جمهورية مصر العربية

معهد التخطيط القومي

الحلقة الخامسة من نشاط المتابعات العلمية

للعام الأكاديمي 2025/2024

عرض تقرير:

التكنولوجيا والابتكار 2023

الصادر عن مؤتمر الأمم المتحدة للتجارة والتنمية

UNCTAD

المتحدث

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مدرس بمركز التخطيط والتنمية الصناعية

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الثلاثاء 4 فبراير 2025

فريق عمل نشاط المتابعات العلمية للعام الأكاديمي 2025/2024

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عقد معهد التخطيط القومي يوم الثلاثاء 4 فبراير 2025 خامس حلقات نشاط المتابعات العلمية للعام الأكاديمي 2025/2024. والتي قدمت فيها الدكتورة/ نورهان العطار – المدرس بمركز التخطيط والتنمية الصناعية بالمعهد عرضًا لتقرير مؤتمر الأمم المتحدة للتجارة والتنمية UNCTAD 2023 حول التكنولوجيا والابتكار. تضمن العرض استعراضًا للفصول الرئيسية للتقرير، وأهم ما جاء بها من نتائج واستخلاصات. كذلك تم استعراض الرسائل الأساسية للتقرير وأهم الخطوات الواجب اتباعها من قبل كل من الدول النامية والدول المتقدمة لتعزيز وتضمين التطور التكنولوجي والابتكار في كافة القطاعات المختلفة.

❖ The UNCTAD Technology and Innovation Report 2023

The 2023 UNCTAD's report focuses on the integration of technology and innovation into the industrial sector, particularly in developing countries. The report emphasizes the importance of leveraging frontier technologies to achieve sustainable development, mitigate climate change, and reduce carbon emissions. It provides a comprehensive framework for developing countries to transition towards greener and more sustainable industrial practices while addressing social and economic challenges.

❖ Key Themes and Focus Areas

The report is structured around six chapters, each addressing critical aspects of technology and innovation in the context of sustainable development:

1. Green Windows of Opportunity: Developing countries can achieve technological catch-up by capitalizing on green opportunities. The chapter introduces the concept of "green windows of opportunity" (GWOs), which are time-limited opportunities driven by changes in policies, markets, and technologies. These windows allow countries to adopt green technologies and transition to low-carbon industries.

2. Accelerating with Frontier Technologies: The report identifies 17 frontier technologies, including artificial intelligence (AI), the Internet of Things (IoT), green hydrogen, and electric vehicles, which can drive sustainable development. The economic value of these technologies is projected to grow from $1.5 trillion in 2020 to $9.5 trillion by 2030. However, the dominance of developed countries in innovation and patents poses challenges for developing nations.

3. Renewable Energy-Driven Growth: This chapter explores how developing countries can harness renewable energy sources like solar PV, biofuels, and green hydrogen to drive economic growth. Case studies of countries like China, Brazil, and Morocco highlight the importance of policy support, investment, and strategic planning in creating opportunities for green growth.

4. The Dual Transition of Global Value Chains, Green and Digital: The chapter discusses the integration of green and digital technologies in global value chains (GVCs). It emphasizes the need for developing countries to adopt Industry 4.0 technologies and sustainable production practices to remain competitive in global markets.

5. Pathways to Diversified and Sustainable Production: Developing countries need to diversify their economies towards sectors with lower carbon emissions. The chapter provides a framework for identifying and implementing greener production pathways, emphasizing the importance of economic diversification and strategic industry selection.

6. International Collaboration for More Sustainable Production: The final chapter stresses the need for international cooperation to support developing countries in their green transition. It covers aspects such as trade policies, intellectual property

rights reform, and financial assistance. The report suggests mechanisms like South-South cooperation, regional innovation partnerships, and global challenge funds to facilitate technology transfer and capacity building. -

❖ Key Insights and Recommendations

1. Green Innovation and Technological Catch-Up:

- Developing countries should focus on green innovation to achieve economic growth while addressing climate change. This involves adopting sustainable technologies, investing in renewable energy, and transitioning to low-carbon industries.

- Green windows of opportunity (GWOs) are time-limited opportunities that arise from changes in policies, markets, and technologies. Countries must be proactive in seizing these opportunities by investing in infrastructure, R&D, and policy frameworks.

2. Frontier Technologies

- The report identifies 17 frontier technologies, divided into three categories: Industry 4.0 (e.g., AI, IoT, 3D printing), green and renewable energy technologies (e.g., solar PV, wind energy, green hydrogen), and other frontier technologies (e.g., nanotechnology, gene editing).

- The market for these technologies is expected to grow significantly, but developing countries face challenges in adopting and adapting these technologies due to limited innovation capabilities and infrastructure.

3. Renewable Energy and Green Growth:

- Developing countries have significant potential to lead in renewable energy production, particularly in solar PV, wind energy, and green hydrogen. Countries like China, Brazil, and Morocco have successfully developed their renewable energy sectors through policy support and strategic investments.

- Green hydrogen offers substantial opportunities for countries with abundant renewable energy resources, such as those in Africa and the Middle East. However, challenges related to high costs, immature technologies, and infrastructure readiness need to be addressed.

4. Digital and Green Transitions in Global Value Chains:

- The integration of green and digital technologies in global value chains (GVCs) can make supply chains more efficient and environmentally friendly. Developing countries need to build digital competency, infrastructure, and institutions to seize opportunities created by emerging technologies.

- Industry 4.0 technologies, such as AI, IoT, and robotics, can enhance manufacturing efficiency and sustainability. However, developing countries must address challenges related to digital infrastructure, skills gaps, and regulatory frameworks.

5. Economic Diversification and Sustainable Production:

- Developing countries need to diversify their economies towards sectors with lower carbon emissions. This involves transitioning from traditional industries to more complex and sustainable production pathways.

- Policymakers must identify and prioritize industries with high technological complexity and low emissions, while also considering social and economic factors such as job creation and gender equality.

6. International Cooperation and Technology Transfer:

- International collaboration is essential for supporting developing countries in their green transition. The report suggests mechanisms like South-South cooperation, regional innovation partnerships, and global challenge funds to facilitate technology transfer and capacity building.

- Trade policies and intellectual property rights (IPRs) should be reformed to align with the Paris Agreement and support the development of green technologies in developing countries.

❖ Case Studies and Examples

1. China: China has become a global leader in renewable energy, particularly in solar PV and wind energy. The country has large internal markets for green technologies and a diverse industrial structure, enabling it to capitalize on green windows of opportunity.

2. Brazil: Brazil is a global leader in bioethanol production, with a well-developed production system and extensive sugar and ethanol processing plants. The country has successfully stimulated both demand and supply through its biofuel policy frameworks.

3. Morocco: Morocco has promoted concentrated solar power (CSP) through strong political commitment and investments in renewable energy infrastructure. However, opportunities for local manufacturing of solar energy components remain limited.

4. Chile: Chile has ambitious climate targets and has developed a green hydrogen strategy to capitalize on its abundant renewable energy resources. The country aims to become a major exporter of green hydrogen by 2025.

❖ Challenges and Barriers

1. High Costs and Immature Technologies: Many green technologies, such as green hydrogen, face challenges related to high production costs and immature technologies. Significant investments in R&D and infrastructure are needed to overcome these barriers.

2. Limited Innovation Capabilities: Developing countries often lack the innovation capabilities and infrastructure needed to adopt and adapt frontier technologies. This limits their ability to compete in global markets.

3. Policy and Regulatory Uncertainty: Frequent changes in policies and regulatory frameworks can disrupt the long-term adoption of green technologies. Developing countries need stable and supportive policy environments to foster green innovation.

4. Skills and Infrastructure Gaps: Developing countries face significant gaps in digital infrastructure and skills, which hinder their ability to adopt Industry 4.0 technologies and integrate into global value chains.

❖ Conclusion

The 2023 UNCTAD Technology and Innovation Report provides a comprehensive framework for developing countries to leverage technology and innovation for sustainable development. By focusing on green innovation, renewable energy, and digital transformation, developing countries can achieve economic growth while addressing climate change and reducing carbon emissions. However, significant challenges remain, including high costs, limited innovation capabilities, and policy uncertainty. International cooperation and strategic investments in infrastructure, R&D, and skills development are essential for supporting developing countries in their green transition.

For countries like Egypt, the report offers valuable insights into how to enhance industrial integration through the adoption of advanced technologies, sustainable practices, and digital transformation. By leveraging its strengths in R&D and skills, Egypt can position itself as a competitive player in the global industrial landscape while addressing challenges related to finance, infrastructure, and technological dependence.

❖ Key Messages and main discussion aspects: investigate the potential impact of new military technologies on Egypt's national security and technological development strategies.

- Research Efforts should be towards analyzing the potential alternatives for Egypt in case of U.S. withdrawal from international climate agreements.
- More investigation is required to clarify discrepancies between Egypt's high ranking in skills and R&D in the report versus perceived weaknesses in these areas.

- INP should start thinking about preparing and issuing a comprehensive report on Egypt's readiness for green technology adoption and job creation in new industries.
- The Necessity of coordination among different government agencies and parliament to produce updated reports beyond the 2030 vision, focusing on technological readiness and sustainable development.
- Efforts are needed for deep analysis of Egypt's current industrial development in relation to environmental sustainability goals.
- The importance of thinking about the potential impacts of new military technologies on Egypt's national security and technological development strategies.