Forum: Commission on Science and Technology for Development

Issue: Establishing a framework for the development of digital infrastructure in LEDCs and rural areas

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Introduction

In the current era of rapid technological progress, digital infrastructure has become a important part of sustainable development. Yet, a huge digital divide still exist between developed and developing countries, and even more seriously, between urban and rural regions in the same country. Limited internet access, insufficient WIFI coverage, and insufficient investment in information and communication technologies (ICTs) have make many communities in Less Economically Developed Countries (LEDCs) have no access to connect with the global digital community. This inequality not only blocks economic growth but also declines the access to education, healthcare, and essential government services. Recognizing these challenges, the Commission on Science and Technology for Development (CSTD) wants to establish a well-rounded framework that supports the further establishment of digital infrastructure in LEDCs and rural areas. Such a framework should be aware of the financial, technical, and policy concerns. It should also promote international cooperation and ensure that digital development can drive the achievement of equity (United Nations, 2024).

Definition of Key Terms

Less Economically Developed Country (LEDC)

Less Economically Developed Country (LEDC) represents the countries that are in the progress of development. This can be determined by various economic and social indicators, such as low Gross Domestic Product (GDP), limited industrialization, and resources.

Digital Infrastructure

Digital infrastructure refers to technologies, including internet networks, mobile communication, etc. In regards of this topic, development of digital infrastructure means the expansion of such technologies. The other term for digital infrastructure is network infrastructure.

Information and Communications Technology (ICT)

Information and Communications Technology (ICT) is a board term that covers the combined use of information technology, such as software, computing, and data management, as well as that of communications technology, such as internet, networks, and telecommunication to create, store, or retrieve data.

Connectivity Infrastructure

It is a physical and technological network that enables digital networks. Connectivity infrastructure is a core determinant of service quality and cost.

Background

The third industrial revolution brough computers, microprocessors, personal computing, and the Internet, changing how people live forever; however, not everyone has the opportunity to be online. Only around half of the world's population has access to the internet, and in LEDCs more than 80% of people do not have access (Alliance for Affordable Internet). Thus, building digital infrastructure for those in LEDCs becomes a key priority.

The Digital Divide

The digital divide refers to the increasing gap between those that have access to ICTs and those that do not, which can be attributed to a variety of factors including but not limited to education, age, and for this issue economics ("Digital Divides"). Like all issues, the digital divide has evolved from initially being a question of having access or not to what is currently an issue that encompasses factors like accounting for affordability, sustainability, privacy, and digital literacy (Pollitzer). For LEDCs the

digital divide not only divides them in terms of technology but also participation in the global economy (Opp).

In the 1990s digital infrastructure developed at an alarming rate in MEDCs, fiber optic networks were improved, and the speed at which information spread was revolutionized. This paved the way for events like the falling of the Berlin wall to be broadcasted (Darke). While MEDCs invested in developing digital frameworks, LEDCS were not able to do this as they had a lack of capital and their economic systems did not allow for a similar boom (Coats and Khatkhate). In many LEDCs the government system did not allow for innovation which limited access to ICTs, further deterring the development of technology (Yang et al.).

With this being an issue international bodies responded. The World Bank, United Nations (UN), and the International Telecommunication Union (ITU) all acted. The UN supported actions that would allow the economies of LEDCs to develop, thus giving them the ability to later develop digital frameworks (UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT). Although the projects would have theoretically helped LEDCs there was little success, which was attributed to the weak regulatory environments, cost of deployment of network, and weak judicial systems.

As time progressed to the 2010s the problems with a digital divide for LEDCs evolved again. The 2010s brought smartphones to LEDCs which also became one of the only forms of internet access. Countries like Kenya had developed digital systems with low functionality (Ngila). While there was some progress it was only progress in a few select areas. There was little to now development in rural and isolated areas.

As of now there approximately a third of the worlds populationwho still do not have access to the internet and a majority of those that do not have access come from LEDCs (Statista). The reasons for this are similar to why people did not have access to internet in the 1990s, poor infrastructure, low digital literacy levels, and high cost. The lack of access to the internet not only prevents people from communicating, it also restricts education, and employment (Kloza). Furthermore, the COVID-19 pandemic exploited these inequalities. It restricted people in LEDCs from accessing education, work, and health, demonstrating the need for a sustainable digital infrastructure.

The Data Divide

Alongside a digital divide there is also a data divide. The data divide refers to the imbalance of those that produce, controls, and utilizes digital data. This proves even more crucial in an age where data is used in everything from training AI models, to data analytics (World Bank Blogs). LEDCs, due to their lack of internet access, are often not included in producing, controlling, and utilizing the data which leaves them isolated.

Data is increasingly important in the modern age, data will drive the future creating economic opportunities, and changing how decisions are made (Global Partnership for Sustainable Development Data). While data plays a crucial role a majority of global data is stored, and analyzed in developed nations (Vopson). This creates an imbalance where LEDCs despite having the potential to be a source of data is not accounted for. The data divide has common causes as the digital divide, poor infrastructure, poor economies, and weak regulatory frameworks. Not only does the data divide force LEDCs to rely on MEDCs it also prevents LEDCs from building sustainable digital infrastructure.

The data divide also affects research into artificial intelligence. Artifical intelligence and research heavily depends on training data, if this data does not fairly represent the world it would lead to bias and limit to applicability of AI technology (Chen). Only if the data divide is resolved can digital infastructures in LEDCs be improved.

Major Parties Involved

United Nations International Children's Emergency Fund

UNICEF has been an active organization voicing for this issue. It predominantly oversees open opportunities for children in terms of lack of education or resources. UNICEF emphasizes the importance of data and innovation to provide connectivity in rural / low-income areas.

International Telecommunication Union

ITU is a specialized UN agency that addresses information and communication regarding technologies. It sets Information and Communications Technology (ICT) standards, coordinates policies, and helps countries adapt to digital infrastructure through structured guidance.

United Kingdom

The United Kingdom supports expanding digital infrastructure in LEDCs through the Digital Access Program (DAP), which works in Indonesia, Kenya, Nigeria, and South Africa to fund policy and regulatory reforms, expand affordable, safe and secure connectivity, and build local skills. Reported outcomes include helping over 2.3 million people across ~300 underserved communities. DAP delivers this via technical assistance for governments and regulators and the International Tech Hub Network, which supports local startups and digital entrepreneurship in partner countries.

Regional Country Partnerships

Regional country partnerships and bodies such as the Association of Southeast Asian Nations (ASEAN), the African Union (AU) and the Caribbean Community (CARICOM) have the potential to harness the revolutionary power of digital technology despite challenges. ASEAN has already established their strides to grapple this issue, with initiatives such as the ASEAN Masterplan 2025. Similar to the ASEAN, the AU and CARICOM have posited strategies to highlight the need for digital infrastructure and a collaborative approach to efficiently solve the problem.

Previous Attempts to Resolve the Issue

In 2019, UNICEF and International Telecommunication Union (ITU) have collaborated to launch Giga, an initiative to connect all schools to the interenet to allow student's access to the broader education. The Giga initiative includes three main factors: Map, Model, and Contract. Map, the Giga system maps the locations of schools and monitor school connectivity status in real time. Model, the Giga tool identifies necessary infrastructure, policies, regukations, and investments needed to

enhance the school connectivity. Lasty, contract, the Giga tool helps governments connect the internet connectivity for schools. The goal of this solution is to ensure that “all students and teachers can access the skills, devices, and content they need” and “to address a new form of inequality” as well (Giga – Connecting Every School to the Internet 2).

In the same year, Indoneisia initiated a “Palapa Ring Project,” which aims to offer telecommunications, including internet access, as a “sky highway” (PDSI KOMDIGI and PDSI KOMDIGI 1). According to Komdigi, Palapa ring, as a national fiber optic development project, this will reach 34 provinces and 440 cities throughout Indoneisia. Although this project is still being developed under a Public Private Partnership (PPP) scheme, the impact of this project seems undeniably significant.

Possible Solutions

- Open-access networks
- Global service/internet access funds from the government (as a program)
- Prioritize schools/clinics for internect access
- Community networks (in rural areas)

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