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Economic and Financial Approaches in the Digital Ecosystem - Effective Partnerships for Advancing Connectivity and Achieving the SDGs

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Introduction

- A digital ecosystem is a group of interconnected information technology resources that can function as a unit.
- Digital ecosystems are made up of:
  - suppliers,
  - customers,
  - trading partners,
  - applications,
  - third-party data service providers and
  - all respective technologies.

Role of Telecom Regulator for Digital Ecosystem

- Introduce telecom/ internet service providers
- Provide necessary spectrum, numbering resources
- Establish interconnection between the telecom operators.
- Regulate tariff of the service offered by the operator
- Instruct to establish and extend network and services
- Monitor service quality maintained by the operator and license terms and conditions

Utilization of RTDF for Digital Ecosystem in Nepal

- NTA is collecting 2% of annual gross revenue of each operator in Rural Telecommunication Development Fund (RTDF).
- Operator are not interested to establish network in low business area i.e. rural area. So, RTDF is necessary to fulfill the gap between urban and rural area.
- NTA is operating Broadband Backbone and Broadband Access Network projects utilizing RTDF.

Utilization of RTDF for Digital Ecosystem in Nepal Cont…

- Broadband Backbone Project:
  - Laying Optical Fiber (96 Core and 48 Core) along Midhill Highway and connecting District Headquarters and nearby municipalities
  - Establishment and Operation of High Capacity Microwave Links
  - Establishment and Operation of DWDM Systems
  - Establishment and Operation High Capacity Core Router Equipments
- Broadband Access Network Project:
  - Establishment and Operation of Broadband Access Network to connect all Local Level's Offices, all Ward Offices, all Community Schools, all Community Health Posts/ Centers/ Hospitals of 74 districts except Kathmandu Valley.

Utilization of RTDF for Digital Ecosystem in Nepal Cont…

- Progress till now:
  - 969 Km out of 6331 Km of optical fiber laid
  - 27 out of 77 DWDM Systems installed.
  - 47 out of 177 High Capacity Core Router Equipments installed
  - 631 Out of 702 Local Level Offices connected
  - 5067 Out of 5933 Ward Offices connected
  - 4437 Out of 5225 Community Secondary Level Schools connected
  - 3567 Out of 4122 Community Health Posts/ Centers/ Hospitals connected

Comparison of Telecom Service Penetration Prior to Operate RTDF Project and Now

Service Type	Status Prior to Start of RTDF Projects (2017 March)	Current Status (2021 March)
Voice	**130.35%**	**133.88%**
Fixed Telephone	3.25%	2.66%
Mobile	123.90%	130.80%
Others (LMS, GMPCS)	3.20%	0.01%
Broadband Internet	**58.08%**	**87.19%**
Fixed Broadband	1.51%	22.35%
Wireless Broadband		0.76%
Mobile Broadband	56.57%	64.08%

Eight Sectors of Digital Nepal Framework

Digital Nepal Enablers

Technology and Infrastructure	Entrepreneurship/PPP	Talent and Skills Development
Digital connectivity needs to be a key priority. Possible actions include: • Make Internet access a fundamental right for every citizen • Improve the availability of spectrum to the operators to enhance service coverage and quality • Take leadership in driving 5G adoption in South Asia • Establish a nationwide fiber network	**Encourage private sector participation.** Possible actions include: • Digitally streamline PPP application system to mobilize private investment • Tax holidays and incentives for investment in Digital Nepal program • Startup accelerator program to build a strong ecosystem for nurturing innovation and entrepreneurship	**Improve digital education.** Possible actions include: • Compulsory IT education in schools and colleges • Increase the education system's capacity to impart advanced ICT education • ICT literacy programs for rural communities and underprivileged Nepalese • Ongoing communication and celebration of digital stories of success
Facilitate the development of a robust financial ecosystem. Possible actions include: • Encourage digital payments • Attract investments in fintech by encouraging the growth of startups and telecom companies to offer services to drive financial inclusion	**Encourage foreign direct investment in priority areas.** Possible actions include: • Fast-track FDI applications for Digital Nepal initiatives • 100% FDI and easier repatriation of funds for Digital Nepal initiatives	**Making public servants digitally-ready will be essential.** Possible actions include • Digital skills training for public sector employees

Contribution of Digital Infrastructure to the Achievement of SDGs

- **SDG 1: End Poverty:**
  - an increase in digital infrastructure investment reduces poverty by reducing transaction costs and information asymmetries.
  - an overall increase of 1 percent of total telecom investment is associated with a reduction in poverty of 0.0132 percent.
- **SDG2: Zero Hunger**
  - Digital application and infrastructure investments can help ensure better conditions for agricultural sustainability and food security.
  - IoT technology can monitor environmental and soil conditions, reducing potential crop damage and improving farm productivity using big data.
  - It also allows farmers to access information and knowledge that can improve the productivity and yield of their crops, such as crop treatments and weather forecasts.

Contribution of Digital Infrastructure to the Achievement of SDGs Cont…

- **SDG 3: Good Health and Well-being**
  - Investments and innovations in IoT have introduced new communication systems that integrate health in those activities for which constant connectivity is guaranteed.
  - The use of IoT technology to monitor and manage human health and fitness is expanding rapidly.
  - internet connections can provide online medical care in the most inaccessible rural areas.
- **SDG 4: Quality Education**
  - There is a positive relationship between digital applications and infrastructures and quality education.
  - Access to connectivity and technology plays a vital role in enabling new educational opportunities.
  - Access to online educational platforms reduces one of the most important barriers to achieving universal quality education: lack of access to educational materials

Contribution of Digital Infrastructure to the Achievement of SDGs Cont…

- **SDG 5: Gender Equality**
  - Access to information about the role of women in urban areas or in other countries where women are more empowered can promote gender equality and be a tool to empower women in communities.

- **SDG 6: Clean Water and Sanitation**
  - Digital applications and infrastructure are important tools to efficiently manage and monitor water consumption both in household and agricultural settings, especially through the IoT.
  - smart water infrastructure can improve drainage or water supply plans, leakage detection services, network performance optimization, and geographic information system (GIS) management.

Contribution of Digital Infrastructure to the Achievement of SDGs Cont…

- **SDG 7: Affordable and Clean Energy**
  - Digital applications and investments can address the lack of enough clean energy by decreasing the energy intensity of sectors.
  - smart grids and smart logistics can promote energy efficiency by reducing energy consumption and transportation
- **SDG 8: Decent Work and Economic Growth**
  - The development of ICT and IoT may lead to an increase in capital spending, as firms invest to take advantage of the new technology.
  - Investment in ICT and IoT thus translates into a direct positive boost to GDP growth.
  - The development of ICT and IoT may also increase productivity and foster economic growth indirectly.

Contribution of Digital Infrastructure to the Achievement of SDGs Cont…

- **SDG 9: Industry, Innovation, and Infrastructure**
  - Investment in digital applications and infrastructure can drive innovation as well as productivity.
  - Investment in digital technology supports domestic technology development, research, and innovation in developing countries.
  - ICT upgrades the technological capabilities of industrial sectors in developing countries by encouraging innovation and substantially increasing public and private R&D spending.
- **SDG 10: Reduced Inequalities**
  - telecom investments could provide an opportunity to reduce poverty and income inequality.
  - telecom investments are crucial in connecting unconnected areas, thus providing less developed countries and rural communities with new work opportunities and free access to knowledge

Contribution of Digital Infrastructure to the Achievement of SDGs Cont…

- **SDG 11: Sustainable Cities and Communities**
  - Investments in digital infrastructure play an important role in achieving and maintaining sustainable cities.
  - By fostering economic growth, digital infrastructure contributes to economic growth and job creation.
  - It also helps to connect citizens and to provide them with quick, up-to-date information to better manage their time.
- **SDG 12: Responsible Consumption and Production**
  - Technology and newer IoT solutions in agriculture play a crucial role in improving the quantity and the quality of harvests.
  - Since unpredictable weather conditions can affect crops and reduce yields, digital applications and infrastructure tools aid farmers to adjust their decisions on when to plant and which crop varieties to choose to achieve higher productivity.

Contribution of Digital Infrastructure to the Achievement of SDGs Cont…

- **SDG 13: Climate Action**
  - Digital technology and investments can help reduce GHG emissions through more efficient energy, transportation, building, and industrial processes using ICT based monitoring system and sensors.
- **SDG 14: Life Under Water**
  - Digital infrastructure and applications play a role in the achievement of marine conservation and sustainability, mainly by providing tools for the real time monitoring of water masses
- **SDG 15: Life on Land**
  - Digital applications and infrastructure (Mobile sensors and IOT) can play a role in the conservation and sustainable use of terrestrial ecosystems and prevention of biodiversity loss.

Contribution of Digital Infrastructure to the Achievement of SDGs Cont…

- **SDG 16: Peace, Justice, and Strong Institutions**
  - Governments and communities can use digital applications and platforms to promote human rights and institutions of good governance.
- **SDG 17: Partnerships for the Goals**
  - Digital applications and infrastructure can contribute to these alliances by facilitating coordination and communication between these actors and fostering their partnerships.

Partnerships for Advancing Connectivity and Achieving the SDGs

- **Partnerships** are also crucial for capacity building in developing countries.
- A successful sustainable development agenda requires **partnerships** between governments, the private sector and civil society.
- NTA has utilize RTDF to provide connectivity in rural area through the licensed telecom/ internet service provider to establish connectivity for:
  - Local Level Governments (Governance)
  - Community Schools (Education)
  - Community Health Posts/Centers/ Hospitals (Health)

Conclusions

- Telecom regulator can play vital role for digital ecosystem.
- Use of RTDF (like USO fund) is supporting for sustainability of rural connectivity and minimization of digital divide.
- Digital Infrastructure is supporting for the Achievement of SDGs.
- Partnerships between governments, the private sector and civil society are for successful sustainable developments.

Thank You!!!