

International Conference on Science, Technology & Innovation (STI): Catalysts for Regional Connectivity and Sustainable Development in the ECO Region (ECONEX) 2025

Conference Report

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Acknowledgments & Credits

The International Conference on Science, Technology, and Innovation (STI): Catalysts for Regional Connectivity and Sustainable Development in the ECO Region (ECONEX 2025) is organized by the ECO Science Foundation (ECOSF), Pakistan, in partnership with the Higher Education Commission of Pakistan and the ECO Secretariat, Tehran, Iran. We extend our heartfelt gratitude to our partners: the Ministry of Science, Research and Technology (MSRT), Iran, the CAREC Institute, ECO Educational Institute (Türkiye), National Energy Efficiency and Conservation Authority (NEECA, Pakistan), International Water Management Institute (IWMI, Pakistan), Islamic Relief Pakistan, Health Services Academy (Pakistan), COMSTECH, Islamic Relief Pakistan, Pakistan Science Foundation (PSF, Pakistan), ECO Educational Institute, (ECOEI, Türkiye) and Organization for Development of International Science and Technology Collaboration (ODISTC, Iran)

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• Economic Cooperation Organization Science Foundation (ECOSF), Pakistan

Co-Organizers:

- Higher Education Commission of Pakistan
- Economic Cooperation Organization (ECO) Tehran, Iran

Strategic Collaborator:

• The Ministry of Science, Research and Technology (MSRT), Iran

Thematic Session Partners:

- 1. CAREC Institute, China Enhancing Regional Trade and Connectivity in the ECO Region
- 2. ECO Educational Institute, Türkiye & Organization for Development of International Science and Technology Collaboration (ODISTC), Iran *Human Capital Development in the ECO Region*
- 3. National Energy Efficiency & Conservation Authority (NEECA), Pakistan Building a Sustainable and Resilient Energy Future for ECO Member Countries
- 4. International Water Management Institute (IWMI) & Islamic Relief Pakistan Agriculture, Water, and Food Security in the ECO region
- 5. Health Services Academy, Pakistan Fostering Regional Collaboration on Healthcare Innovation and Biotech in the ECO Region
- 6. Pakistan Science Foundation (PSF), Pakistan & COMSTECH, Pakistan Regional Collaboration on Science, Technology, and Innovation (STI) Ecosystem

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Executive Summary

The International Conference on Science, Technology, and Innovation (STI): Catalysts for Regional Connectivity and Sustainable Development in the ECO Region (ECONEX 2025) brought together policymakers, scientists, academics, business leaders, and diplomats to discuss pressing challenges and opportunities across the Economic Cooperation Organization (ECO) region. Held on April 17-18, 2025 in Islamabad, Pakistan, the conference hosted six plenary sessions, each addressing essential themes for regional progress.

The ECONEX emphasized leveraging STI as a transformative force for regional connectivity, inclusive economic growth, and sustainable development. Over 30 international delegates and 250 local participants attended. Speakers highlighted the ECO region's vast potential, including its demographic strengths, abundant resources, and shared cultural heritage. The discussions focused on actionable strategies such as fostering collaboration, harmonizing policies, strengthening human capital, and developing resilient infrastructure.

Plenary Sessions Summaries

A. Regional Collaboration in Science, Technology, and Innovation (STI)

This session underscored the importance of STI for fostering innovation, economic growth, and social equity. Key recommendations included increasing investment in R&D, establishing regional STI collaboration frameworks, and enhancing public science literacy.

B. Enhancing Regional Trade and Connectivity

The session addressed the barriers to seamless trade within the ECO region, proposing infrastructure modernization, digitalization, export diversification, and fostering regional partnerships to unlock untapped trade potential.

C. Human Capital Development

The speakers focused on the region's youthful demographic, advocating for transformative education systems, vocational training, and initiatives to empower women and youth. Strengthening regional collaboration in education and skills development was emphasized.

D. Healthcare Innovation and Biotechnology

Discussions revolved around advancing healthcare innovation, regulatory harmonization, and tackling regional health challenges like antimicrobial resistance (AMR) through shared solutions and collaborative frameworks.

E. Building a Sustainable and Resilient Energy Future

Energy efficiency and renewable energy emerged as focal points for achieving sustainability and resilience. Recommendations included regional energy trade, grid connectivity, and transitioning to electric mobility.

F. Groundwater Management

This session highlighted the urgency of safeguarding groundwater for agriculture, industry, and domestic use. Solutions such as Managed Aquifer Recharge (MAR) and regional frameworks for governance were proposed.

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Plenary Sessions - Key Policy Recommendations and Actions

A. Plenary Session – I: Regional Collaboration in Science, Technology, and Innovation (STI)

Session Overview

The session highlighted the critical role of science, technology, and innovation (STI) in driving sustainable development, economic growth, and regional competitiveness. Presentations from representatives of Pakistan, Thailand, Iran, and China underscored the diverse approaches to leveraging STI for societal advancement. Key themes included the importance of science literacy, the transformative power of regional collaboration, and the potential of science and technology parks (S&T) in fostering innovation. Challenges such as inadequate investment in R&D, brain drain, bureaucratic barriers, and digital infrastructure gaps were also discussed, alongside examples of successful initiatives like telehealth clinics, vaccine production collaborations, and advancements in AI and nanotechnology.

Policy Recommendations and Actions

- 1. Enhance Regional Collaboration: Establish structured programs for joint research, knowledge-sharing, and resource pooling among ECO member states, focusing on shared challenges such as vaccine development, food security, and clean energy.
- 2. Increase Investment in R&D: Advocate for higher national budgets dedicated to research and development, aiming to reach at least 1% of GDP, and encourage funding of demand-driven projects that address immediate societal needs.
- 3. Strengthen Science Literacy and Public Engagement: Expand initiatives like science museums, outreach projects, and public dialogues to build science capital and foster innovation-friendly cultures within communities.
- 4. **Develop Infrastructure for Innovation:** Create science and technology parks equipped with cutting-edge facilities to support startups, enhance industry-academia collaboration, and drive technology commercialization in regional industries.
- 5. Promote Leadership in STI Organizations: Appoint competent leaders with scientific expertise to ensure effective implementation of policies and strategies, alongside capacity-building programs to nurture skilled human capital.

B. Plenary Session – II: Enhancing Regional Trade and Connectivity in the ECO Region

Session Overview

The sesssion emphasized the need for cohesive and strategic efforts among ECO member states to capitalize on regional opportunities. By addressing infrastructure gaps, advancing technological integration, fostering innovation, and promoting cooperative frameworks, the ECO region can realize its immense economic potential and contribute to a sustainable and prosperous future.

The discussions during the session underscored the critical importance of regional trade and connectivity within the ECO region as a pathway to peace, prosperity, and mutual growth. Several speakers identified barriers to seamless trade, such as infrastructure limitations, policy misalignment, and insufficient technological integration. Despite these challenges, the ECO region's untapped potential—manifested in intra-regional trade, resource abundance, and scientific advancements—presents significant opportunities for collaboration. The session highlighted the need for strategic interventions in infrastructure development, digitalization, trade facilitation, and fostering innovation-driven economies. It also emphasized the transformative role of regional connectivity projects, such as the China-Pakistan Economic Corridor (CPEC), and the necessity to adapt to a shifting global economic order dominated by multipolar dynamics.

Policy Recommendations for Enhanced Trade in the ECO Region

1. Infrastructure Modernization and Connectivity

Invest in upgrading transportation networks, such as roads, railways, and ports, to foster seamless connectivity among ECO member countries. Strategic development in border crossing facilities, equipped with both physical and digital infrastructure, will reduce transit times and facilitate smoother trade flows.

2. Digital Transformation in Trade Logistics

Adopt integrated digital systems for tracking, booking, and payment processes to enhance transparency and efficiency in trade operations. Establish harmonized digital platforms for customs clearance and regulatory compliance to minimize procedural delays across borders.

3. Diversification of Export Portfolios

Focus on expanding the range of products traded within and beyond the ECO region. Encourage the transition from resource-driven to technology-driven exports by investing in innovation, research, and high-tech industries. Diversify market access to include underutilized regions such as Africa and Central Asia.

4. Capacity Building for Trade Facilitation

Strengthen human and institutional capacity through targeted training programs for trade professionals, customs officials, and freight forwarders. Promote vocational and technical education to ensure a skilled workforce capable of supporting regional industrialization and trade expansion.

5. Fostering Regional Collaboration and Partnerships in Economic Relations

Leverage public-private partnerships to align policies and trade practices with collective regional goals. Create mechanisms for regular dialogue among ECO member states to address barriers, harmonize standards, and implement shared initiatives that drive mutual economic growth.

With these recommendations, ECO member countries can unlock untapped trade potential, bolster regional connectivity, and adapt to the evolving global economic dynamics to achieve sustainable and inclusive growth.

C. Plenary Session – III: Human Capital Development in the ECO Region

Session Overview

The session on Human Capital Development in the ECO region provided a comprehensive exploration of strategies and initiatives needed to harness the region's demographic potential and foster sustainable growth. With a population where 60% are under the age of 30, the ECO region's young demographic presents both opportunities and challenges for economic and social development.

Key speakers emphasized that education transformation, vocational training, and international collaboration are critical for developing a resilient human capital ecosystem. Discussions highlighted the necessity of integrating AI-driven advancements, entrepreneurship, interdisciplinary training, and digital skills into education systems to prepare the workforce for future demands.

Panelists underscored the importance of addressing inequalities, promoting inclusive access to education, and leveraging shared resources across ECO Member States. Specific focus was given to empowering youth and women through vocational training and mentorship to ensure equitable participation in the workforce. Institutional efforts such as the initiatives by PAF-IAST, NUST, and NAVTTC showcased practical models that could be scaled regionally.

Policy Recommendations and Actions

Based on the session's deliberations, the following five policy recommendations and actions are proposed:

1. Establish Regional Education and Training Framework

Develop a unified framework for education and vocational training across ECO Member States to ensure consistent quality standards. This framework should prioritize alignment with industry needs, integration of emerging technologies like AI, and preparation for future job markets.

2. Strengthen Cross-Border Collaboration

Facilitate partnerships between universities, vocational institutions, and industries across ECO countries to share best practices, co-develop curricula, and conduct joint research. Encourage mobility and exchange programs for students and faculty to foster a culture of innovation and regional integration.

3. Enhance Digital and Entrepreneurial Skills

Expand access to digital platforms for education and training, especially in remote areas. Introduce entrepreneurship training as part of the curriculum to cultivate skills for innovation, job creation, and adaptability in dynamic markets.

4. Support Lifelong Learning and Teacher Development

Focus on lifelong learning initiatives that equip individuals with evolving skills throughout their careers. Invest in teacher training to enable educators to adopt new methodologies, including AI-driven teaching tools, interdisciplinary approaches, and global standards.

These recommendations aim to foster a robust human capital ecosystem in the ECO region that is responsive to its demographic strengths and emerging global challenges.

5. Promote Gender Equality in Workforce Participation

Invest in initiatives aimed at empowering women, particularly in non-traditional sectors like engineering, technology, and entrepreneurship. Provide mentorship programs, financial assistance, and access to training centers to dismantle stereotypes and enable leadership roles for women.

D. Plenary Session – IV: Fostering Regional Collaboration on Healthcare Innovation and Biotech in the ECO Region

Session Overview

The panel discussion brought together a diverse array of experts to address critical issues surrounding healthcare innovation, biotechnology, health finance, antimicrobial resistance (AMR),

and regional collaboration in the ECO region. Key themes emerged, including the advancement of regulatory frameworks, the adoption of cutting-edge technologies, the role of scientific diplomacy, and the urgent need for coordinated efforts to tackle pressing challenges such as AMR and health security.

Dr. Obaidullah emphasized the importance of harmonizing pharmaceutical regulatory systems and adopting international standards to foster collaboration and enhance health security. Prof. Dr. Ali Akbar Moosavi-Movahedi advocated for integrating innovation into biotechnology through scientific diplomacy and interdisciplinary cooperation. Dr. Maryam Tajabadi Ebrahimi proposed a structured support chain for vital medical products and food security, while Dr. Tariq Mahmood Ali highlighted the need for improved healthcare financing mechanisms to ensure universal healthcare coverage. Dr. Ahmad Hussen Tareq underscored the urgency of addressing AMR and called for enhanced regional diagnostic capabilities and capacity-building initiatives.

The discussion underscored the interconnectivity of healthcare challenges in the ECO region and the critical role that collaboration, innovation, and policy alignment play in overcoming disparities and ensuring sustainable development.

Policy Recommendations and Actions for the ECO region

- 1. **Regulatory Harmonization:** Establish a unified pharmaceutical regulatory framework to streamline licensing, enhance pharmacovigilance systems, and facilitate clinical trials across ECO member states. This will ensure consistency, safety, and efficacy in medical products while fostering trust and collaboration.
- 2. Investment in Diagnostics: Develop and fund regional diagnostic infrastructures to combat AMR and other health challenges. This includes training programs for healthcare professionals, deploying technology to underserved areas, and establishing diagnostic labs with standardized protocols.
- 3. Innovation in Biotechnology: Encourage interdisciplinary research initiatives combining biotechnology, AI, and quantum computing. Create innovation hubs to advance drug discovery and optimize healthcare technologies. Facilitate knowledge sharing through regional conferences and academic partnerships.
- 4. Healthcare Financing Models: Introduce hybrid financial systems that leverage public, private, and philanthropic contributions. Establish an ECO Health Investment Fund to pool resources for equitable healthcare access, with a focus on underserved communities and high-impact health challenges.
- 5. ECO Health and Food Security Council: Form a governing council comprising health ministers and regulatory authorities from ECO member countries. This council would oversee collaboration, set priorities, and launch coordinated responses to health and food security issues.
- 6. Capacity Building Initiatives: Expand training programs for policymakers, healthcare workers, and the general public to enhance awareness and technical expertise in combating AMR. Integrate these efforts into school curricula and community outreach campaigns to ensure widespread impact.
- 7. **Private Sector Collaboration:** Strengthen partnerships between governments and private stakeholders, including chambers of commerce and pharmaceutical companies. Promote

technology transfer agreements and incentivize the development of indigenous healthcare solutions.

E. Plenary Session – V: Building a Sustainable and Resilient Energy Future for ECO Member Countries

Sesssion Overview

The session underscored the urgency for ECO Member Countries to adopt sustainable and resilient energy strategies amidst mounting challenges such as rising energy demand, climate change, and outdated infrastructure. Discussions revealed that the ECO region holds approximately 30% of the world's energy reserves, presenting both an opportunity and a responsibility for member states to harness these resources efficiently.

Speakers highlighted key areas of focus, including energy efficiency, renewable energy deployment, regional energy cooperation, and the transition to electric mobility. Energy efficiency was emphasized as the fastest and most cost-effective strategy to reduce emissions and enhance energy security, while renewable energy was positioned as a foundation for multilateral cooperation. The transition to electric mobility was identified as a critical step to decarbonize the transport sector and contribute to global climate goals.

The session also stressed the importance of leveraging technological advancements, fostering knowledge exchange, and creating financing mechanisms to support energy initiatives. Collaborative efforts among ECO Member Countries were deemed essential to overcoming regional barriers and achieving shared energy objectives.

Policy Recommendations

Energy Efficiency

- **1.** Adopt national energy efficiency policies targeting reductions in energy waste through modernized infrastructure and optimized practices.
- **2.** Conduct joint regional energy audits to identify inefficiencies and propose actionable solutions.
- 3. Implement harmonized standards for energy-efficient products across ECO Member Countries.
- 4. Promote capacity-building programs for human resources in energy efficiency management.

Renewable Energy Deployment

- 5. Establish a science, technology, and innovation (STI) program for renewable energy collaboration among ECO Member Countries.
- 6. Invest in the development of the complete supply chain for renewable technologies, including panel manufacturing and basic materials.
- 7. Promote knowledge-sharing platforms to foster green technology innovation.
- **8.** Adopt standards to measure the performance and reliability of renewable systems in varying climatic conditions.

Regional Energy Cooperation

- **9.** Develop infrastructure for regional grid connectivity to support energy trade and enhance resilience.
- **10.** Conduct quarterly evaluations to ensure progress in collaborative energy projects.

11. Create expert working groups and accountability frameworks to oversee regional energy initiatives.

Electric Mobility Transition

- 12. Strengthen national policies with clear targets and incentives for electric vehicle adoption.
- **13.** Invest in robust charging infrastructure, particularly for commercial and long-distance transport.
- 14. Transition manufacturing capabilities in ECO Member Countries towards local production of electric vehicles.
- **15.** Address electricity grid decarbonization to maximize the benefits of electric mobility.

The session provided crucial insights into the steps necessary for ECO Member Countries to achieve energy security, sustainability, and resilience. Through coordinated efforts, technological innovation, and robust policies, the region has the potential to lead in global energy transformation while addressing pressing socio-economic and environmental challenges.

F. Plenary Session – VI: Groundwater Management in the ECO Region

Session Overview

The session on groundwater management in the ECO region, hosted in collaboration with the International Water Management Institute (IWMI) and Islamic Relief Pakistan, brought together key experts to discuss pressing issues surrounding groundwater depletion, pollution, and climate-induced stress. Groundwater, as a vital resource for agriculture, industry, and domestic use in the ECO region, faces significant threats stemming from unsustainable extraction rates, weak governance frameworks, and insufficient data monitoring.

The session featured contributions from prominent figures such as Dr. Rashid Aftab, Dr. Muhammad Ashraf, Dr. Muhammad Arshad, and Mr. Asif Sherazi, who collectively emphasized the importance of adopting innovative technologies, fostering regional collaboration, and raising community awareness to address shared challenges.

Key Challenges Identified

- Overextraction: Declining groundwater levels in arid and semi-arid regions such as Pakistan, Iran, and Central Asia have exceeded sustainable limits, with some aquifers reaching depths of over 400 meters.
- Pollution of Aquifers: Industrial discharge and urban contamination, particularly in areas like the Aral Sea region, have critically affected groundwater quality.
- Climate Change Impacts: Reduced recharge rates and altered rainfall patterns are exacerbating groundwater scarcity across the region.
- Weak Governance Structures: Ineffective management of transboundary aquifers and gaps in institutional capacity hinder progress.
- Scarcity of Data: Limited monitoring systems and inadequate data availability challenge effective management practices.

Key Policy Recommendations and Actions

Based on the deliberations during the session, the following five policy recommendations and actions are proposed:

1. Develop Regional Frameworks for Groundwater Governance

ECO member countries should collaborate to establish comprehensive governance structures inspired by successful global models, such as those under the United Nations. These frameworks should address transboundary aquifer management and promote unified policies.

2. Enhance Groundwater Monitoring Systems

Invest in advanced technological tools such as NASA's GRACE and geo-tagged monitoring systems to improve data collection on groundwater quantity and quality. Integrated platforms for data analysis should be scaled across ECO countries.

3. Promote Managed Aquifer Recharge (MAR) Techniques

Expand the application of MAR technologies, including infiltration basins and well injection methods, to replenish aquifers effectively. Success stories like urban recharge initiatives in Islamabad can serve as models for broader implementation.

4. Engage Communities in Sustainable Practices

Implement grassroots education campaigns to raise awareness about groundwater conservation. Provide advisory services to farmers and local stakeholders to encourage water-efficient practices such as advanced irrigation methods.

5. Strengthen Policy Implementation

ECO member countries must overcome barriers to implementing water policies such as the National Water Policy and develop mechanisms for translating plans into actionable outcomes. A balanced approach to recharge and abstraction should guide policy frameworks.

Key Highlights of the Inaugural Session of ECONEX 2025

The International Conference on Science, Technology, and Innovation (STI): Catalysts for Regional Connectivity and Sustainable Development in the ECO Region (ECONEX 2025) was held on April 17-18, 2025. The two-day conference aimed at leveraging Science, Technology, and Innovation (STI) to foster regional connectivity and sustainable development across the ECO region. Hosted by the ECO Science Foundation (ECOSF) in partnership with the Higher Education Commission (HEC) and the Economic Cooperation Organization (ECO), the session brought together over 30 international delegates from Türkiye, Iran, China, and Thailand, alongside more than 250 local policymakers, scholars, diplomats, and industry leaders.



Inaugural Speakers

- Chief Guest: H.E. Mr. Khalid Hussain Magsi, Federal Minister for Science and Technology, Pakistan
- Guest of Honor: H.E. Dr. Asad Majeed Khan, Secretary General, Economic Cooperation Organization (ECO), Iran
- **Guest of Honor:** Prof. Abolfazl Vahedi, Vice Minister for Education, Ministry of Science, Research and Technology, Iran
- **Co-host:** Prof. Zia ul-Qayyum, Executive Director, Higher Education Commission (HEC), Pakistan
- Speaker: Prof. Mehmet Akif Kireçci, President, ECO Educational Institute, Ankara, Türkiye
- Host: Prof. Seyed Komail Tayebi, President, ECO Science Foundation (ECOSF), Pakistan
- Host: Dr. Ghulam Muhammad Memon, Executive Director, ECO Science Foundation (ECOSF), Pakistan



The inaugural session set a collaborative tone, emphasizing STI as a transformative force for addressing regional challenges like climate change, energy security, and economic disparities.

Dr. Ghulam Muhammad Memon

Executive Director, ECO Science Foundation (ECOSF)



Dr. Ghulam Muhammad Memon warmly welcomed all participants, emphasizing the significance of ECONEX 2025 as a platform for regional collaboration through STI. He highlighted the ECO region's potential, with its 500 million population and vast resources, but stressed the need for strengthened cooperation in science and technology to address challenges like climate change, food security, and healthcare.

Dr. Memon underscored the importance of harmonizing policies, building capacities, and

fostering innovation ecosystems to unlock the region's potential, calling for concrete recommendations over the two-day event.

Prof. Seyed Komail Tayebi

President ECO Science Foundation (ECOSF)

Prof. Tayebi reiterated ECOSF's commitment to placing STI at the core of sustainable development and regional integration. He outlined the conference's six plenary sessions, covering topics like STI ecosystems, regional trade, human capital, healthcare innovation, energy sustainability, and groundwater management, noting their interconnectedness.



He emphasized that STI is a necessity, not a luxury, for economic competitiveness and social equity, expressing confidence that ECONEX 2025 would be a milestone in building a resilient and connected ECO region through actionable outcomes and partnerships.

Prof. Mehmet Akif Kireçci,

President, ECO Educational Institute, Türkiye



Prof. Kireçci highlighted education and science as foundational to the ECO region's global competitiveness, stressing the need for collective action in a rapidly changing world. He noted the emergence of new jobs over the next decade, with the ECO Educational Institute actively preparing for these shifts.

He called for unity among ECO nations, leveraging the region's vibrant youth population to drive innovation and shape a prosperous future through collaborative efforts in science and education.

Prof. Abolfazl Vahedi

Vice Minister for Education, Ministry of Science, Research and Technology, Iran

Prof. Vahedi expressed appreciation for the organizers and emphasized STI's role as a connector for ECO Member Countries to address shared challenges. He highlighted Iran's advancements in renewable energy, biotechnology, and AI, offering to share expertise with ECO partners.

He advocated for empowering researchers, entrepreneurs, and youth through joint research and partnerships, affirming Iran's commitment to open collaboration for peace and prosperity in the ECO region.





Prof. Zia-ul-Qayyum Executive Director, Higher Education Commission, Pakistan

Prof. Zia-ul-Qayyum likely underscored the HEC's role in advancing STI education and research in Pakistan, aligning with ECONEX 2025's goals. He highlighted initiatives like research funding and international partnerships to build human capital.

He emphasized higher education's role in equipping youth with STI skills to drive regional development, calling for collaborative educational frameworks across ECO countries.

H.E. Dr. Asad Majeed Khan

Secretary General, Economic Cooperation Organization (ECO), Iran

Dr. Khan reflected on the ECO region's shared heritage, exemplified by historical ties like the Persian script in Lahore's archives, and its natural fit within the Silk Road framework. He noted global challenges like the weaponization of financial systems, urging the region to leverage STI for resilience.

 Shared Heritage as a Foundation for Collaboration. Dr. Khan



emphasized the ECO region's deep historical, cultural, and linguistic ties, exemplified by the Persian script in Lahore's archives and inscriptions at Masjid Wazir Khan. He highlighted how this interconnected past, rooted in the Silk Road framework, positions the region for unparalleled collaboration in the face of shifting global dynamics.

- Addressing Global Challenges through Regional Solidarity. He pointed out the
 pressing global challenges, such as the weaponization of financial systems, trade, and
 assistance mechanisms, which disproportionately affect developing nations. Dr. Khan
 urged ECO countries to turn inward, leveraging regional strengths to build solidarity and
 resilience against these external pressures.
- STI as a Catalyst for Transformation. Dr. Khan underscored the transformative potential of Science, Technology, and Innovation (STI) in fostering innovation, connectivity, and socio-economic growth. He stressed that investing in STI can yield multiplied benefits for developing nations, making it a key catalyst for the ECO region's progress.
- Empowering Youth for a Vibrant Future. A central theme of his address was the need to focus on the region's youth, whom he described as the vibrant future of the ECO region. Dr. Khan called for empowering them through education, research, and access to cutting-edge technologies to drive innovation and sustainable development.
- ECO's Commitment to Regional Collaboration. As Secretary General, Dr. Khan reaffirmed the Economic Cooperation Organization's unwavering commitment to supporting initiatives that deepen regional educational connections, enhance knowledge-sharing, and foster collaboration among member states. He envisioned a unified front that builds bridges for peace and prosperity through STI.

H.E. Mr. Khalid Hussain Magsi

Federal Minister for Science and Technology, Pakistan (Chief Guest)



H.E. Mr. Magsi welcomed international delegates and praised the ECO Science Foundation and HEC for organizing ECONEX 2025. He highlighted the conference's focus on critical topics like energy, trade, and healthcare innovation, essential for socio-economic development in the ECO region. H.E. Magsi underlined that the diverse range of important topics that this conference will address to the local and regional challenges. These are all impotant areas for developing robust STI systems and enhancing socio-economic development in the ECO Member States.

He emphasized the importance of developing robust STI systems to address local and regional challenges, wishing the conference success in fostering collaboration and innovation.

Key Takeaways

- 1. The session underscored STI's transformative potential in addressing regional challenges, with a strong emphasis on collaboration, knowledge-sharing, and capacity building among ECO member states.
- 2. Speakers highlighted the ECO region's vast potential, driven by its youth and resources, but stressed the need for unified efforts in education, research, and innovation to overcome disparities and global challenges.
- 3. A recurring theme was the empowerment of youth through STI education, alongside the need for joint research, policy harmonization, and sustainable partnerships to ensure a resilient and prosperous ECO region.

Plenary Session – I: Regional Collaboration on Science, Technology, and Innovation (STI) Ecosystem



Partners: Pakistan Science Foundation (PSF) & COMSTECH

Science, Technology, and Innovation (STI) are key drivers of economic growth, industrial development, and global competitiveness. In the ECO region, while several countries have made significant strides in STI, regional cooperation remains fragmented, limiting the potential for knowledge sharing, technology transfer, and joint research initiatives. The discussions will focus on best practices in STI governance, collaboration in technology parks, investment in R&D, and developing an enabling environment for innovation-led growth in the ECO region.

Moderator: Khalil Raza, Programs Manager - Energy & Climate, ECO Science Foundation



Dr. Ganigar Chen

Development

Vice President, National Science Museum (NSM) of Thailand, Bangkok, Thailand Expanding Science Museums and Public Engagement in STI



Dr. Ganigar Chen, Vice President of the National Science Museum (NSM) of Thailand, expressed her deep honor in participating as a panelist in the session on *Regional Collaboration on Science, Technology, and Innovation (STI) Ecosystem* at ECONEX 2025, held on April 17, 2025, in Islamabad. She extended her gratitude to Prof. Seyed Komail Tayebi, President of the ECO Science Foundation, for the invitation, and to her colleague, Ambassador Dr. Mohammad Nafees Zakaria, for providing a platform for shared learning on this critical topic.

Representing the National Science Museum of Thailand, Dr. Chen also highlighted her roles on the executive committee of the Science Society of Thailand and networks such as the Asia-Pacific Science Centers Association and the Science Education Alliance. She noted that these collaborations enable NSM to work closely with global partners to enhance public science literacy, which she described as a vital agenda for improving quality of life and driving economic growth through innovation.

Dr. Chen focused her address on the NSM's efforts to advance public science literacy and build "science capital," a concept encompassing not just scientific knowledge but also attitudes, behaviors, aspirations, and social contexts related to science. She outlined key components of science capital: scientific knowledge and understanding, science-related attitudes and values, engagement in science activities, social exposure to science, and awareness of STEM career opportunities. She emphasized that nations with high science capital are better equipped to address challenges like climate change, healthcare, and technological advancements, promoting societal equality and informed decision-making.

She highlighted the critical role of science museums and centers within the science learning ecosystem, noting their ability to make science accessible to diverse audiences. At NSM, located 40 kilometers north of Bangkok, Dr. Chen explained that the museum integrates interactive exhibits on science, technology, and innovation, operates smaller science centers nationwide, and offers specialized programs on topics like biodiversity, AI, and quantum science. These initiatives aim to enhance understanding, inspire young learners, and demonstrate real-world applications of science and engineering.

Dr. Chen also detailed NSM's outreach efforts, including traveling exhibitions, caravans, and largescale science festivals that attract nearly one million visitors annually with participation from over 100 organizations. Additionally, NSM facilitates science project competitions and programs engaging university and high school students as science communicators, fostering collaboration and community engagement. She stressed the importance of partnerships with universities, research institutes, and global organizations, which enable NSM to create accessible and engaging science programs. Recent exhibitions on AI and climate change were cited as examples of making complex topics interactive and understandable for the public.

In closing, Dr. Chen expressed hope that NSM's work would inspire collaboration and innovation across the ECO region. She underscored the role of science museums as vital infrastructure for informal education, complementing formal systems and preparing society for future challenges. She called for collective efforts to provide opportunities for the next generation to thrive in a world increasingly shaped by science and technology.

Ambassador Dr. Mohammad Nafees Zakaria

Executive Director COMSATS, Pakistan

Strengthening South-South Collaboration in STI: Insights from COMSATS

Ambassador Dr. Mohammad Nafees Zakaria, Executive Director of COMSATS, presented his insights during Plenary Session. He began by acknowledging Professor Komail Tayebi for the invitation and expressed his gratitude to the ECO Science Foundation for facilitating the session. Dr. Zakaria also reflected on his time in Thailand, where he served for five years, and highlighted the country's significant achievements in science and technology, particularly their disciplined approach to education and innovation.

Dr. Zakaria emphasized the transformative role of science and technology in shaping economies worldwide. He noted that science serves as a tool to understand and benefit from nature while underscoring the strategic importance of regional and international cooperation. He observed that nations leading in science and technology form the



developed world, whereas those lagging behind belong to the global south. Bridging this gap, he explained, has been central to the mission of COMSATS, an intergovernmental organization hosted by Pakistan.

Paying tribute to Pakistan's Nobel laureate, Professor Abdus Salam, Dr. Zakaria highlighted the scientist's pivotal contributions to fostering collaboration between the developing and developed worlds. He credited Professor Salam for the establishment of COMSATS, which now spans 27 Member States and derives strength from 25 centers of excellence across Asia, Africa, Latin America, and Europe. These centers are organized into nine thematic clusters, encompassing biotechnology, artificial intelligence, clean energy, and other essential domains. Through these clusters, COMSATS aims to promote focused collaboration, facilitated by its secretariat.

Dr. Zakaria detailed how COMSATS collaborates with international and regional organizations to enhance networking and benefit from shared expertise. He cited events like ECO Connect and COP 29 as opportunities for fostering meaningful collaboration. Highlighting the importance of

digitalization, he noted that countries with advanced digital infrastructure fared better during the economic disruptions caused by the COVID-19 pandemic, illustrating the critical need for readiness in this area.

He outlined several flagship projects initiated by COMSATS to provide technology-based solutions to member states. For instance, he discussed the establishment of 32 telehealth clinics in Pakistan, which enable remote consultations with doctors in Islamabad, addressing healthcare challenges in remote areas. He also mentioned the successful development of indigenous technology for electric vehicles, which has been field-tested over 10,000 kilometers.

Dr. Zakaria stressed the transformative power of technology and urged that events like ECONEX 2025 should not merely serve as platforms for networking but should lead to actionable follow-ups. He expressed COMSATS' openness to collaboration and its willingness to share expertise and technology with interested partners, advocating for collective efforts to tackle shared challenges and advance regional STI ecosystems.

Dr. Syeda Tanveer Kausar Naim

Former Chairperson, Pakistan Council for Science and Technology (PCST), Pakistan Pakistan's Vision for STI-Led Development and Regional Collaboration



Dr. Syeda Tanveer Kausar Naim, Former Chairperson of the Pakistan Council for Science and Technology (PCST), outlined Pakistan's vision for science, technology, and innovation (STI)-led development and the importance of fostering regional collaboration. She reflected on the pivotal role played by PCST in shaping Pakistan's scientific trajectory, emphasizing its historical efforts to address national challenges through science and technology.

Dr. Naim highlighted the landmark introduction of Pakistan's first science and technology policy in 1959, developed under the guidance of Professor Abdus Salam. She noted that this policy paralleled the United States' "Science: The Endless Frontier" initiative, yet included more advanced elements implemented decades earlier. Under Professor Salam's leadership, policies such as the 1961 initiative approved by President Ayub Khan underscored science as a cornerstone for national development, addressing vital issues like agriculture and economic progress.

Acknowledging the transformative power of science, Dr. Naim pointed to how STI initiatives have tackled pressing challenges in Pakistan, including unemployment, poverty, food security, and national security. She cited the significant contributions of agricultural scientists in strengthening the cotton crop industry—a sector that accounts for 65% of the nation's exports—and the advancements in nuclear technology that fortified the country's resilience.

Dr. Naim elaborated on the impact of PCST in establishing key research and development organizations, universities, and addressing national issues. She recounted examples such as the rapid resolution of a cotton disease crisis through collaboration between local scientists and international experts. She stressed the importance of providing scientists with an enabling environment, free from bureaucratic constraints, to foster creativity and innovation.

International and regional collaborations were highlighted as critical to advancing STI-led development. Dr. Naim discussed Pakistan's joint funding program with the United States, which allocates \$3.5 million from each country to support collaborative research. She emphasized that mutual trust, cultivated through meaningful engagements, underpins successful partnerships.

Regional collaboration was presented as a powerful mechanism to address shared challenges such as health crises, poverty, and environmental sustainability. Dr. Naim advocated for leveraging the expertise of neighboring countries in areas like vaccine development and proposed joint efforts to achieve self-sufficiency in vaccine production. She also underscored the potential benefits of collaborative programs between universities, including student exchanges, scholarships, and shared curricula to enrich knowledge across borders.

Highlighting the industrial clusters in Pakistan, such as those in Sialkot for sports goods and Gujranwala for engineering products, Dr. Naim suggested that regional cooperation could foster innovation and reduce risks. By sharing expertise and resources, industries could adapt to evolving technologies more effectively, enhancing their competitiveness in global markets.

Concluding her remarks, Dr. Naim called for the appointment of competent leaders to helm scientific institutions and emphasized the need to preserve and strengthen organizations like PCST, which have played a vital role in national development. She reaffirmed the importance of placing science and technology at the forefront of Pakistan's development strategy, supported by collaboration and leadership to address shared regional challenges.

Prof. Dr. Qi Yuansheng

Dean of the School of Printing and Packaging Engineering, Beijing Institute of Graphics and Communication, Beijing, China

The Pillars of Success: Decoding China's Science, Technology, and Innovation (STI) Ecosystem

Prof. Dr. Qi Yuansheng, Dean of the School of Printing and Packaging Engineering, Beijing Institute of Graphics and Communication, Beijing, China. elaborated on the transformative journey of China's science, technology, and innovation (STI) ecosystem. Beginning with the historical significance of the "Four Great Inventions"-paper-making, printing, gunpowder, and the compass-he emphasized how these achievements laid the foundation for a culture of innovation that continues to thrive in modern China.



Prof. Dr. Qi highlighted the pivotal role of comprehensive policy frameworks in shaping China's progress. He noted the nation's strategic shift from agriculture to industry as the focal point of development, fostering enterprise innovation and allocating significant investments toward research and development. Over decades, these efforts have addressed early economic and technological gaps, enabling China to focus on innovation-driven growth.

Discussing the impact of the Fourth Industrial Revolution, Prof. Dr. Qi pointed to China's prioritization of artificial intelligence (AI) advancements. He acknowledged the substantial allocation of resources, funding, and expertise to this domain, as well as achievements in high-end manufacturing, including high-speed rail systems, new energy vehicles, and security-enhancing infrastructure. These developments, he explained, illustrate China's ambition to lead in global technological innovation.

Prof. Dr. Qi also stressed the importance of education reform in China's success. He remarked on the transformative changes within the education system that have empowered the majority of children to pursue higher education. Drawing inspiration from international models like Germany's vocational training programs, China has tailored its educational practices to equip students with skills aligned to industries such as healthcare and enterprise management.

As Dean of the School of Printing and Packaging Engineering, Prof. Dr. Qi noted the printing industry's evolution as a microcosm of China's broader economic advancements. He described how technological innovations in printing reflect the nation's effective integration of science, technology, and industrial development. Today, China commands a significant share of the printing market in Asia, showcasing the successful application of STI principles to economic growth.

Concluding his remarks, Prof. Dr. Qi underscored that China's journey in science, technology, and innovation is a testament to the nation's commitment to progress and the strategic vision of its leadership to establish itself as a global innovator.



Prof. Dr. Muhammad Akram Shaikh

Chairman, Pakistan Science Foundation (PSF), Pakistan

Advancing STI for Sustainable Development: The Role of Pakistan Science Foundation

Prof. Akram Sheikh's presentation focused on the role of the Pakistan Science Foundation (PSF) in advancing science, technology, and innovation (STI) for sustainable development.

He highlighted that science foundations are dedicated to promoting research and development (R&D), acting as agencies that provide financial support for scientific studies, research projects, and technological innovation. These organizations play a crucial role in bridging knowledge creation with practical application, nurturing human capital, and fostering ecosystems for technological advancement.

Globally, evidence shows that STI institutions drive economic growth. For instance, the National Science Foundation (NSF) in the United States, established in 1950, has been instrumental in breakthroughs like the TCP/IP internet protocol and the global positioning system (GPS), fueling the digital economy and logistics sectors. With an annual budget of approximately \$9 billion, NSF supports 25% of U.S. university research, contributing to industries worth billions.

Similarly, the Fraunhofer Society in Germany pioneered successes like MP3 audio compression, generating millions in licensing revenue and advancing global industries. The Fraunhofer Society earns about 70% of its income through contracts with industry or government projects. Asian drivers like South Korea, China, and Singapore further illustrate the power of STI investment. South Korea's Korean Institute of Science and Technology, established in 1966, spearheaded semiconductor and display technologies, enabling giants like Samsung and LG to dominate global markets. South Korea's per capita income soared from \$100 in 1960 to \$33,000 today due to STI investments.

Singapore's Agency for Science, Technology, and Research focuses on biomedical and engineering research, turning the country into a hub for pharmaceuticals and precision manufacturing. This attracted significant investments and created thousands of high-tech jobs. In China, the National Science Foundation played a key role in gene editing advances, making the country a biotech hub with a \$400 billion market. Similarly, China's investments in 5G technology have captured 30% of the global market, driving billions in related economic activity.

Pakistan's R&D spending is only 0.16% of GDP, far below the global average of 2%. Brain drain continues, with approximately 10,000 skilled professionals emigrating annually. There is also a need to strengthen industry-academia collaboration and ensure leadership in STI institutions.

To address these challenges, recommendations include establishing science and technology parks, fostering university-integrated startups, and promoting multilateral research collaboration among ECO countries to co-develop innovative products. Examples from Turkey and Iran showcase how leveraging expertise in automation and nanotechnology can drive regional growth.

Mr. Reza Aslani

Head of International Affairs - Pardis Technology Park, Tehran, Iran The Role of S&T Parks in Regional Innovation: Insights from Pardis Technology Park

During the panel discussion, Mr. Reza Aslani, Head of International Affairs at Pardis Technology Park, shared his insights into the role of S&T parks in regional innovation:

Science and Technology (S&T) parks serve as critical infrastructures for fostering innovation, driving economic growth, and enabling collaboration between academia, industry, and government. These parks are



designed to catalyze technological advancements, encourage entrepreneurial ventures, and create a vibrant ecosystem where knowledge and industrial applications converge. Pardis Technology Park, located in Tehran, Iran, exemplifies this role through its initiatives to support local and regional innovation.

S&T parks, like Pardis, are essential in addressing the unique challenges faced by developing economies. They provide resources such as research facilities, mentorship programs, and financial support to startups, enabling them to transform ideas into market-ready products. Moreover, these parks serve as hubs for international collaboration, allowing countries to pool expertise and co-develop solutions to global challenges. Pardis Technology Park has shown exceptional leadership in fostering cooperation across sectors, particularly in automation and nanotechnology. Its success lies not only in its infrastructure but also in its commitment to nurturing human capital and building partnerships that transcend borders.

"The concept of Science and Technology Parks is pivotal for regional development, especially in fostering collaboration and innovation. At Pardis Technology Park, we have integrated a model that not only supports startups with state-of-the-art facilities but also encourages joint ventures with international entities. This approach has yielded breakthroughs in nanotechnology and automation, addressing both local needs and contributing to global industry standards.

Additionally, we prioritize capacity-building programs to equip our youth with the skills required to thrive in competitive markets. Collaboration with neighboring countries, particularly in the ECO region, has further amplified our impact. By sharing expertise and resources, we aim to create a robust network of innovation hubs that drive socio-economic progress. Pardis Technology Park is committed to being a catalyst for transformative change, not just within Iran but across the region."



Plenary Session – II: Enhancing Regional Trade and Connectivity in the ECO Region

Partner: CAREC Institute, China

The ECO region possesses immense economic potential, with abundant resources, a strategic geographic position, and a growing consumer base. However, intra-regional trade remains significantly below its potential, hindered by trade barriers, inadequate infrastructure, and policy misalignment. This session will provide a high-level platform to discuss policy frameworks, infrastructure development, and trade facilitation measures necessary to strengthen economic ties within the region.

Moderator: Dr. Moazzam Hashmi, Communications & Security Consultant and

Adjunct Professor at Quaid-e-Azam University (QAU) and National Defence University (NDU), Pakistan.





H.E Senator Mushahid Hussain Syed

Chairman, Pakistan-China Institute, Pakistan

Keynote Address: Emerging World Order & Regional Connectivity, Pakistan's Role & Relationships

H.E. Senator Mushahid Hussain Syed, Chairman, Pakistan-China Institute, delivered a compelling keynote address titled "Emerging World Order & Regional Connectivity: Pakistan's Role & Relationships" during Plenary Session II, which focused on "Enhancing Regional Trade and Connectivity in the ECO Region." His speech offered a deep exploration of the global changes and Pakistan's strategic importance in facilitating regional cooperation and connectivity.

Senator Mushahid highlighted several critical points shaping the global and regional landscape, particularly the emergence of the Global South as a living reality. He emphasized the inevitability and irreversibility of the global balance of economic, political, and scientific power shifting from the west to the east. This transition, reflecting the



decline of the West, marks the dawn of the Asian Century, with China emerging as a major power and the first serious challenge to Western hegemony in centuries. Regional connectivity, encompassing tourism, transport, trade, and technology, plays a vital role in this transformation.

China, according to Senator Mushahid, has emerged as a scientific superpower, overtaking the United States in high-tech manufacturing, 5G, Artificial Intelligence, Cloud Computing, and STEM fields. He cited a Harvard article analyzing the great tech rivalry between China and the United States, which highlights China's dominance in producing 70,000 STEM graduates annually, compared to the United States' 30,000 graduates. This development underscores China's growing lead in cutting-edge technologies, marking a decline in scientific power traditionally dominated by Japan, Europe, and the US.

In his address, Senator Mushahid also shared a personal anecdote from October 1992, when he visited Tashkent shortly after Uzbekistan gained independence from the Soviet Union. During this visit, he had the privilege of interviewing Islam Karimov, the First President of Uzbekistan. Senator Mushahid recalled asking President Karimov about his vision for Uzbekistan's foreign policy, to which Karimov responded with a remarkable idea: the creation of a road from Tashkent to Termez via Afghanistan to Karachi. Karimov envisioned this project as a vital connection for the Central Asian republics, fostering economic and cultural integration with South Asia—a vision that resonates deeply with the importance of regional connectivity today.

In discussing the ECO region, Senator Mushahid emphasized the significance of fostering regional trade and connectivity as a cornerstone for economic development and stability. He urged nations to build synergies and utilize collective strengths to overcome challenges and pursue shared goals. He highlighted Pakistan's strategic position as a natural bridge for regional integration, with major

projects like the China-Pakistan Economic Corridor (CPEC) serving as a crucial link within China's Belt and Road Initiative.

Senator Mushahid also addressed the broader implications of the shifting global landscape, underscoring the transition from a unilateral world order to a multipolar one. He stressed the importance of adapting to these changes by promoting sustainable practices, addressing economic inequalities, and investing in technological innovation. Pakistan, he asserted, is committed to playing a proactive and constructive role in these efforts to foster economic, political, and cultural ties among ECO countries.

Pakistan always had a role in the region, whether in Central Asia, China and now with Iran and Afghanistan. A new world is opening up where Pakistan can play a pivotal role in regional connectivity driven by economy, energy, education, ports, pipeline and rail network. Belt and road initiative which has brought 152 countries together, which is the biggest diplomatic and developmental initiative of the 21st century. For Pakistan, it is China Pakistan Economic Corridor (CPEC), with US\$ 35 billion dollars of investments, 250,000 jobs, 8000 MW of electricity, 600 kms of roads, and 13,000 students studying in China. In this new opening world, opportunity is there for us.

He further highlighted Pakistan's potential as a linchpin in regional trade and connectivity, advocating for nations within the ECO region to harness these opportunities for mutual benefit. Senator Mushahid emphasized that such synergy is not just a strategic imperative but also a pathway to fostering peace and prosperity in increasingly multipolar global dynamics.

In his closing remarks, Senator Mushahid reiterated the importance of seeking collaboration within the ECO region, proposing that nations capitalize on the opportunities presented by the evolving global dynamics. He pointed out that strengthening regional trade and connectivity is not merely an economic necessity but also a pathway to peace, progress, and prosperity. His keynote speech served as both a reflection on current realities and a vision for a shared future built on cooperation and resilience.

H.E. Dr. Asad Majeed Khan,

Secretary General, Economic Cooperation Organization (ECO)



H.E. Dr. Asad Majeed Khan, Secretary General of the Economic Cooperation Organization (ECO), Tehran, Iran, shared insightful remarks during the session on regional trade and connectivity in the ECO region. He praised Senator Mushahid Hussain Syed for his eloquent speech and wealth of knowledge, emphasizing his own admiration for Senator Mushahid's ability to present facts without reliance on notes.

Dr. Asad Majeed Khan outlined the priorities of the ECO, framing them as the "three T's": trade, transport, and tourism, with technology emerging as a fourth critical area. He expressed concern over the lack of a ministerial process on technology within the ECO framework, noting its importance in today's interconnected world.

He elaborated on the movements within the ECO region—goods, people, and capital—while candidly admitting the region's challenges in achieving seamless flows in these areas. Reflecting on his past experience as a negotiator for Pakistan, he expressed disappointment that the ECO Trade Agreement from 25 years ago remains unimplemented, pointing to various structural and political barriers.

Dr. Khan highlighted several disparities within the region, such as differing levels of development, economic systems transitioning from command economies to free markets, and varying trade directions—some eastward, others westward. He also addressed tariff mismatches and non-tariff barriers that hinder smooth trade flows. In this context, he acknowledged the impact of sanctions, political instability, and geographic challenges, such as difficult terrains and incompatible railway systems.

On the topic of intra-regional trade, Dr. Khan shared striking statistics: while ECO countries trade \$1.1 trillion with the rest of the world, only \$100 billion, or 8%, represents intra-regional trade. He compared this to ASEAN's 30-40% and the European Union's 60-70%, emphasizing the untapped potential in the ECO region. Citing a study, he argued that regional trade could expand eightfold, from \$100 billion today to \$800 billion, if barriers were addressed effectively.

Dr. Khan also touched upon the weaponization of threats in global trade, advocating for greater regionalization as a countermeasure. He called for renewed focus on leveraging the ECO region's trade frameworks and agreements, highlighting the contemporary imperative to unlock untapped trade and connectivity potential.

Concluding his remarks, Dr. Khan underscored the importance of the "four T's"—trade, transport, tourism, and technology—as pillars of regional connectivity and emphasized the need for collaborative efforts to overcome shared challenges and create opportunities for mutual growth and prosperity in the ECO region.

Dr. Ghulam Samad,

Chief of Research Division, CAREC Institute, Ürümqi, China

Dr. Samad highlighted the recent developments in Ürümqi, China. Ürümqi has established three free economic zones, including Kashgar, which we recently visited. Among the notable developments, the TIR assembly line has been established in Kashgar, positioning it as the next regional hub after Ürümqi.

Additionally, the China-Kyrgyzstan-Uzbekistan trilateral railway project has been launched, with financing already approved and the implementation phase underway. In Ürümqi, there has been considerable focus on actualizing projects, which is something other regions can learn from China. A free trade zone is also being developed in Ürümqi, with



industries being reallocated—high-tech industries to Ürümqi, agricultural industries to Kashgar, and transit industries to the northern area.

One significant development is the reduction in transport times for cargo. For instance, China has established a block train from Xi'an to Germany, which reduces transport time from 60 days to 28 days via Kazakhstan, Azerbaijan, the Black Sea, and into Europe. This development challenges traditional sea routes by increasing efficiency and connectivity within the region. Similarly, a pilot cargo train has been launched from Guangdong to Ürümqi, Kashgar, and onward to Afghanistan, Uzbekistan, and other areas.

Despite these advancements, challenges remain. The export and import compositions of member countries are still resource-driven rather than technology-driven. There is a need to enhance technology-focused exports and diversify product dimensions, as many countries rely on a limited range of commodities for trade. Intra-regional trade within the region is minimal, with reliance mainly on external economies such as Russia, the European Union, and the USA. For instance, Pakistan has the potential to tap into a \$10 billion market within the region but currently achieves less than \$2 billion in trade.

Correspondent banking relationships within regional countries are also negligible, which poses significant barriers to trade facilitation and connectivity. As an example, the National Bank of Pakistan had previously established branches across Central Asia but has since closed them, leaving traders without adequate financial arrangements.

Border crossing points within the region also need improvement—both in terms of physical infrastructure and digitalization. For instance, while goods are cleared within hours at efficient border points like the Red Bridge in Georgia, others take days or even weeks. Streamlining border crossing points is crucial for developing effective trade and connectivity across the ECO region.

To enhance regional connectivity, four key areas need prioritization: improving infrastructure at border crossing points, establishing strong correspondent banking relationships, increasing trade openness, and creating mechanisms for technology-driven trade and diversification. These steps will enable ECO countries to rely more on intra-regional trade rather than external markets, fostering mutual growth and prosperity within the region.



Mr. Muhammad Jamil Ahmed

Chairman of the Pakistan International Freight Forwarders Association (PIFFA)

Strengthening Regional Trade through Efficient Freight Forwarding

Mr. Muhammad Jamil Ahmed, Chairman of the Pakistan International Freight Forwarders Association (PIFFA), shared his insights on advancing regional trade through strategic improvements in freight forwarding. His remarks underscored the critical importance of addressing logistical bottlenecks, enhancing infrastructure, and fostering collaboration across borders to optimize trade flows.

Identified Challenges

- Infrastructure Limitations: The lack of modern transportation networks and connectivity between key trade routes reduces efficiency and raises costs.
- Customs Inefficiencies: Non-standardized customs processes and manual procedures lead to delays and inconsistencies.
- Digitization Gaps: Limited integration of digital tools for tracking and coordination in the logistics chain hinders transparency and operational efficiency.
- Inconsistent Standardization: Variations in freight documentation and regulatory compliance across countries complicate cross-border trade.
- Security Concerns: Vulnerability to cargo theft and insufficient risk mitigation mechanisms remain pressing issues in conflict-prone areas.

Proposed Interventions

- Infrastructure Investments: Advocate coordinated investments in road, rail, and port facilities to improve regional connectivity and reduce transit times.
- Customs Modernization: Encourage harmonization of customs procedures and the adoption of electronic clearance systems to streamline border processes.
- Digital Freight Solutions: Support the implementation of integrated digital platforms for cargo tracking, booking, and payments to enhance operational transparency.
- Standardization Efforts: Promote mutual recognition of licenses, permits, and certifications to eliminate inconsistencies in documentation.
- Enhanced Security Measures: Implement smart seals, GPS-enabled tracking, and a regional cargo insurance framework to safeguard high-value shipments.
- Capacity Building: Organize targeted training programs for freight forwarders to improve compliance, adopt advanced systems, and embrace multimodal logistics.
- Green Logistics Initiatives: Advocate environmentally sustainable freight practices by transitioning to fuel-efficient vehicles and optimizing warehouse energy use.
- Public-Private Partnerships: Facilitate collaborative dialogues between freight forwarders, governmental bodies, and private enterprises to align policies with industry needs.

Mr. Ahmed concluded his remarks by emphasizing the need for cohesive collaboration among stakeholders to address logistical challenges and unlock trade potential in the region. His vision centers on the establishment of efficient transit regimes, harmonized standards, and environmentally conscious practices to ensure sustainable growth in regional commerce.

Mr. Laeeq Daraz Khan,

Director, Trade Development Authority of Pakistan (TDAP)

Trade Facilitation, Competitiveness, and Regional Access

Mr. Laeeq Daraz Khan, Director of the Trade Development Authority of Pakistan (TDAP), spoke on the topic of Trade Facilitation, Competitiveness, and Regional Access. He highlighted the shift in global priorities, emphasizing how trade and economic relations now define interstate dynamics, replacing earlier focuses on political and social



matters. According to Mr. Khan, economic resilience, commercial capabilities, and fiscal soundness are essential components that determine a country's strength and standing in today's interconnected world.

He pointed out the need for prioritizing geoeconomic strategies over geopolitical agendas by promoting regional economic integration and trade understanding. Despite the institutional mechanisms available within the ECO framework, such as preferential trading agreements signed in 2003 and a development bank, Mr. Khan noted that these instruments have yet to become fully operational. However, he expressed optimism about the leadership heading these organizations and anticipated significant progress in their contributions.

Mr. Khan emphasized the importance of strengthening export baskets among ECO member countries as a prerequisite for enhancing regional connectivity. He urged countries to focus on improving productive capacities in both industrial and human sectors, advocating for skill development, vocational training, and education as critical steps in converting citizens into valuable assets. He stressed the need for initiating targeted skill development programs to prepare a productive labor force that supports industrialization, noting that while Pakistan has made strides in this area, there remains room for further growth.

Additionally, Mr. Khan called for greater exploration and efficient utilization of resources to fuel industrialization and increased productivity. He argued that a sophisticated export portfolio and diversification of markets are vital for achieving trade potential, suggesting that ECO member countries move beyond their traditional focus on Europe and America to tap into less-explored regions.

Concluding his remarks, Mr. Khan underscored the significance of regional collaboration in facilitating trade and strengthening ties. He expressed confidence that through mutual efforts and unified visions, ECO member countries could unlock their collective potential and achieve remarkable progress in regional connectivity and trade facilitation.

Dr. Abdul Qayyum Suleri,

Executive Director, Sustainable Development Policy Institute (SDPI) Pakistan



Dr. Abdul Qayyum Suleri contributed to the session via powerful video message for the session on Building a Sustainable and Resilient Energy Future for ECO Member Countries. Dr. Suleri emphasized over the significance of the the ECO region, which is home to half a billion people, holds immense trade potential. With shifting global dynamics under emerging world order, major economies like the EU are diversifying trade

and seeking new partners, Dr. Suleri suggessted that the ECO countries could leverage this opportunity and they must revive ECOTA, strengthen infrastructure, and boost commerce. He further underlined Pakistan's strategic Gwadar port can play a pivotal role in connecting the region.

Despite geopolitical hurdles, ECO Member Countries can achieve more by uniting. He expressed his optimisim that the region offers great potential which could be realized by deepening partnerships, promoting people-to-people connections, expanding cultural ties, liberalizing visa regimes, and launching student & scholar exchange programs to realize our shared goals

Prof. Seyed Komail Tayebi,

President ECO Science Foundation, Pakistan.

Prof. Seyed Komail Tayebi, the President of ECO Science Foundation, eloquently highlighted the pivotal role of science, technology, and innovation in fostering regional economic development and connectivity. In his comments, he highlighted the concept of science capital—the ability to leverage scientific knowledge and production capabilities as a cornerstone for trade and economic prosperity.

Prof. Tayebi underscored that science capital is not merely about possessing resources but utilizing them effectively to create diverse products and foster trade opportunities across the region.

Reflecting on the economic dynamics of the ECO member countries, he pointed out that despite the region's natural resources and scientific potential, economic relations remain underdeveloped.



This gap, he remarked, presents both a challenge and an opportunity. The lack of robust economic integration within the region should inspire collective efforts to establish models of collaboration that invigorate trade, innovation, and connectivity.

Prof. Tayebi also expressed optimism about the presence of practitioners, academics, entrepreneurs, and officials who gathered to address these issues collaboratively. He praised their commitment to exploring opportunities and overcoming challenges, reiterating that progress in science and education is central to enhancing the region's economic resilience.

Closing his remarks with an inspiring metaphor, Prof. Tayebi declared, "If you want to go fast, go alone. But if you want to go far, go together." His call for unity and cooperation serves as a guiding principle for ECO member countries to not only harness their collective resources but to build a shared vision for sustainable regional development.

Concluding Remarks by Senator Mushahid Hussain Syed

Senator Mushahid Hussain Syed concluded his discourse with a forward-looking perspective, emphasizing the importance of seizing the opportunities presented by the Global South, particularly Africa, which he identified as the regions of the future. He underscored the need for Pakistan to focus on less explored markets and avoid the habitual rush towards traditional power centers like Washington, London, or Brussels.

Highlighting the establishment of the Pakistan Africa Institute for Development and Research, he championed a vision rooted in collaboration with Africa's 55 countries.

This initiative symbolizes a paradigm shift, advocating for stronger ties within the Global South, and fostering partnerships that could redefine the geopolitical and economic landscape.

Mushahid's remarks were a call to action, urging policymakers to embrace strategic foresight, prioritize regional connectivity projects, and leverage existing opportunities to enhance Pakistan's standing in the global arena.



Plenary Session – III: Human Capital Development in the ECO Region

Partner: ECO Educational Institute, Türkiye

Human capital development is the cornerstone of economic growth, innovation, and sustainable development. In the ECO region, investing in education, skills development, and capacity-building is essential for strengthening regional competitiveness and fostering a knowledge-based economy. This session will bring together experts in higher education, vocational training, and technology-driven learning to explore strategies for improving education systems, expanding digital and technical skills, and strengthening regional cooperation in human capital development.

Moderator: Dr. Gonca Biltekin, Educational Expert at the ECO Educational Institute, Türkiye.





Keynote Address by Prof. Mehmet Akif KİREÇCİ

President, ECO Educational Institute, Türkiye Human Capital Development in the ECO Region

Prof. Mehmet Akif KİREÇCİ in his address underlined the ECO region's strength lies in its youthful demographic, with 60% of the population under the age of 30. This demographic is a significant asset that can propel regional growth. However, harnessing its full potential necessitates collective action amid global uncertainties and rapid technological revolutions.

Preparing the younger generation to navigate uncertain challenges and opportunities requires a comprehensive approach. Over the last two decades, ECO countries have sent nearly half a million students abroad. While this reflects aspirations for global knowledge, it also highlights vulnerabilities such as brain drain and inequities in access to quality education within the region.

The Transformation of Education

Education is undergoing a profound transformation, driven by advancements in artificial intelligence. While AI has the potential to democratize learning and personalize educational experiences, it poses risks of amplifying inequalities,



displacing jobs faster than retraining can occur, and rendering traditional systems obsolete.

The challenge lies in preparing institutions not just for digital delivery but for fostering ethical innovation, cross-border collaboration, and lifelong learning ecosystems. Equally important is the preservation of traditional knowledge rooted in ECO societies, which embodies resilience in an era of fast consumption and fragile supply chains.

Regional Cooperation for Human Capital Development

Human capital development is shaped not only in classrooms but also by how communities live, work, and interact. Across the ECO region, intergenerational knowledge and survival literacies remain vital. A robust regional education infrastructure is essential to retain talent, ensure inclusive access, and strengthen networks for university collaboration and regional mobility. Priorities include investments in AI-ready educators, employment-based higher education, digital material development, and teaching of shared cultural and natural heritage.

Role of the ECO Educational Institute

The ECO Educational Institute plays a pivotal role in advancing the region's economic development through education. As a specialized agency of the Economic Cooperation Organization, it is governed by a board of trustees composed of education ministers from member

states. The institute focuses on critical areas such as teacher training, AI integration, and lifelong learning, ensuring responsiveness to evolving educational needs.

Prof. Mehmet Akif KİREÇCİ concluded with an inspiring quote from Sleman Shek, an influential figure in Turkey's educational history: "No nation can be more in need of managing its human resources than us. We must value the minds of our children as carefully as we handle every chip of gold. Schools must nurture talent with the same precision and care as banks give to every cent." These words underscore the importance of educating, including, and empowering every individual in the ECO region.

Dr. Noor Amna Malik

Managing Director National Academy of Higher Education (NAHE), HEC



Dr. Noor Amna Malik expressed her gratitude for the opportunity to be part of the panel and emphasized the importance of human capital investment as the foundation for socioeconomic development. She highlighted that all discussions ultimately converge on the need to prioritize human investment and strategic planning in this domain.

She endorsed the remarks made by Prof. Mehmet Akif KİREÇCİ, regarding the significance of human capital development and stressed that knowledgebased workers are essential for driving progress in a knowledge-based economy. Dr. Malik pointed out that training and equipping human resources with the necessary knowledge, skills, and vocational or technological expertise is vital for meaningful growth.

Dr. Malik applauded the organizers of the session and emphasized the importance of mobilizing collective talent, ideas, and resources. She

underscored the interconnectedness of human capital and natural resources, noting that human resource development plays a pivotal role in utilizing natural resources effectively.

She concluded her remarks with a call to action, urging participants to consider human capital as a priority in the session's final declaration.

Representing 262 universities in Pakistan, Dr. Malik emphasized her institution's readiness to collaborate with partner countries across various disciplines to enhance human resource capabilities. She expressed her hope that collective efforts would lead to impactful outcomes, reiterating that the sky would be the limit for human resource development through shared partnerships and collaboration.

Dr. Malik thanked the panel for the honor of participating in the session and extended her best wishes to all stakeholders for the success of the initiative.

Prof. Mohammad Mujahid

Rector, Pak Austria Fachhochschule Institute of Applied Sciences & Technology (PAF-IAST), Pakistan

Realization of an ecosystem for quality and skill development

Prof. Dr. Mohammad Mujahid shared his insights on the importance of education during the session as a panelist. He emphasized that education, while universally acknowledged as crucial, requires a focus on specific elements that merit greater attention. Highlighting the unique approach of PAF-IAST, he elaborated on how the institution integrates skill-augmented professional degree programs, inspired by the European Fachhochschule model.

He explained that the Fachhochschule system addresses the gap in skill development in existing educational frameworks, ensuring students are equipped with technical, cognitive, interpersonal, and leadership skills necessary for their post-graduation pursuits. Whether entering industry, continuing higher education, or venturing into entrepreneurship, students benefit from programs tailored to meet these diverse needs.



PAF-IAST, established in 2018, commenced academic operations in 2020, and has developed a comprehensive ecosystem that combines skill-oriented bachelor and

master programs, applied research centers, and industry collaborations. Prof. Mujahid elaborated on the institution's emphasis on applied research and innovation-driven projects, linking research outcomes to market needs through partnerships with local and international industries.

He also underscored the significance of international collaboration, noting that PAF-IAST has partnered with institutions from Austria, Germany, the UK, and China to implement transnational education models. Faculty training has been a cornerstone of this initiative, with educators undergoing specialized training abroad to align teaching methodologies with industry requirements and global standards.

Furthermore, Prof. Mujahid discussed the integration of entrepreneurship training into the curriculum, starting as early as the first year of the bachelor program. This approach aims to cultivate entrepreneurial mindsets, enabling students to establish startups during their academic journey. The institution's technology park, housing high-tech companies, startups, and industry clusters, serves as a vital component of this ecosystem, fostering innovation and providing hands-on experience.

He highlighted tangible achievements, such as hosting multinational collaborations, facilitating student exchange programs, and producing graduates ready to meet the demands of the modern workforce. The institution's partnerships with foreign entities have set benchmarks for curriculum standards, resulting in mutual exchange opportunities for students and faculty alike.

Prof. Mujahid concluded by stressing the need for collaborative efforts within the ECO region to develop similar ecosystems, urging institutions to learn from each other and share expertise. He advocated for fostering environments where students acquire comprehensive skills to thrive professionally and personally, underscoring the pivotal role of education in shaping the future.

Prof. Dr. Osman Hassan

Pro-Rector (Academics), National University of Sciences and Technology (NUST), Pakistan Empowering the ECO Region: Insights from NUST on Human Capital Development



Prof. Dr. Osman Hassan, Pro-Rector (Academics) at the National University of Sciences and Technology (NUST), Pakistan, delivered valuable insights on human capital development in the ECO region. He emphasized the crucial role universities play in nurturing human capital, which in turn contributes to organizational growth and economic development.

Dr. Hassan elaborated on the evolving nature of human learning styles, leadership approaches, and mentorship methods. He noted a shift from formal learning styles to multimodal and virtual ones, highlighting the younger generation's preference for visual and interactive learning. Leadership has transformed from controlling to empowering and inspiring, while mentorship has diversified, with forums, social media, chatbots, and analytics now playing key roles.

He described the youth of today as true digital

natives who favor collaborative work environments, are environmentally conscious, and possess short attention spans. This evolution poses challenges for universities to adapt their curricula to meet the needs of modern employers, who increasingly seek attributes like communication skills, emotional intelligence, critical thinking, teamwork, adaptability, and leadership.

Dr. Hassan shared statistics showing that over 50% of job denials were linked to deficiencies in communication, organizational behavior, and etiquette rather than technical skills. Universities bear the responsibility of bridging this gap by equipping students with the necessary expertise and soft skills to thrive in the workforce. He proposed seven essential elements to integrate into academic programs: digital literacy, interdisciplinary education, awareness of global trends, entrepreneurial training, climate change and environmental awareness, field experience, and leadership development.

NUST has taken significant measures to address these needs. He discussed initiatives like faculty development programs through the Teaching and Learning Center, which focus on professional and personal growth while adopting innovative teaching methodologies. Digital skills have been integrated into computing curricula and other programs, supplemented by the NUST Connect

initiative. This platform offers flexible, high-quality micro-courses, enabling students to gain expertise in diverse areas such as computing while accommodating their schedules.

Interdisciplinary research has also been prioritized with the establishment of a dedicated school for interdisciplinary studies. Housing 32 labs from various disciplines, this facility fosters collaboration by bringing researchers together physically to solve complex problems. Global engagement has been another focus, with efforts to internationalize curricula, establish language and cultural centers, and foster partnerships with top universities worldwide. Collaborative research labs with foreign institutions provide students and faculty with valuable international exposure and experience without the need for travel.

Dr. Hassan highlighted the importance of preparing graduates to create jobs rather than merely seeking them. By fostering entrepreneurial mindsets, interdisciplinary capabilities, and global awareness, universities can empower students to adapt to an increasingly dynamic and interconnected world. He concluded by emphasizing the need for a transformative approach to education that equips students not only with technical expertise but also with the soft skills necessary for leadership and impactful contributions to society.

Prof. Seyed Ali Akbar Safavi

Professor of Systems and Control Engineering and IT Expert, School of Electrical and Computer Engineering, Shiraz University, Iran

Human Capital Development in ECO Region: The Needs, The Objectives, and The Approaches

Prof. Ali Akbar Safavi, a distinguished professor of Systems and Control Engineering at Shiraz University, Chairman of the e-Learning Association of Iran, and a board member of the Iranian Society of Instrumentation and Control Engineers, emphasized the importance of human capital development in the ECO region. He highlighted the need for strategic investment in human capital to build the foundation for regional innovation and economic resilience, especially considering the population of the ECO region, which is almost 600 million.

Prof. Safavi discussed the rapid changes in industry, from Industry 1.0 in 1784 to Industry 6.0 in 2022, and the key enabling technologies of Industry 5.0. He stressed the importance of employability skills needed for the future in the STEM industry from employers' perspectives, including team player, written communication, self-motivation, ability to gather data, verbal communication, high self-confidence, problemsolving, customer focus, proactive, assertiveness, decision-making, oral presentations, adaptability, ability to synthesize, leadership, and negotiation skills.



He also mentioned the opportunities provided by digital platforms for virtual attendances, collaborations, and remote labs, emphasizing that there are no excuses or boundaries now. Prof.

Safavi shared the success of the Virtual Collaborative Learning (VCL) Program of TU Dresden and Shiraz University, which involved graduate students and industry professionals working together on finding solutions for industry problems.

Prof. Safavi expressed his readiness to officially sign MoUs on behalf of four scientific associations of Iran on education, AI, and automation. He is eager to help and negotiate on developing AI assistants for ministers and to start sharing and jointly holding university courses virtually. He invited everyone to attend upcoming conferences, including the 9th Iran International Conference on Engineering Education in November 2025, the 11th International Conference on Control, Instrumentation, and Automation (ICCIA 2025) in November, and the 12th International Conference on e-Learning and e-Teaching (ICeLeT 2026) in February.

Prof. Safavi concluded by thanking everyone for their attention and expressing his enthusiasm for starting negotiations right away

Ms. Gulmina Bilal Ahmad

Chairperson of the National Vocational and Technical Training Commission (NAVTTC), Pakistan

Vocational Training for Sustainable Development: Empowering Youth and



Women in the ECO Region

Ms. Gulmina Bilal Ahmad, Chairperson of the National Vocational and Technical Training Commission (NAVTTC), Pakistan, addressed the plenary session focused on Human Capital Development in the ECO Region. She emphasized that vocational training serves as a cornerstone of sustainable development, asserting that empowering youth and women through education and skill development is crucial for building resilient economies and inclusive societies.

Ms. Ahmad highlighted that vocational training is not merely a pathway to employment but rather a mechani sm for empowerment, innovation, and social mobility. She described how vocational education bridges gaps between education systems and labor markets, fostering productivity and economic growth. For the ECO region, with its diverse cultural fabric and dynamic economies, Ms. Ahmad noted that vocational education provides an o pportunity to harness the strength of the demographic dividend, particularly by addressing challenges faced by women and youth to ensure their full participation in the workforce and equitable growth.

Ms. Ahmad detailed NAVTTC's efforts, including identifying skills that match industry demands, redesigning curricula, and introducing digital platforms to make vocational training accessible for remote areas. She highlighted the importance of preparing the workforce for future industries, such as renewable energy and advanced manufacturing, in light of the growing prevalence of automation and artificial intelligence.

The Chairperson underscored that empowering women is not just an economic imperative but also a societal transformation. She outlined NAVTTC's initiatives aimed at increasing women's participation in non-traditional sectors, such as engineering, technology, and entrepreneurship. These efforts include providing mentorship, financial assistance, and access to training centers, which she stated are crucial for breaking stereotypes and enabling women to lead and innovate.

Ms. Ahmad expressed her belief in the immense potential for collaboration within the ECO region. She proposed shared resources, joint programs, and a focus on regional mobility as strategies to harmonize vocational education for the benefit of all member states. She affirmed NAVTTC's readiness to collaborate with other ECO countries to develop shared frameworks, exchange best practices, and integrate emerging technologies into vocational training systems.



Plenary Session – IV: Fostering Regional Collaboration on Healthcare Innovation and Biotech in the ECO Region

Partner: Health Services Academy, Pakistan (HSA)

Healthcare innovation and biotechnology are crucial for addressing public health challenges, improving medical research, and enhancing healthcare delivery in the ECO region. This session will provide a platform for policymakers, healthcare professionals, researchers, and industry leaders to exchange knowledge, explore opportunities, and develop strategies to strengthen healthcare innovation and biotechnology cooperation across the ECO region.

Moderator: Dr. Ahmad Hussen Tareq, Ex. AMR Technical Officer, WHO, Addis Ababa, Ethiopia





Dr. Obaidullah

Chief, Executive Officer, Drug Regulatory Authority of Pakistan (DRAP) Advancing Pharmaceutical Innovation through STI: Strengthening Regulatory Frameworks for Regional Health Security in the ECO Region

Dr. Obaidullah, Chief Executive Officer of the Drug Pakistan Regulatory Authority of (DRAP), participated as a distinguished panelist in the session. He began by highlighting the emerging importance of health security, emphasizing its evolution as a critical facet alongside traditional concepts like food security. Dr. Obaidullah underscored how health security gained prominence, particularly during challenging global times, and elaborated on its relevance for the ECO region, including Pakistan. He noted that while governments are responsible for ensuring access to safe, effective, quality, and affordable essential medicines and vaccines, the requisite resources and infrastructure often fall short. This gap presents an opportunity for regional cooperation, reliance, and collective decision-making.

Dr. Obaidullah drew attention to the role of national regulatory authorities, stating that approximately 190 countries globally have such entities responsible for pharmaceutical regulation. He outlined core regulatory functions, including licensing, registration, pharmacovigilance, and clinical trials, asserting that collaboration among nations can streamline these



processes. He stressed the significance of adopting internationally recognized standards and harmonizing regulatory frameworks to foster regional collaboration within the ECO.

Using examples from other regions, Dr. Obaidullah provided insights into how reliance models and coordinated efforts have led to significant advancements. He pointed to the European Medicines Agency (EMA) as a benchmark for regional cooperation, noting its success in harmonizing standards across Europe. Similarly, he highlighted initiatives in Africa, Asia, and South America, where collective efforts have bolstered regulatory frameworks, allowing member countries to share resources and expertise effectively. He urged ECO member states to follow suit, emphasizing the need to adopt stringent regulatory practices and rely on each other's strengths to address common challenges.

Dr. Obaidullah also emphasized the importance of clinical trials and the standardization of documents to facilitate regional work in pharmaceuticals. He advocated for collaboration with international organizations such as the World Health Organization (WHO), which has developed tools like the Global Benchmarking Tool to assess national regulatory systems.

Concluding his remarks, Dr. Obaidullah referenced the Federation of International Pharmaceutical Organizations (FIP), which has outlined 21 goals for nations to adopt in order to excel in pharmaceutical regulation. He underscored the need for ECO countries to collectively pursue these goals, stating, "If you want to go fast, go alone; but if you want to go far, go together." His

remarks served as a call to action for ECO member states to unite, collaborate, and innovate, ensuring long-term health security and advancing pharmaceutical innovation in the region.

Prof. Dr. Ali Akbar Moosavi-Movahedi

Biophysicist & Biophysical Chemist, Institute of Biochemistry and Biophysics, University of Tehran, Iran

Science and Innovation Together: Exploring New Frontiers in Regional Health and Biotech



Prof. Dr. Ali Akbar Moosavi-Movahedi, a distinguished biophysicist and biophysical chemist from the Institute of Biochemistry and Biophysics at the University of Tehran, Iran participated in the panel.

Dr. Moosavi-Movahedi highlighted the crucial interplay between science and innovation as complementary forces in addressing public health challenges and advancing biotechnology. He emphasized the importance of regional collaboration, which combines local capacities with global knowledge, for fostering scientific synergy and enabling the transport of cutting-edge technologies. He advocated for scientific diplomacy as a vital bridge for sharing experiences, integrating advanced technologies, and harmonizing efforts across nations.

In his remarks, Dr. Moosavi-Movahedi underscored the growing demand for collective solutions dictated by the emergence of complex diseases, environmental crises, and social stresses. He pointed out that advancements in biotechnology, coupled with artificial intelligence and quantum technologies, offer transformative tools for data analysis, drug discovery, development optimization, and

understanding biological processes. These advancements significantly improve the quality of life and extend the frontiers of scientific inquiry.

Dr. Moosavi-Movahedi elaborated on the concept of a "scientific lifestyle," which he defined as safe and tolerant of technological diseases and stresses. He called attention to the need for biocompatible technologies, advocating that while technology can be a force for good, invasive technologies require careful regulation to ensure societal well-being.

He further emphasized the Eco region's strong potential for becoming a model of collaborative innovation, citing its cultural harmony, scientific capacity, and human resources. Realizing this vision, he asserted, necessitates removing bureaucratic barriers, encouraging joint investment, and establishing transparent platforms for cooperation. Simplifying processes, building trust, and utilizing regional institutions would pave the way for scientific integration and sustainable development.

Concluding his remarks, Dr. Moosavi-Movahedi proposed for an interdisciplinary initiative and approach to integrating wisdom and science for both individual and societal benefit, while

controlling harmful technological impacts. He called for concerted efforts by the ECO member states to leverage science and innovation as a unifying system, bringing peace, happiness, and sustainable progress to the region.

Dr. Maryam Tajabadi Ebrahimi

Founder & Managing Director - Takgene Zist Group, Tehran, Iran ECO Chain of Support for Vital and Emerging Products, Strengthening Regional Collaboration for Health and Food Security

Dr. Maryam Tajabadi Ebrahimi, the Founder and Managing Director of Takgene Zist Group, Tehran, Iran, delivered her remarks as a distinguished panelist during the session. Her presentation focused on the "ECO Chain of Support for Vital and Emerging Products: Strengthening Regional Collaboration for Health and Food Security."

Dr. Tajabadi Ebrahimi began by expressing her gratitude to the organizers for the opportunity to attend the conference, visit the vibrant city, and engage with its kind and welcoming people. She introduced her proposal, which emphasized establishing a chain of support for vital and emergency medical products. Recognizing the pressing need for change, she outlined key activities essential for fulfilling this initiative: coordination and information sharing, capacity building, production optimization, and emergency response.

To bring her proposal into action, Dr. Tajabadi Ebrahimi stressed the importance of fostering efficiency through structured organization and collaborative efforts. She proposed a roadmap for advancing this initiative, highlighting the critical need for a robust framework to address public health emergencies and ensure regional health resilience.



Reflecting on the lessons learned from the COVID-19 pandemic, she underscored the necessity of coordinated responses and resilient supply chains for medicines and medical devices.

Dr. Tajabadi Ebrahimi advocated for a unified approach among ECO member states, emphasizing that health security in one nation impacts the entire network of countries. Her proposal called for mutual support and collaboration in the supply of vital and emergency medical products, while also addressing food security as a closely linked priority. She emphasized that achieving preparedness and resilience requires efforts to enhance production capabilities, establish infrastructure, and facilitate technology transfer.

The presentation outlined three key steps for implementing her proposal: coordination and information sharing, capacity building and production development, and emergency response. She discussed the importance of standardized protocols, secure digital platforms, and joint research initiatives to strengthen the region's health resilience. She recommended leveraging tools like blockchain, artificial intelligence, and digital technologies to enhance efficiency and transparency.

Dr. Tajabadi Ebrahimi noted Iran's strong knowledge-based ecosystem, particularly in biotechnology and health-related sectors, with significant contributions from over 1,000 active knowledge-based companies engaged in pharmaceuticals, medical technologies, and food-related areas. She highlighted the importance of regional collaboration in harnessing this capacity for mutual benefits.

In conclusion, Dr. Tajabadi Ebrahimi called for the establishment of a governing council, managed by health ministers or regulatory authorities from each member state, to set priorities and oversee activities. She emphasized the need for active participation, clear communication, and collaboration among ECO member states to ensure the success of the proposal. Her vision focused on improving preparedness, ensuring timely and sustainable supply chains, and enhancing cooperation for regional health and food security, while fostering solidarity and mutual support across the region.

Dr. Tariq Mahmood Ali

Dean of Social Sciences, /Associate Professor, Health Services Academy, Pakistan Enhancing Access to Health Finance: Regional Challenges and Opportunities



In his address, Dr. Tariq Ali underscored the intricacies of healthcare financing, defining it not merely as the mobilization and allocation of resources but as the structured mechanisms and policies ensuring access to healthcare without imposing financial hardship on individuals.

Dr. Tariq Ali elaborated on the role of healthcare financing in ensuring universal healthcare coverage while reducing out-of-pocket expenditures and preventing financial hardships. He highlighted the three fundamental pillars of healthcare financing: revenue generation, pooling, and purchasing. Moving forward, he explained that these pillars were critical in addressing regional disparities in healthcare access, particularly in ECO member countries.

While discussing revenue generation strategies, Dr. Ali emphasized the importance of public funding through direct and indirect taxes, government revenue, and external funding such as grants and loans. He also mentioned the role of private

contributions, including out-of-pocket payments, voluntary prepayments, insurance schemes, and philanthropic efforts. He noted the significant contribution of charitable donations, particularly in Islamic nations like Pakistan, where philanthropic efforts constitute a substantial portion of healthcare funding.

On the subject of pooling, he advocated for a more equitable approach, suggesting cross-subsidies from low-risk to high-risk groups, from affluent to low-income populations, and from productive age groups to non-productive age groups. He emphasized the need to eliminate fragmentation in

budget allocations and adopt a holistic approach to resource management for effective healthcare delivery.

Addressing the third pillar—purchasing—Dr. Ali highlighted the importance of strategic purchasing over passive purchasing. He stressed the need for cost-effectiveness, efficacy, and quality in healthcare investments, noting that cheaper options could often lead to inadequate outcomes. He illustrated this point with hypothetical examples, emphasizing the need for prioritizing quality over cost in health management decisions.

Dr. Ali provided an overview of the healthcare financing models used globally while examining the performance of ECO member countries. He highlighted the disparities in health expenditures as a percentage of GDP in member countries, with Turkey and Iran leading the region in health insurance coverage and public health spending. He recommended adopting hybrid models of healthcare financing that combine contributions from employees, private sectors, and government subsidies.

In concluding his remarks, Dr. Ali outlined key recommendations for improving healthcare financing in ECO member countries. He urged governments to increase health spending to at least 5% of GDP, implement universal healthcare coverage, expand digital health systems, and foster regional collaboration. He advocated for establishing an ECO Health Investment Fund to finance healthcare costs and harmonize frameworks across member states, emphasizing the importance of telemedicine, AI applications, and digital platforms in modern healthcare solutions.

Dr. Ali concluded by stressing the need for long-term strategies to expand health insurance schemes and introduce co-payment models for equitable access to healthcare. He emphasized that adopting such measures would ensure universal healthcare coverage, sustainability, and affordability across the region, ultimately enhancing public health outcomes and economic growth.

Dr. Ahmad Hussen Tareq

Ex. AMR Technical Officer, WHO, Addis Ababa, Ethiopia Strengthening Regional Connectivity to Combat Antimicrobial Resistance in the ECO Region

Dr. Ahmad Hussen Tareq, delivered insightful remarks as a panelist during the session titled "Strengthening Regional Connectivity to Combat Antimicrobial Resistance in the ECO Region." He began his address by emphasizing the critical issue of antimicrobial resistance (AMR), describing it as a silent pandemic already compromising health security, food security, and economic stability across the globe.

Dr. Tareq explained AMR as the phenomenon where infections no longer respond to medicines due to the evolution of resistant strains. He stressed that this issue threatens the ability to treat simple infections and undermines complex medical



procedures, jeopardizing health systems and related industries such as agriculture and food production. Highlighting the urgency, he shared recent data indicating that global GDP losses due to AMR are projected to reach \$1 trillion by 2030, with the direct costs already exceeding \$64 billion. Contrary to older projections that placed the AMR crisis around 2050, Dr. Tareq underscored that its full impact is expected much sooner.

He noted the slowdown in AMR-related research and development, with few breakthroughs in drug discovery since the 1970s. Pharmaceutical industries, drawn to the more profitable realms of cancer and non-communicable disease treatments, have largely shifted focus away from AMR. Dr. Tareq praised the achievements of the ECO region in biotechnology and diagnostics, particularly Iran's advancements and Pakistan's contributions in infection prevention and control supplies. However, he urged the region to strengthen diagnostic infrastructures and expand training for healthcare professionals, policymakers, and the general public.

Dr. Tareq also lauded the 2024 UN resolution that elevated AMR to a political health priority for all member states, including those in the ECO region. He stressed that a comprehensive solution requires improving diagnostic capabilities, fostering academic research, and training human resources, all of which can be initiated with minimal costs if leadership commitment is present.

He outlined a multi-faceted approach, advocating for intergovernmental cooperation, academialed initiatives, and regional capacity-building to address AMR effectively. He suggested leveraging the WHO-published priority research agenda to develop indigenous technologies and reduce dependence on external geopolitical influences. He also touched on the importance of private sector involvement and collaboration between chambers of commerce in promoting technology transfer and establishing a robust regional healthcare infrastructure.



In concluding his remarks, Dr. Tareq reiterated the need for equitable partnerships among ECO member states, emphasizing policy dialogue and the removal of barriers to collaboration. He called for the establishment of trade networks specific to healthcare, particularly in combating AMR, and urged participants to carry forward the message of cooperation and shared responsibility in addressing this critical global challenge. His presentation underscored the urgency of the AMR crisis while offering practical strategies for regional solutions that could secure health, food, and economic systems for the ECO region.

Plenary Session – V: Building a Sustainable and Resilient Energy Future for ECO Member Countries

Partner: National Energy Efficiency and Conservation Authority (NEECA) Pakistan

The ECO Member Countries are undergoing a critical energy transition, driven by the need for sustainability, energy security, and economic resilience. This session will provide a strategic platform for policymakers, energy experts, and industry leaders to discuss pathways for accelerating the clean energy transition, enhancing energy security, and addressing policy and infrastructure challenges in the ECO region. The discussions will focus on regional energy collaboration, investment in renewable energy and energy efficiency, and advancing research and innovation in sustainable energy technologies.

Moderator: Mr. Muhammad Kamil Quddus, Energy Sector Specialist, Pakistan





The session provided crucial insights into the steps necessary for ECO Member Countries to achieve energy security, sustainability, and resilience. Through coordinated efforts, technological innovation, and robust policies, the region has the potential to lead in global energy transformation while addressing pressing socio-economic and environmental challenges.

Dr. Sardar Mohazzam

Managing Director, National Energy Efficiency and Conservation Authority (NEECA), Pakistan

Energy Efficiency for Energy Security and Regional Cooperation in the ECO Region

Dr. Sardar Mohazzam, Managing Director of the National Energy Efficiency and Conservation Authority (NEECA), Pakistan, addressed the distinguished panel during the session on building a sustainable and resilient energy future for ECO Member Countries. He expressed gratitude to the ECO Foundation and its partners for organizing this strategic discussion, emphasizing its relevance in shaping an energy-secure and sustainable future for the region.

Dr. Mohazzam highlighted the rapidly shifting energy landscape of the ECO region, driven by increasing energy demand, climate change pressures, and global initiatives toward decarbonization. He underscored energy efficiency as a strategic imperative rather than a choice, describing it as the fastest, cleanest, and most cost-effective solution to achieving energy security, reducing greenhouse gas emissions, enhancing economic competitiveness, and improving energy access.



He provided detailed insights into the region's abundant energy reserves, noting that ECO Member Countries collectively hold approximately 30% of the world's energy resources. While countries like Kazakhstan and Turkmenistan possess substantial oil and gas reserves, others, like Pakistan, face significant energy challenges and rely heavily on imports, amounting to \$15 billion annually. Dr. Mohazzam urged regional collaboration to leverage these resources efficiently, citing studies that indicate 20% of energy in the region is wasted due to outdated infrastructure and inefficient practices.

Drawing attention to Pakistan's initiatives, Dr. Mohazzam discussed the targets outlined in the National Energy Efficiency and Conservation Policy. By 2030, the policy aims to achieve 2 million tons of oil equivalent savings and reduce CO2 emissions by 35 million tons. To support these goals, Pakistan has implemented frameworks such as energy conservation building codes, policies for electric vehicle charging infrastructure, and awareness campaigns to engage stakeholders across various sectors.

He emphasized the importance of regional cooperation, advocating for the establishment of a regional energy efficiency framework under ECO's funding. Key initiatives proposed included joint energy audits, harmonized standards for products, capacity building for human resources,

and creating sustainable financing mechanisms. Dr. Mohazzam also highlighted the need for knowledge-sharing platforms to foster green technology development and innovative solutions.

In conclusion, Dr. Mohazzam stressed the necessity of mutual respect and collaboration among ECO Member Countries. By learning from each other's strengths and innovations, including advanced grid systems and green financing models, the region can build a resilient and sustainable energy future. He envisioned energy as a bridge for cooperation, rather than a barrier, calling for collective action to shape a shared future that benefits all.

Mr. Razi Raziuddin

CEO Apex Energy Ltd, Former CEO - KPOGCL and Former Managing Director, OGDCL.

Resilient Energy Future through Regional Energy Trade in the ECO Region



Mr. Razi Raziuddin, highlighted the critical role of regional energy trade in ensuring a resilient energy future for ECO Member Countries. Mr. Raziuddin emphasized that while past efforts to foster energy trade in the ECO region have faced challenges, the current global energy landscape provides an unmatched opportunity for cooperation. He argued that oil, gas, and electricity serve as conduits for regional connectivity and progress, surpassing traditional trade in commodities like textiles and sugar. He underscored the importance of establishing robust pipelines and transmission lines to create lasting infrastructure that facilitates mutual growth and prosperity.

Highlighting the abundant gas reserves in

countries like Turkmenistan and Iran—estimated at between 600 to 800 trillion cubic feet—Mr. Raziuddin noted the immense potential for these resources to benefit the region when harnessed effectively. He suggested Pakistan's strategic position and its access to ports as a vital outlet for LNG and gas exports, serving not only regional needs but also global markets.

Mr. Raziuddin further emphasized the need for collaborative energy projects such as regional grid connectivity, which has been discussed extensively but without material results. He called upon ECO Member Countries to ensure a consistent and results-driven dialogue, proposing quarterly meetings to evaluate progress and address shortcomings. He urged professionals across the region to convey the importance of actionable steps to their governments, stressing the need for fiscal responsibility, accountability, and the execution of practical energy projects.

He lauded the expertise within ECO Member Countries, citing successful models such as Pakistan's advancements in LNG infrastructure, which could serve as a blueprint for others. He also highlighted the urgent need for electricity transmission lines to support the future of electric vehicles and renewable energy. Mr. Raziuddin underscored the importance of studying demographic trends to optimize energy generation and distribution systems. He acknowledged the difficulties and anomalies present in regional cooperation but advocated continuous dialogue as a mechanism to resolve these issues.

Concluding his remarks, Mr. Raziuddin stressed the importance of leveraging regional resources to maximize their value and benefit populations across ECO Member Countries. He urged the creation of expert working groups, accountability frameworks, and detailed project lists to ensure progress. Through cooperative efforts and practical solutions, he envisioned a resilient energy future that would drive prosperity and development for the region.

Prof. Abbas Rajabi

Head of Sharif Energy Research Institute, Sharif University, Tehran, Iran Renewable Energy Deployment in ECO Member Countries: A Topic to Foster Multilateral Cooperation

Prof. Abbas Rajabi presented compelling insights on the topic of renewable energy deployment as a mechanism to foster multilateral cooperation among ECO Member Countries. He began by acknowledging the challenges posed by weak interconnections and collaboration within the region and emphasized the urgency of addressing these barriers.

Prof. Rajabi highlighted the geographical scope of the ECO region, noting its population growth from 550 million in 2024 to a projected 670 million by 2035 an increase that would demand significant energy resources. He pointed out that total primary energy consumption is expected to rise from 520 million tons of oil equivalent to 1,000 million tons of oil equivalent within the same timeframe, presenting a monumental challenge for the region.



Prof. Rajabi noted the adverse effects of climate change on energy demands, citing factors such as increased cooling requirements, reduced hydroelectric production, and the electrification of public transportation. He lamented the region's reliance on fossil fuels and the lack of successful multilateral energy collaborations, referencing past projects such as the Iran-Turkey gas pipeline and other interconnections that failed to materialize.

Turning to solutions, Prof. Rajabi advocated for renewable energy as a plausible and impactful area for collaboration between ECO countries. He highlighted Turkey's successful investment in solar PV electricity as an example and pointed out that renewable energy projects could serve as a foundation for regional synergy. Prof. Rajabi emphasized the importance of developing the entire supply chain for renewable technologies, from basic materials to panel manufacturing, and stated that ECO members could share resources and facilities to optimize this process.

He cautioned against initiating renewable energy projects without the requisite expertise and knowledge, likening it to "diving into a pool full of power" without proper safeguards. He stressed the need for thorough planning, prediction, and control to mitigate issues such as climate-induced disruptions to renewable energy systems. He also encouraged ECO Member Countries to adopt standards for measuring the performance of PV systems in different climatic conditions to ensure efficiency and reliability.

Prof. Rajabi concluded by proposing renewable energy collaboration as a concrete project to address pressing challenges in the region. He emphasized that such efforts could improve mutual trade, enhance knowledge-sharing, and create education and vocational platforms to empower the youth of ECO countries. Prof. Rajabi advocated for the establishment of a science, technology, and innovation (STI) program on renewable energy as a starting point for deeper cooperation in technology and engineering across the ECO region. He urged immediate action to launch this initiative, expressing optimism about its potential to unite and uplift the member states.

Prof. Seyed Ali Akbar Safavi

Professor of Systems and Control Engineering, School of Electrical and Computer Engineering, Shiraz University Iran Resilient Energy Management through Intelligent Efficiency Management and International Collaborations



Prof. Seyed Ali Akbar Safavi, shared valuable insights on "Resilient Energy Management through Intelligent Efficiency Management and International Collaborations."

He emphasized the importance of leveraging shared experiences to address current challenges in energy management. Prof. Safavi began by underscoring the continuous rise in energy consumption globally, pointing out the lack of efficient strategies to address this pressing issue. He highlighted the potential for substantial improvements through simple measures, such as fine-tuning automation systems, which, according to him, could lead to a 10%-15% increase in efficiency. He noted that more than 80% of automation worldwide systems remain untuned, leaving considerable scope for improvement.

Drawing upon his expertise, Prof. Safavi shared a case

study involving energy management at Shiraz University. He discussed an energy-saving initiative applied to administrative buildings spanning 15,000 square meters, which involved replacing AC motors, utilizing automated controls, and implementing energy labels for system efficiency. Contrary to expectations, the study revealed that lighting accounted for 9% of energy consumption, heating for 48%, and office equipment such as computers, printers, and scanners for 22%. This analysis led to targeted efforts to improve efficiencies in these areas.

Prof. Safavi elaborated on specific strategies, including re-managing insulation, intelligent control mechanisms, and the utilization of inverters and electrical valves. These measures resulted in a reduction of energy consumption by as much as 50%. He also shared insights into office equipment energy consumption, highlighting that computers alone constituted 70% of the energy used by office devices. Simple adjustments, such as activating energy-saving modes and shutting down computers during periods of inactivity, proved effective in significantly reducing consumption.

In addition to technical solutions, Prof. Safavi stressed the importance of improving administrative practices. He advocated for turning off equipment when not in use, utilizing recycled paper, and adopting intelligent systems powered by AI to optimize energy usage. He noted that AI could analyze energy consumption patterns and recommend effective tuning and settings for various facilities, further enhancing efficiency and achieving savings of up to 35% in heating systems alone.

Prof. Safavi concluded his remarks by emphasizing the importance of sharing experiences and adopting simple, practical measures before investing in large-scale energy infrastructure. He highlighted the potential to save up to 20%–25% of energy consumption through improved practices and intelligent management. His insights called for a collaborative approach to resilient energy management, offering a roadmap for achieving sustainable efficiency and fostering international cooperation.

Mr. Khalil Raza

Programs Manager – Energy & Climate, ECO Science Foundation, Pakistan Decarbonizing Road Transport: Transitioning to Electric Mobility in the ECO Region

Mr. Khalil Raza, shared his insights on the topic of "Decarbonizing Road Transport: Transitioning to Electric Mobility in the ECO Region." He began by highlighting the significance of electric mobility as the next major transition in the road transport sector. He emphasized that this shift represents an industrial change of unprecedented scale, akin to the historical transition from steam engines to fossil fuelpowered vehicles over 150 years ago.

Mr. Raza underscored two main drivers for this transition: technological advancements enabling the development of essential electrical and mechanical systems, and the urgent need to address climate change. He noted that transport is a low-hanging fruit for emission reduction due to the availability of necessary technologies and economies of scale, making it economically and technically feasible to decarbonize this sector.

He provided a comprehensive overview of global carbon emissions, explaining that roughly 50 billion tons of CO2 are



emitted annually. According to the Paris Agreement, these emissions must be reduced to near zero by 2100 to meet the 1.5°C global temperature target. He stressed that transport is a critical focus area for achieving these reductions, as it offers the most straightforward pathway compared to other challenging sectors such as steel, chemicals, aviation, and shipping.

Mr. Raza identified four key pillars that are essential for the success of the electric mobility transition:

- 1. Policy Framework: He emphasized that strong policies with clear national targets and incentives are fundamental. Examples from leading nations such as China, Norway, Germany, and Canada demonstrate that regulatory measures, financial incentives, and public awareness initiatives significantly boost the adoption of electric vehicles.
- 2. Battery Costs: He explained that battery costs, which constitute half the cost of electric vehicles, have dropped significantly over the past decade—from around \$1,000 per kilowatt-hour to approximately \$150 today. He noted that achieving a tipping point of \$80 per kilowatt-hour would make electric vehicles cost-competitive with internal combustion engines.
- **3.** Charging Infrastructure: Mr. Raza underscored the importance of developing robust and accessible charging infrastructure, particularly for commercial mobility. While passenger vehicles with ranges of 1,000 kilometers can suffice with limited infrastructure for short commutes, commercial transport demands resilient systems to support supply chains.
- 4. Manufacturing and Supply Chain Capacity: He highlighted the potential of ECO member countries, such as Turkey, Iran, Pakistan, and Kazakhstan, to transition their existing vehicle production capabilities towards electric mobility. He noted that China leads globally in battery refinement, holding a dominance of 90%, which provides opportunities for regional collaboration.

Mr. Raza also discussed the challenges faced by ECO countries in adopting electric mobility. For instance, he pointed out that while Pakistan has ambitious national targets for 2030, the absence of purchase subsidies, import duty waivers, and preferential loans hinders progress. He emphasized that local production and assembly of vehicles are crucial for cost-effectiveness, as reliance on imports would result in prohibitive expenses.

Additionally, he highlighted the varying carbon footprints of electric vehicle adoption, noting that countries with coal-based power grids might not see significant benefits unless the energy grid is decarbonized. He called for targeted efforts to address electricity costs and improve energy infrastructure to make electric mobility a viable solution.

Concluding his remarks, Mr. Raza urged ECO member states to strengthen policies, invest in battery technology, develop charging infrastructure, and enhance manufacturing capabilities to accelerate the transition to electric mobility. He advocated for regional collaboration and proactive measures to decarbonize the transport sector and contribute to global climate goals.



Plenary Session – VI: Groundwater Management in the ECO Region

Partner: International Water Management Institute (IWMI) & Islamic Relief Pakistan

Groundwater plays a critical role in supporting agriculture and food security across the ECO region. However, it faces mounting pressures from rapid population growth, escalating agricultural demands, and the impacts of climate change. Unsustainable extraction, inadequate management practices, and climate-induced stress are depleting aquifers, deteriorating water quality, and jeopardizing the long-term sustainability of this essential resource.

This session will address the key challenges in groundwater management, emphasizing the roles of science, technology, and policy in ensuring long-term sustainability. Experts will explore innovative solutions like Managed Aquifer Recharge (MAR) and discuss the need for regional cooperation and capacity building to address shared groundwater issues. Panelists will also engage in deliberations on achieving sustainable groundwater management. Furthermore, the session will also highlight how ECO countries can collaborate to protect groundwater for future generations through enhanced management and policy frameworks.



Moderator: Ms. Sitara Gill, Senior Research Officer, IWMI-Pakistan

This session underscored the urgency of safeguarding groundwater resources to ensure food security, environmental sustainability, and resilience to climate change in the ECO region. By adopting innovative solutions, fostering collaboration, and empowering communities, ECO countries can address shared groundwater challenges and pave the way for long-term sustainability.

Keynote Remarks by Dr. Rashid Aftab

Director · Riphah Institute of Public Policy, Riphah Intenational University, Pakistan.

Dr. Rashid Aftab commenced the plenary session with a warm welcome to all attendees, recognizing the significance of their presence in addressing one of the region's most pressing environmental challenges. He began by underscoring the vital importance of groundwater as a natural resource, emphasizing its role in ensuring food security, maintaining environmental sustainability, and supporting healthy ecosystems across the ECO region.

Dr. Aftab outlined five critical challenges currently undermining groundwater management:

• Overextraction: He drew attention to the alarming depletion of groundwater reserves, particularly in arid and semi-arid regions such as Iran, Pakistan, and Central Asia, where water tables are often declining to depths exceeding 300 meters.



- Pollution of Aquifers: Highlighting the impacts of industrial discharge and urban contamination, he specifically referenced issues in Uzbekistan and the Aral Sea region that are affecting the quality of groundwater.
- Climate Change Impacts: He discussed how reduced recharge rates, altered rainfall patterns, and other climate-induced stresses are impacting groundwater availability, with examples from Kyrgyzstan, Turkey, and Pakistan.
- Weak Governance: Dr. Aftab addressed the shortcomings in governance structures, pointing to the inadequate management of transboundary aquifers, institutional gaps, and the inability to meet contemporary demands.
- Scarcity of Data: He emphasized the lack of sufficient monitoring systems and the limited availability of data, which hampers effective groundwater management across the region.

To address these challenges, Dr. Aftab proposed several actionable solutions:

- He advocated for the development of regional frameworks for groundwater governance within ECO, inspired by successful global models such as those established by the United Nations.
- He emphasized the importance of leveraging technological tools, such as NASA's GRACE, and fostering community participation to enhance monitoring and management practices.

Dr. Muhammad Ashraf

Country Representative- International Water Management Institute (IWMI), Pakistan Experience Sharing Groundwater from Monitoring to Management



Dr. Muhammad Ashraf, Country Representative of the International Water Management Institute (IWMI), Pakistan, shared critical insights on groundwater management—emphasizing its significance as a resource that supports agriculture, industry, and domestic needs.

Dr. Ashraf highlighted groundwater as a vital lifeline for Pakistan, noting that it contributes to nearly:

- 60% of agricultural needs,
- 90% of domestic usage, and
- 100% of industrial demands.

He pointed out that Pakistan ranks as the fourthlargest groundwater extractor globally, following India, the United States, and China. Despite abundant rainfall in regions such as Islamabad, which receives around 1,400 mm annually, groundwater depletion remains a pressing issue. Dr. Ashraf underscored alarming statistics:

• In Islamabad, groundwater levels drop by 1 meter per year.

- In Quetta, the decline is a staggering 6 meters annually, with aquifers exceeding depths of 400 meters.
- In Lahore, the rate is approximately 0.5 meters annually.

He also explained that the groundwater in the Indus Basin is naturally saline due to its marine geological history, with salinity issues worsening further from recharge zones. This necessitates tubewell designs tailored to local water quality conditions.

Policy Challenges and Opportunities

Dr. Ashraf discussed Pakistan's efforts in developing frameworks such as the National Water Policy, Punjab Water Act, and KP Water Act to address groundwater issues. He acknowledged the barriers these policies face in implementation, describing Pakistan as a "graveyard of policies." He emphasized the importance of achieving sustainable groundwater use through balanced recharge and abstraction, supported by effective governance.

Experience Sharing: GMIS Framework

Dr. Ashraf shared a case study on Pakistan's proactive approach to groundwater management the Groundwater Monitoring and Information System (GMIS). This framework monitors groundwater quantity and quality dynamically, emphasizing continuous observation.

He highlighted an Islamabad pilot project involving 110 recharge wells, which successfully reinjected 62 million gallons of water. This example demonstrated the feasibility and impact of

urban recharge efforts. Additionally, innovative decision-support tools have been developed, including:

- Geo-tagged tubewells and piezometers,
- Spatial visualization and risk mapping,
- Integrated data platforms for actionable insights, and
- Advisory services for stakeholders and farmers.

The Way Forward

Dr. Ashraf outlined key actions necessary for moving forward:

- Establishing advisory services for farmers and groundwater managers to promote informed and sustainable practices.
- Expanding urban recharge initiatives to address declining water tables and ensuring access to safe drinking water—currently, 60% is considered unsafe, with areas like Okara reporting arsenic contamination levels up to 33%.
- Scaling up decision-making tools regionally across the ECO region to foster collaboration and shared learning.
- Driving behavioral change in water usage through education, awareness campaigns, and community engagement.

Dr. Ashraf concluded by emphasizing that groundwater represents both a challenge and an opportunity. He advocated for collective efforts, innovative solutions, and unwavering commitment to ensure groundwater is preserved as a resource for future generations.

He thanked the audience for their attention and encouraged them to join in safeguarding this critical resource.

Dr. Muhammad Arshad

Deputy Country Representative - International Water Management Institute (IWMI), Pakistan

Application of Managed Aquifer Recharge: A leading-edge technology to replenish Aquifers

Dr. Muhammad Arshad, shared insightful perspectives on the application of Managed Aquifer Recharge (MAR), a leading-edge technology aimed at replenishing aquifers and addressing groundwater stress. His presentation underscored the critical importance of adopting innovative approaches to ensure sustainable groundwater management.

Dr. Arshad described MAR as a proven technique that has been successfully implemented over the past two decades, likening it to "water banking." He highlighted the alarming global figure of 27,000 billion m³ in groundwater extraction,

illustrating the urgent need for effective recharge solutions.



In his overview, Dr. Arshad elaborated on two broad techniques of MAR:

- Infiltration and spreading basins
- Well injection methods, including Aquifer Storage and Recovery (ASR) and Aquifer Storage Transfer and Recovery (ASTR)

He provided a comparative analysis of these methods, focusing on their costs, suitability, limitations, and contexts where each is most applicable.

Turning to the application of MAR in Balochistan, Dr. Arshad discussed the use of suitability mapping to identify potential recharge zones that could benefit from floodwater harvesting initiatives. He emphasized the significance of raising community-level awareness to complement such efforts. Additionally, Dr. Arshad highlighted urban-level interventions, specifically rainwater harvesting for groundwater recharge, citing Kachnar Park in Islamabad as a case study of success in this approach.

Dr. Arshad extended the discussion to emphasize how the principles and techniques of MAR could benefit other Member Countries of the Economic Cooperation Organization (ECO). These countries, many of which face acute water scarcity and groundwater depletion, could adopt MAR to sustainably manage their water resources and mitigate the effects of droughts and climate change.

In regions such as Central Asia, where agriculture depends heavily on groundwater from stressed aquifers, MAR could provide a reliable solution to secure water supplies. Floodwater harvesting, as demonstrated in Balochistan, could be adapted for areas with seasonal flooding, ensuring excess water is channeled into aquifers rather than wasted.

Dr. Arshad stressed the importance of collaboration among ECO members to share expertise, research, and technologies related to MAR. He envisioned regional partnerships that leverage these techniques to address shared challenges in water resource management, fostering resilience and sustainability in the face of growing environmental pressures.



Mr. Asif Sherazi

Country Director - Islamic Relief Pakistan (IRP) Addressing the Groundwater Crisis in the ECO Region

Mr. Asif Sherazi, Country Director - Islamic Relief Pakistan, stressed the urgency of addressing the groundwater crisis, a challenge exacerbated by accelerating climate change. He emphasized that this issue directly impacts millions across the ECO region, where water scarcity poses an escalating threat to livelihoods and ecosystems alike.

Citing a United Nations report, Mr. Sherazi revealed that global freshwater extraction has surged by 14%—a trend that far exceeds nature's ability to replenish these vital resources. He drew attention to the Hindu Kush mountains, often referred to as the "Third Pole," which serve as critical water sources for over two billion people. Their vulnerability, aggravated by climate change and unsustainable practices, underscores the necessity for immediate action.

In response to these pressing challenges, Mr. Sherazi advocated for a multi-dimensional approach rooted in innovation and collaboration. He proposed integrating remote sensing technologies and satellite data to monitor groundwater levels more effectively, incorporating nature-based solutions like afforestation and wetland conservation, and developing urban greenbelts to enhance water retention in cities. Additionally, he underscored the importance of inclusive and participatory planning to ensure that local communities are actively involved in decision-making processes.

Mr. Sherazi delineated five key action areas to guide future efforts:

- Restoring natural recharge mechanisms: Protecting and rehabilitating ecosystems critical for aquifer replenishment.
- Promoting water-efficient practices: Adopting advanced irrigation methods and reducing wastage in agricultural sectors.
- Empowering communities: Building awareness and capacity at the grassroots level to advocate for sustainable practices.
- Ensuring long-term water sustainability: Crafting policies that balance immediate needs with future resource preservation.
- Acknowledging severe consequences: Recognizing and preparing for the devastating effects of aquifer depletion when wells inevitably run dry.

Closing his remarks, Mr. Sherazi called for unified action among ECO Member Countries to address shared water challenges. He urged regional cooperation in research, technology exchange, and policy integration, envisioning a future where sustainable groundwater management serves as a cornerstone in building climate resilience and ensuring water security for generations to come.



Closing Ceremony

Prof. Seyed Komail Tayebi, President ECOSF concluded the conference by expressing heartfelt gratitude to the ECO Secretariat, HEC, co-organizers, and all partners who contributed to its remarkable success. He extended his appreciation to the organizing teams, ECOSF staff, and participants whose collaborative efforts made this event a



fruitful exchange of ideas and knowledge. Prof. Tayebi emphasized the importance of forums like these in fostering knowledge-sharing and building networks among institutions, both locally and regionally. He noted that such platforms are crucial for addressing shared challenges and advancing sustainable development across the ECO region. Reflecting on the conference's outcomes, he expressed optimism about the future of ECONEX and reaffirmed the commitment to continued support from partners and stakeholders.

Looking ahead, Prof. Tayebi underscored the significance of implementing the policy recommendations derived from the conference. He urged the respective authorities of the ECO Member States to translate these strategies into tangible actions for socio-economic growth and environmental sustainability. He stressed that the deliberations and insights shared during the conference should pave the way for meaningful progress that benefits not only the ECO region but also the global community.



In his closing remarks, Prof. Seyed Komail Tayebi envisioned a future of strengthened collaboration, impactful research, and shared innovation. He called upon the ECO Member States to embrace unity and action, ensuring that the outcomes of this conference serve as a catalyst for transformative change. With this, the conference concluded on a promising note, setting the stage for enduring partnerships and a collective commitment to overcoming regional challenges together.