International Internet Connection(IIC) Cost : in aspect of Bangladesh

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Introduction

Per Capita Income $1,314

GDP Size $170 Billion

GDP Growth 6.51 %

Life Expectancy 71 Y

Self Sufficiency in Food Grain

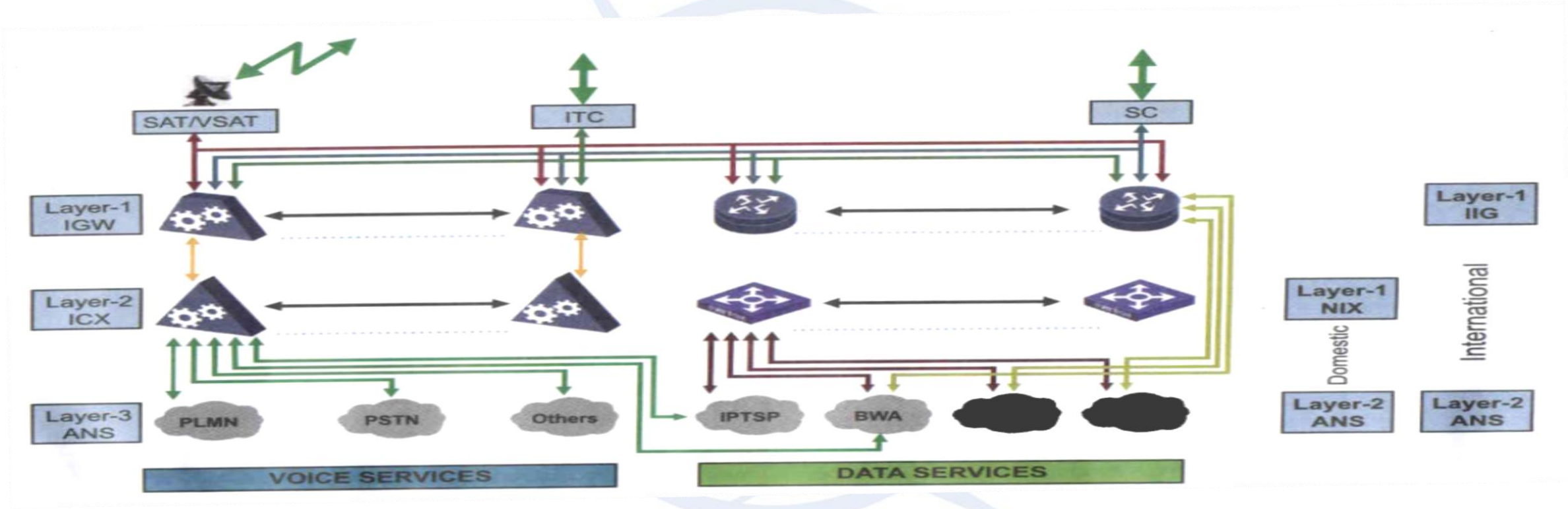
One of the N11 Countries (Goldman Sachs)

A brief Introduction to the Telecommunication/ ICT Scenario in Bangladesh

Governing Policies/ Acts

- National Telecommunications Policy 1998 (amended in 2012)
- The Bangladesh Telecommunication Act 2001 (amended in 2010)
- ILDTS Policy 2007 (As amended in 2010)

National Network Topology



ILDTS Policy 2010

Telecommunication Infrastructure

ILDC

Sl.	Operator	No of Operators
1	Submarine Cable	1
2	International Terrestrial Cable (ITC)	6

National Infrastructure

Sl.	Operator	No of Operators
1	Nationwide Telecommunication Transmission Network (NTTN)	5

Operators in different Layers

Voice

Data

Layer – 1

Sl	Operator	No.
1	International Gateway	25

Sl	Operator	No.
1	International Internet Gateway	37
2	National Internet Exchange	2

Layer - 2

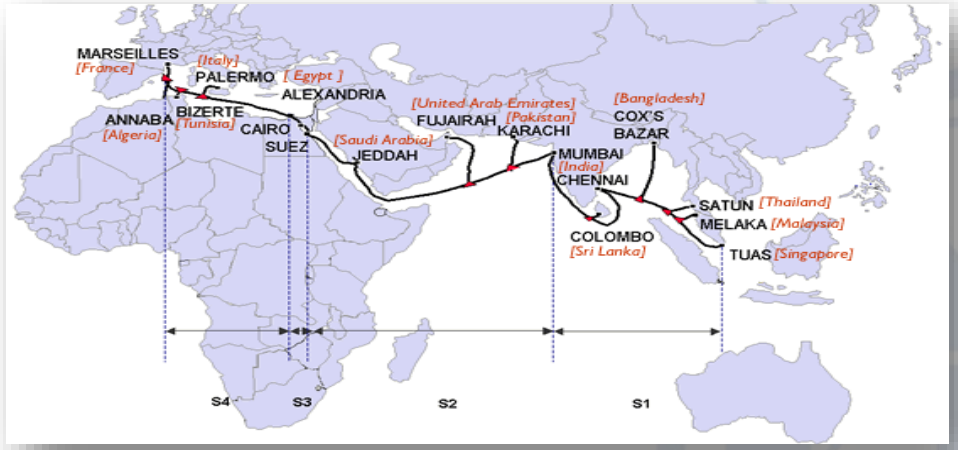
Sl	Operator	No.
1	Interconnection Exchange	26

Sl	Operator	No.
1	ANS (ISP, BWA, 3G)	-

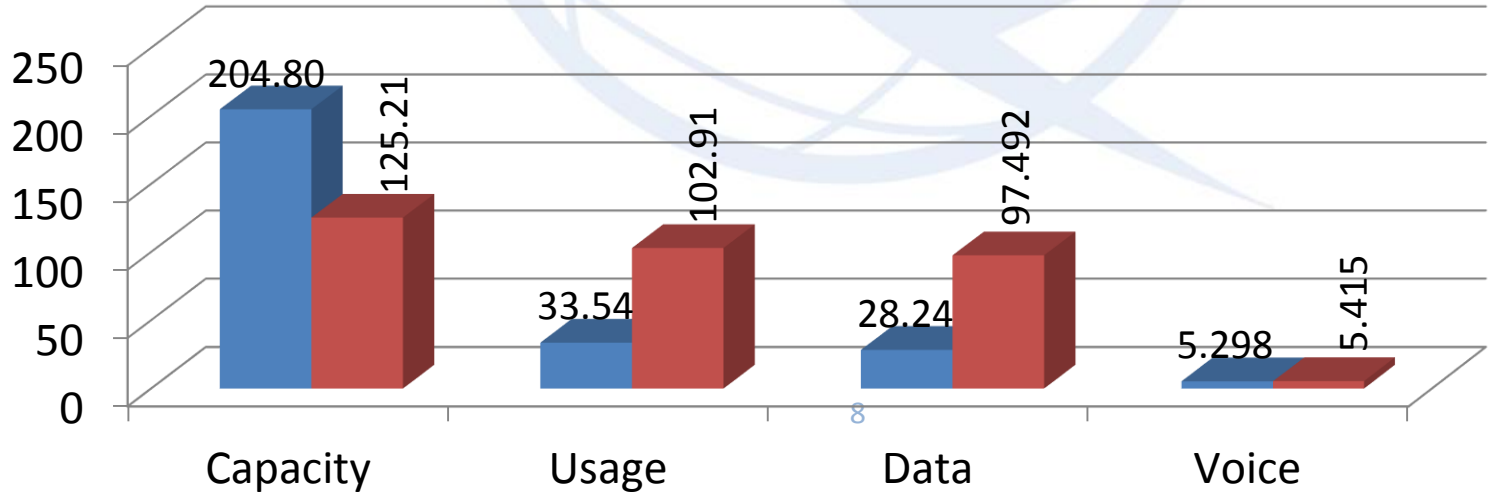
Layer - 3

Sl	Operator	No.
1	ANS (PLMN, PSTN, IPTSP, BWA)	-

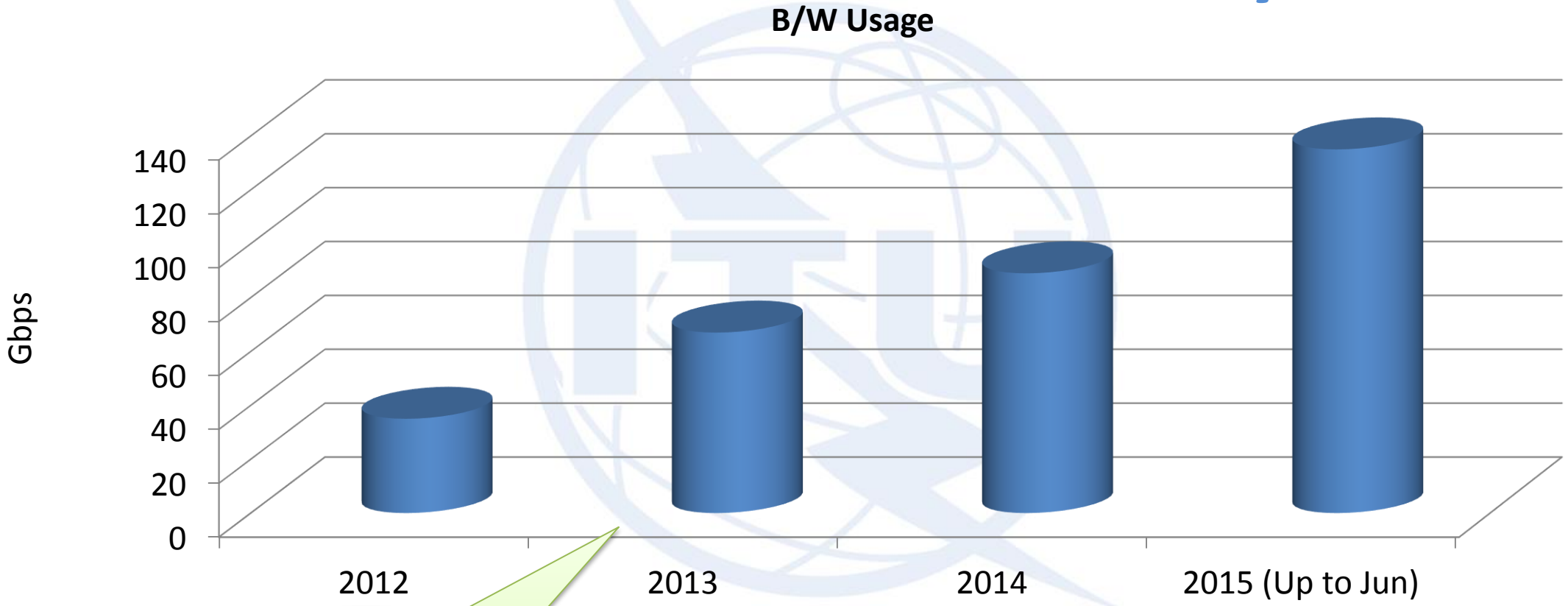
Connectivity with the World



- BSCCL (SEA-ME-WE-4)
- ITC (6 Operators)



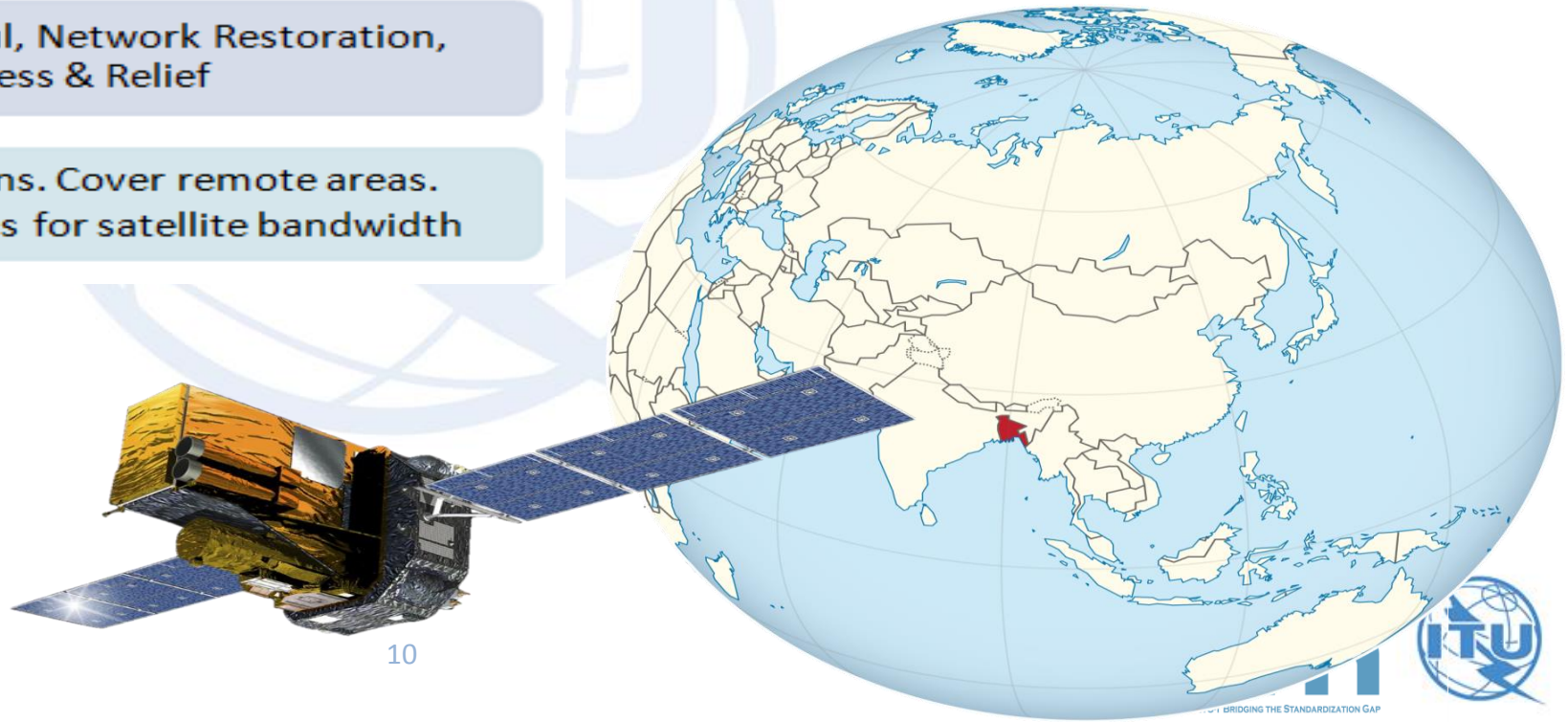
International Connectvity



Connectivity with the World

Coverage	• Bangladesh, Neighboring Countries, South East Asia, Europe, MENA, and East Africa
Capacity	• 1600 MHz
Services	• DTH, VSAT, Backhaul, Network Restoration, Disaster Preparedness & Relief
Vision	• An alternative means. Cover remote areas. • Meet regional needs for satellite bandwidth

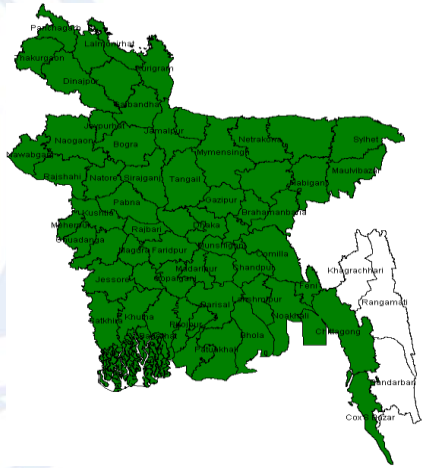
Bangabandhu Satellite Project

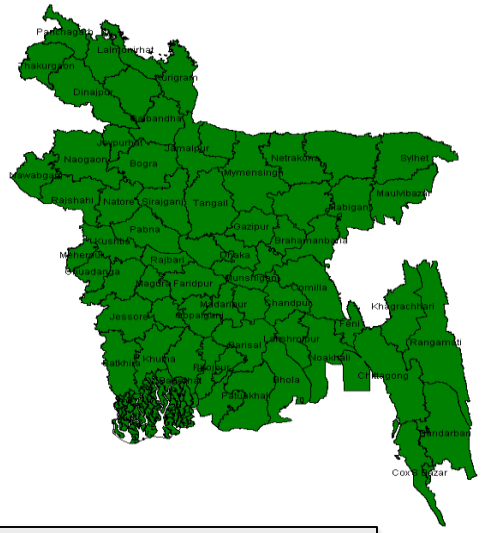


Expected to be launched in 2017

Network Coverage

1997	2000	2002	2004	Present
3 Districts	**30 Districts**	**50 Districts**	**61 Districts**	**All Districts**





99% of Population and
98.5% Geographical Area is under Telecom Network

Data/ Internet Services

Data/ Internet Services

BWA

- 3 Operators

ISP

- 482 Operators

Internet 30.62% **Density**

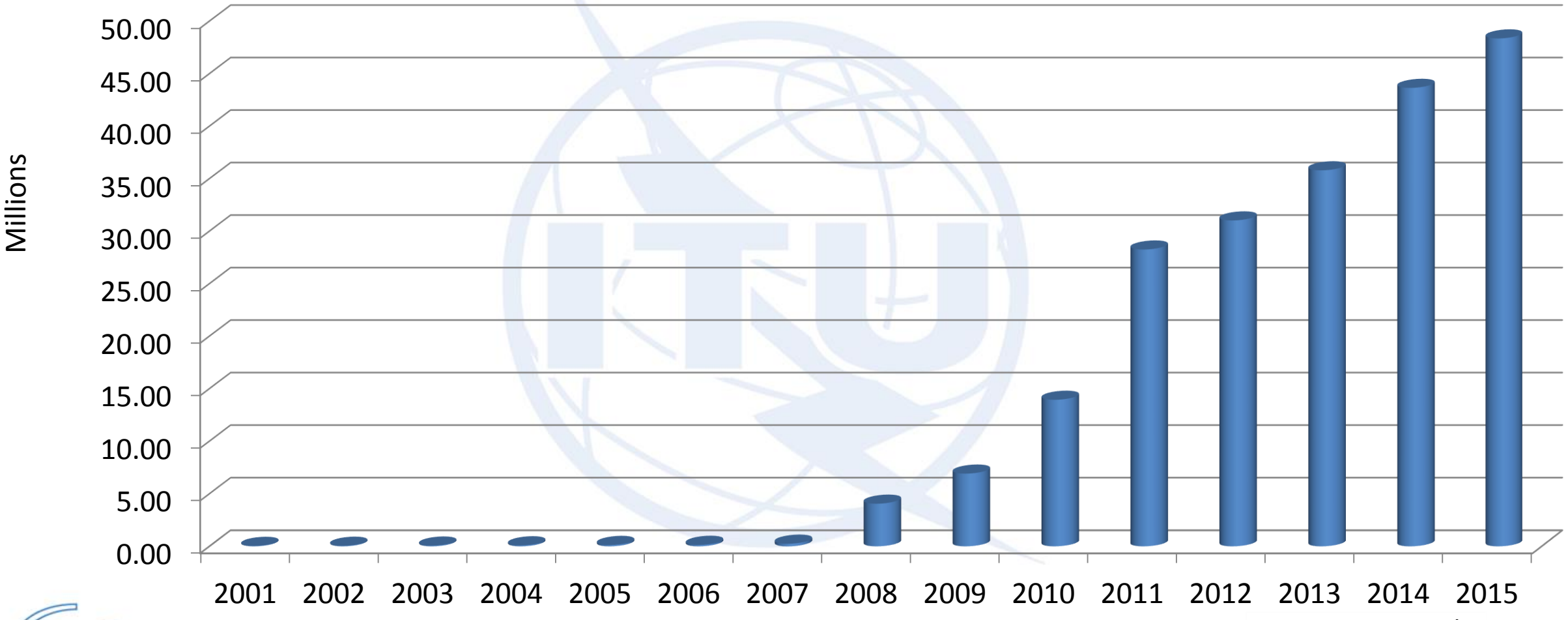
MNO (3G/ EDGE/ GPRS)

- 6 Operators

PSTN

- 4 Operators

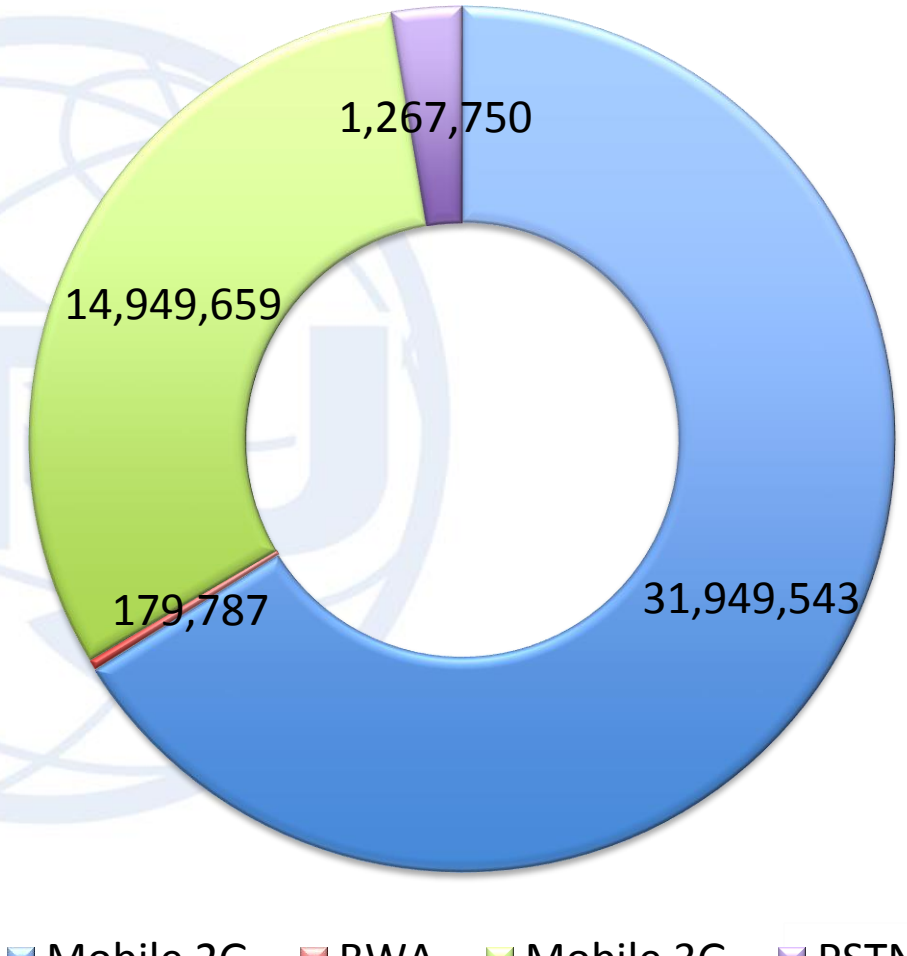
Internet Subscriber Growth



Internet Subscribers

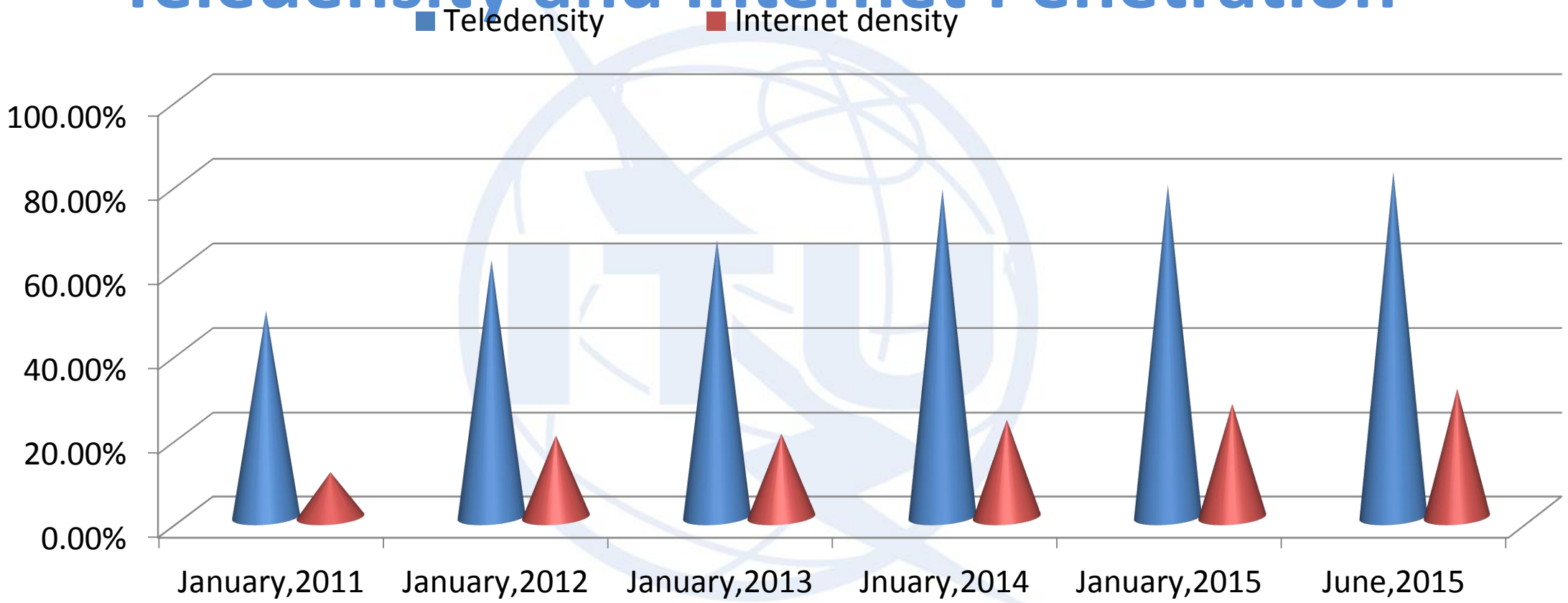
Internet Subscriber
48.35 M

Broadband Subscriber
16.4 M



3G Subscriber Growth

Teledensity and Internet Penetration



OFC Connectivity/ Transmission

National Connectivity

Number of Operators	OFC Length
5	47,876 k.m.

Covered Divisional HQ	Covered District HQ	Covered Upazilla HQ
All (7)	All (64)	409

Domestic Optical Fiber Network

Concern related with cost modeling of International Internet Connectivity(IIC)

Overview

- An overview of the impact of the current models of International Internet Connectivity (IIC) costs on the developing countries, and of the debate as to whether this issue requires global governance or not. This contribution paper states that the IIC problem needs a grand collaboration among all stakeholders from developing and developed countries in order to attain practical mechanisms that would allow for fair distribution of cost among all internet providers.

- As Bangladesh's IIC arrangement is kind of unique, studying this scenario will obviously provide further opportunity to fine-tune the cost-model schemes and tools of ITU-T and Bangladesh being an low-middle income country will also be benefitted from the ITU-T study and its outcome.

Introduction

- At the highest level, International Internet Connection (IIC) is provided by those companies known as T1 (Tier 1), large operators of high capacity networks. Other operators connect to a Tier 1 backbone either directly, or through other companies. The T1 providers refer to each other as “peers”, a term which organized from the premise that outbound traffic was similar to inbound, as regards the internet. Few companies are defined as T1 operators, and this enables and facilitates the commercial agreements between them. They usually have global presence, or at least they operate in number of different countries and/or continents.
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Concern regarding IIC

- International Internet Connection (IIC) costs, despite having decreased rapidly over the past few years, are still considered a major component in the pricing of internet services. The debate on IIC is not as widely known outside the industry as some other internet issues as spam and cyber security. Nevertheless, a problem exists in ensuring that each provider of connectivity is fairly compensated for handling international traffic. This happens because Internet Service Provider (ISPs) based in countries remote from Internet backbones, particularly in the developing countries, must pay the full cost of the international circuits.

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- Current cost models of IIC are based on market power without considering any public policy objectives related to internet development. Businesses of the developed world have frequently argued that market competition, local peering and infrastructure expansions shall help developing nations overcome this problem. Some developing countries such factors are reasonably achieved and yet the cost of IIC remains unchanged.

- To pinpoint the source of the challenge, the price comparison was drawn between the local, regional and international costs for STM-1 and STM-4 capacities. It was apparent form from the comparison that the cost of cross border capacity was insignificantly lower to that of international capacity. In many developing countries it was substantially higher than that traffic exchanged at international locations. Information asymmetry can be attributed to the higher costs of International Internet connectivity costs.

- Transmission of Internet traffic between countries is, at the highest level, that there is neither transparent nor uniform as to how the costs of providing Internet access and Internet content services are allocated among the Internet service providers (ISPs) who incur costs in providing those services or who derive revenue from them. This issue manifests itself in a perception that the net distribution of costs and benefits arising from provision of Internet access and Internet content services does not reflect either the distribution of value or the distribution of investment.

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- The business model and technical characteristics of the Internet are such that to date, only two stable interconnection models have emerged. They are:
- **Sender-keep-all:** This usually applies when two ISPs agree that the value of connecting their networks is roughly equal and they therefore interconnect on a payment-free basis. Thus, traffic may be exchanged between their networks, with each bearing its own costs.
- **Customer/supplier:** This usually applies when the value of interconnection for each of two networks is disparate-for instance, when a small ISP connects to a larger ISP that operates a national Internet backbone. In this circumstance, the small ISP is the customer acquiring Internet connectivity from the larger ISP, and it pays for that service.

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- Traffic flows is open to abuse because currently, the systems and business models necessary to implement such an arrangement do not exist. A number of organizations are trying to resolve these issues. But even if the technical issue regarding traffic flows is resolved and if some form of a carriage-cost-sharing model becomes possible, there still will be no uniform business model for Internet content.

- The issue has two practical implications for Asia-Pacific ISPs: Asia-Pacific Internet users pay higher charges for international Internet connectivity than their U.S. counterparts, and Asia-Pacific Internet-based businesses have an incentive to relocate to the U.S., where global Internet connectivity is cheaper.

- Developing countries wishing to connect to the global Internet backbone must pay for the full costs of the international leased line to the country providing the hub. Once a leased line is established, traffic passes in both directions, benefiting the customers in the hub country as well as the developing country, though the costs are primarily borne by the latter. These higher costs are passed on to customers in developing countries. On the Internet, the net cash flow is from the developing South to the developed North

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- Internet connectivity and bandwidth inhibits the growth of Internet usage in much of the developing world, especially the least developed countries (LDC). One reason for this high cost is that most developing countries use international bandwidth to exchange data at a local level. “When an African Internet user sends a message to a friend in the same city or a nearby country, that data travels all the way to London or New York before going back to that city or the nearby country. However, Internet backbone providers in the developed world respond that they do not charge developing-country Internet service providers (ISP) any more than their other customers. They believe that the majority of international costs are incurred for a number of reasons, such as poor telecommunication infrastructure at national and regional levels, fewer peering and exchange points than elsewhere, and a genuine lack of competition in many developing countries.

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- The most promising option for most developing-country ISPs to connect to the global Internet is via a transit agreement signed with their upstream providers. However, because developing-country ISPs have a small customer base, the international Tier-1 and Tier-2 providers have no business incentive to enter shared-cost peering agreements with them. As a result, these ISPs have to bear the full costs of both outbound and inbound traffic exchange under the terms of the transit agreement, in addition to the leased line costs. The ISP on the other end of the international link does not share the cost of exchanged traffic.
- If developing countries had a greater ability to exchange traffic locally at a national level and regionally, they would not be paying for expensive international bandwidth for their connections. Similarly, if these countries had more outgoing traffic and more regional carriers, these carriers would be able to peer with their international counterparts and lower the costs of international bandwidth. An Internet exchange point (IXP) interconnects ISPs in a country or region, allowing them to exchange domestic Internet traffic locally without having to send that traffic (for example, e-mail messages or Web traffic) across several international hops to reach their destination. But, the reality today is that most developing countries lack local IXPs.

Proposal

- Establishing a local Internet Exchange Point (IXP) is one possible solution. An IXP interconnects ISPs in a country or region. These ISPs can then exchange domestic Internet traffic locally, without having to send that traffic across multiple international transit routes to reach the local destination. In addition, more outgoing traffic and more regional IP carriers may make it feasible for these carriers to establish peering agreements with their international counterparts.

- In countries where there will be only one or two cables there may be need for some form of price regulation: A price cap based on a cost model is a good solution given the error-margins involved in cost calculation.

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- This proves the need to seriously contemplate the IIC issue, not only through the forums where it has been discussed for quite a long time, but through some high level international internet governance mechanism that need to be created. The main challenge here is to come up with an innovative solution that on one hand maintains the dynamism and efficiency of the internet, while on the other hand allow operators in developing nations to provide better, widespread and cost effective services for all..

Thank You