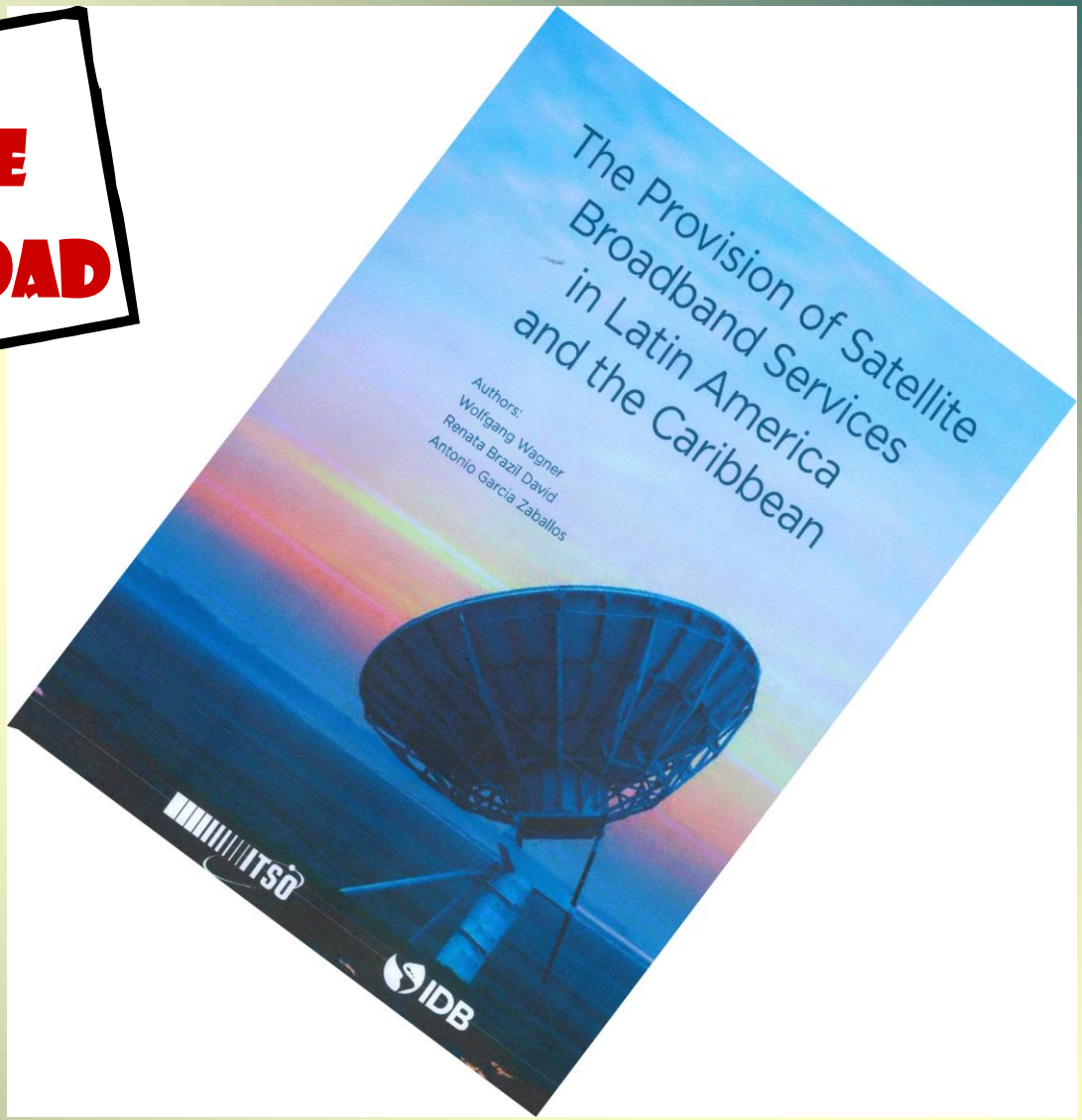
ITSO SYMPOSIUM

SATELLITE BROADBAND

Wolfgang Wagner



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Jack of all trade…

Challenge & Opportunity:

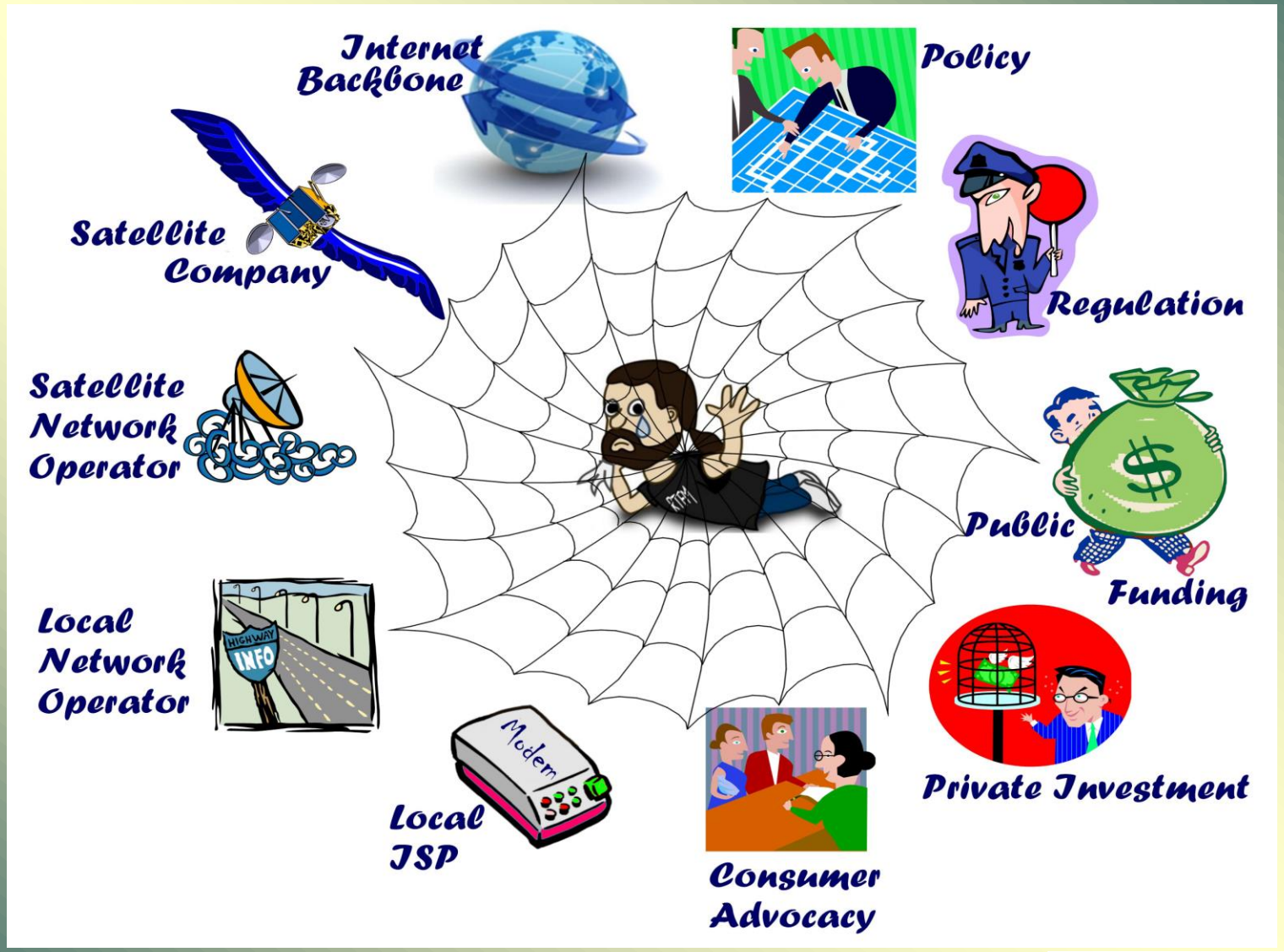
TARGET AUDIENCES

ITSO

Telecommunications Community

IDB

Financial Decision Makers
Political Decision Community
Non-technical Audience


Internet Backbone
Policy
Satellite Company
Regulation
Satellite Network Operator
Public Funding
Local Network Operator
HIGHWAY INFO
Modem
Local ISP
Private Investment
Consumer Advocacy

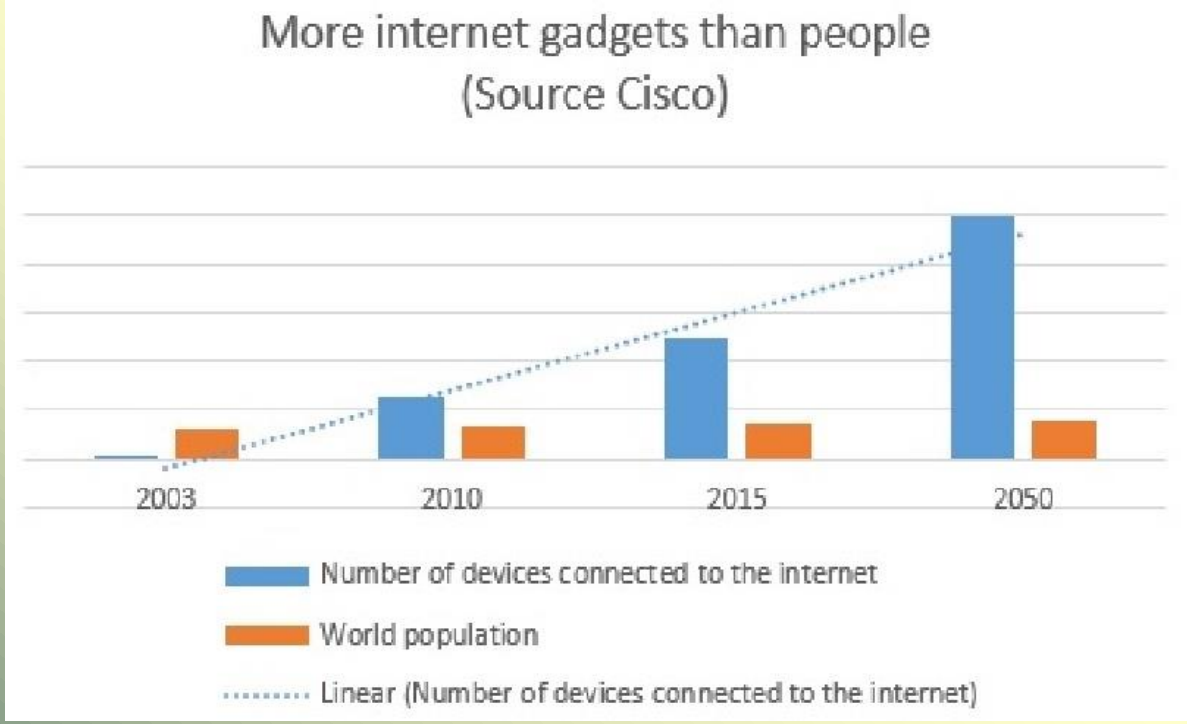
Mission:

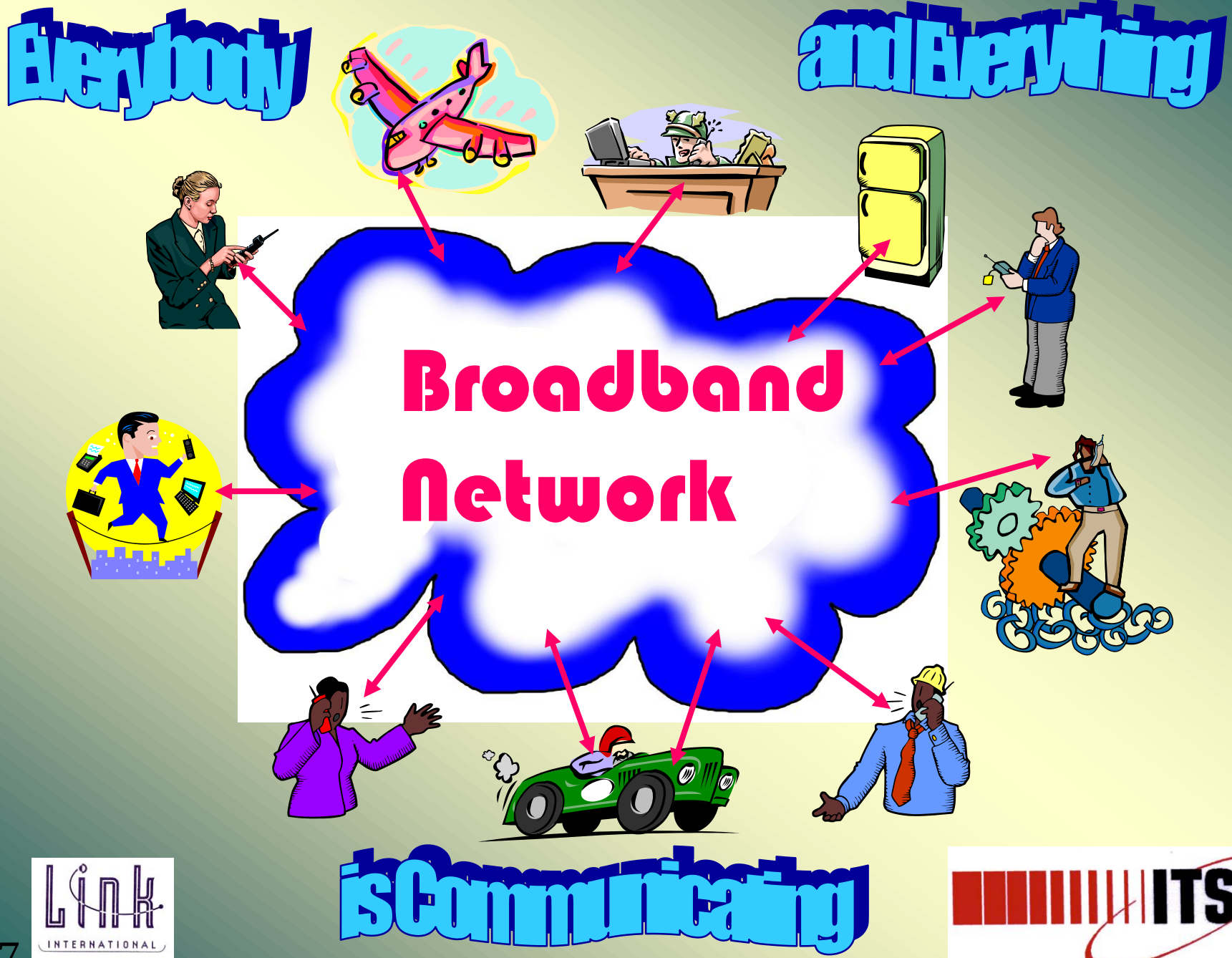
- Address the prejudice with non-technical decision makers that broadband services can only be delivered by fiber optic systems.

- Advocate the role of telecommunications satellites as a crucial part of holistic network designs for rural broadband customers.

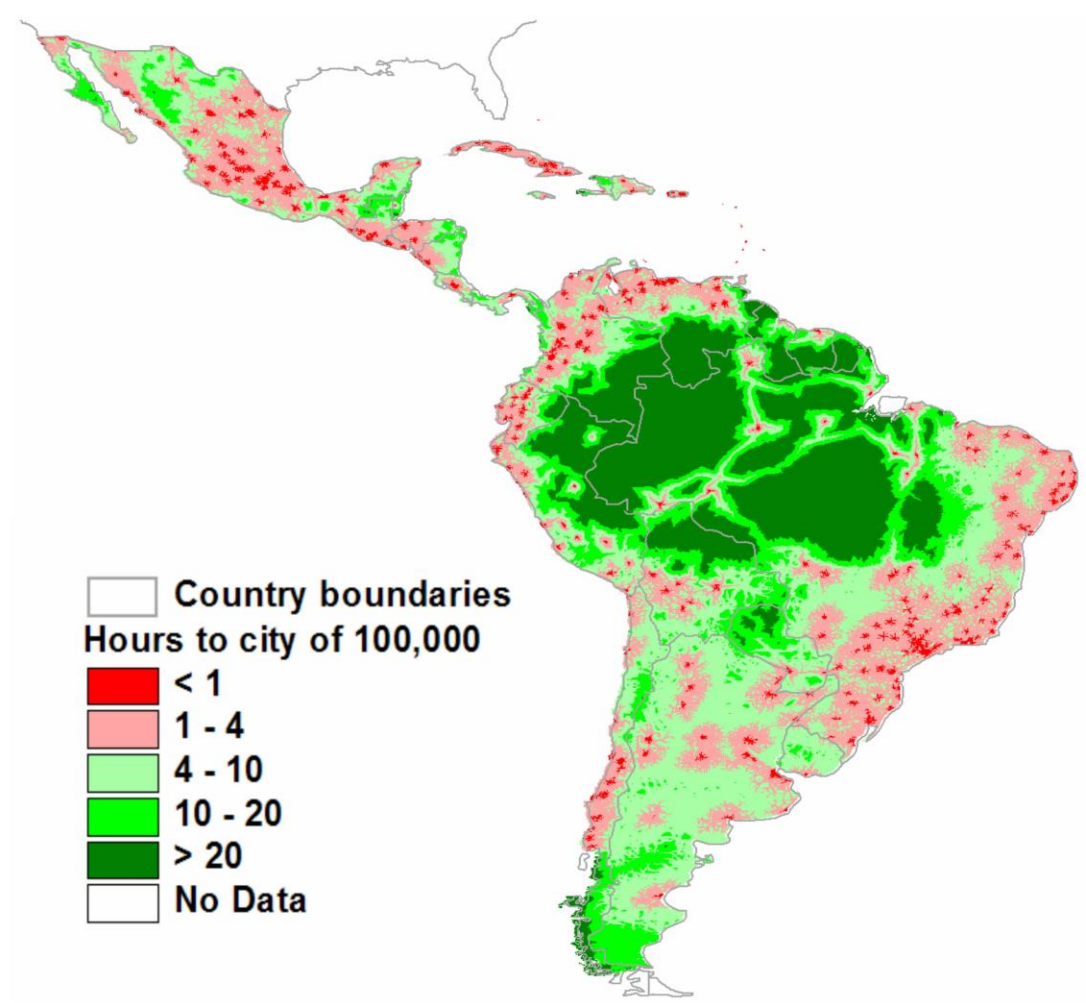
A Seemingly Random Fact?

Since about 2009, more devices are connected through the Internet than people.



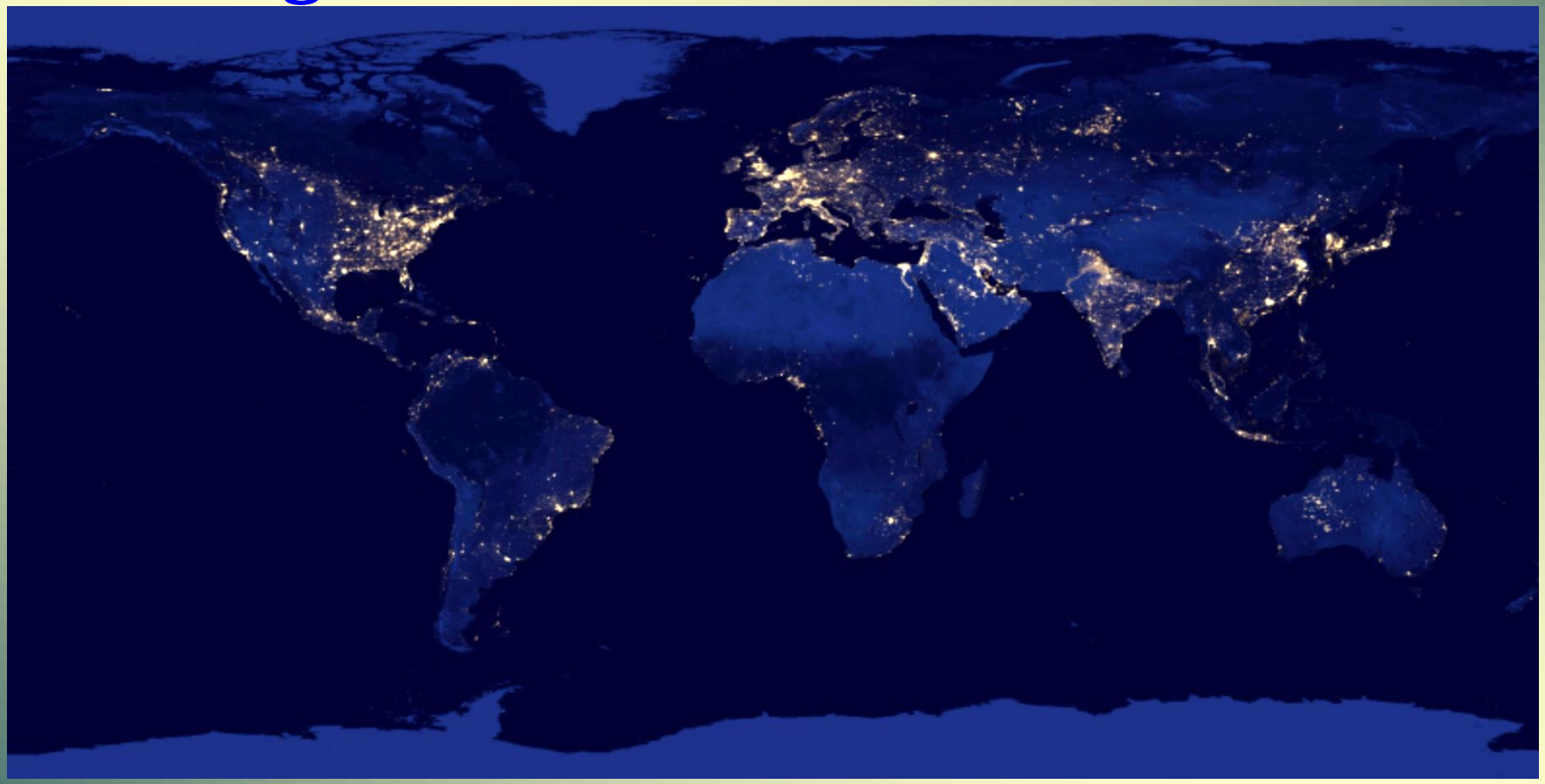

Everybody
and Everything
Broadband
Network
is Communicating

…but who is left on the sidelines?



Source: World Bank

Left on the Sidelines:
The Digital Divide in Rural Areas



The Crux

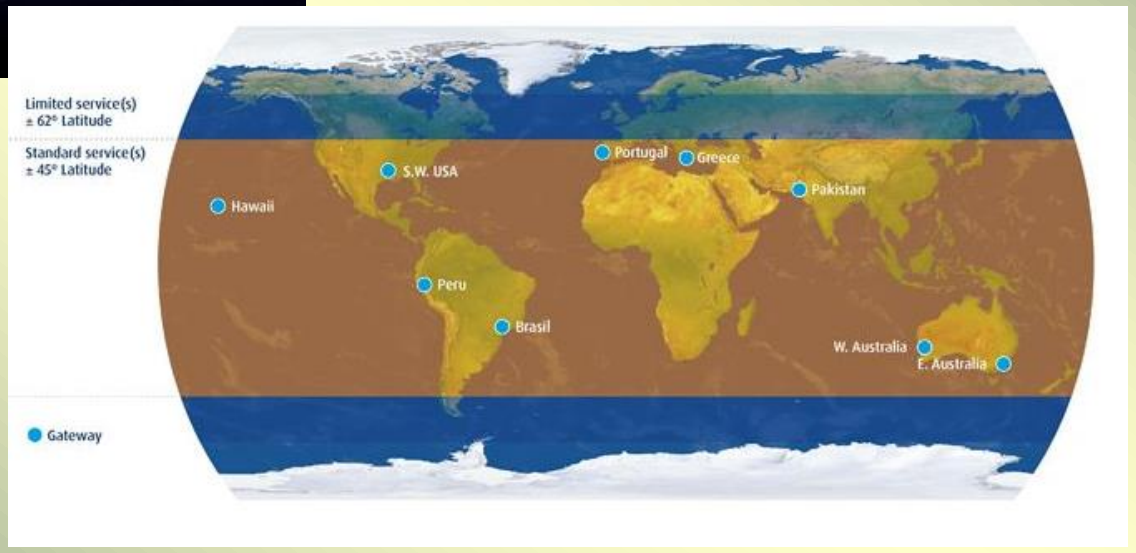
Using presently available technology, broadband service can be brought to any place on earth.

The crux is:

- **at what cost?**
- **can it evolve into a sustainable business for a given community of users?**

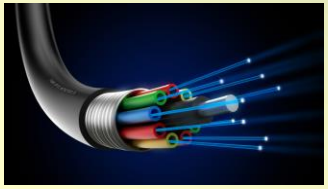
The Principles of Satellite Broadband

The O3b Constellation System

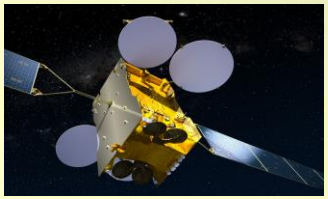


THE PRINCIPLE TRANSMISSON MEDIA FOR BRODBAND NETWORKS

Fiber Optic Cables



Satellite Links



Terrestrial Microwave Links

Including

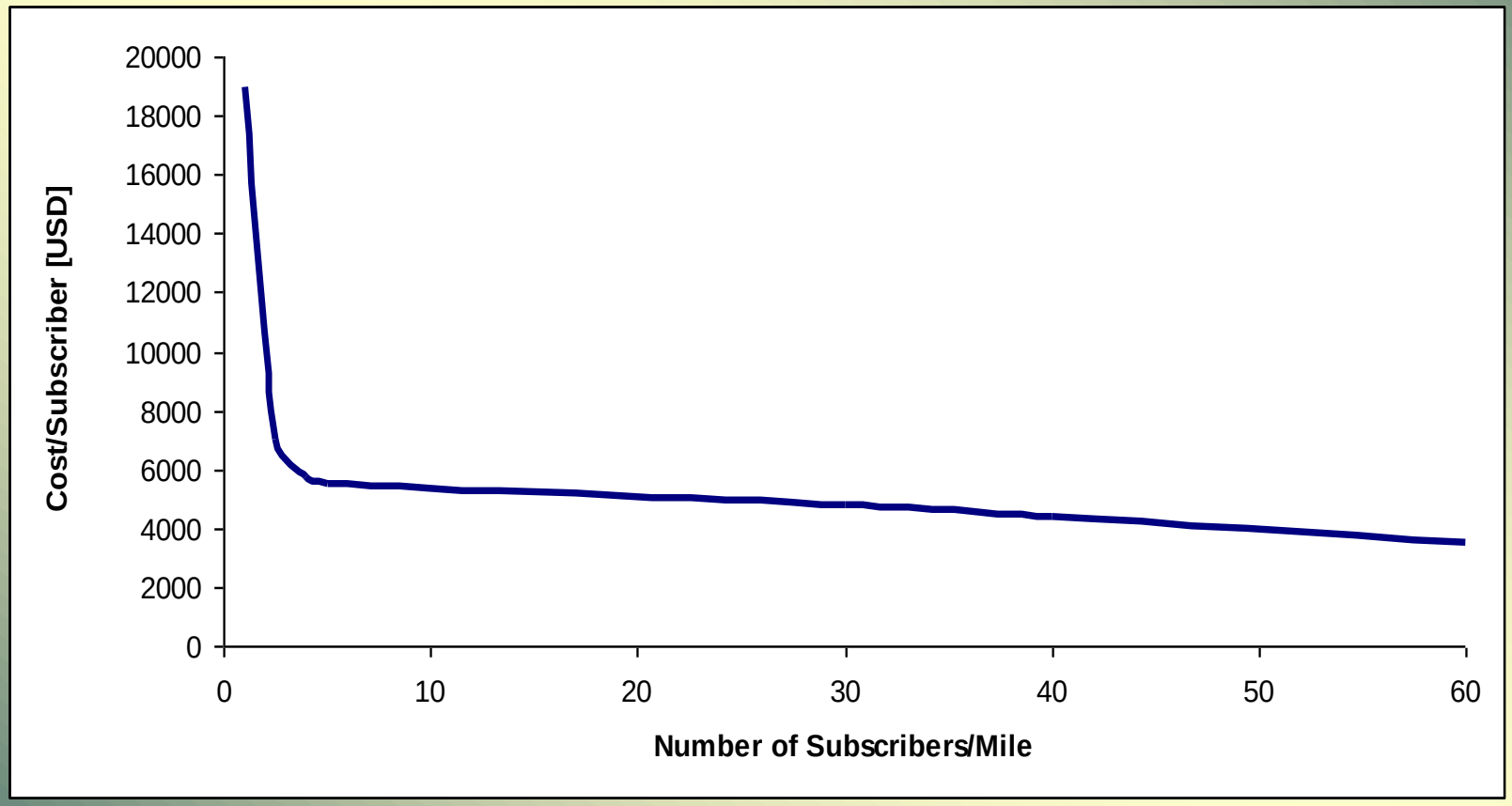
- Relay Links
- WBA
- WiFi
- Cellular/Mobile

The Choice between Broadband Technologies:
Pros and Cons of Cables

+ Unsurpassed Transmission Speed
+ Long Design Life
+ Low Electromagnetic Interference

- Distance-dependent CAPEX and OPEX
- Long Lead Times to Deploy
- Possible Disruption

Pros and Cons of Cables

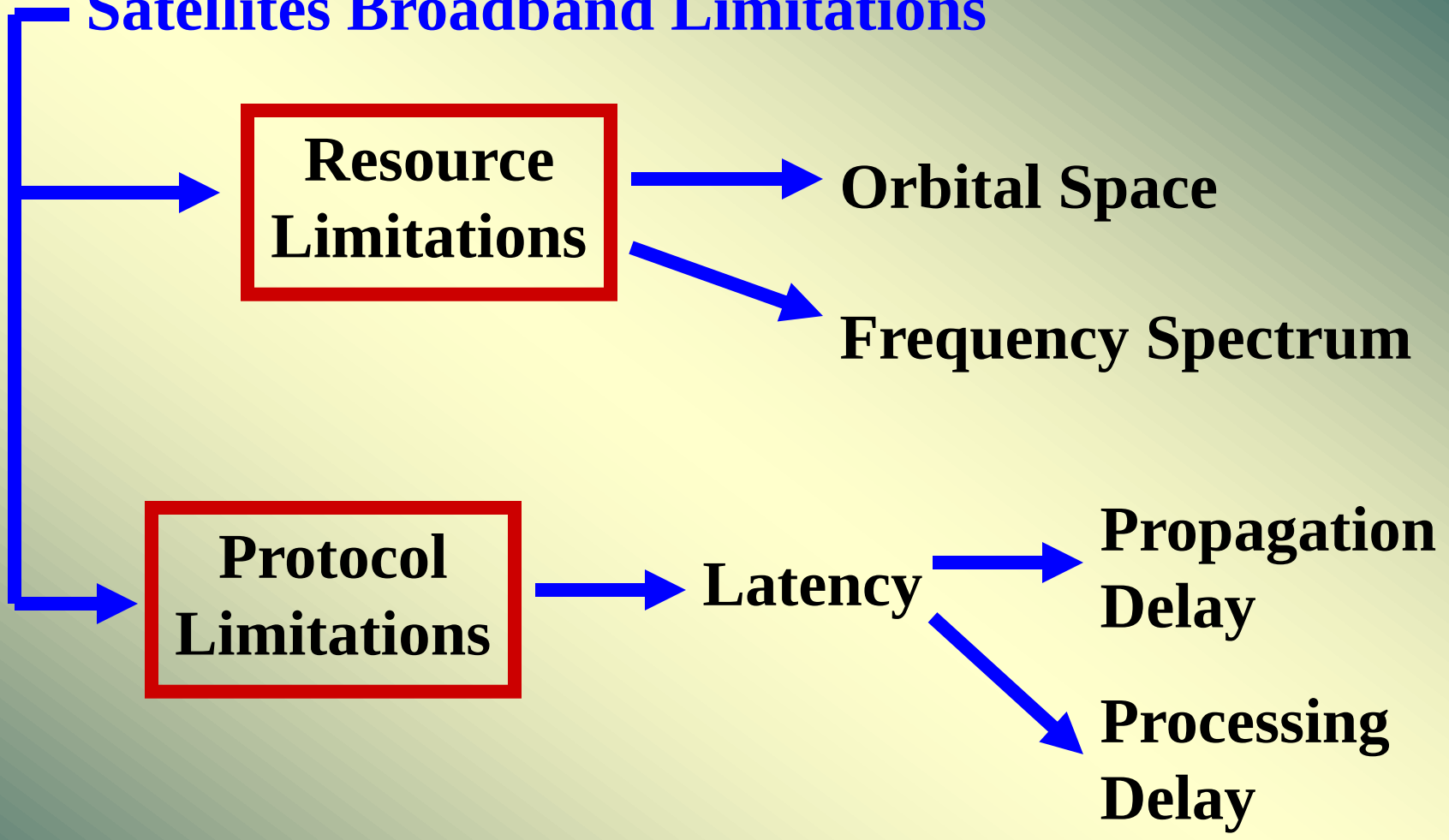


The Choice between Broadband Technologies:
The Pros and Cons of Satellites

+ Generic multi-point capability
+ Distance-independent CAPEX and OPEX
+ Fast Implementation
+ Low Risk of Interruption

- Lower Transmission Speed than Cable
- Potential Resource and Protocol Limitations

Satellites Broadband Limitations



Quintessence:

- **Use the pros of each transmission Technology while avoiding the cons.**
- **Communicate what you are proposing and why to the decision makers.**

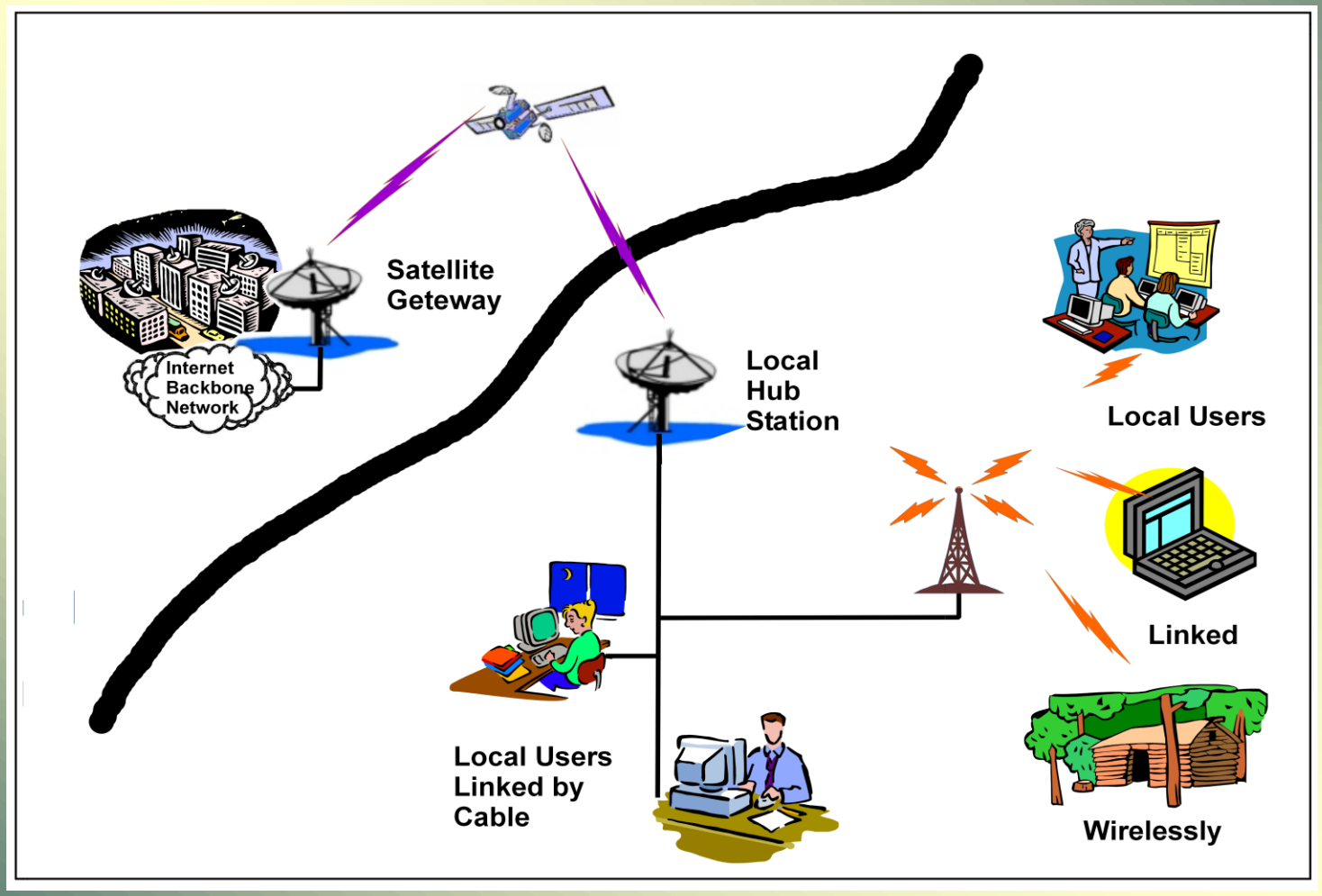
Scenario 1:
Densely Populated Urban/Suburban Area

Characteristic Precondition:	**Distance to existing service provider facilities and the Internet backbone is short. The area is generally already served with broadband.**
Connection of ISP to the Internet backbone:	**Existing fiber optics.**
End User Access Alternatives:	**Fiber Optic Cable** **Broadband Wireless Access** **Cellular Wireless Systems**

Scenario 2:
Remote Village

Characteristic Precondition:	**Remote village, larger settlement, or cluster of houses with no broadband access.**
Connection of ISP to the Internet backbone:	**Satellite feeder link to local hub.**
End User Access Alternatives:	**Broadband Wireless Access (BWA)** **Direct (Consumer) Satellite Broadband**

Scenario 2: Remote Village Network

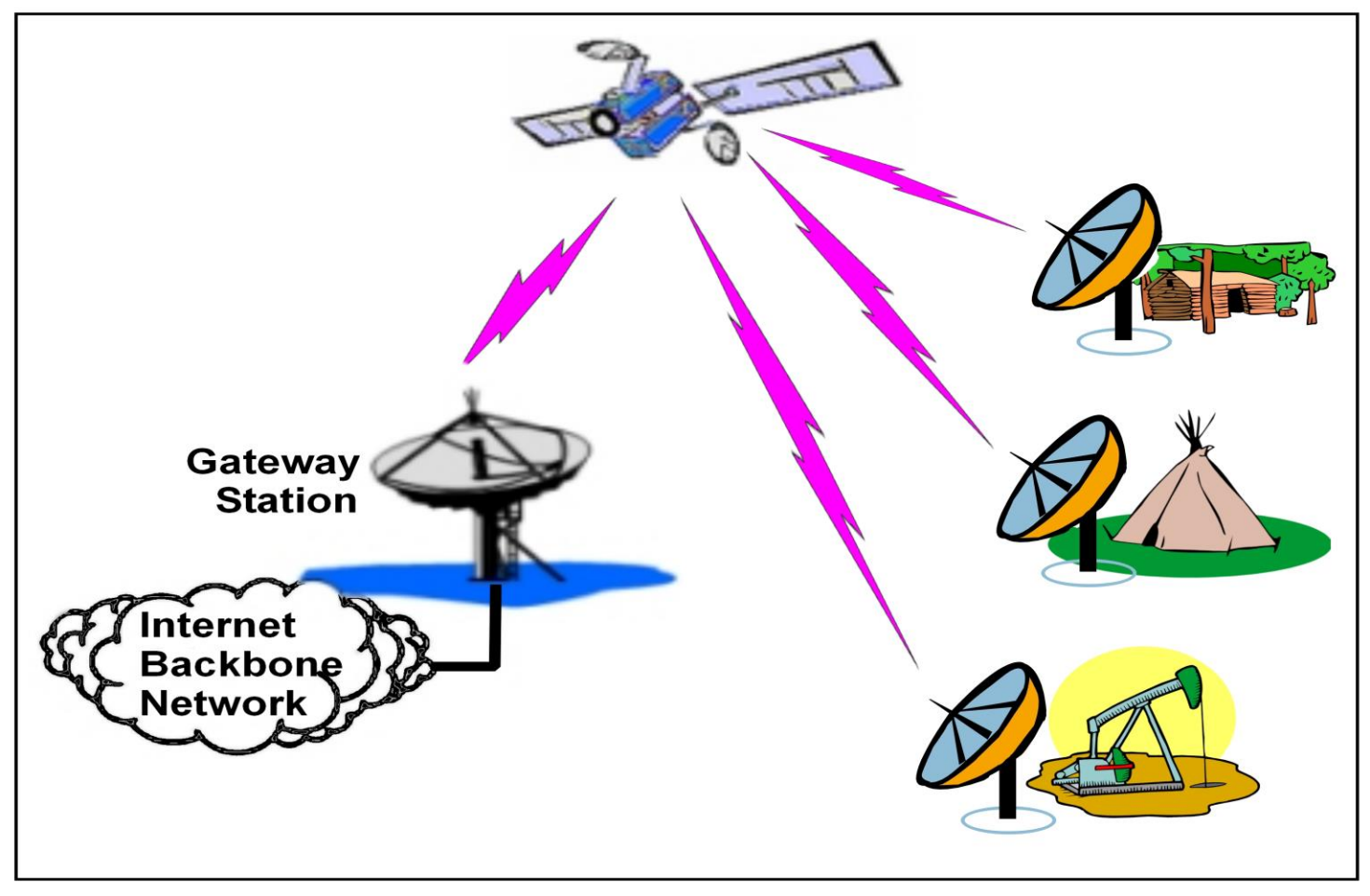


Scenario 3
Widespread Remote Settlement

Characteristic Precondition: **Very remote, widespread settlements, no distinct sizable clusters, native villages, single farms, natural resources sites, etc. No, or only rudimentary telecommunications exist.**

End User Access Alternatives: **Direct (Consumer) Satellite Broadband**

ITSO Model 4: Widespread Remote Settlement



Implementing Rural Broadband Systems:

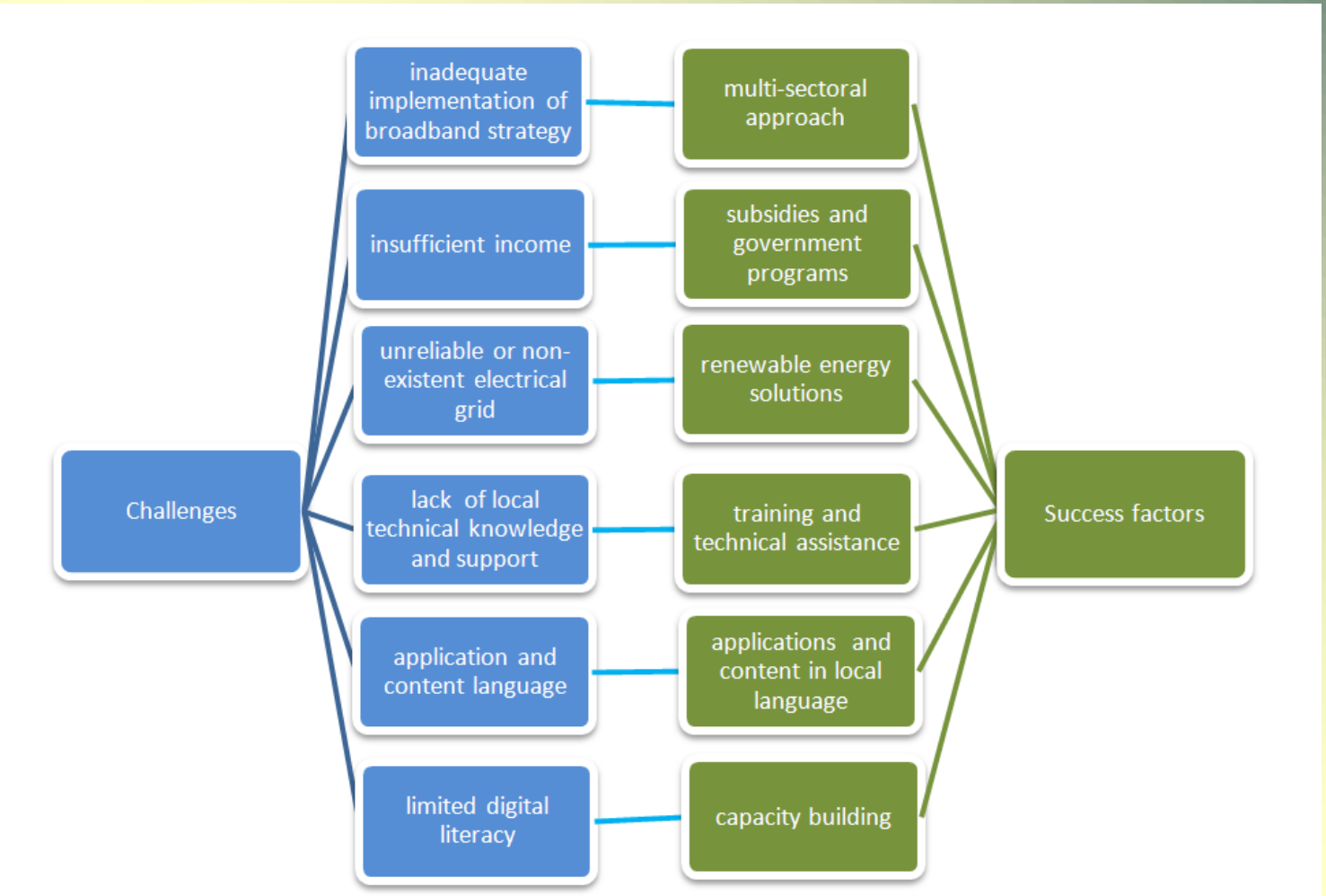
Because of a small and poor customer base, rural Broadband is not a profitable business.

Making Rural Broadband Economically Viable

- **Tax incentives**
- **Government Subsidies**
- **Pilot Project Funding**
- **Universal Service Funds**

Implement incentive policies that are attractive to service providers and infrastructure owners.

Rural Broadband Success Factors:



ITSO Satellite Broadband Checklist (a)

- Acknowledge the specific and urgent need for taking services to rural populations, and strongly reflect it throughout government policy and regulation.

- Identify rural, remote and low population density communities that need broadband coverage and cannot be served by terrestrial media.

- Include and consider satellite broadband as a readily available alternative, and make it an integral part of any National Broadband Plans.

- Identify region-wide needs and develop projects amongst or covering countries that are on the same satellite coverage footprint and are therefore able to share capacity.

- Acquire unbiased, professional, technical, financial and management expertise to develop and implement a holistic, optimized network design to be applied on a case-by-case basis, and inclusive of the specific rural customer requirements.

ITSO Satellite Broadband Checklist (b)

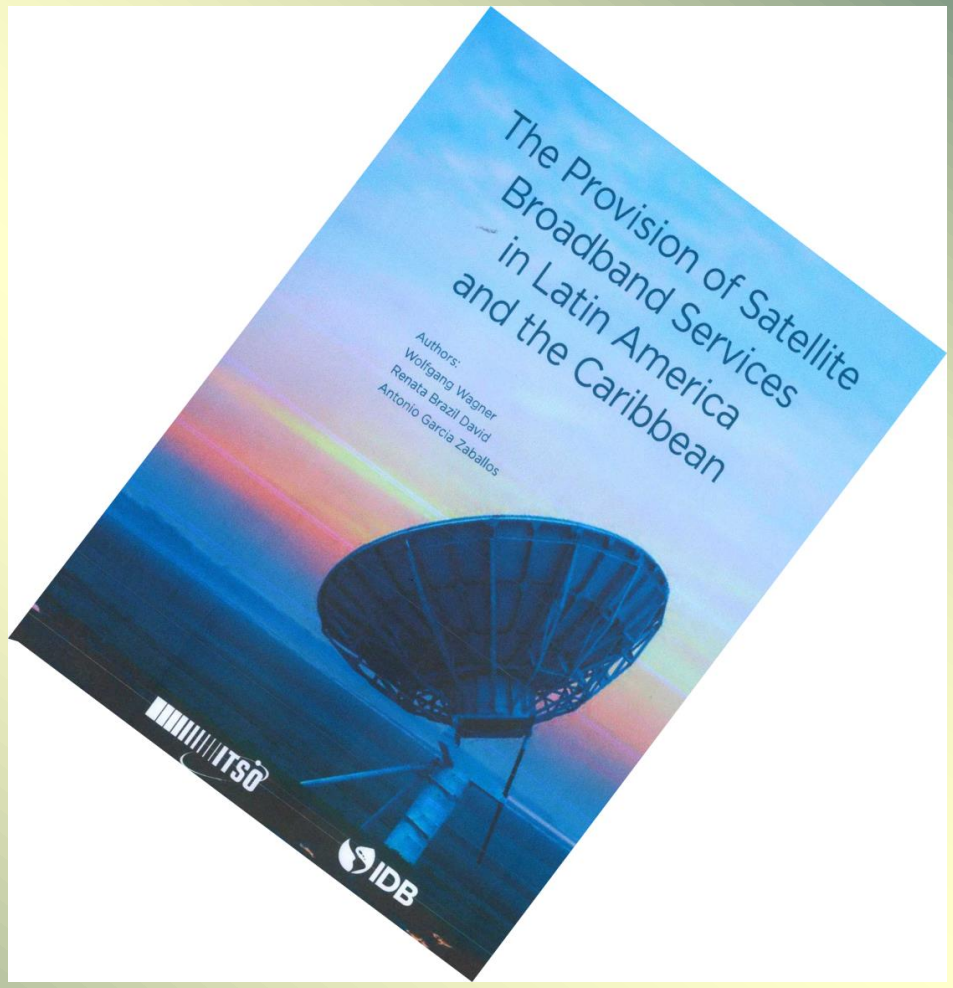
- Consider new technologies which have recently becoming available specifically for the future broadband markets, such as High Throughput Satellites (HTS), and Medium Earth Orbit systems like O3b.

- Consider, define and implement financing policies for broadband services in rural and remote areas, such as Universal Service Funds with a specific inclusion of broadband, tax incentives, direct government funding for pilot projects and CAPEX subsidies for equipment procurement.

- Identify and enter into potential partnerships with international organizations, multi-lateral development banks and satellite operators for specific projects.

- Create demand for broadband services by making services affordable, increasing digital literacy and ensuring that there is relevant local content available.

Jack of all trade…



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