. The

country was able to digitalize 95% of services to combat COVID-19 ramifications, including the development of techno-parks. While digitalization has advanced the country, a roadmap of upgrading to achieve Industry 4.0 has been established to increase competitiveness on the national and regional levels.

- » In Azerbaijan, the Azerbaijani Service and Assessment Network (ASAN) model includes the digitalization of social services and services for start-ups, in which 400 services are delivered in the country. With UNIDO's cooperation, digital transformation will bring out 4IR-related resources and outcomes that emphasize digital development processes towards the expansion of local markets in conjunction with economies in the region.
- » In relation to UNIDO's work, the IFR aims to inform companies about opportunities of robot implementation, build technical skills and understanding, increase the usability of technologies and education levels across the population, and promote life-long learning.
- » A cross sector strategy presented includes the common regional market action plan, signed in 2020 by the six Prime Ministers of the Western Balkans region, which contains cooperation measures on innovation and digitalization.
- » EEG and WEOG Member States also presented national strategies related to the 4IR.
- » During the interactive discussion, EEG and WEOG Member States noted that enhancing the profile of analytical research, advisory services and standards-setting has brought progress in the promotion of 4IR, particularly during the COVID-19 pandemic.
- » Also highlighted was the cooperation between the European Union to promote the digital transformation of manufacturing industries.
- » Information was requested on UNIDO's contribution to ensure that SMEs are included in the framework of the 4IR.
- » Some EEG and WEOG Member States stressed that they are particularly active in the areas of augmented reality, virtual 3D simulations, digital transformation, artificial intelligence, machine learning, big data, robotics and control technologies.

CONCLUSION

Developed and developing countries alike must be prepared to absorb the new technologies presented by the 4IR, especially to enhance their competitiveness for inclusive and sustainable industrial development in the post-COVID landscape, improve livelihoods as well as to address climate change and achieve the SDGs. UNIDO Member States and other relevant stakeholders in attendance of recent 4IR-related UNIDO events reiterated this sentiment, highlighting the need for increased digital skills development through capacity building and policy interventions addressing the uptake of 4IR technologies. For the 4IR to work for all, as envisioned in the UNIDO 4IR Framework, stakeholders stressed the importance of support for women and youth in particular.

To this end, UNIDO seeks to continue its engagement with its Member States and other partners at the regional level towards the development of regional frameworks and strategies on this pressing topic. This includes organizing regional dialogues to continue the consultation process on the UNIDO 4IR Strategic Framework, and meeting the strong demand of its Member States determined to leverage 4IR opportunities. UNIDO recognizes that customizing its approach to countries' specific needs is paramount to success.

©UNIDO, 2022







Vienna International Centre
Wagramerstr. 5, P.O. Box 300,
A-1400 Vienna, Austria



+43 1 26026-0



www.unido.org



unido@unido.org



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION