



Impact of School Connectivity on Societal Empowerment

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Purpose

The purpose of this document is to describe the impact of school connectivity on societal empowerment in Tanzania. The pilot of connecting 10 schools aims at establishing sustainable business models for the operational expenditures (OPEX), and involves all actors in the value chain. Together with the Universal Communications Service Access Fund (UCSAF), Mobile Operators, UNICEF and the Internet Society, we see school connectivity as a first step for establishing access to information in local communities, and thus contribute to digital inclusion. Demanding affordable Internet access is not only part of the Sustainable Development Goals (SDGs), it was further stressed by the United Nations⁴, Governments⁵, the Internet Society, NGOs and local communities.

COVID-19 has addressed the need for digital inclusion and accelerated the digital uptake in a not-expected way. However, the digital divide has rather increased, as those having broadband connectivity could follow remotely both education and work related activities, while those without digital connectivity were left behind. Already before the pandemics, girls, women, and vulnerable and marginalized groups were least likely to have access to technology. This dire disadvantage has been enhanced due to lack of connectivity. As such, the digital divide has become even more alarming⁶. In March 2020, a report by the OECD found, "roughly 327 million fewer women than men have a smartphone and can access mobile internet. Women are on average 26 percent less likely than men to have a smartphone⁷. This gender divide, in South Asia and Africa these proportions stand at 70 percent and 34 percent, respectively." According to UN Women, 1.7 billion women in low- and middle-income countries do not own a mobile phone.

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⁴ The United Nations' High-level Panel on Digital Cooperation listed in their final report the recommendation 1A as follows: "We recommend that by 2030, every adult should have affordable access to digital networks, as well as digitally-enabled financial and health services, as a means to make a substantial contribution to achieving the SDGs...". See <https://digitalcooperation.org>

⁵ The Government of Norway has pointed out affordable access, together with skill, regulations and inclusion as the four drivers for Norwegian Policy. Source: "Digital Transformation and Development Policy", Norwegian Government, Message to the Parliament, Meld. St. 11 (2019-2020), Apr2020, https://www.regjeringen.no/no/dokumenter/meldst11_summary/id2699502/?ch=1

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<https://www.devex.com/news/opinion-we-cannot-allow-covid-19-to-reinforce-the-digital-gender-divide-97118>

⁷ World Food Programme

<https://insight.wfp.org/coronavirus-pandemic-is-exposing-the-gender-digital-divide-6c9e1fef8ece>

On this background, the Government of Norway has pointed out affordable (i) access, together with (ii) skills, (iii) regulations and (iv) inclusion as the four drivers for Norwegian Development Policy⁵. The work in Tanzania in establishing Information Spots (“InfoSpots”) in rural areas⁸ has been outlined in the report of the Norwegian Government. By connecting schools we will create the instantiation of the four drivers, contribute directly to SDG target 4.1 on the percentage of schools connected to the Internet, and create the international showcase for School connectivity in rural areas. As such, the results of the pilot are both an input for the national strategy by UCSAF and the Ministry of Education (MoE), a contribution to GIGA⁹, the partnership on school connectivity launched by ITU and UNICEF, as well as the mobile operator alliance GSMA¹⁰.

Hypothesis on Sustainable Business Models

Our aim is to create sustainable business models for the OPEX of school connectivity. Our hypothesis is that “free access to information on the Internet” can be established for an OPEX of less than 20 USD/month, and thus satisfy the recommendation from the School Connectivity Panel discussion¹¹ in February 2019 in Dar es Salaam. The evaluation focuses on three models, though is open for upcoming other business models:

- I. **Wholesale approach** - a mediator acts as a wholesale agent towards mobile operators, and purchases say 100 GB/month for 10 schools. Thus, instead of each school paying TZS 35.000/month, the total bill will be e.g. TZS 200.000 for the 10 schools. This model is in use by the Basic Internet Foundation a.o. in Norway.
- II. **Tax Reduction** - The amount of information used for school connectivity is accounted for as net costs and reduces the yearly license fee paid by mobile operators for the use of mobile frequencies. As an example, connecting 100 schools accounts for 1 Terabyte (1 TB) of data per month, or an estimated net cost of 500 USD/month¹². This net cost can be reduced from the yearly license fees.

III. License Regulation -

Access to school and health content is provided free of charge (“zero-rated”) as part of the license conditions for the mobile network licenses. The government of Ethiopia has established such a regulation as part of the COVID-19 response (see Figure).

COVID-19 response Implementation in Ethiopia

- Government Ethiopia - Agreement
 - “free access to health & education”
 - Ministry of Health
 - Ministry of Education
- Ethio Telecom offers “zero rating”
 - Health (MoH): MoH.gov.et
 - Ephi.gov.et & Covid19.et
 - Education: National Data Library NDL.ethernet.edu.et
- follow-up from discussions after African Innovation Week (AIW2019)

BasicInternet.org @Basic4all "Free Access to Information"

ethio telecom

ኢትዮ ግብርና ምርትና አገልግሎት ተቋማት ተግባራዊ እና ሙሉ ሆኖ ተግባራዊ ማድረግን ያሳያል፡፡

ከግብርና ምርትና አገልግሎት (COVID-19) ምርጫው በመግባት በኩል በርካታ አርምዎች አተላላፊ ሲሆን ከእነዚህም መካከል የገፅ ለገፅ ትምህርት በማድረግ ተግባራዊ ሲሆንም አገልግሎት ማድረግ ይቻላል፡፡

ከዚህ ጋር በተያያዘ ከግብርና ምርትና አገልግሎት 21 ቀን 2022 ዓ.ም. ጀምሮ የግብርና ትምህርት ተቋማት ሙሉ ሆኖ እና ተግባራዊ ትምህርት ጋር ተያያዥ ያላቸው አገልግሎቶች ከ <http://ndl.ethernet.edu.et/> በባለ ማግኘት አገልግሎት በማድረግ የመገናኛ ማስተማር ሂደት እንዲቀጥል የተዘጋጀ አገልግሎት ማድረግን በይዘት ይታወቃል፡፡

በተመሳሳይ ሁኔታ ከግብርና ምርትና አገልግሎት ጋር በተያያዘ ለግብርና ምርትና አገልግሎት የግብርና ምርትና አገልግሎት <http://www.moh.gov.et/> የኢትዮጵያ ህብረተሰብ ጤና አስተዳደር <http://www.ephi.gov.et/> እንዲሁም የተቋሙ የግብርና ምርትና አገልግሎት ምርትና አገልግሎት <http://www.covid19.et> በባለ ማግኘት ማድረግ ይቻላል፡፡

⁸ The DigiL project (2017-2020) focussed on Digital Health provision through information spots in Tanzania, see: <http://DigiL.BasicInternet.no>

⁹ GIGA is a unique partnership launched by ITU, the UN specialized agency for information and communication technology and UNICEF -

<https://news.itu.int/mapping-schools-worldwide-to-bring-internet-connectivity-the-giga-initiative-gets-going/>

¹⁰ GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators - <https://www.gsma.com/aboutus/>

¹¹ Sustainability in School Connectivity-Feb2020 -

https://its-wiki.no/wiki/DigiL:TZ-Sustainability_SchoolConnectivity_Feb2020

¹² The estimated net costs of 1 TB = 500 USD are based on existing commercial offers by OPTUS in Australia, offering 75 GB for AUD 50 ~ USD 35 (12Jul2020)

<https://www.whistleout.com.au/Broadband/Mobile-Broadband-Plans>

Through the pilot project we will address the pros/cons of the three models, especially when measuring against the needs of the schools.

The innovative aspect of “free access to information”

Addressing school connectivity in rural areas is an aspect of network availability, bandwidth and costs. Needless to say, a broadband connection to schools would be preferable, but is economically not viable. As of now (July 2020), the cost prices of a 4 Mbit/s dedicated Internet connection costs around USD 600/month¹³, stopping a viable business model for Internet roll-out through dedicated lines, though community networks and other forms of access are under development.

As a result, Internet access is provided predominantly through mobile networks.

The Basic Internet Foundation suggests the “free access to information on the Internet”, introducing the **freemium model** for access. Free access to information, called “Internet Lite¹⁴”, and premium access to broadband services. Using lightweight protocols, as e.g. provided through the AMP protocol¹⁵, by the Internet of Good Things¹⁶, the amount of data used is in the order of 2-3% of the bandwidth of the mobile network. Building InfoSpots¹⁷ based on these lightweight protocols will provide good user experience, and needs only little mobile data.

Adding a local server to the InfoSpot at the schools allows the hosting of education-specific broadband content, such as videos. The “Non-discriminating access for Digital Inclusion” (DigI¹⁸) project has demonstrated health knowledge uptake through InfoSpots with specific health videos¹⁹. In the school connectivity pilot we work together with educational content providers such as Shuledirect²⁰ to establish educational information at schools.

Conclusions

The COVID-19 pandemic showed clearly how important digital inclusion is, not only for providing digital health information, but also for inclusion in times where schools and universities are closed. The school connectivity pilot project will contribute directly to SDG target 4.1 on the percentage of schools connected to the Internet, and create the international showcase for School connectivity in rural areas. As such, the results of the pilot are both an input for the national strategy by UCSAF and the Ministry of Education (MoE), a contribution to GIGA, the partnership on school connectivity launched by ITU and UNICEF, as well as the mobile operator alliance GSMA. Furthermore, the school connectivity pilot will instantiate the priorities “access, skills, regulations and inclusion” of the Government of Norway for “Digital Transformation and Development Policy”.

¹³ The price for a 4 Mbit/s dedicated Internet line consists of roughly USD 400 for the Internet, plus a co-location fee of USD 250 (Offer from Halotel for connecting Izazi, Apr 2019).

¹⁴ The freemium model for access and Internet Lite: http://its-wiki.no/wiki/Internet_Lite

¹⁵ AMP, previously called “accelerated mobile pages”, is an open-source set of lightweight protocols. See <http://amp.dev>

¹⁶ UNICEF ventures established a cooperation for the Internet of Good Things (<http://InternetOfGoodThings.org>), providing information at no cost in various countries in Africa.

¹⁷ An InfoSpot consists of three elements, the mobile reception, a local network controller and an local school server - see <http://Solutions.BasicInternet.no>

¹⁸ The DigI project (2017-2020) focussed on Digital Health provision through information spots in Tanzania, see: <http://DigI.BasicInternet.no>

¹⁹ Digital Health Promotion (DHP) videos were provided to villages in Tanzania as part of the DigI project. - <https://digitalhealth.yeboo.com>

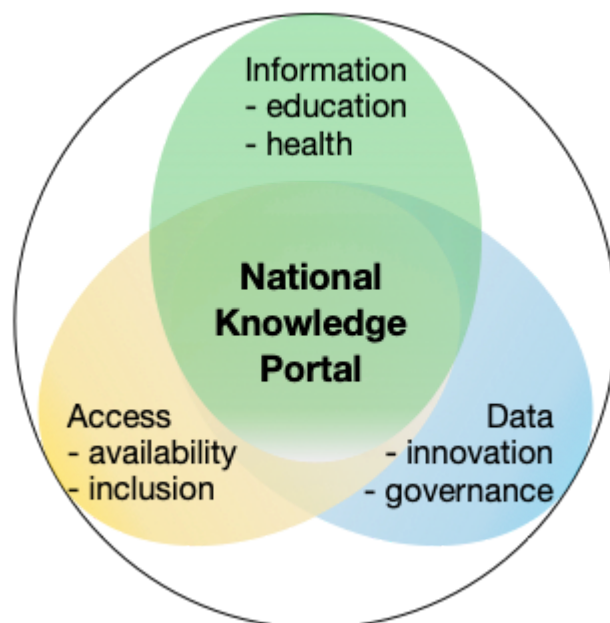
²⁰ Shuledirect, educational content for schools - <https://www.shuledirect.co.tz/>

The main focus is on the sustainability of operational expenses (OPEX) for school connectivity, based on three models to be evaluated through the pilot.

Outlook: “Free access to the National Knowledge Portal”

School connectivity and free access to educational content is a first step towards a National Knowledge Portal²¹, which we believe is central for the empowerment of societies:

1. Knowledge distribution for education, health, governmental information, as well as digital public goods. As an example, the portal may hold courses to acquire digital skills, and handle certificates for the educational sector.
2. Data governance and innovation of national data is the core for value creation within the country. “Data is the new oil”, this statement of Telenor’s CEO Sigve Brekke demonstrates the value of data, and the need for building the economy around these national data. By combining the innovations from the private sector, and the governmental data, one can create the innovation ecosystem for the Private-Public-Partnership (PPP).
3. Inclusive access to the National Knowledge Portal is an easy way ahead for regulations. License conditions for Internet Service Providers (ISPs) and Mobile Operators could include the “free access to the National Knowledge Portal” as a prerequisite for a license.



The argumentation for a National Knowledge Portal is straight forward, given the clear advantages for owning such a portal on a national level. The Portal has the ability to become the driver for societal innovation, based on the ownership and governance of the national data. Through application interfaces to the national data, one can invite for public-private partnerships, both making business on the use of the data, and at the same time enhancing the quality of the data. The re-use of biometrical information in Tanzania for acquiring a SIM card for the mobile phone is one such example. On arrival in Tanzania every visitor is asked for a fingerprint, which is then used as the basis for purchasing a SIM card.

Furthermore, the portal contributes to development of the educational sector, as content for schools and universities can be made available for everyone in the society. Regarding digital health and community involvement in public health, both aspects can be covered through converting health messages into digital health, and making them available through the portal.

²¹ “Free access to the National Knowledge Portal”, read more at http://its-wiki.no/wiki/National_Knowledge_Portal