Main conclusions of the International Conference on Technologies for the Sustainable Use of Natural Resources, held in Moscow and online on 3 December 2025

I. Introduction

1. The International Conference on Technologies for the Sustainable Use of Natural Resources was attended by 167 virtual participants (89 M, 78F) from 21 member States of the Economic and Social Commission for Asia and the Pacific and about 100 in-person participants in Moscow.

2. The Plenary Session highlighted the importance of strengthening scientific and technological cooperation to ensure sustainable natural-resource use. The session emphasised deeper collaboration among various stakeholders especially in the context of rising climate pressures requiring integrated and emerging technology solutions.

3. The Conference featured technical sessions on: (a) Innovative & Emerging Technologies for Sustainable Development of Natural Resources in the Asia-Pacific; (b) Innovative Technologies in the Field of Water Conservation; and (c) Living Labs Approach for Technologies for Sustainable Natural Resource Management; (d) Modern Methods and New Technologies for the Sustainable Development of Subsoil Resources; (e) Young Scientists for the Planet: Breakthrough Research in Ecology & Environmental Management; and (f) Opportunities for Regional Technology Cooperation for Sustainable Use of Natural Resources. The detailed presentations will soon be available on the Centre's website.

II. Summary of discussions

1. The conference highlighted the importance of strengthening scientific and technological cooperation to ensure sustainable natural-resource use, showcased diverse technological pathways for strengthening natural-resource sustainability, focused on water conservation through advanced sensing, modelling, and community-led management, explored collaborative innovation platforms enabling communities, researchers, and policymakers to co-create climate and resource-management solutions, highlighted the integration of advanced geoscience, low-carbon development instruments, and sustainable mineral strategies, noted the importance of research contributions from emerging scientists across a wide range of environmental disciplines, and shared member States' priorities including harmonisation of regional datasets, expanding digital-twin, groundwater, and coastal-resilience pilots, strengthening SME participation, and deepening South–South technology exchange.

2. The deliberations emphasized the importance of technology and international cooperation for implementing innovative solutions to address the challenges of natural resource management and climate change. In this regard, key considerations are: IP protection and legal aspects, investment, adoption of technology to local environment, and finding optimal solutions

3. Development of resilient infrastructure requires collective responsibility of researchers, industry, policymakers and society through developing affordable and scalable solutions, adopting clean technology and circular economy principles, and creating an enabling policy environment. Innovative technologies include laced steel-concrete composite system, joint free bridge deck system, folded textile reinforced concrete panels, etc.

4. The world community needs a new energy paradigm comprising of zero-waste solutions, hydrogen energy, diversification of traditional energy systems, integration of centralized and distributed energy systems, low-cost and efficient energy infrastructure. These are essential requirements for establishing new settlements.

5. The challenges of transitioning from oil and gas to renewable energy are attributed to: low institutional capacity for renewable energy innovation, heavily subsidized conventional energy sources, limited access to finance, insufficient technical skills, weak education and vocational programmes, limited energy storage capacity, low digitization and smart grid system, and low societal awareness.

6. Comprehensive assessment of marine resources uses advanced technologies such as remote methods comprising scanners, decoding algorithms, spectral bio-optical models, etc. It is recommended to develop a mechanism for countries for ecological monitoring, use government laboratories, collaborative research, and collective decision making.

7. International cooperation in geological education for natural resource management could be based on key pillars such as mineral deposits exploration, training and internship exchange, research partnerships, and application of artificial intelligence, machine learning, and big data for natural resource management. EcoGeoScan is an innovative environmental monitoring station in Zimbabwe implemented in collaboration with the Russian Federation.

8. The speakers showcased innovative technologies and solutions for natural resource management. They are Ecobiomonitor for aquatic environment monitoring using artificial intelligence and machine learning in the Russian Federation; Water management framework using a participatory approach in local communities in India; and Community-led water sustainability using advanced hydroinformatics in Thailand.

9. Living Labs approach for climate adaptation can effectively used for decision making support, research and development promotion, co-creation of solutions, and developing government climate adaptation plan. A key example is the co-creation of a climate disaster alarm message system in the Republic of Korea.

10. Digital twin-based research and development using sensor networks and high-performance computing offers promising potential for social problem solving. The Centre could customize this framework to country specific contexts as per the relevance and needs of member countries in the Asia-Pacific region. Transnational living lab ecosystem would require multilayered governance structure aiming at developing capabilities of stakeholders in countries.

11. Risk management is a vital element of sustainable development and effective use of natural resources. Digitalization of risk management systems offers promising

solutions and opportunities to. use fewer human resources, real-time access to risk maps, documents, and more accurate results.

III. Recommendations from the Panel Discussion

1. Prioritise key technology areas: green and low-carbon energy (especially solar and storage), climate-resilient agriculture, hydro-informatics and water management, sustainable marine/coastal resource use, and modern waste/pollution control.

2. Create regional platforms and living labs: establish shared digital technology depositories and one-window platforms, plus cross-border living labs and thematic clusters to co-design, pilot and scale solutions in real-world contexts.

3. Strengthen early-warning and adaptation systems: build joint centres and tools for climate, water and disaster risk, with shared data standards, forecasting, and decision-support services.

4. Support responsible mining and circular economy: develop regional standards, projects and capacity for environmentally responsible extraction, processing and recycling of critical and heavy minerals.

5. Invest in human capital and inclusion: run long-term, structured capacity-building (fellowships, training, exchanges) for young professionals and small-scale/community enterprises, with special attention to least-developed and island economies and to traditional knowledge holders.

6. Offer end-to-end technology transfer support: provide IP advisory, matchmaking, demonstration support, and hand-holding through the full project cycle so that technologies move from databases to deployment.

7. Leverage digital, AI and cybersecurity: use AI/ML and multilingual tools to assist countries throughout the technology-transfer chain and ensure robust, secure data systems for cooperation.

8. Secure and pool financing: design practical funding mechanisms using member contributions, development finance and innovation capital, and collaborate with other regional/multilateral bodies to tap existing funds and expertise.

9. Adopt clear multi-year roadmaps: agree on time-bound regional roadmaps with thematic priorities, measurable targets and explicit integration of community-based approaches and protection of traditional and indigenous knowledge.