

# Improve the International Connectivity of Africa Using Existing Terrestrial Cables

China Academy of Information and  
Communication Technology (CAICT)

Chen Hui

# International Connectivity is the Need for ICT Development

- Shortage of international Internet connections is an important factor restraining the development of Internet, and social and economic development.
- Currently, submarine cables are the main means for connecting to international Internet, however, many countries have no landing sites of submarine cables.

**Among 64 countries in the Asia and Pacific regions, only 29 countries have access to submarine cables. For the other 35 countries, either they are landlocked countries or can not afford the cost of submarine cables.**



- ESCAP reported that, countries with submarine cable sites usually enjoy a cheaper, more rapid high-quality Internet connections, but the landlocked countries didn't fully benefit from the Internet broadband.



- Terabit Consulting research found that, the lack of Internet connectivity is causing great digital divide between ASEAN member states.

# Most International Internet Traffic Are Carried By Submarine Cables while Terrestrial Tables Are Not Fully Utilized

- 1、 95% of international Internet traffic is carried by submarine cables
- 2、 Only 5% of international Internet traffic is carried by terrestrial cables

**Challenge of International connectivity using submarine cables**



## Advantage of submarine cables

- 1、 Some countries can only be connected by submarine cables
- 2、 Avoid the lower connectivity among countries caused by uneven development of ICT.



**High construction cost**



**Difficult to operate and maintain**



**Single route**



**Long Detours**

# The Status Quo in the Utilization of Terrestrial Cable

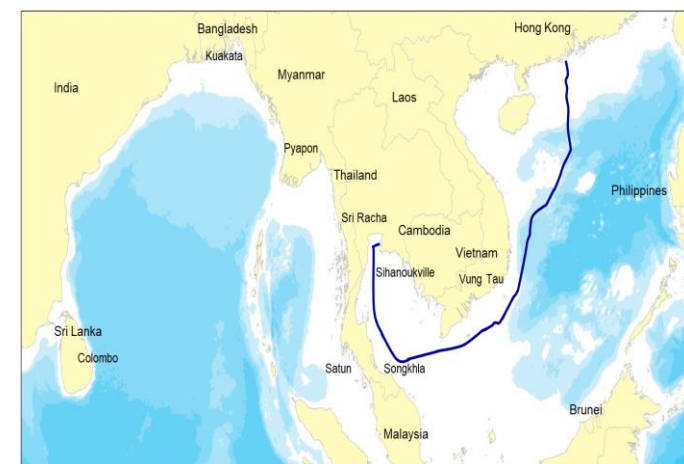
- Terrestrial cables is not fully utilized because different countries have different standards for charging international circuits' transit



- land-locked countries have difficulty in accessing to international communications



- Many countries can not access to the Internet in an affordable price



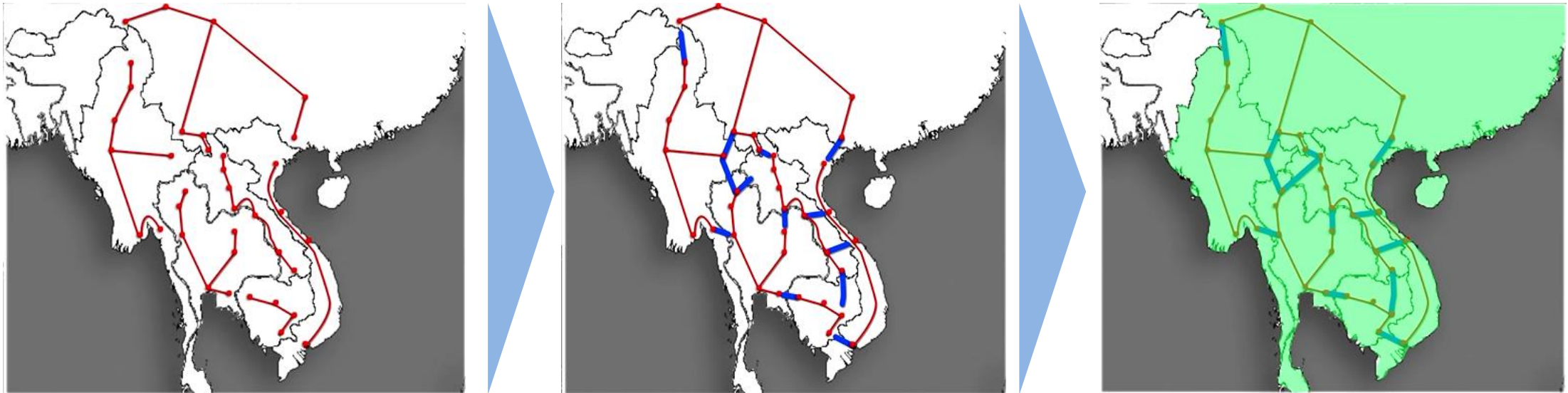


# Advantages for Terrestrial Cable



# The Advantages of Trans-multi-country Terrestrial Cable (1)

- By connecting the domestic backbones with dispersed trans-border terrestrial cables, we can establish large-capacity international terrestrial cable networks that can cover **each region, continent and even the whole world.**



## The Advantages of Trans-multi-country Terrestrial Cable (2)

- **Increase the capacity of the existing transmission channels between countries, especially for those land-locked ones.**
- **Increase the traffic flowing on the submarine cable** because more inland countries can reach submarine cables in an affordable price and get connected to other countries through submarine cable.
- **Reduce the cost of international connectivity,** it fully utilizes the existing domestic backbone transmission networks of each country.



# Problems Facing the Use of Existing Terrestrial Cables

The existing terrestrial cable resources are effectively utilized only between two neighboring countries



When a third or more countries are involved, these resources can not be fully used due to over-charging for the transit services by the intermediate countries.



Large quantities of existing domestic terrestrial cables fail to be utilized in carrying the traffic of international trans-border service.



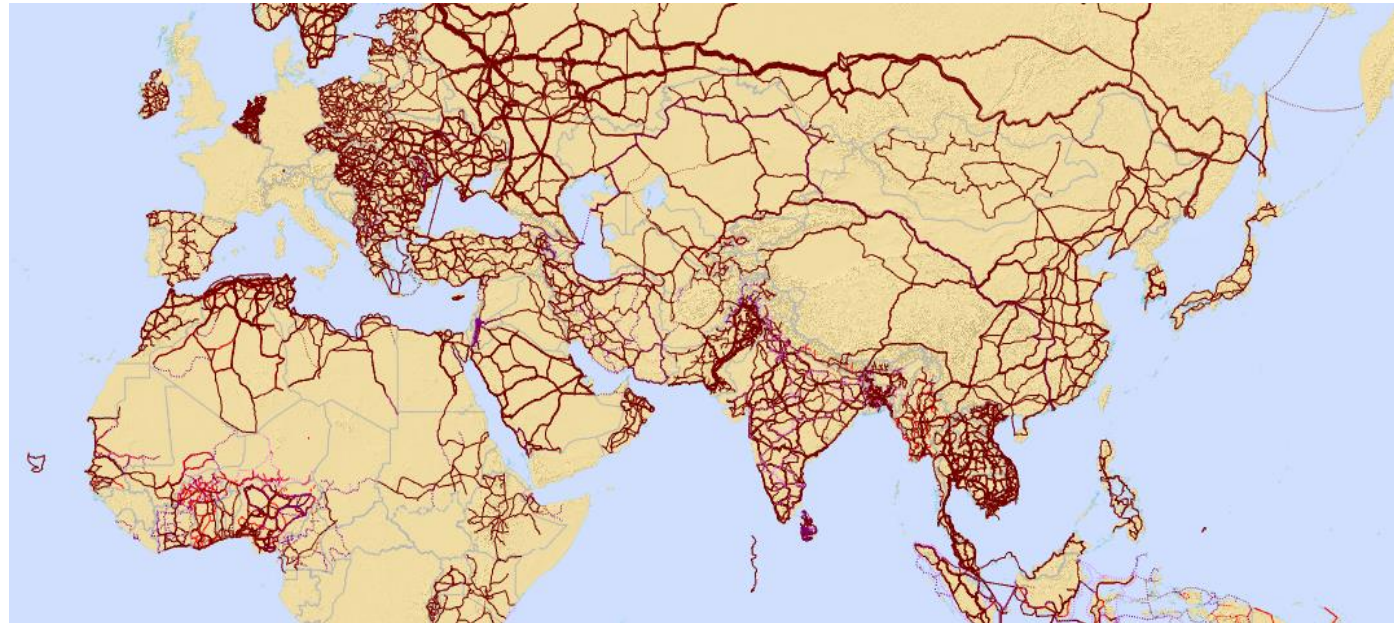
# The High Cost of Transit Charge of the Third Country



# Readiness for Increasing the International Connectivity by Terrestrial Cable

- Most countries in the world have built their own domestic backbone optical networks.
- Cross-border terrestrial optical cable systems are already established between neighboring countries and can be utilized to improve the international connectivity among different countries in the world.

## Global Terrestrial Optical Cable Map



Source: ITU

# Need for Exploring New Charging and Operational Model for International Terrestrial Cable Systems

- **Lack of feasible charging and operation models for trans-multi-country terrestrial cables.**
- **Interconnection needs the cooperation of countries and carriers along the lines:** the operation models of international submarine cables, International Through Railway Transport, international crude oil transport, and international electric transmission can be used as reference.



# Useful References in other Sectors

**The International Air Services Transit Agreement Successfully Solved the Cross-border Charging Problems of International Aviation Industry.**

more than 40 Asian & Pacific countries signed **the Inter-Governmental Agreement on Trans-Asia Railway Network and Inter-Governmental Agreement on Trans-Asia Road Network** recently, which successfully solved the problem in settlement of railway and road transportation cross multiple countries in the Asia and Pacific region .

**Intergovernmental Agreement on the Asian highway Network and Agreement on International Railroad Through Transport of Goods (2015)**

Agreement on International Railroad Through Transport of Goods has **25 member states** and the applicable scope of the agreement is **over 270000 kilometers**.

Regulations and rules on international through railway transport have been established, including **Rules for Unified Transborder Rate of International Through Railway Transport**, which provides the methods for calculating and checking transborder rates.



# Work that Needs to be done

## Develop " Standards and rules regarding the transit charges on trans-multi-country terrestrial cables "

- Connecting the existing domestic backbone networks in each country via trans-border terrestrial cables to form an international terrestrial cable network that reduces the cost and increases the efficiency.
- The traffic carried by the submarine cables is increased with more and more inland countries connected to the submarine cables
- Large quantities of spare domestic terrestrial cables can be used in carrying the International Internet traffic and maximize the utilization of spare domestic backbone networks of many countries.



# Study Undertaken by ITU-T SG3 Q.13

## **Name of the Newly Established Study Question 13 of ITU-T SG3**

Study of Tariff, Charging Issues of Settlements Agreement of Trans-multi-country Terrestrial Telecommunication Cables

## **Link of the Newly Established Study Question 13 of ITU-T SG3**

<https://www.itu.int/en/ITU-T/studygroups/2017-2020/03/Pages/questions.aspx>

## **Tasks of Q.13 of ITU-T SG3**

To study and develop Recommendations and guidelines, as appropriate, regarding the policy, tariffs, charging and economic aspects of trans-multi-country terrestrial telecommunication cables.



# Study of Q.13 of ITU-T SG3 is Crucial for Promoting the International connectivity of African Countries

## **Study Items of Q.13 of ITU-T SG3**

1. Identify difficulties facing the deployment of trans-multi-country terrestrial telecommunication cables and demands of all parties concerned;
2. Identify various issues/aspects related to the policy, tariffs, charging and economic aspects of trans-multi-country terrestrial telecommunication cables;
3. Study and develop Recommendations and guidelines, as appropriate, regarding the settlement agreements of trans-multi-country terrestrial telecommunication cables.

**Contribution is Welcomed and Can now be Submitted to This New Study Question 13**

# Progress at the ITU-T SG3 Rapporteur Group Meeting for Q.13

Two work items under Q.13 were proposed and agreed at the RGM. The proposed work items will be submitted to the next ITU-T SG3 meeting (April, 2018).

## ◆ Proposed new work item on study for charging and accounting settlements in trans-multi-country terrestrial cable circuit

### Scope:

The study aims to identify charging and accounting settlement challenges pertaining to trans-multi-country transmission circuit, especially excessive transit costs. Relevant difficulties will be analysed and options identified which could facilitate the utilization of spare domestic terrestrial cables to carry international trans-border traffic. It will also study how the combination of terrestrial and submarine cables will improve international connectivity around the globe as per case studies and solutions.

## ◆ Proposed new ITU-T Recommendation on the model of trans-multi-country terrestrial cable resource sharing

### Scope:

This new work item is intended to develop a “model of trans-multi-country terrestrial cable resource sharing” to provide a solution to the problem faced by landlocked countries in accessing the international internet.

The purpose of the model is to enhance the access to international internet for all countries involved through sharing of their cable resources among each other, in particular for the benefits of landlocked countries.

# Progress at the SG3RG-AFR

## C78: Support for the New Work Items under Question 13 – Terrestrial Trans Multi Country Terrestrial Cables by Zambia.

- ◆ This contribution calls on Member States to support and contribute towards the proposed new work items to study charging and accounting settlements in Trans-multi-country terrestrial cable circuits as well as to develop a model of trans-multi-country terrestrial cable resource sharing as per the outcomes of the Rapporteur Group Meeting for Question 13/3 held in November 2017.
- ◆ Member States are further called upon to consider developing a regional recommendation on the topic of trans-multi-country terrestrial cables with a view to adopting a mutually beneficial model of trans-multi-country terrestrial cable resource sharing for the Region.

The case studies and observations from African countries, in particular those landlocked countries, is of great significance to the study of Q 13.

**We welcome your contributions to Q 13 and value your support!**





**Thank You !**