

TechNet Brown Bag Presentation at the World Bank

Rapid Development of Communications Capabilities in Low-Income Countries

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Note: This presentation reflects only the views of the author. This presentation does not necessarily reflect the views of the Federal Communications Commission, its Commissioners, or staff members other than the author.

Three Keys

1. commercial incentives for dissemination of offers and opportunities
2. communication regulation based on rights and freedoms not merely defined by government authority
3. large-scale, low-cost global industry providing general purpose radio equipment

Different Frameworks for Communications Development

- Amateur radio: non-commercial, emphasis on government authority, nationally and globally
- Internet: non-commercial and commercial, dependent on existing telecom infrastructure
- Mobile telephony: commercial, service providers dependent on radio regulation, capital-intensive big business
- Fixed wireline telephony: state enterprise, public utility

Case Study: Uganda

- 1995: 0.20 wire tel. lines/100 persons
0.00 mobile tel/100 persons
- Mobile service providers: CeITel (May 1995),
MTN Uganda (Oct. 1998), UTL (Jan. 2001)
- 2001: 0.28 wire tel. lines/100 persons
1.43 mobile tel/100 persons

Case Study: Guatemala

- 1995: 2.87 wire tel. lines/100 persons
0.25 mobile tel/100 persons
- 1996: radical reform of radio regulation See Ibarquen (2001).
- 2001: 6.47 wire tel. lines/100 persons
9.70 mobile tel/100 persons

Table 1
Countries/Economies with Mobile Telephone Subscribers
Exceeding Fixed Wireline Telephone Subscribers

Region	Total Economies	With Mobile>Fixed	With Mobile>Fixed
Western Europe	22	19	86%
Africa	45	32	71%
Middle East	10	8	80%
Caribbean	14	5	36%
North and Central America	10	4	40%
South America	12	5	42%
Asia	19	10	53%
Oceania	11	3	27%
Central and Eastern Europe	21	7	33%
World	164	93	57%

Table 2
Users Per Hundred Persons
 (median for countries in class)

Income Class	Countries	Amateur Radio	Internet	Mobile Telephony	Fixed Lines
1. High	39	0.0766	31.0	71.1	52.9
2. Upper Middle	32	0.0332	8.2	21.2	25.0
3. Lower Middle	47	0.0080	2.6	6.7	10.4
4. Low	46	0.0002	0.3	1.0	0.9
All Classes	164	0.0095	3.5	10.5	13.7
Comparing Income Classes					
Ratio of Users Per Hundred					
		Amateur Radio	Internet	Mobile Telephony	Fixed Lines
1/2: High/Upper Middle		2.3	3.8	3.3	2.1
2/3: Upper/Lower Middle		4.1	3.2	3.2	2.4
3/4: Lower Middle/Low		36.9	9.8	7.0	11.6
Comparing Fields					
Ratio of Users Per Hundred					
		Amateur/Internet	Amateur/Mobile	Internet/Mobile	Fixed/Mobile
Income Class					
1. High		0.25%	0.11%	44%	74%
2. Upper Middle		0.41%	0.16%	38%	118%
3. Lower Middle		0.31%	0.12%	38%	156%
4. Low		0.08%	0.02%	27%	94%
All Classes		0.27%	0.09%	33%	130%
Sources: See Galbi (2002), App. A and C.					

Table 3
Users Per Hundred Persons
 (median for countries in class)

Region	Countries	Amateur Radio	Internet	Mobile Tel.	Fixed Tel.
Western Europe	22	0.0840	30.0	74.8	56.2
Africa	45	0.0002	0.3	1.5	1.0
Middle East	10	0.0038	6.9	20.9	19.8
Caribbean	14	0.0318	5.1	11.7	27.9
North/Central America	10	0.0160	3.4	12.2	14.2
South America	12	0.0206	5.0	16.2	14.3
Asia	19	0.0016	2.6	8.1	5.1
Oceania	11	0.0192	2.2	1.8	9.7
Central/Eastern Europe	21	0.0260	5.7	18.8	28.6
World	164	0.0095	3.5	10.5	13.7
Ratios Across Fields					
Region	Amateur /Internet	Amateur /Mobile	Internet /Mobile	Fixed/ Mobile	
Western Europe	0.28%	0.11%	40%	75%	
Africa	0.08%	0.02%	19%	72%	
Middle East	0.05%	0.02%	33%	95%	
Caribbean	0.62%	0.27%	43%	238%	
North and Central America	0.48%	0.13%	27%	116%	
South America	0.41%	0.13%	31%	88%	
Asia	0.06%	0.02%	33%	63%	
Oceania	0.87%	1.09%	125%	549%	
Central and Eastern Europe	0.46%	0.14%	30%	152%	
World	0.27%	0.09%	33%	130%	

Sources: See Galbi (2002), App. A and C.

Communication: A Fundamental Issue of Human Development

- **Communication is a defining human activity. Communication capabilities matter for a wide range of personal and social opportunities.**
- **About 40% of persons in the world live in low-income countries. Amateur radio, Internet, mobile telephony, and fixed line telephony all have median use rates of 1% or less in low-income countries.**
- **With appropriate technology and regulation, some aspects of communications capabilities can improve rapidly.**

Amateur Radio

- Key problem in low-income countries is weak government institutions.
- Amateur radio emphasizes personal rights as defined by government institutions.
- Amateur radio is a relative failure in low-income countries.
- Amateur radio could play an important role in developing technical skills and providing public services in low-income countries.
- Amateur radio would develop more effectively in low-income countries if regulation was based less on government authority and more on natural human rights and freedoms.

The Internet

- The Internet is a global field that emphasizes rights and freedoms from a liberal, democratic tradition.
- But Internet use depends on the telecom infrastructure. Limitations of the telecom infrastructure limit possibilities for the Internet.
- Commercial incentives help drive spread of technology. Getting strong commercial incentives for spread of the Internet is a significant policy challenge.

Mobile Telephony

- Has rapidly expanded communications capabilities in relatively short time.
- Well-understood commercial framework of rights and freedoms for users (Mango in Uganda: “100% pure freedom”).
- Capital requirements and radio regulation for operators shape industry structure.
- For more service innovation and more opportunities for new, small enterprises, need more liberal radio regulation. Learn from Guatemala and others.

Fixed Line Telephony

- Has been relatively effective in developing communications capabilities in middle-income countries.
- Limited potential for rapid development: capital intensive, scales badly, wire-based technologies more subject to hold-up and appropriation than wireless
- Realizing communications rights and freedoms with wire-based networks require more developed social and political capabilities.

Global Context

- International radio regulations and global equipment industry centralizes important aspects of regulation.
- Low-income countries have distinctive circumstances and needs:
 - Geography and climate
 - Service cost/quality trade-offs
 - Role of literacy/linguistic diversity
 - Credit/payment institutions
 - Role of military
- More decentralized radio regulation would better serve needs of low-income countries

General Purpose Radio Technology

- Software-defined radios: large-scale, low-cost global equipment industry that more effectively incorporates local knowledge (local software).
- Allows low-income countries to avoid costs of inefficient, legacy radio regulation in high-income countries. Instead, radio regulation can be patterned on community regulation of activities such as walking and talking that invoke intuitive understanding of rights and freedoms.
- Promoting general purpose radio technology in high-income countries is global development aid that fosters human agency and activity in low-income countries.

References

- Ibarquen S., Giancarlo (2001), “Liberating the Radio Spectrum in Guatemala,” paper presented at AEI (Washington, DC), Nov. 9, 2001, forthcoming in Telecommunications Policy.
- Guatemalan Radio Regulator: Superintendencia de Telecomunicaciones (SIT), <http://www.sit.gob.gt/>
- Galbi, Douglas A., “Revolutionary Ideas for Radio Regulation,” online at <http://www.galbithink.org> and forthcoming on <http://www.ssrn.com>