

UiO • **Department of Technology Systems**
University of Oslo

Elektrofagdag - OsloMet - 9Apr2021

Digitalisering og bærekraft - i en internasjonalt perspektivet

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Addressing Education 5.0 and Global Challenges

- Cognitive skills
 - literacy and numeracy
 - critical thinking
 - problem solving

Edu 3.0

- Social and emotional skills
 - empathy, teamwork
 - leadership, cultural awareness
 - fraternity & social friendship

Edu 4.0

- Global challenges
 - Climate, Sustainability (SDGs)

Edu 5.0

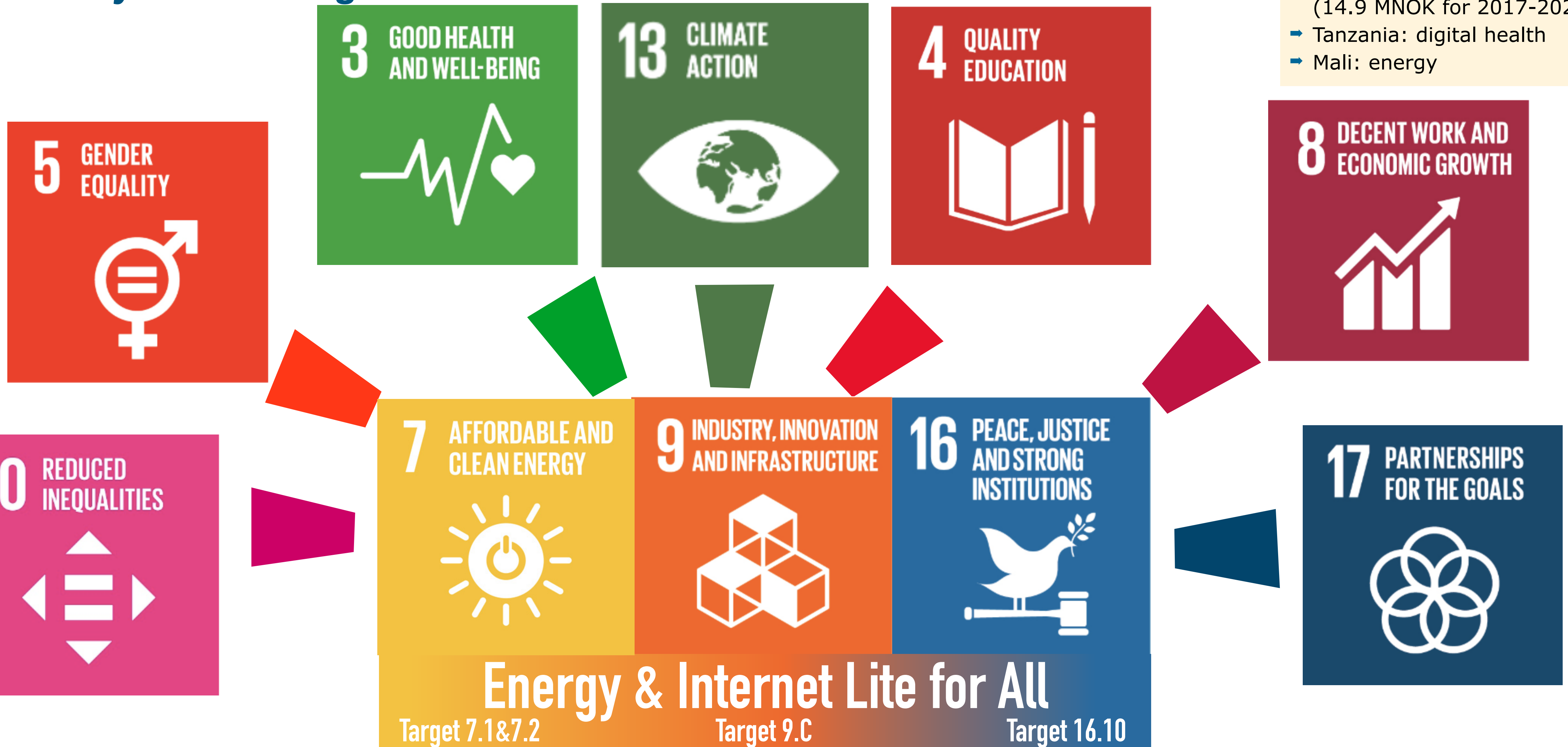


Affordable Energy & Internet Lite for All

the catalysts for the goals

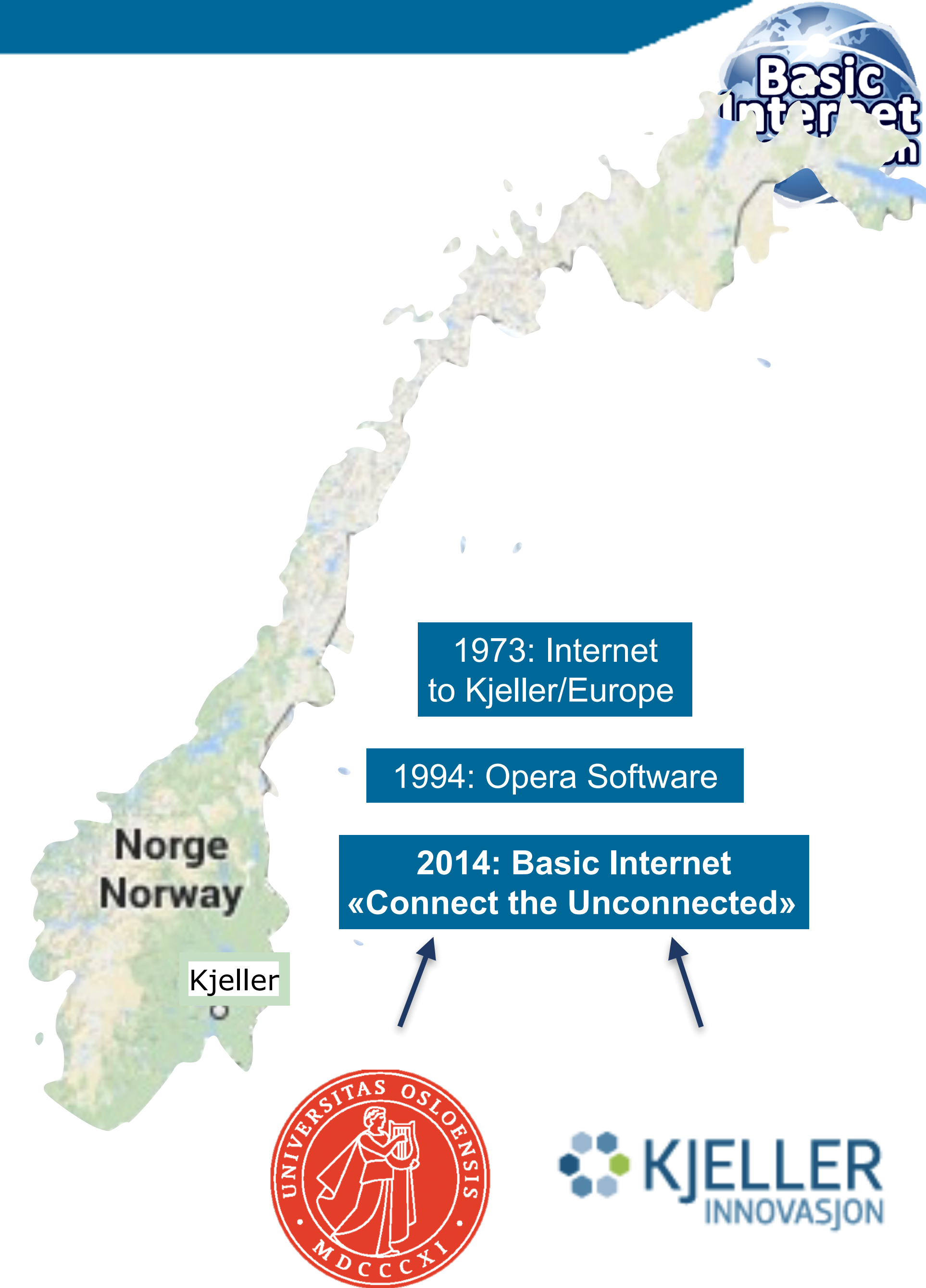
Showcase
“*Non discriminating access*”
project

- funded by RCN and Mfa/Norad (14.9 MNOK for 2017-2020)
- Tanzania: digital health
- Mali: energy



Special Purpose Vehicle (SPV): **Basic Internet Foundation** (non profit)

- **Information** is the **basis** for **education, health** and entrepreneurship
- **Digitalisation** is the engine of **economic growth** and wellbeing of people
- Sustainable development requires **digital inclusion**, which necessitates Internet for all
- **Impact** lives of the **unconnected** 3.5 billions of people in the world
- **University of Oslo** (UiO/UNIK) and **Kjeller Innovation** co-founded the Basic Internet Foundation
 - “**Internet Lite for all**”
 - free access to information for all



On the Basic Internet Foundation's upcoming 6th birthday, our founder professor Josef Noll reflects on the challenges we face to deliver on our vision of internet

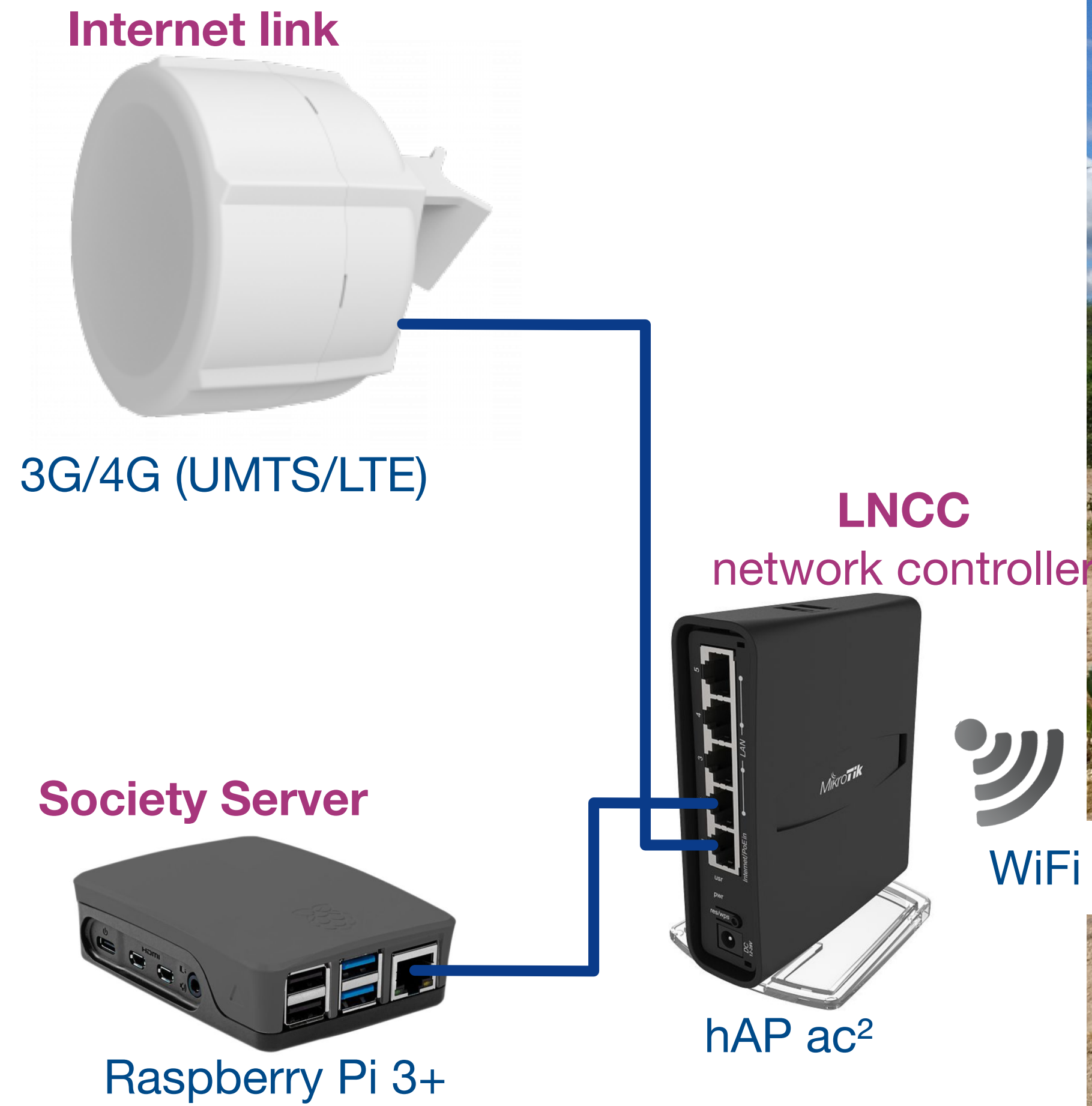


“Our vision is to improve the life of **every human** through **free access to information** on the Internet....”

“This vision is carrying us forward every single day.
We **solved** the **challenge of access**, and are focusing now on **National Knowledge Portals** to **empower** individuals, societies and nations. Through **free access** to the portal we address **access, skills, regulations** and **inclusion**”



Technology to be Used.



Hvordan samarbeider vi

- ➔ VGS: Utdannelse i fag og bærekraft
 - Ullern, Bjerknes, Strømmen,....
 - Skolen etabler utstyr
 - Elever bruker utstyr for læring
- ➔ Sender til partnerskoler i utviklingsland
- ➔ Etabler global partnerskap med skoler i utviklingsland
- ➔ optional: join Global Culture Education Initiative GCEI.net

Praktiske oppgaver [\[edit\]](#)

VG 1: <https://www.udir.no/lk20/ele01-03/om-faget/tverrfaglige-temaer>

- Freemium (fri & premium) model: fri tilgang til informasjon, betalt tilgang til bredbånd. Kan vi anvende eksempel fra veinett, hvor fotgjengere og syklister kan bruke veien uten å må betale? - Praktisk: måle hvor mye data brukes ved å streame video
- Radio: line-of-sight versus hinder på veien
- **Dekning og rekkevidde:** løpe rundt og måle Wifi eller/og mobildekning. Trenger en Android tablet/phone med Network Cell Info Lite, se: [Digl:Establish_InfoSpot](#)
- fordelene med Raspberry Pi (RPI) som "school server" versus 3G nett. Teste ved at 5-6 elever hente video via et dårlig 3G/4G nett, versus hente video lokalt fra RPI.
- koble sammen kabler for å etablere Wifi nett
- **Energi og informasjon:** hvor mye energy bruker hele equipment? Hvor stor må solselte og batteri være for å holde hele natt, 1,5 dager, ...

VG 2 elenergi og ekom: <https://www.udir.no/lk20/ele02-03>

VG 2 Datateknologi og elektronikk: <https://www.udir.no/lk20/del02-03>

- **planlegge landsby**, frekvens, dekning, kapasitet, f. eks. link fra [Digl:Migoli](#) til [Digl:Izazi](#), eller fra [Digl:Selela](#) til Mto wa Mbu, se [Digl:Calculation_of_Radio_link](#)
- **Avstander i Afrika**, Se: <https://its-wiki.no/wiki/RDB52G> for plasser hvor utstyr er installert
- konfigurering: login to antenna, LNCC (RDB52G)
- **Konfigurering av en Raspberry PI**, hvordan installere en Web server og innhold
- Mesh-network basert på lokal hot-spot med 5 GHz og 2,4 GHz

1 Factpage of Project Digitalisering_VGS
 1.1 Praktiske oppgaver
 2 Open Action Items
 3 Meetings

https://its-wiki.no/wiki/Digitalisering_VGS

What we achieve together

- ➔ Free access to National Knowledge Portal
 - 1) Access - Information Spot per village
 - 2) Skills - Health, Edu on Knowledge Portal
 - 3) Regulations - Freemium model
 - 4) Inclusion - Free access for all #LeaveNoOneBehind
- ➔ Internet Lite & Freemium model for access
 - free access to National Knowledge Portal for all
 - premium access to broadband
 - sustainable solution

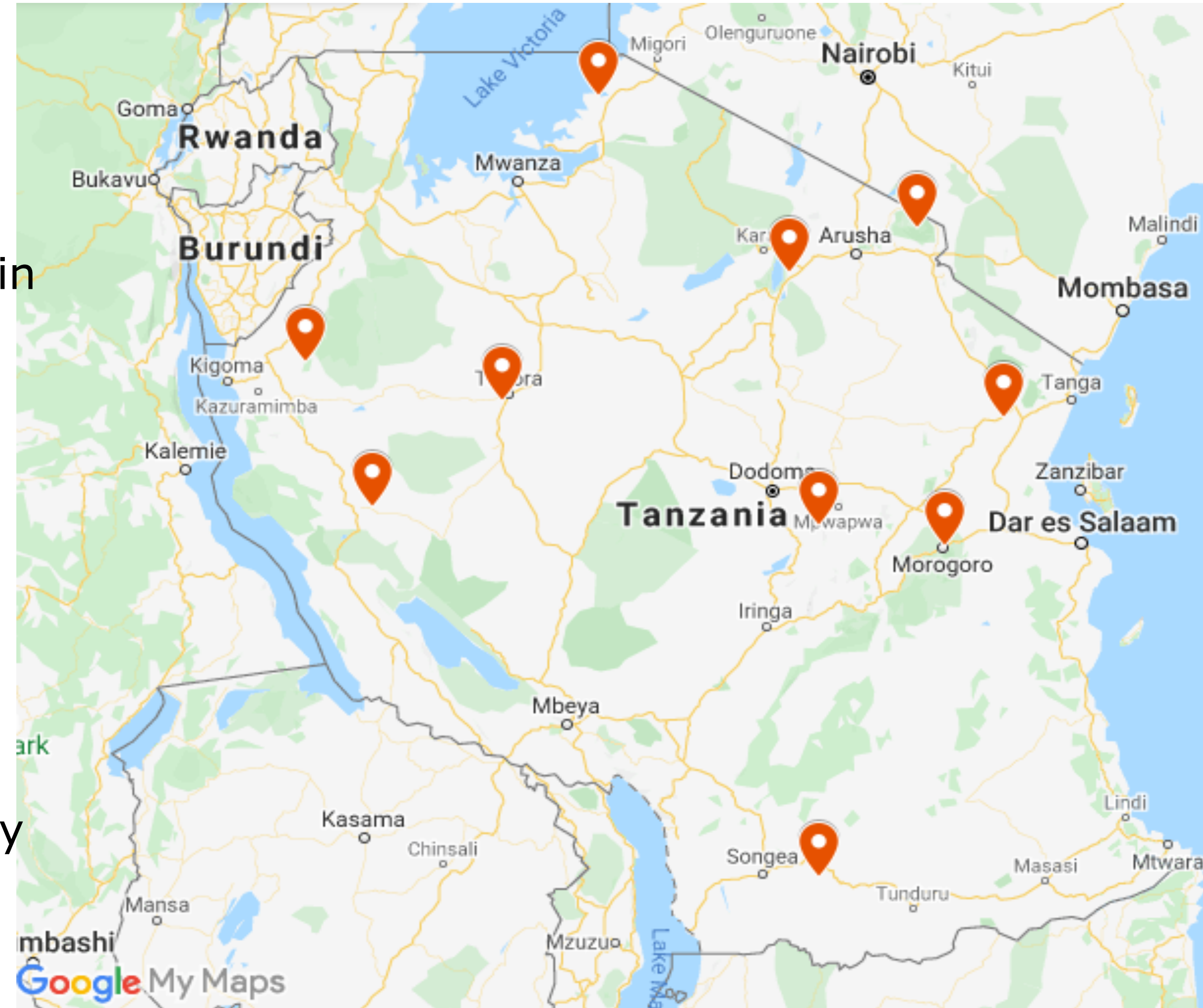
+18 dB
>20 km

“Providing Internet to the basic of the pyramid isn't a question of affordability, but rather a question of sustainability”
Internet Governance Forum, Panel, WIN

At least
one Information Spot
per village

School Connectivity Tanzania

- ➔ Goal:
 - Mapping, connect and ensure free access to educational contents in 10 schools from 10 regions in Tanzania.
- ➔ General Objectives:
 - To create sustainable model for school connectivity and offer free access to educational content at the end of the project.
- ➔ Specific Objective:
 - To offer free digital educational contents in secondary Schools.
 - Reliable service provider in schools.
 - Installing internet infrastructures in school.





















Success story: Digital Health Promotion

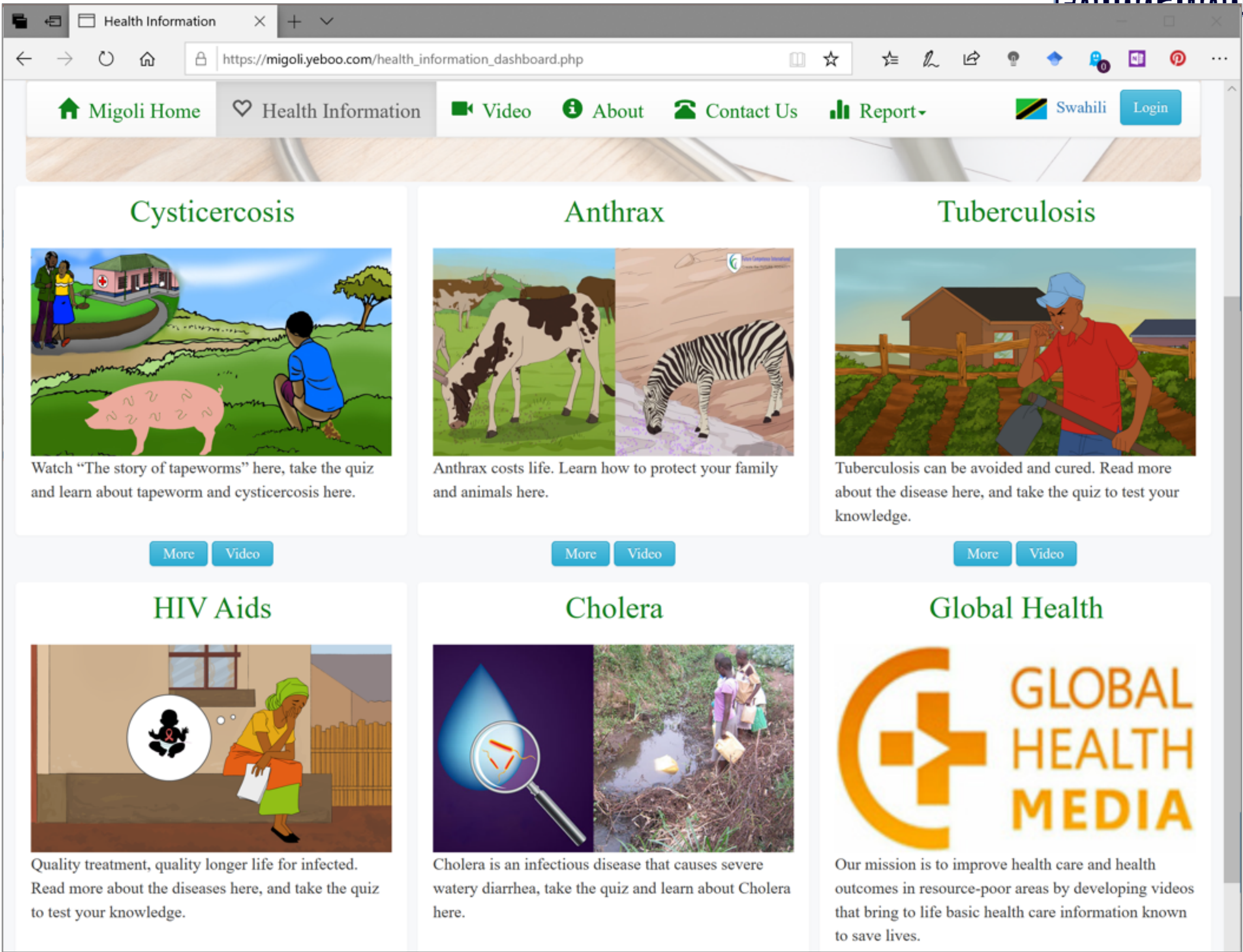
First Results: **Knowledge increase** in
Cysticercosis (TSCT) 60%
Tuberculosis 30%
HIV/AIDS 13%

Village Platform at <https://Migoli.Yeboo.com>



The website will contain locally stored information on

- Health
- Entrepreneurship
- Education
- Agriculture
- Financial inclusion (e.g. via Women Community Centers)



Exemplary: Digital Health Information

Example:

Corona/COVID-19 video for African countries



YouTube:
<https://www.youtube.com/watch?v=Bc3ojifPRlc>

Download (16:9)
<https://owncloud.basicinternet.org/index.php/s/4gB1Zdux6Clx1yR>

Download (social media)
<https://owncloud.basicinternet.org/index.php/s/jERKYmObsGcePBH>

Success story: Ethiopia

- ➔ Pilot connection: Koye Secondary School
- ➔ Adoption of Regulations, “free access to health and education”
- ➔ Invitation by the Ministry of Education to connect 3500 secondary schools
 - lack of funding
- ➔ Excellent University Network



Free access to information - 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 Digital Library NDL.ethernet.edu.et
- follow-up from discussions after African Innovation Week (AIW)

ኢትዮ ቴሌኮም የከፍተኛ ትምህርት ተቋማት ተማሪዎች እና መምህራን ትምህርታዊ መረጃዎችን ከ <http://ndl.ethernet.edu.et/> በነፃ ማግኘት እንዲችሉ አደረገ

በአገራችን የኮሮና ቫይረስ (COVID-19) ወረርሽኝን ለመከላከል በመንግሥት በኩል በርካታ እርምጃዎች እየተወሰዱ ሲሆን ከእነዚህም መካከል የገፅ ለገፅ ትምህርት በማቋረጥ ተማሪዎች ቤታቸው እንዲቆዩ መደረጉ ይታወቃል።

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Addressing the need

- ➔ School connectivity in Ethiopia
 - Total Project: connect all schools
 - Phase 1: 3.500 secondary schools
 - ▶ 6 months time frame, 35 Million USD
 - Phase 2: all secondary schools
 - ▶ time frame 2020-2022
- ➔ Norway's share
 - Connect 500 secondary schools
 - 45.950 NOK, 1 year project
- Collaboration & Innovation
 - Competence building
 - Local deployment (Univ. & IBA Ethiopia & local ground)
 - Community empowerment (re-using)



ቀን / Date: 20/8/2012
ቁጥር / Ref: 1/2-4344/23296/35

Innovation Norway Oslo, Norway

Subject: Financial Support for Digital Interconnection of Ethiopian Secondary Schools

Currently more than 26 Million students are in School in Ethiopia in more than 46 thousand Schools in the pre-Primary, Primary and Secondary level classes. Among these large number of Schools, Schools connected to a bear 2Mbps Internet connectivity is less than 500 in number. It implies that these young generation is being brought up in non-digital Schools in a Digital Age.

The Ministry of Education has now decided to change this through implementation of two Phases. Phase one is provision of 300Mbps Internet connectivity to the 3500 Secondary Schools within a time period of 6 months at an estimated Budget amount of 35 Million USD. The Second Phase is to be implemented over two years and is set to interconnect all the remaining Primary and Pre-Primary Schools at a minimum of 50Mbps speed. The Budget requirement for the Second phase is yet to be worked out.

The Educational Network Connectivity is going to be exclusively used for Educational and governmental Services and once installed will provide free internet services to the 3500 Secondary Schools and other government offices.

This is, therefore, to kindly request your good office to financially support the first phase of this Project and be part of the digital transformation in the Ethiopian General Education Sector.

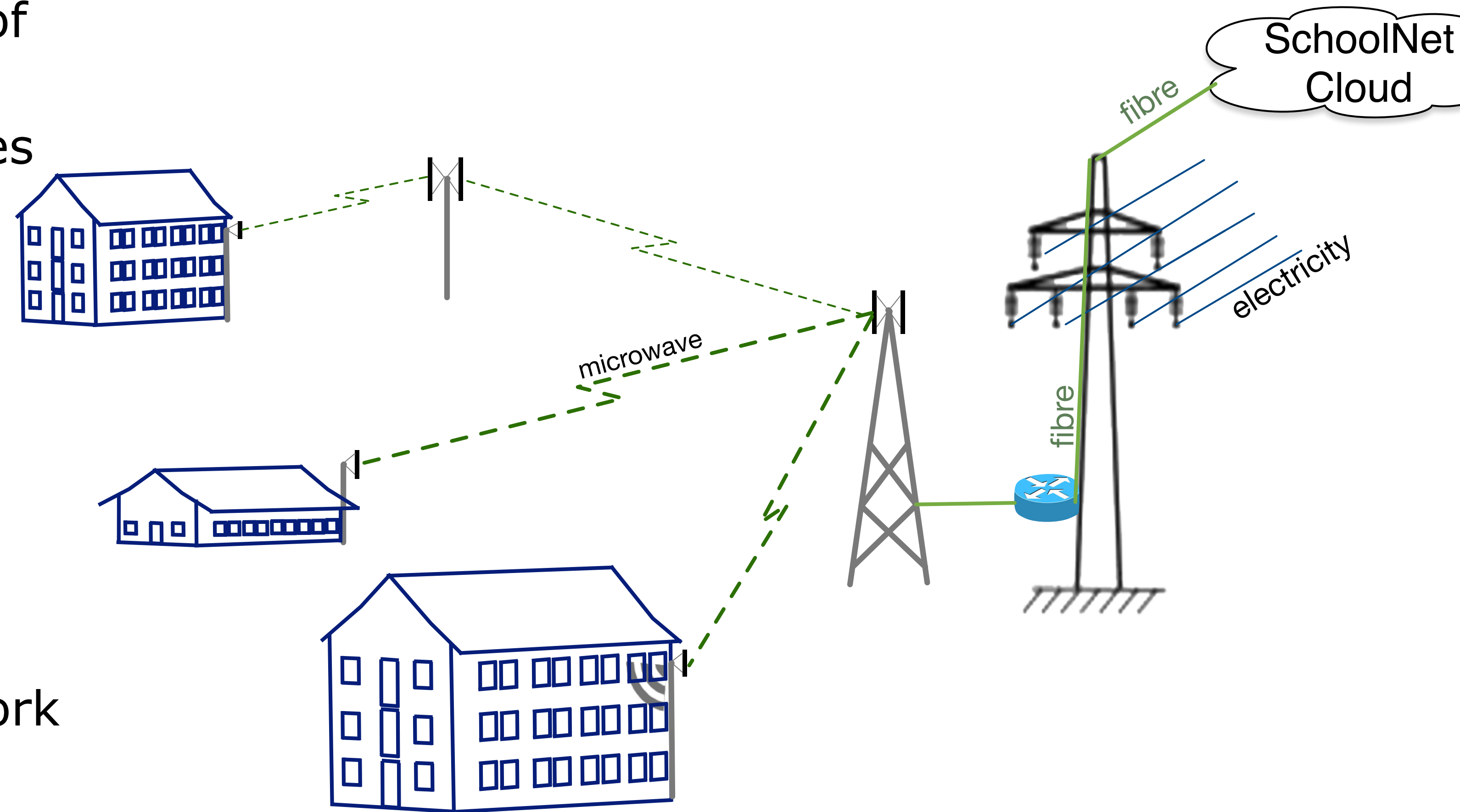
My Best Regards

Dr. Ing. Getahun Mekuria
Minister



Realisation

- SchoolNet distribution
 - educational network by Ministry of Education (MoE)
 - national fibre on high-voltage lines
 - fibre to microwave
- Microwave distribution
 - 0-5 km: point to multipoint
 - 5-15 km: point to point (mast)
 - >15 km: microwave relay mast
- Local school
 - receive microwave antenna
 - local Wifi distribution: local network controller & school server



Proof of concept

- ➔ Koye Secondary and Preparatory School
 - connected as part of African Innovation Week 2019
 - using mobile network
- ➔ Local knowledge portal
 - yeboo.com health information



Success story: Tanzania

- ➔ Successful DigI project
- ➔ Ongoing School Connectivity
 - 10 schools proof of concept
 - Scale-up to 450 schools
- ➔ 4 active communities pushing for connectivity
- ➔ Part of “Digital Transformation” Board of Ministry of Communications and ICT

Connectivity provided by **BOACSE**

- **Chiwanda Secondary School** is at Chiwanda village in Nkangamo Ward, Tunduma Township Authority - in collaboration with **BOACSE** <https://plus.codes/RH79+CP> (Rashid)
- **Chikanamlilo Secondary School** in Halmashauri, Momba - in collaboration with **BOACSE**

Connectivity provided by **African Child**

- **Mkuranga District**, in the North-East of Tanzania - in collaboration with **African Child** at Kiparang'anda and Mwanambaya
 - Kiparang'anda: <https://plus.codes/R5VG+RC>
 - Mwanambaya: <https://plus.codes/6G4XX62R+82>

School connectivity in TZ with **UCSAF**, **TTCL**, **Vodacom**, **African Child**, **Shuledirect**, ...

- see: [School_Connectivity_TZ](#) for project description
- Musoma tech secondary school: <https://plus.codes/FRCJ+GJ>
- Morogoro secondary school: <https://plus.codes/5MCF+35>
- Kigoma grand secondary school: <https://plus.codes/F5GC+G5>
- Tabora boys secondary school: <https://plus.codes/XR57+FR>
- Mizengo Pinda secondary school: <https://plus.codes/V5R4+RC>
- TPC secondary school: <https://plus.codes/F8RF+73>

Connectivity provided by **UDES** Usevya Development Society

- **Youth Centre Mpanda - Katavi**, connected by the Usevya Development Society (**UDES**) in November <https://plus.codes/V6RP+MC>
- **Usevya village and plans for other 5 sites**, Secondary School, Youth Center and Health Center

Connectivity provided by **Tanzania Community Networks Association** (**Matogoro Jabera**)

- Kasulu,



see: Villages.BasicInternet.no



Our InfoSpot in Esilalei, TZ
Solar-powered



Mto wa Mbu

Lake Manjara

Esilalei

Dispensary

4.6 km

Esilalei (Arusha)





“Connect the Unconnected” Selela Market Place



- Antenna in 6 m height
- Reaches Tigo tower > 20 km away



The mobile phone has replaced the machete (even in places without Mobile Broadband)



“Connect the Unconnected” Izazi



Antenna

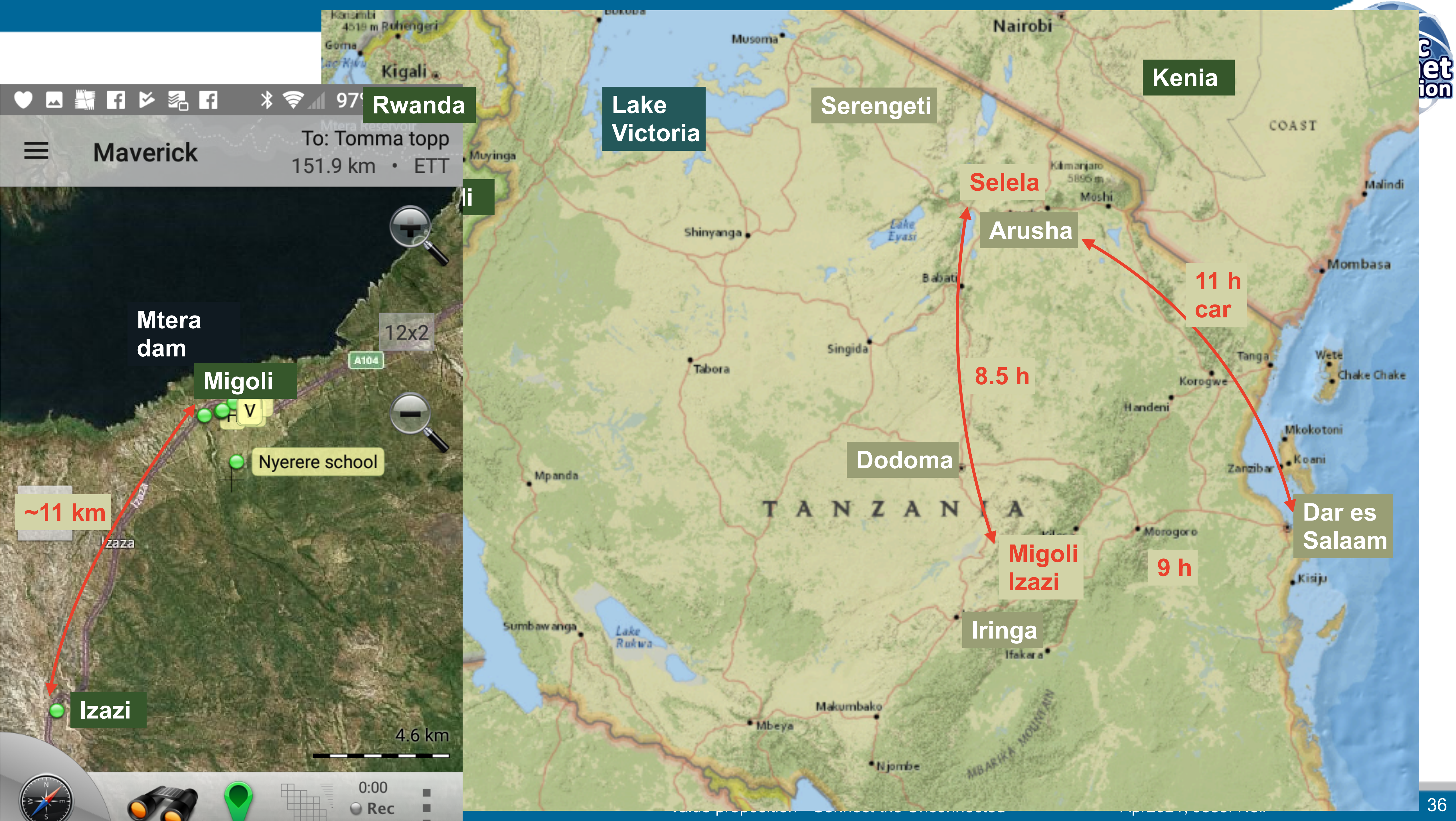
Village office

Installation time: 1,5 h
catching the signal from the Vodacom
tower in Migoli (~10km away)

Selela Market Place



- Antenna in 6 m height
- Reaches Tigo tower > 20 km away



Migoli (Nyerere High School)



1271 pupils, 34 full-time teachers
9 m pole (above trees) base to connect
- Migoli health station
- Migoli village office



Success story: Kenya

- ➔ Business driven country
- ➔ Focus: Kisumu and Siaya Counties
- ➔ Strong communities
- ➔ Good opportunity for scaling

Collaboration with Africa Higher Education Research Initiative ([AHERI](#)) and CISS

- Contacts Robert Owino and Barrack Otieno, Phase 1 with 6 installations in Spring 2020
- Nyalenda Informal Settlement in Obunga in Partnership with KUAP (www.pandipieri.org)
- Obunga Informal settlement in partnership with KUAP (www.pandipieri.org)
- Omuga Technical and Vocational Centre Kabondo Homabay
- CISS Community Centre Akala Gem County Rural www.cisskisumu.org
- CISS Community Centre Ng'iya Rural www.cisskisumu.org
- CISS Community Centre Kisumu County Peri-Urban

Collaboration with the Siaya County

- Siaya County with Library <http://www.siayalibrary.org/> (Rotarian [John Malamba](#))
- Connectivity to 8 villages with Siaya Library as a hub

Collaboration with [Techbridgeinvest](#)

- Tsunguni village, at a retail shop. It is about 300m from Tsunguni Primary School. It is within Kilifi County Kenya. <https://plus.codes/5MF9+XM>  Kaloleni

