ITU Regional Workshop on Bridging the Standardization Gap

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Low-cost sustainable optical cable "backhaul" to rural, remote areas in developing countries

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Internet, such a high priority for Least Developed Countries?

(1) May 2011, Dr. Hamadoun Touré : 'YES'

Internet, especially **Broadband*** is MUST to deliver eHealth, eEducation,,,

LDC
25% of All
30% of Asia

*Broadband: not defined here but, US FCC defines "Up 1 Mbps, Downs 4 Mbps"

(2) Dec. 2012, Revised ITR* approved.

Preamble: ITRs recognize the right of access of Member States to telecom services. ← 89 countries supported

*ITR: International Telecommunication Regulations

(3) Internet Penetration in LDCs

2010: 2.5 %

↓

2015: 15 % : ITU Commitment to the UN

Broadband Internet –a key for development needs to be prioritized, even in the world's poorest nations.

Trend in Mobile Handsets
Mobile Phones to Smart Phones & Tablets

2013

Population	7.3 B
Mobile Phones	6.4 B

2018

Population	7.5B
Smart Phones	4.5 B

2013 >256 kbps
Developed Countries 51 %
Developing Countries 8 %

Backhaul delivers the lifeblood, such as eEducation and eHealth. Broader-band Backhaul better saves human lives and enables equal and quality education in rural and remote areas in developing countries

Broadband is “must” for Future Backhaul Connecting between Cities and Rural Areas

Microwave

Optical Fiber

Trank Line

Mobile Base Station
TeleCenters, Schools
Hospitals,,,

Backhaul with insufficient bandwidth once installed
real broadband might only be brought in after many years

Characteristics; Microwave vs Opt. Cable

Microwave Solution

Data Capacity < 1 Gbps, mostly

Antenna spacing : direct view, a few kilometers

(Air Transmission with Tower, Antenna and Power)

Optical Fiber Solution

Data Capacity: upgradable to > 1 T bps

West Africa (Submarine) Cable Systems (WACS)

500 Gbps upgradable to 5.12 Tbps (40 Gbpsx32 ch x 4 sys.)

Cable Span > 100 km (no electric power needed)

Multiple route layout avoids communication blackout

Bare Fiber: very cheap today (< 1 cent / m)

Wirelss or Wired: misunderstanding today

Misleading statements in an ITU-D contribution in 2013

A key component of any data service is the backhaul, routing traffic from cells sites into the core network.

The lowest OPEX route is to install fibre,

but with costs of around $ 85,000 per km to install it, the CAPEX is not financially viable

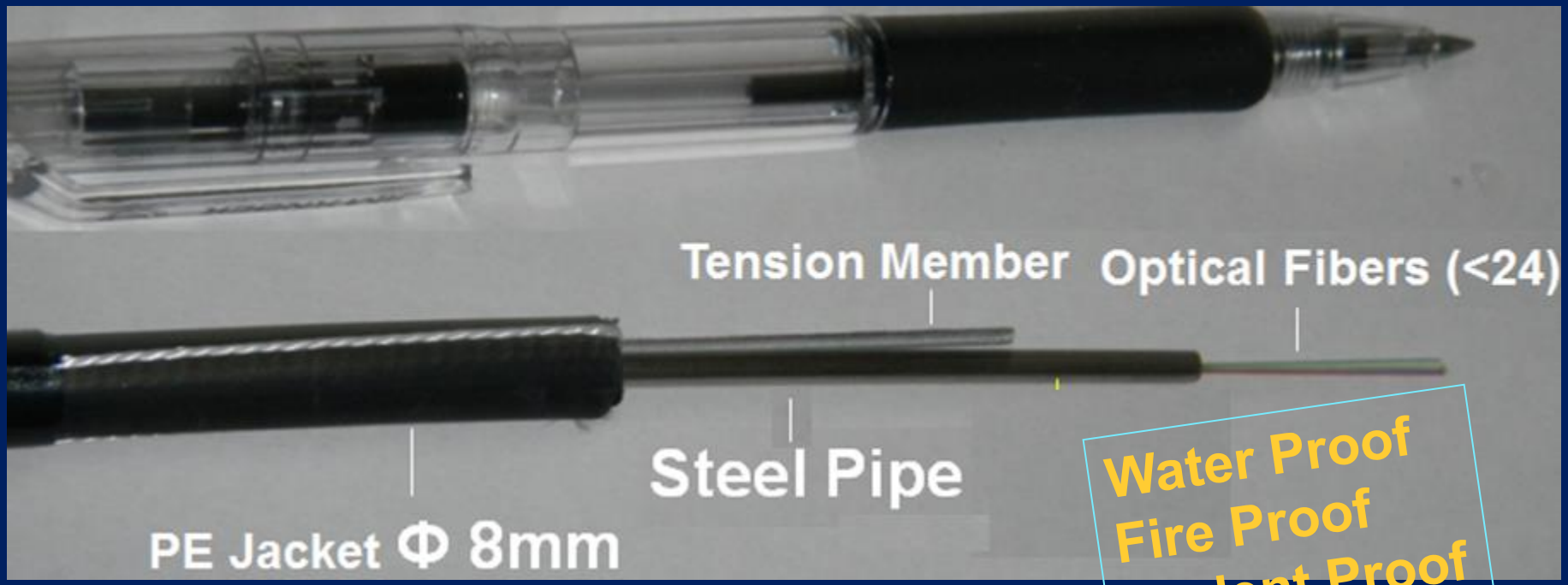
Wired typically takes longer to install than wireless

Wireless will continue to be central to backhaul

The statements in the box above is misleading

→ An innovative optical cable could shift the paradigm

Thin, Lightweight Optical Cable for Direct-Buried or Open-Air Installation (1)



Outer diameter	Φ8 mm
Weight	85 kg/km
Tensile Strength	90 kg
Lateral pressure	200kg/100mm

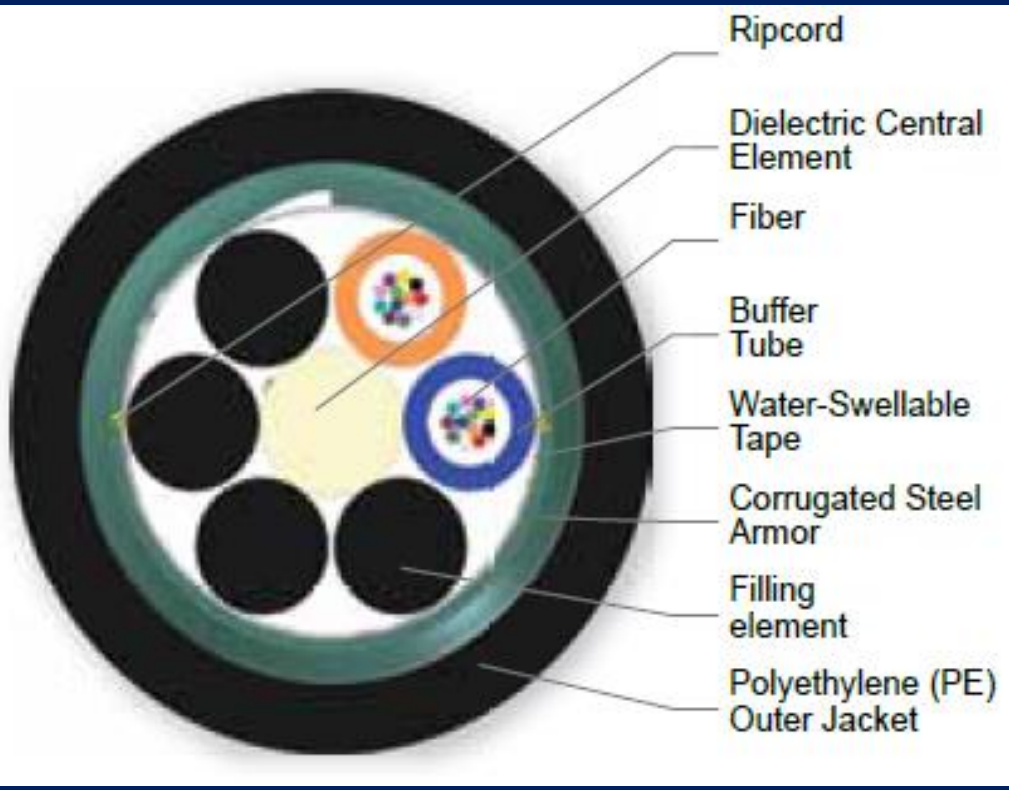
Data Capacity do not worry
(>40 Gbps, 32 ch WDM/fiber)
One-Piece length 12 km
Electric power: no need >100 km

Optical Cable for Direct-Buried Installation (2)

with corrugated steel armor

Fiber count: ≤24, Weight 129 kg/km

Φ12.1 mm

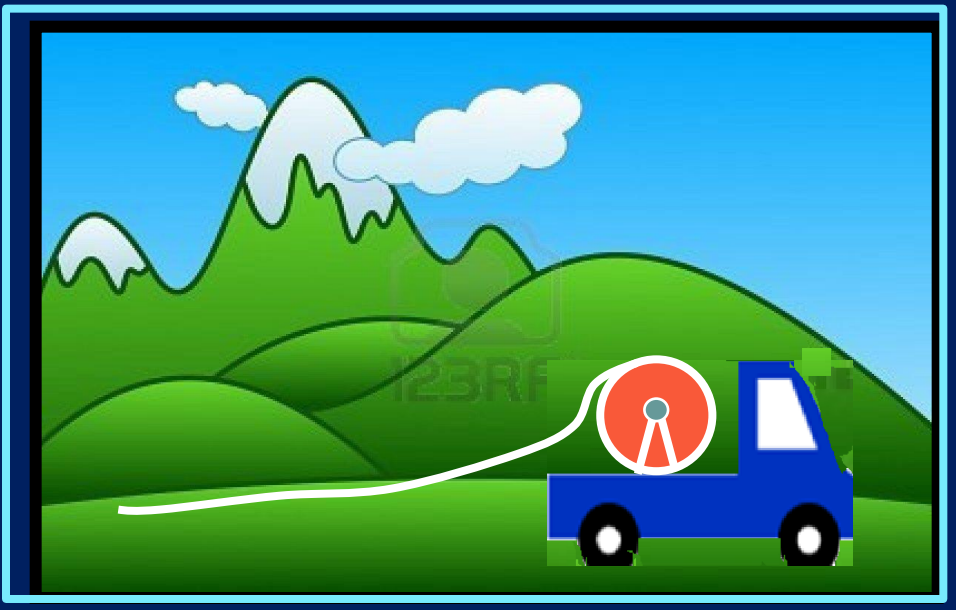


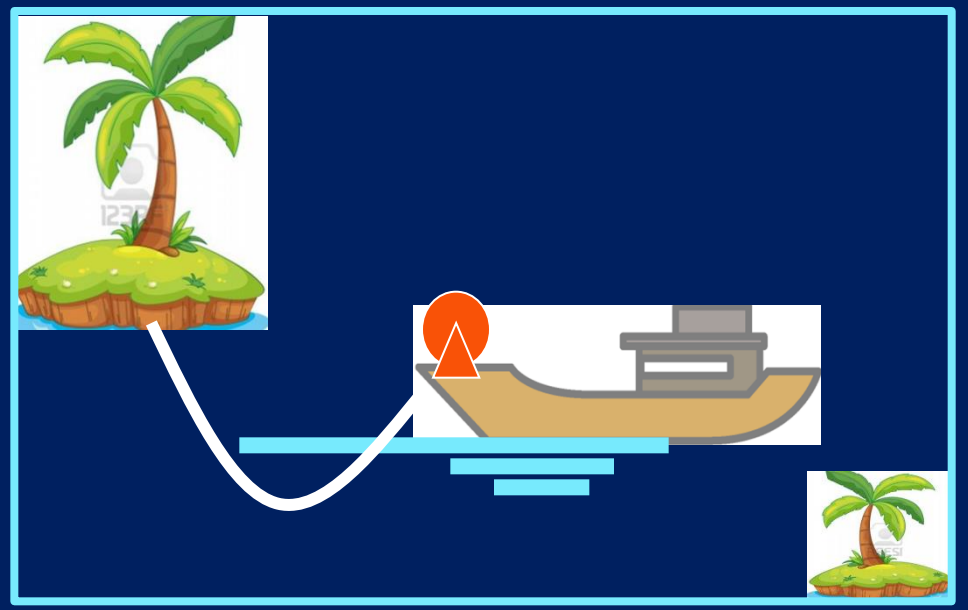
Fully waterblocked for direct-buried installation

Outer diameter	**Φ12.1 mm**
Tensile Strength	**90 kg**

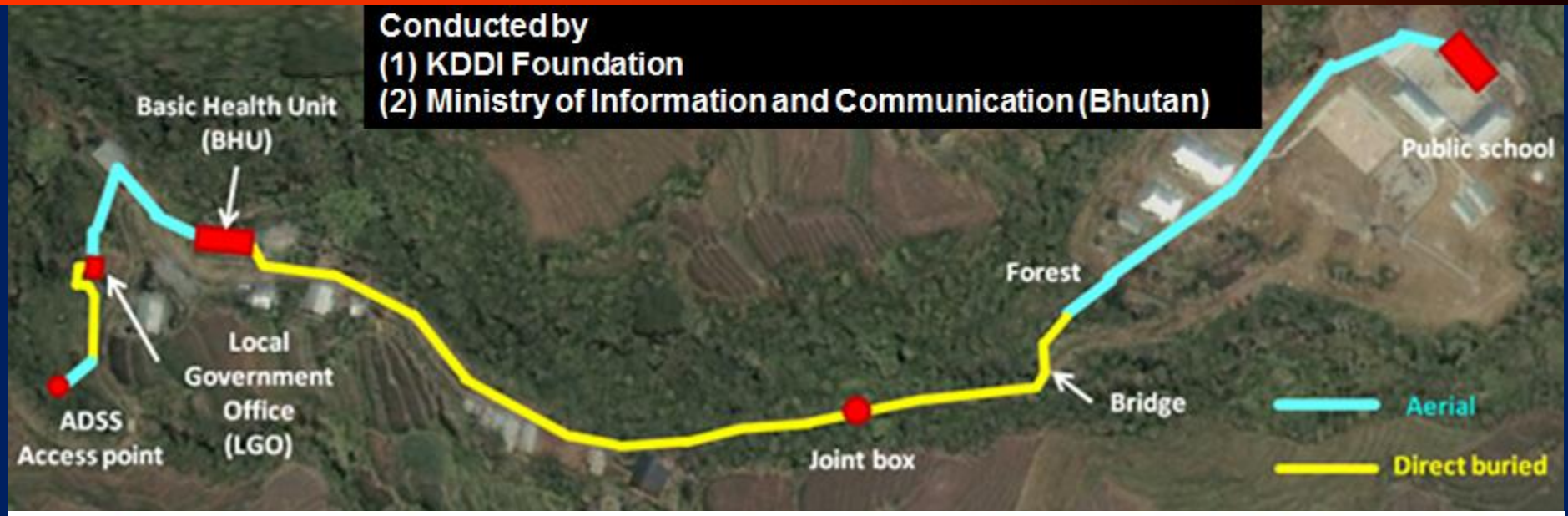
Thin and Lightweight Cable

Cost-Effective Easy Cable Laying Enables “Do it yourself”





APT J3 Project in Bhutan, March 2013
4-day construction for 1.2 km

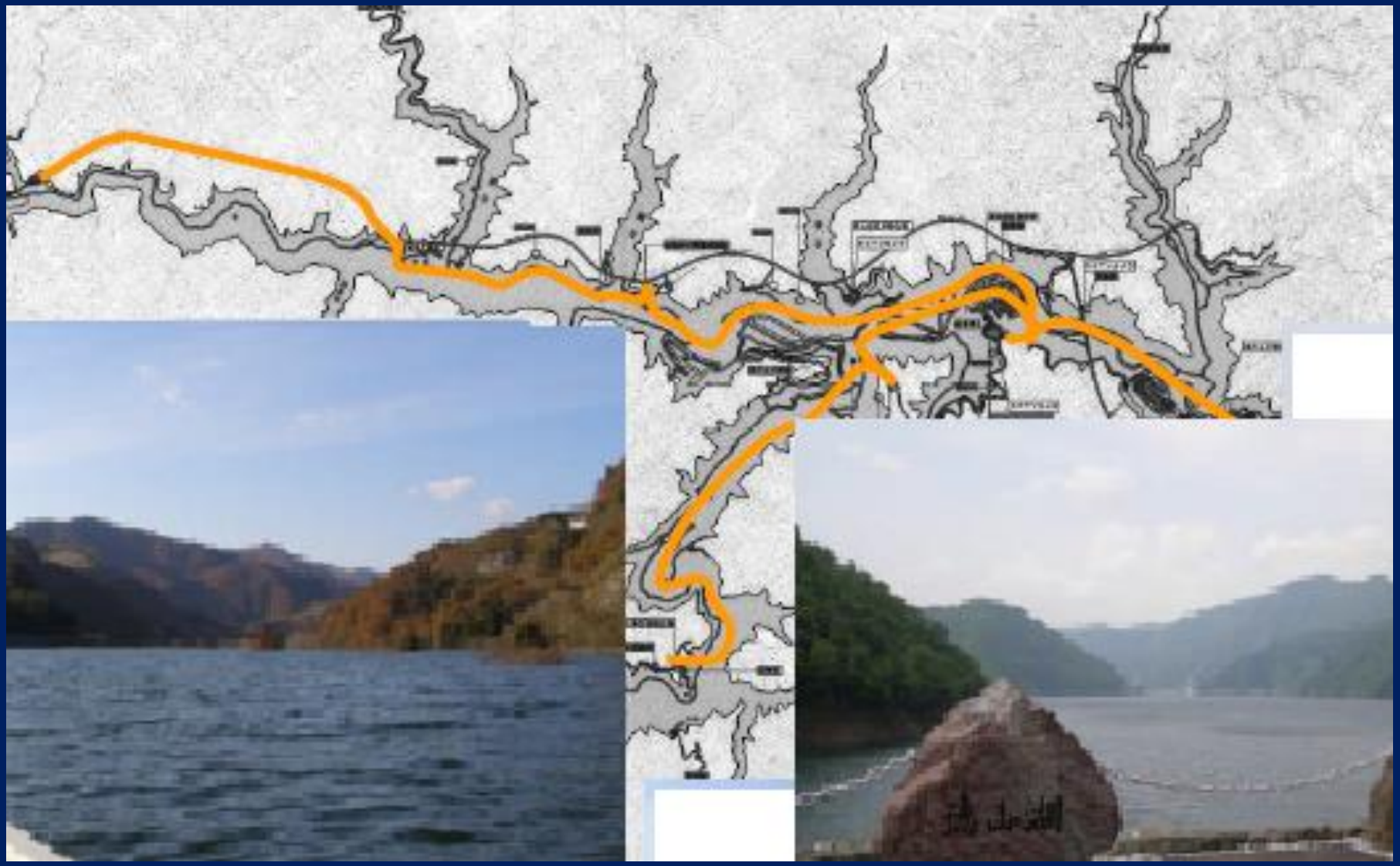


Digging trench

Joint box(Connecting cables)

Burying directry

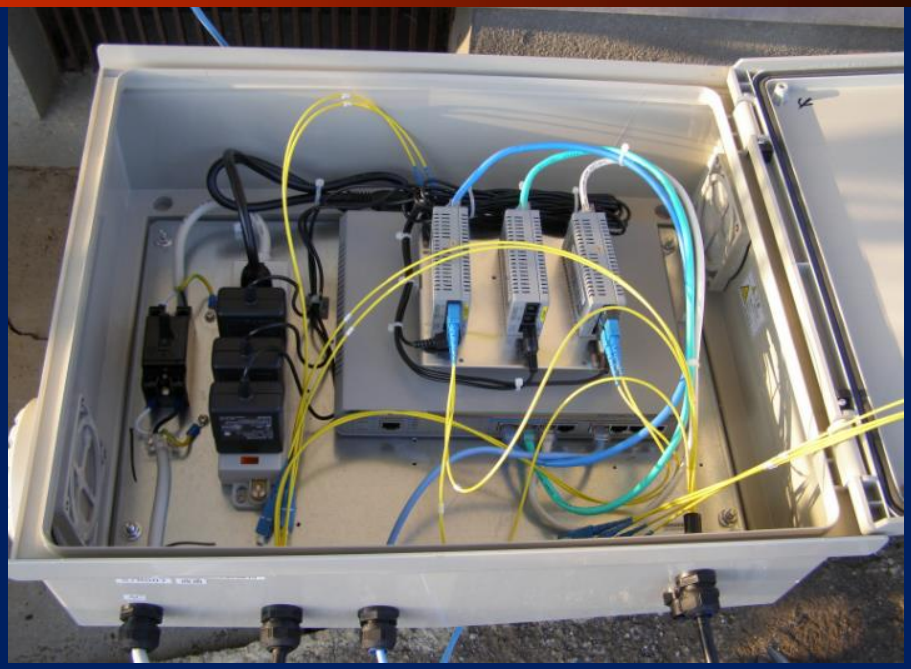
Water proof cable : Used in Lakes, Japan




OPTIC FIBER
CABLE PROGRAMME
Conventional Cables
need deep burial

Transmission Equipment (Outdoor)

Optical Cable



Air-conditioning not needed.

- Anti-corrosion film
- Moisture absorber

can be used, where necessary.

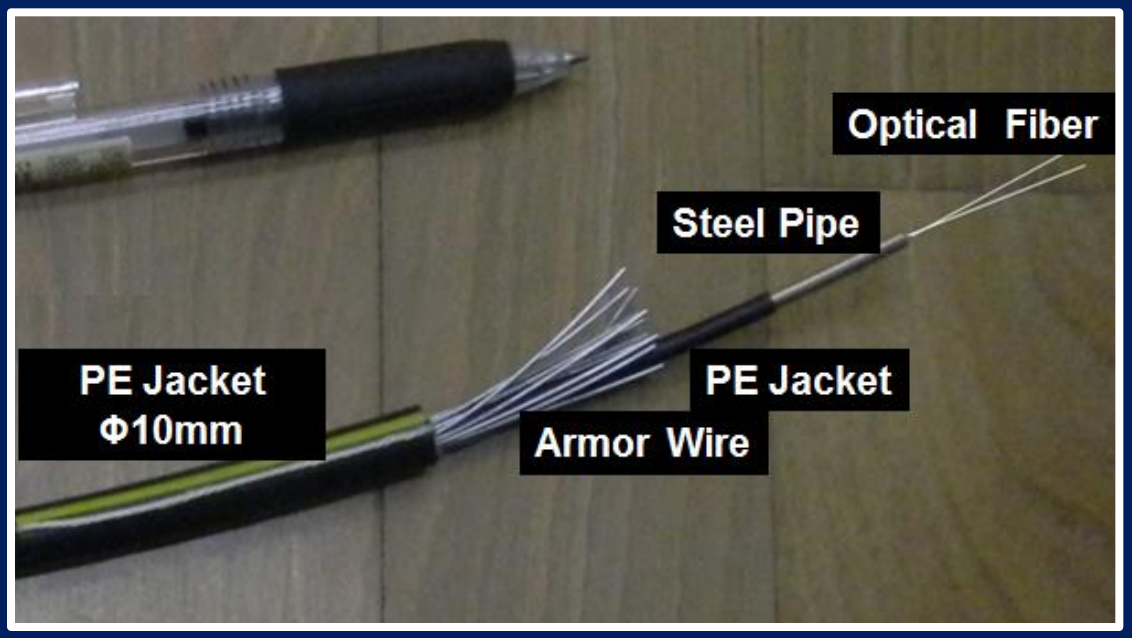
Multiple cables to Secure the Backhaul Link

Mobile Base Station

Multiple Cables conquering e.g., difficult terrain

Summary (1) All are already available

- Optical Cable: Thin, Lightweight and Low-cost
  Water-Proof, Rodent-Proof, Fire Resistant
  Direct Burial
  Open-Air Exposure
  → Possible
- Transmission Equipment : Mass-Produced Media Converter
- Fiber splicer : Coated-fiber mechanical splice loss: <0.2 dB
- Labor forces : "Do it yourself" by Non-Skilled Local People



→ Local People In Remote Area Could Quickly Construct Optical Cable At a Low Cost

Summary (2)　Let's take action

(1) Identifying how to meet local needs

- Identify services; which info., eHealth, eEducation
- Select Cable/Equipment; population decentralization, difficult terrain/climate, non-skilled human resources

In AP, Africa, Arab, Americas, 21 countries identified interests in conducting the field test.

(2) Standardizing; wide/quick broadband penetration

Reduce introduction barriers of opt. fiber solution

Lower the cost through economy of scale

"Do it yourself" solution for Quick Bottom-up

SG05 Q14, low-cost green telecom infra. for rural, developing countries

SG15 Q16 Outside plant and related indoor installation

(3) Constructing the local-needs-oriented Local NWs before connecting each other & to Global Internet