

Asian and Pacific Centre for Transfer of Technology

Conference Report

International Conference on Emerging Fourth Industrial Revolution (4IR) Technologies for Sustainable Development 22nd July 2021 Guangzhou, China (Virtual mode)

A. Summary of discussions

1. The International Conference brought together 154 participants from 15 member States of Economic and Social Commission for Asia and the Pacific (ESCAP), namely Afghanistan, Azerbaijan, Bangladesh, Bhutan, Cambodia, India, Islamic Republic of Iran, Malaysia, Nepal, People's Republic of China, Pakistan, Philippines, Republic of Korea, Sri Lanka and Uzbekistan. The participants included government officials, policymakers and representatives from research and development institutions, universities, private sector, technology intermediaries, small and medium enterprises and other relevant stakeholders involved in innovation and technology transfer.
2. The International Conference deliberated on the following topics: 4IR technology innovations for sustainable development – Challenges, opportunities and strategies; promoting 4IR technologies – Strategies for collaborative research, innovation and technology transfer in the Asia-Pacific; and strategies for regional cooperation to promote collaborative R&D and innovations of 4IR technologies.
3. The conference emphasized on need for intensified development and uptake of 4IR technologies spatially and across sectors on a large scale to realize its potential in achieving the Sustainable Development Goals (SDGs). It highlighted that strengthened cross-border collaborations and regional cooperation will be crucial to fast-paced development, transfer and adoption of these technologies and applications across Asia and the Pacific in equitable and sustainable manner.
4. 4IR technologies such as Artificial intelligence (AI), Big data, IOT are finding innovative applications in various sectors such as for agriculture and health, smart cities, manufacturing and for circular economy. For instance, these technologies enable precision agriculture by

input and water use optimization helping to reduce agriculture's impact on water use by 2-5%. The Government of India is planning to launch a national programme on AI to tap the potential in wide range of sectors. A good national strategy for 4IR implementation includes innovative governance, innovative business models, skilling and capacity building, innovative financing models and building of community ecosystems to drive the agenda.

5. Digital twin technologies and open source ecosystem are being widely applied in China for integrated precision farming and for smart manufacturing such as Intelligent Unmanned Aerial and ground Vehicles. The digital twin platforms offer applications in manufacturing at three levels: system level, intelligence level and product life cycle level. There are many examples of smart manufacturing related products and practices from China that can be utilized to optimize the different functionalities of a smart factory and offer wide spectrum of advantages. For instance, various applications of 4IR technologies in facilitating unmanned transportation in mining industry are helping in addressing challenges of open mining such as harsh working environment and frequent safety incidents.
6. A structure of typical Integrated Cyber Physical System was elaborated. Such system normally performs through a cloud based high performance computing mechanism and integrates the three types of platforms namely the physical platform, the Big Data and AI platform and the simulation platform.
7. 4IR technologies have played a crucial role in the fight to COVID-19 pandemic. For example, the Republic of Korea contained COVID-19's impact with effective policy responses, reduced infections and limited economic downturn. A COVID-19 test kit was developed in about two weeks using AI algorithms. A governance structure in form of presidential committee on 4IR has helped in promoting such technologies by preparing the groundwork for regulatory and institutional reforms in support of public-private partnerships and fostering ecosystems for new industries. The K-Quarantine is a successful model adopted by the Republic of Korea for effectively conducting testing, tracking, and treatment of Covid-19 infections. Some of the policy measures/ strategies include emergency use authorization system, producing and sharing reliable data which is fundamental to 4IR, bridging the digital divide through education, and ensuring public safety and security.
8. Despite the potentials of the 4IR technologies, there are still challenges in its applications such as producing and sharing reliable data,

hurdles like digital divide and inadequate 4IR literacy, and public safety and security concerns using those technologies because they deal with personal information and data. The governments should consider guidelines for using such technologies regarding authorization, supervision and monitoring.

9. Promotion of public goods and utilities should be considered as part of the open systems of innovation framework. There is a need to emphasis on incremental innovations as part of promoting R&D in 4IR technologies to facilitate the transformation towards their application.
10. Regional level agreements and multilateral frameworks may play a crucial role in enhancing collaboration and cooperation for better adoption of 4IR technologies in the Asia-Pacific region.
11. Regulatory frameworks, cyber security, digital trade, e-Governance and digitization of public services in countries are important areas where 4IR technologies could make a significant impact.
12. Universities and research institutes could promote interdisciplinary research to break the barriers for innovation in 4IR technologies. They have also a role to empower the workforce through knowledge, skill development, entrepreneurship to cater to the needs of 4IR driven industry.
13. Enabling software and analysis of data for 4IR applications can be key areas for regional collaboration where India can play a vital role. Several Covid-19 technologies have been developed by Indian stakeholders at affordable investment and cost.
14. The Pandemic like emergency approach to develop vaccines within a short time of one year could be adopted for rapid development of innovative 4IR applications. This approach showed how countries could come together to develop many vaccines during the pandemic. Having collaborative projects between institutions and industries from two countries could help in the development and commercialization of 4IR technologies.

B. General/Policy Recommendations

1. Enabling policy frameworks such as national strategies, policy tools to promote R&D and innovation are key to develop and adopt 4IR technology innovations.
2. It is necessary to reshape the educational curriculum (from the grassroots level) which must be proactively taken up by governments in

the light of emerging technologies. Key knowledge areas are life science, engineering biology, medicine and health which have very high applications of 4IR.

3. Universities and Industries should collaborate from the beginning of the R&D process to increase the commercialization potential of 4IR technologies. This will also attract research funding from the industry to universities and research institutes.
4. Complete chain of infrastructure and support framework should be put in place for taking the technology from lab-scale to bench-scale to pilot scale to commercialization which is limited in many countries of Asia-Pacific region currently. Re-skilling and upscaling of workforce for adoption of 4IR technologies should be part of this initiative and should be done with involvement of academia.
5. Adoption of 4IR technologies should take into consideration the socio-economic conditions of countries. Regional institutions like APCTT should work towards fostering international agreements between countries to promote sharing of knowledge and technologies in the 4IR field.
6. Private sector and big multinational companies should play a vital role for regional cooperation. Cross-country Public-Private partnership models can be explored and promoted to increase the adoption and utilization of 4IR technologies by countries of Asia-Pacific.

C. Feedback from participants

The workshop was received very well by the participants, which was corroborated through positive feedbacks. Around 85% of the responses received indicated that the knowledge gained from the workshop was highly useful in their present profession and the conference covered strategies for cross-border R&D collaboration for 4IR technology innovation. More than 90% of the responses received indicated that they found the presentations and deliberations by resource persons highly informative and insightful.