UiO : Department of Technology Systems
University of Oslo

NGI-NO Meeting, Mar2021

Next Generation Internet in a Societal Perspective: Societal Security, Resilient Communities, Digital Empowerment, GovStack
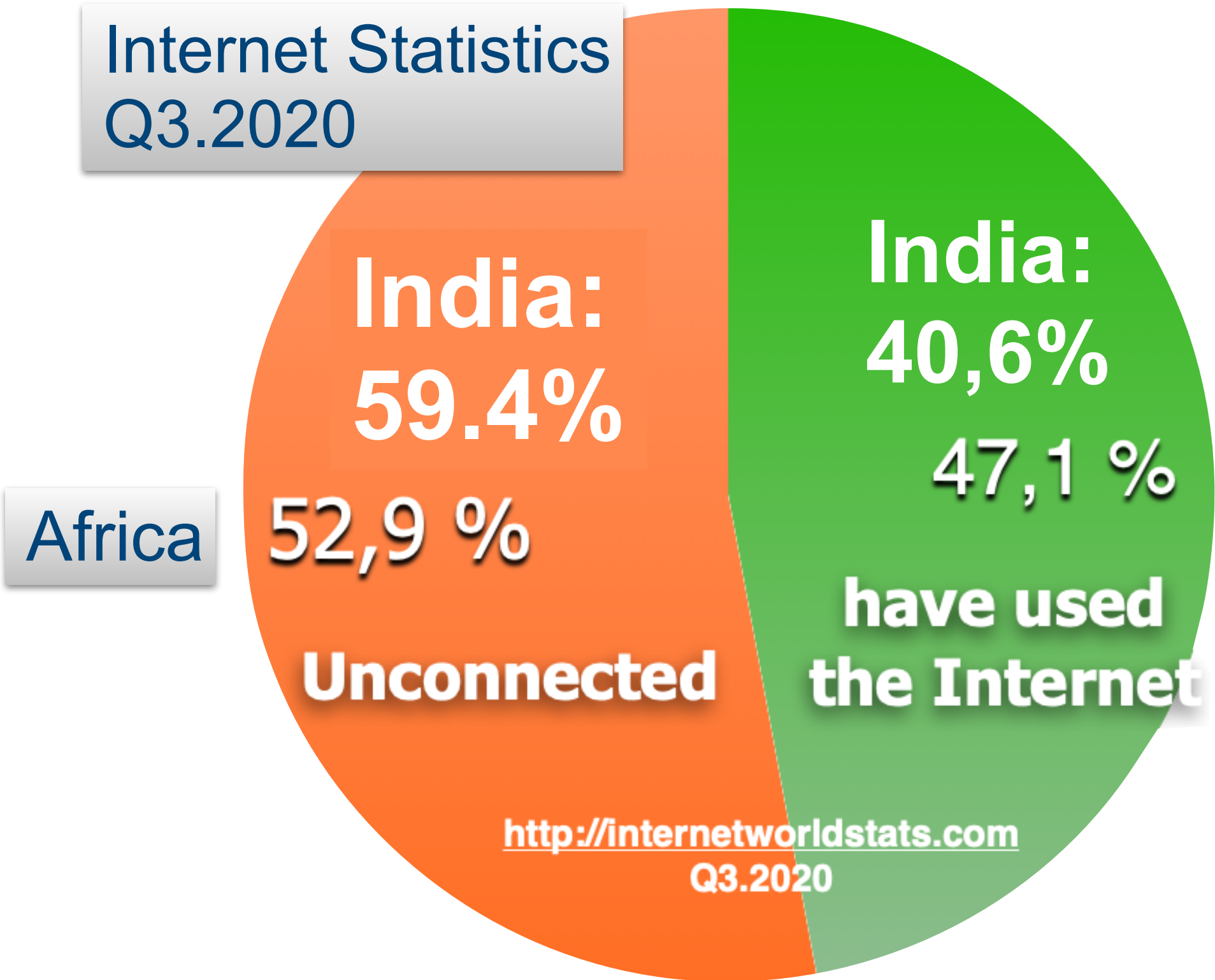
Josef Noll,

Professor, University of Oslo, Department of Technology Systems
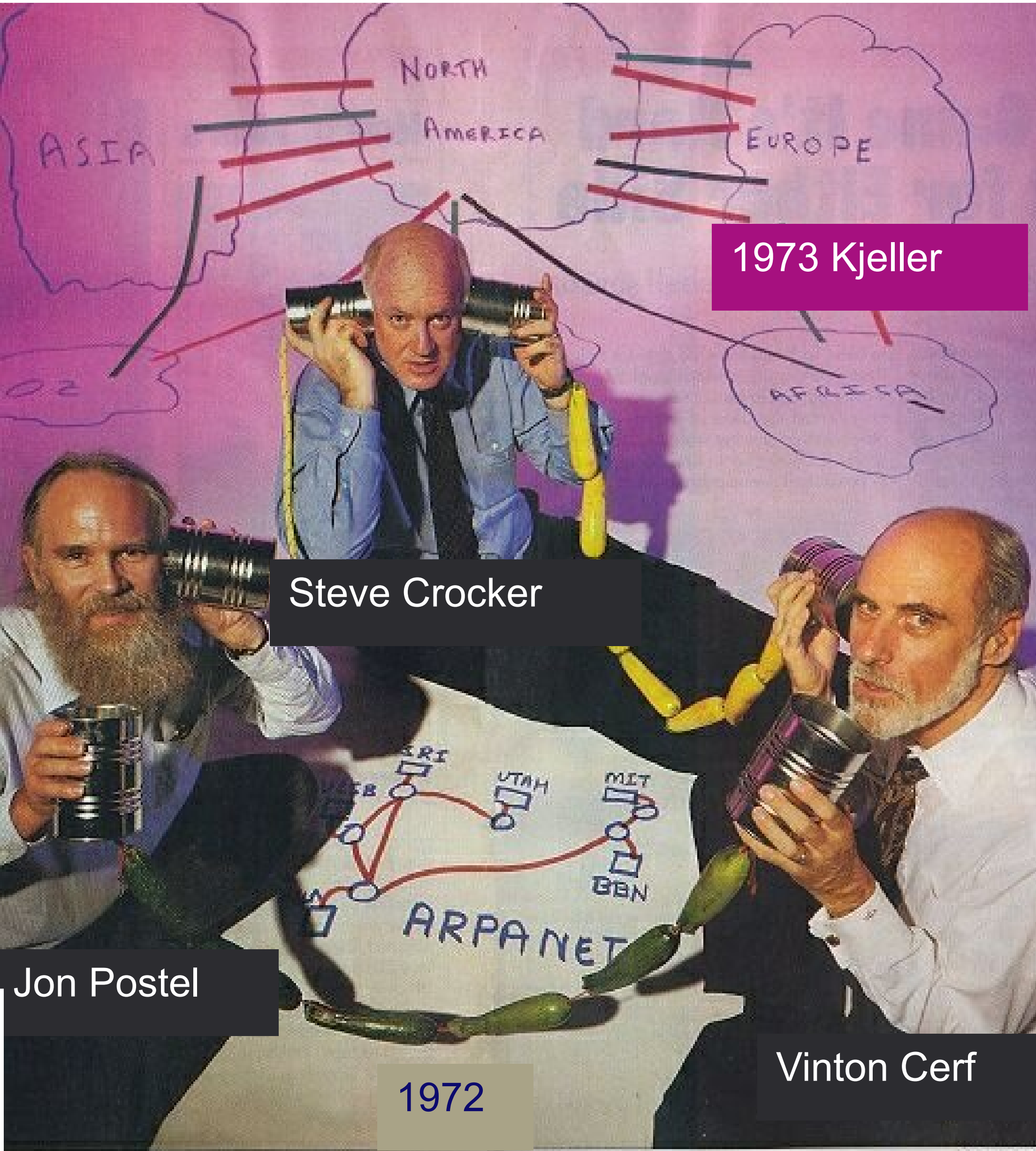
Kjeller, Norway, m: +47 9083 8066, e: josef@jnoll.net

Information as basis for empowerment and trust

Internet Statistics Q3.2020

India: 59.4%
52,9 %
Africa
Unconnected

India: 40,6%
47,1 %
have used the Internet

http://internetworldstats.com
Q3.2020

1973 Kjeller

Steve Crocker

Jon Postel

1972

Vinton Cerf

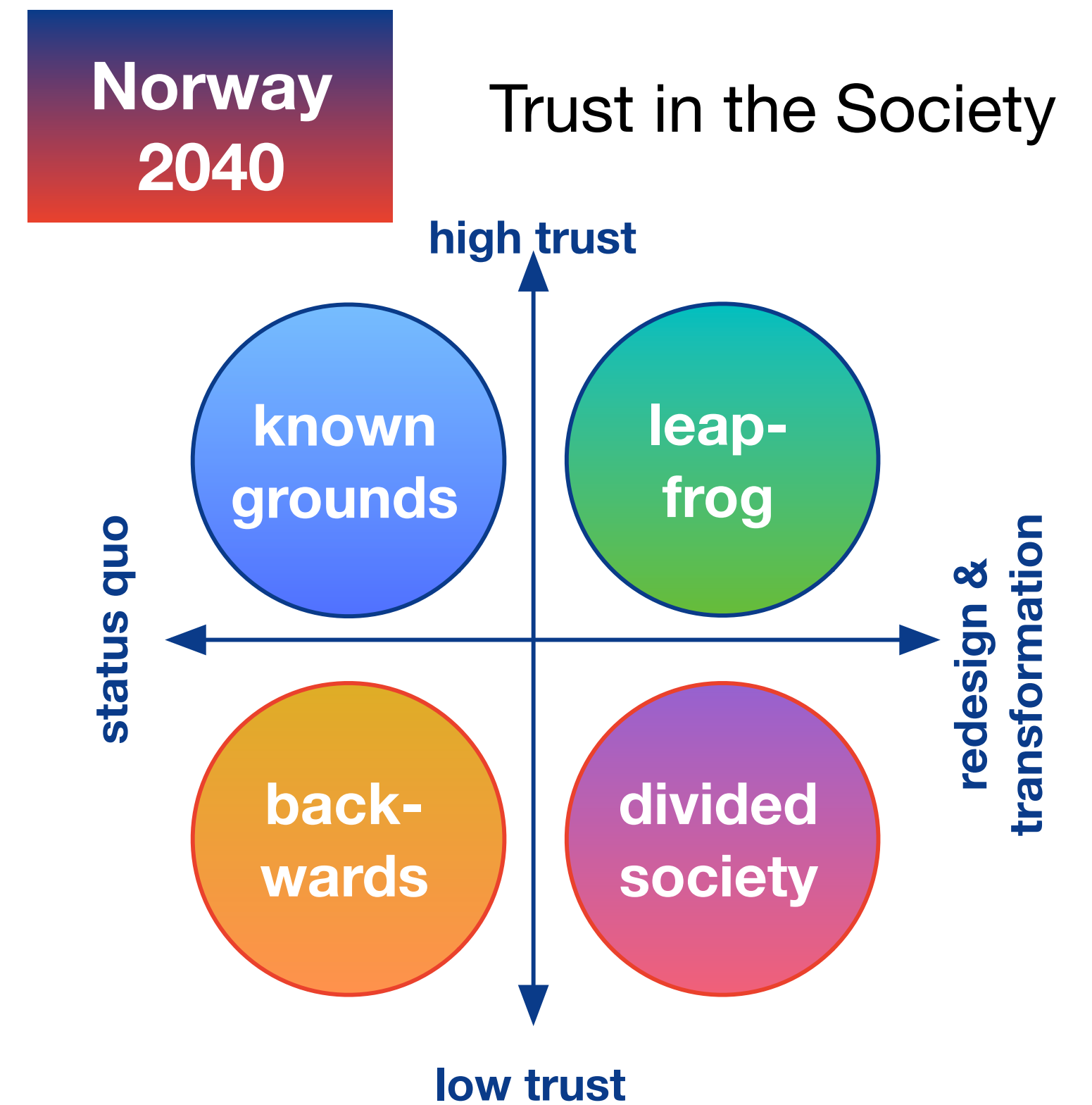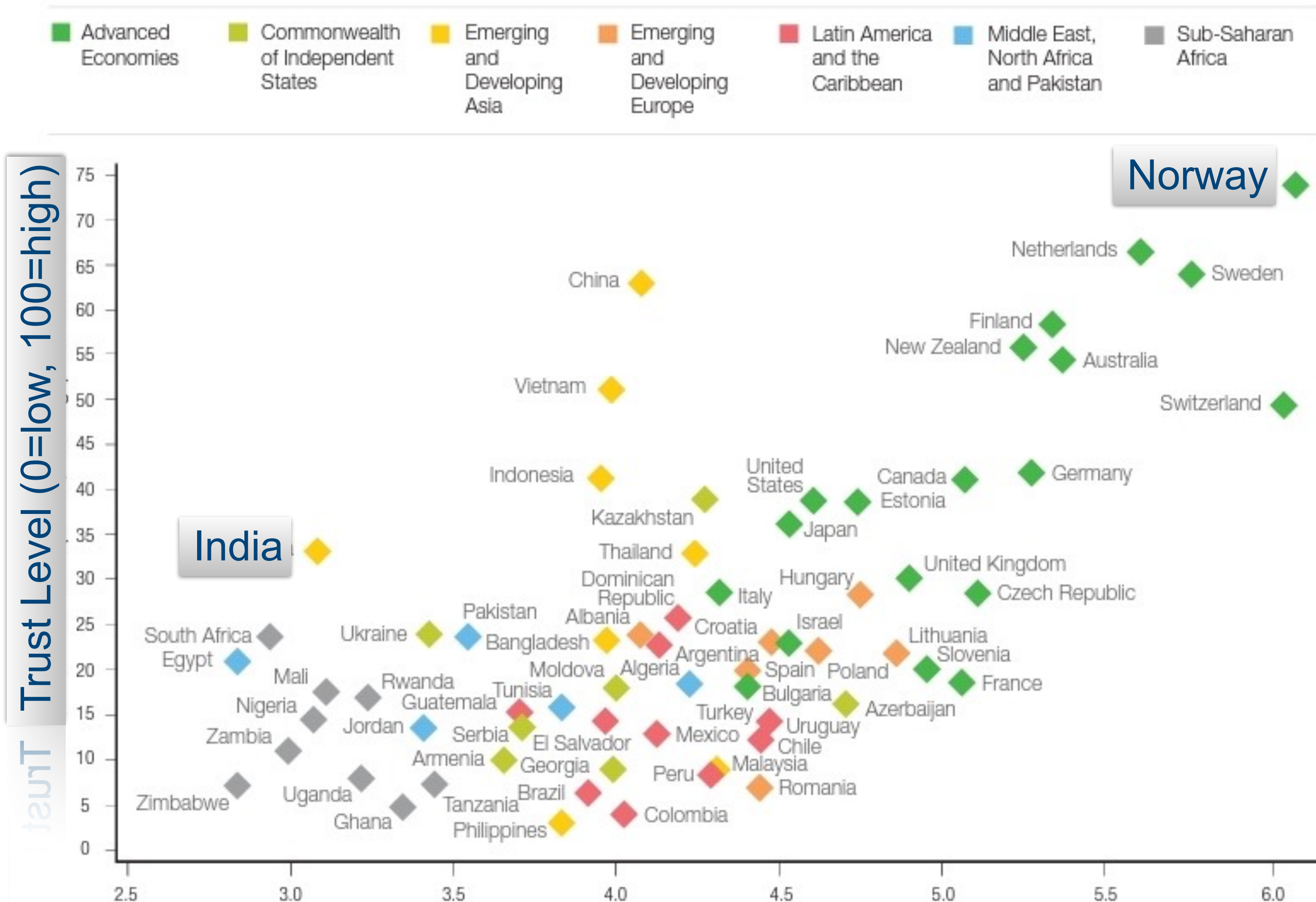Source: http://www.michaelkaul.de/History/history.html

ASIA INTERNET USE, POPULATION STATISTICS DATA AND FACEBOOK DATA - JUNE 30, 2020

ASIA	Population (2020 Est.)	Internet Users, (Year 2000)	Internet Users 31-MAY-2020	Penetration % Population	Users % Asia	Facebook 31-MAR-2020
India	1,380,004,385	5,000,000	560,000,000	40.6 %	24.3 %	251,000,000

Department of Technology Systems

The Faculty of Mathematics and Natural Sciences

Inclusive Development Performance and Interpersonal Trust

Legend:
- Advanced Economies (green)
- Commonwealth of Independent States (olive)
- Emerging and Developing Asia (yellow)
- Emerging and Developing Europe (orange)
- Latin America and the Caribbean (red)
- Middle East, North Africa and Pakistan (blue)
- Sub-Saharan Africa (gray)

Y-axis: Trust Level (0=low, 100=high)

X-axis: IDI Overall (1=Worst, 7=Best)

Scatter plot labels: Norway, Netherlands, Sweden, China, Finland, New Zealand, Australia, Vietnam, Switzerland, Indonesia, United States, Canada, Germany, Estonia, Kazakhstan, Japan, India, Thailand, Hungary, United Kingdom, Dominican Republic, Italy, Czech Republic, Pakistan, Albania, Croatia, Israel, South Africa, Ukraine, Bangladesh, Argentina, Lithuania, Slovenia, Egypt, Mali, Moldova, Algeria, Spain, Poland, France, Nigeria, Rwanda, Tunisia, Bulgaria, Azerbaijan, Zambia, Jordan, Guatemala, Turkey, Uruguay, Serbia, El Salvador, Mexico, Chile, Armenia, Georgia, Peru, Malaysia, Zimbabwe, Uganda, Brazil, Romania, Ghana, Tanzania, Philippines, Colombia

Norway 2040 — Trust in the Society

high trust

- known grounds
- leap-frog

status quo ← → redesign & transformation

- back-wards
- divided society

low trust

[Source: World Values Survey (2014) World Economic Forum]

Sources: World Values Survey (201...

3

Affordable Energy & Internet Lite for All
the catalysts for the goals

Energy & Internet Lite for All

Target 7.1&7.2   Target 9.C   Target 16.10
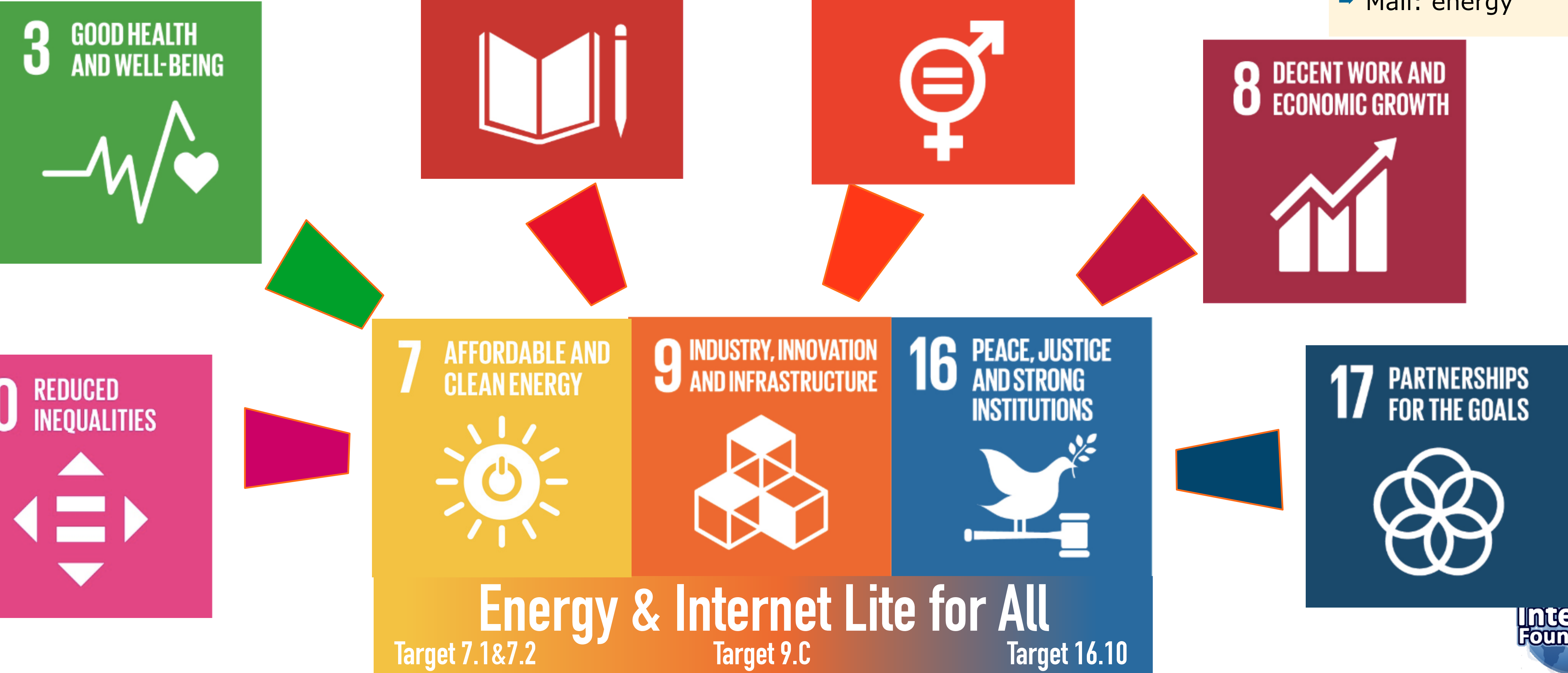
Public Opinion on SDGs (afrobarometer.org)

➡ Priorities by people in Africa

- decent work
- zero hunger
- good health
- ...

SDG	Priority	%
8 DECENT WORK AND ECONOMIC GROWTH	decent work	57%
2 ZERO HUNGER	zero hunger	31%
3 GOOD HEALTH AND WELL-BEING	good health	27%
16 PEACE AND JUSTICE STRONG INSTITUTIONS	peace & jus	26%
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	industry	24%
6 CLEAN WATER AND SANITATION	clean water	24%
1 NO POVERTY	no poverty	22%
4 QUALITY EDUCATION	qual. edu	21%
7 AFFORDABLE AND CLEAN ENERGY	clean energy	13%
11 SUSTAINABLE CITIES AND COMMUNITIES		4%
13 CLIMATE ACTION		3%
10 REDUCED INEQUALITIES		2%
5 GENDER EQUALITY		1%

need to have

nice to have

https://blogs.worldbank.org/africacan/how-do-africans-priorities-align-with-the-sdgs-and-government-performance-new-results-from

Addressing the Priorities of Norway

Norwegian Ministry
of Foreign Affairs

➡ Report to Stortinget 11 (2019-2020), Priorities
  ▪ Access, skills, regulations, inclusion

➡ "Boys have the toys"
  ▪ digital divide in both devices
    ▪ Gender gap: 52% BD, 48% UG, 39% KE
  ▪ and mobile broadband access

➡ Integrated model for digital inclusion
  ▪ School connectivity (SDG indicator 4.A.1)
  ▪ Knowledge Portal as facilitator
  ▪ Knowledge transfer
  ▪ Community involvement

Meld. St. 11 (2019–2020) Report to the Storting (white paper)

Digital transformation and development policy

Access

Skills

Regulations
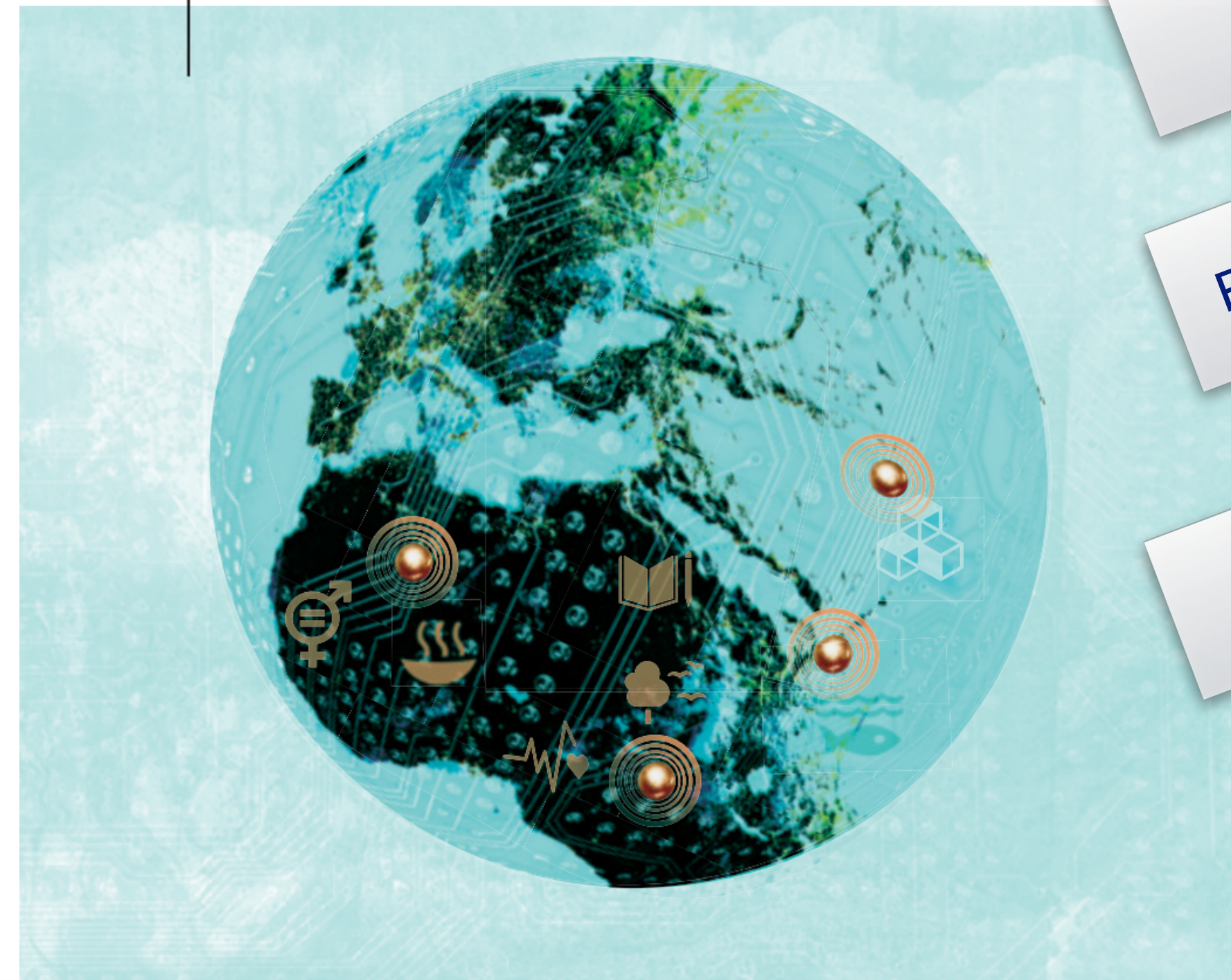
Inclusion

https://www.regjeringen.no/no/dokumenter/meldst11_summary/id2699502/?ch=1

Basic Internet Foundation

Activities and Projects

- Digital Assistant 2021
  - ➜ New public services, service migration
  - ➜ Outcome: Trust as the enabler for novel services
- Digital Cooperation and Diplomacy
  - ➜ Follow-up: UN High-level panel
  - ➜ GovStack (GIZ, EE, UNDP)
  - ➜ Estonia Gov: Microservices
- El- og Data - Schools4DigitalInclusion
  - ➜ OsloMet & UiO cooperation
  - ➜ Curriculum VG1 and VG2
  - ➜ Electrical Engineering, Data, Electronics
  - Outcome: Digital Inclusion as topic

- Global Culture Education Initiative (GCEI)
  - ➜ Outcome: Global School cooperation
- Ministry of Communication and ICT (TZ)
  - ➜ Task force for digital transformation
- School Connectivity (TZ)
  - ➜ <20 USD/month OPEX target
  - ➜ 5 schools connected
  - ➜ offer to incorporate 450 schools
- Center for Global Health (CGH@UiO)
  - ➜ Digital Health as cross-cutting issue
  - ➜ Outcome: Digital Literacy, Health Literacy

Addressing Education 5.0 and Global Challenges

➡ Cognitive skills

Edu 3.0

- literacy and numeracy
- critical thinking
- problem solving

Edu 4.0

➡ Social and emotional skills

- empathy, teamwork
- leadership, cultural awareness
- **fraternity** & **social friendship**

Edu 5.0

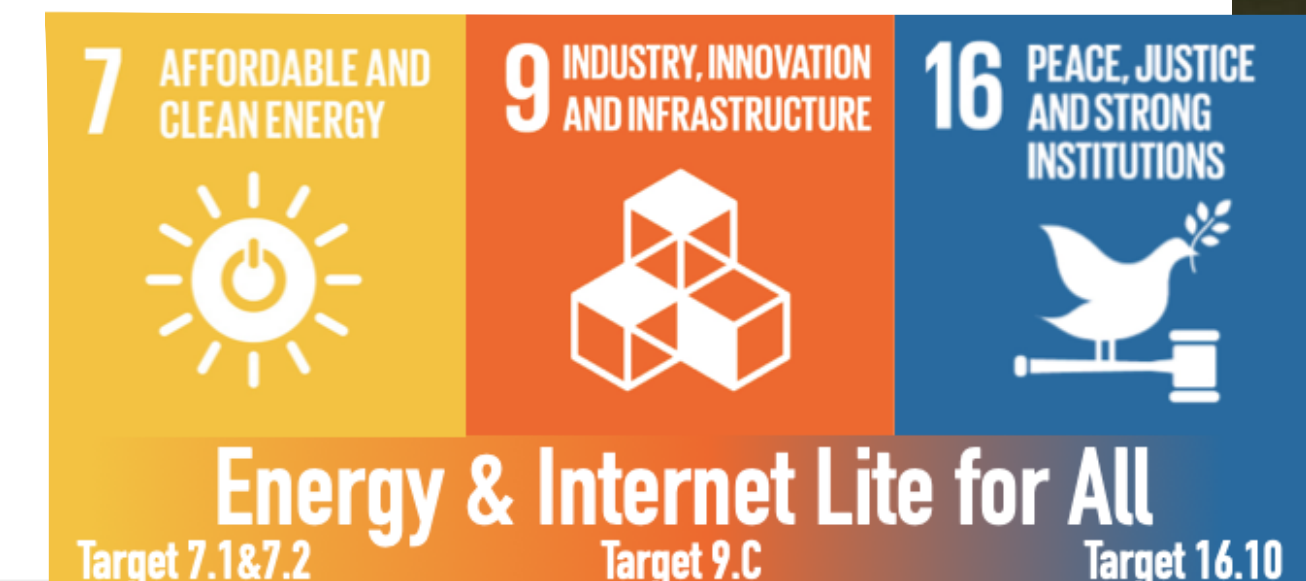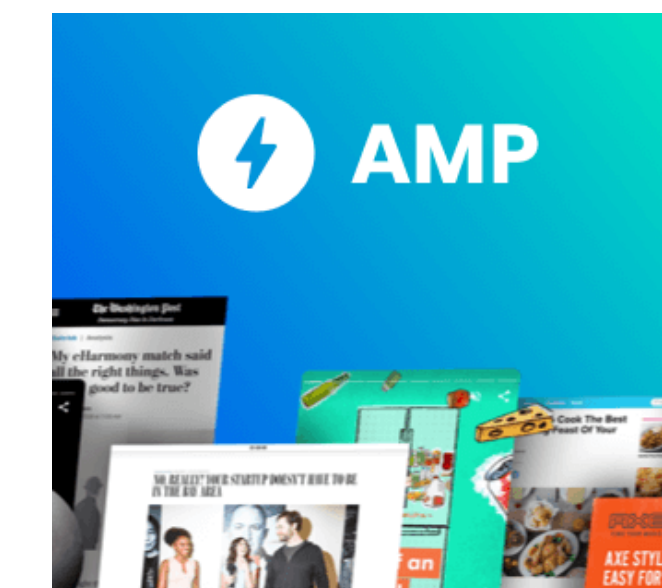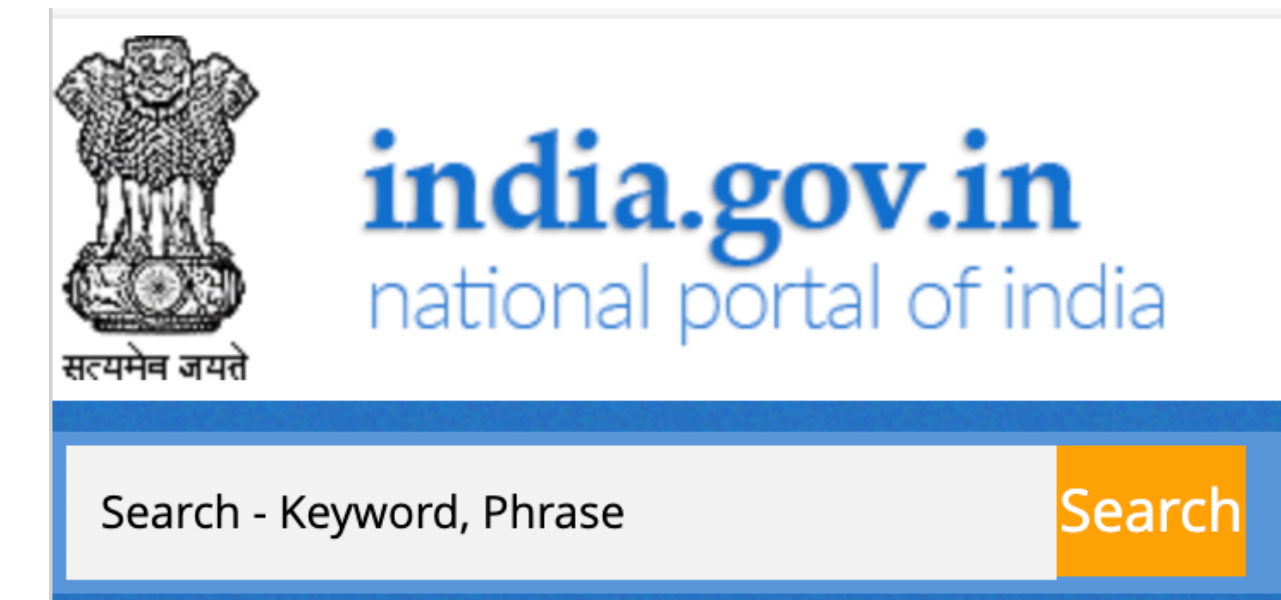➡ Global challenges

- **Climate**, **Sustainability** (SDGs)

NGINO:
Solutions for ~3.5 Billion non-digital people

1) Value proposition:
  ✓ Freemium access: Free access to digital education, health, online learning and skills development,
  ✓ Local empowerment, Relevant content (Village empowerment)

2) Technology and Capacity to absorb digital technologies
  ✓ Local Info Spots connected to schools, health dispensaries, govern. buildings
  ✓ Solar/wind, Macro and micro cells, Integrated terrestrial (TVWS)/ Satellite/ backhaul, Crowd sourcing, mesh networks, Aggressive use of cloud and virtualization

3) Affordability (Business/Economic)
  ✓ Freemium model for access
  ✓ Collaborations with governments (public-private partnership)
  ✓ Downward price trend under $85 (large 2nd hand market), Regulations, Push for barter and shared business models, Micro-operator eco-system mandated by the government, Replace USOF

india.gov.in
national portal of india

Search - Keyword, Phrase   Search

Rural connectivity

5G network slice

AMP

7 AFFORDABLE AND CLEAN ENERGY
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Energy & Internet Lite for All
Target 7.1&7.2   Target 9.C   Target 16.10

Background material
- Projects and Activities
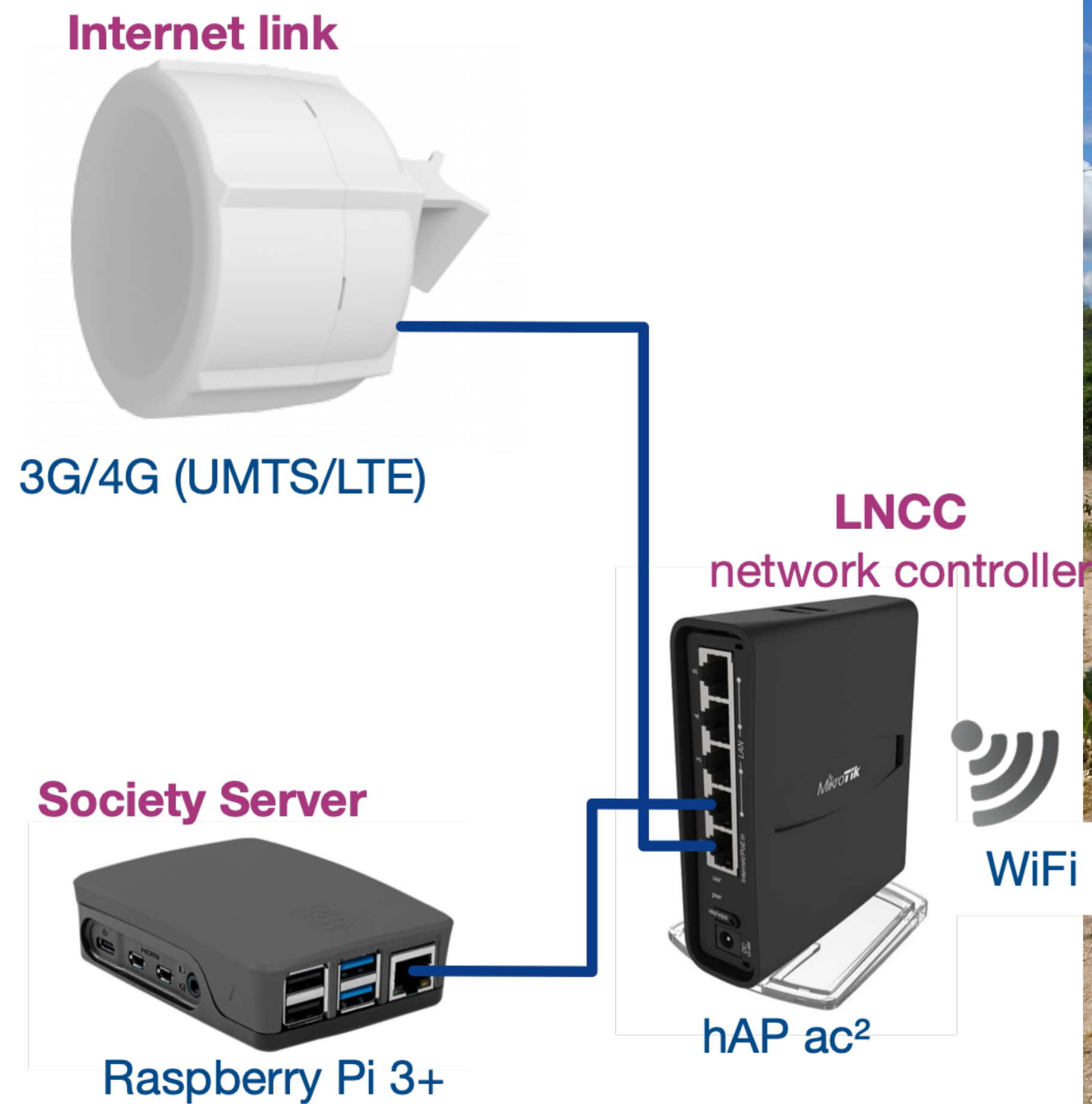
School Connectivity

- 10 Schools in TZ
  - ➡ Focus on sustainability
    - ▪ OPEX <20 USD/month
  - ➡ Costs sharing
    - 1/3 Norway
    - 1/3 Vodacom, Tigo, TTCL
    - 1/3 UCSAF (Gov)
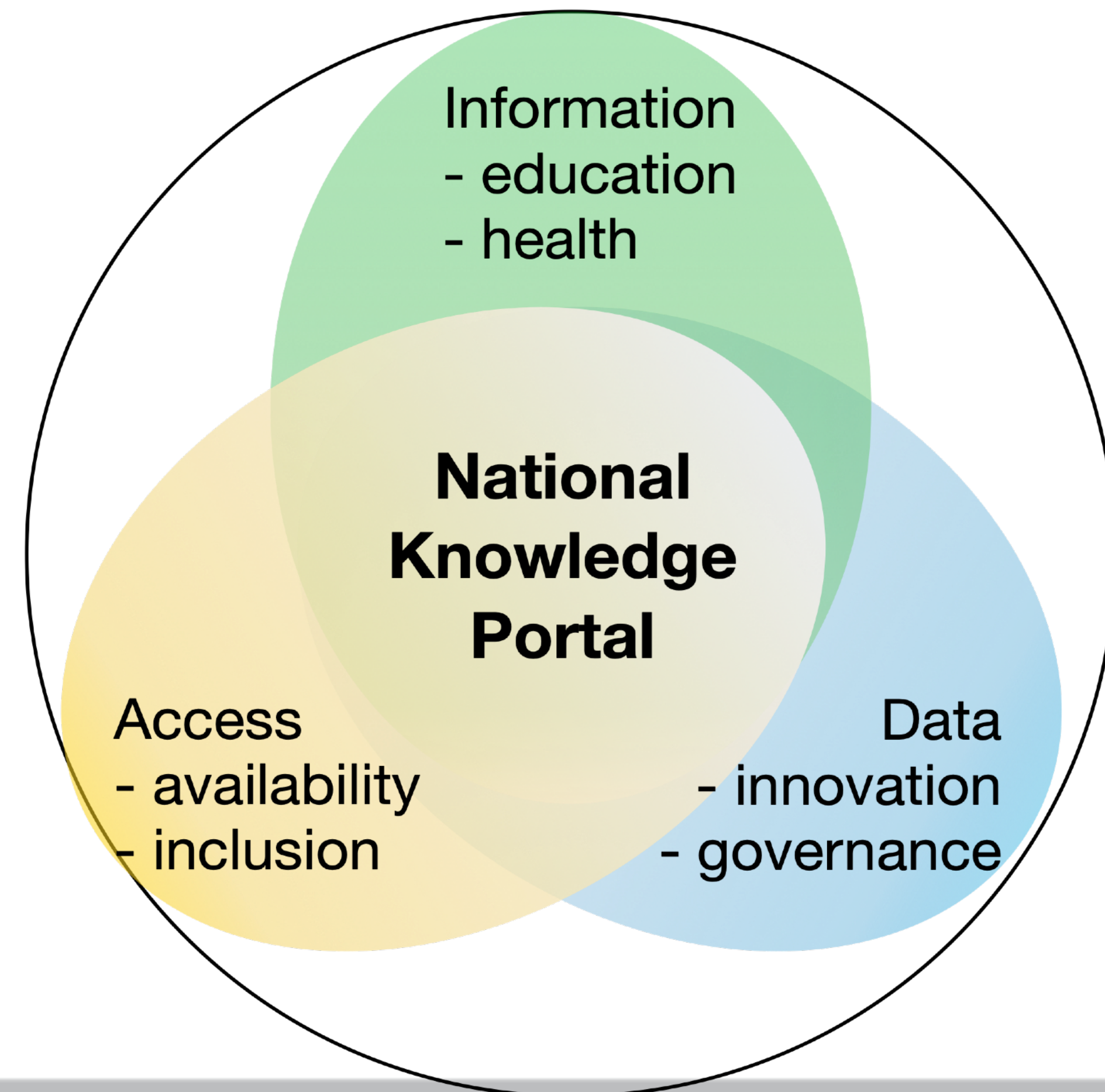- Offer to incorporate 450 schools (Halotel)

Technology Used

http://Solutions.BasicInternet.no

Internet link

3G/4G (UMTS/LTE)

LNCC
network controller

WiFi

hAP ac²

Society Server

Raspberry Pi 3+

# Addressing global connectivity challenges through Innovations & Collaborations

__Meaningful connectivity__ to the internet on __daily basis and skills for__ using an __appropriate device__ with __enough data__ and a __fast connection.__

Information
- education
- health

National Knowledge Portal

Access
- availability
- inclusion

Data
- innovation
- governance

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
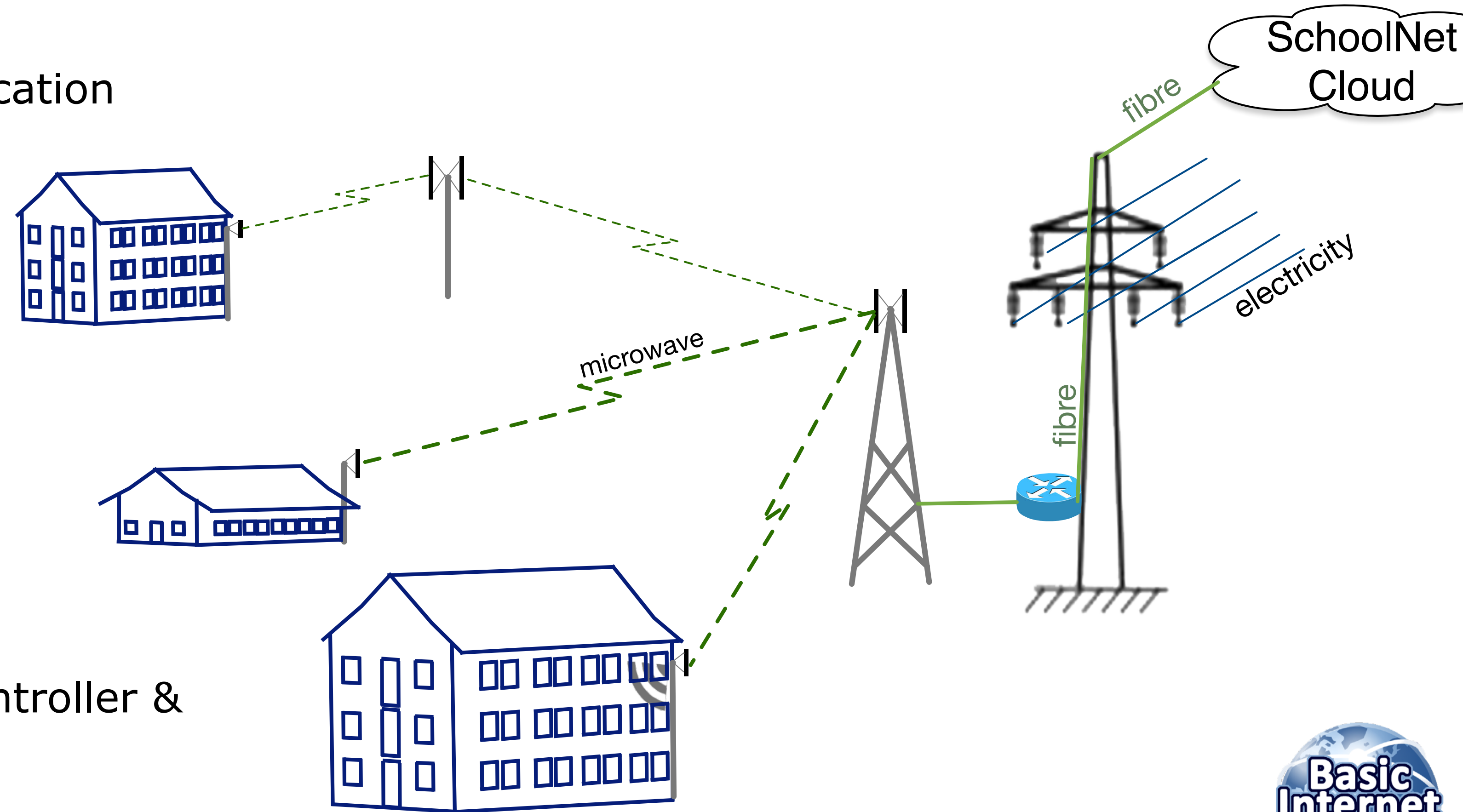
Free access to information – in Ethiopia

➡ 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 (AI

ethio telecom

ግንቦት 24 ቀን 2012 ዓ.ም

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 በመንግስት በኩል በርካታ እርምጃዎች እየተወሰዱ ሲሆን ከአዚህም መካከል የገፅ ለገፅ ትምህርት በማቁረጥ ተማሪዎች ቤታቸው እንዲቆዩ መደረጉ ይታወቃል::

ከዚህ ጋር በተያያዘ ኩባንያችን ከግንቦት 21 ቀን 2012 ዓ.ም ጀምሮ የከፍተኛ ትምህርት ተቋማት መምህራን እና ተማሪዎች ከትምህርት ጋር ተያያኝነት ያላቸውን አጋዥ መረጃዎች ከ **http://ndl.ethernet.edu.et/ በነፃ ማግኘት** እንዲችሉ በማድረግ የመማር ማስተማሩ ሂደት እንዲቀጥል የበኩሉን አስተዋፅኦ ማድረጉን በዲስታ ይገልፃል::

በተመሳሳይ ሁኔታ ኩባንያችን ስለወረርሽኙ ወቅታዊ መረጃ ለህብረተሰቡ እየሰጡ የሚገኙትን የጤና ሚኒስቴር http://www.moh.gov.et ፤ የኢትዮጵያ ህብረተሰብ ጤና እንስቲትዩት http://www.ephi.gov.et እንዲሁም የተቋቋሸ የኮቪድ 19 መቆጣጠሪያ ስርዓት ድረ-ገፅን http://www.covid19.et በነፃ እያቀረበ መሆኑ ይታወቃል::