International Telecommunication Union

IMT-2000 Activities in Support of Developing Countries

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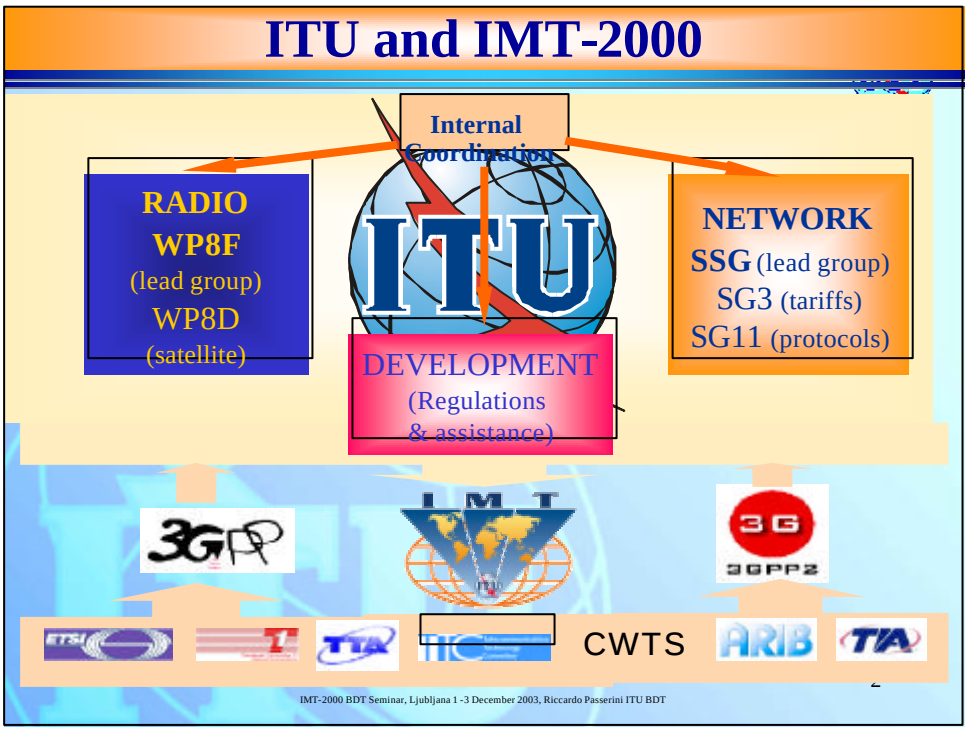
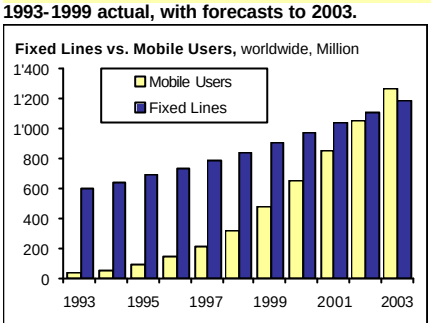
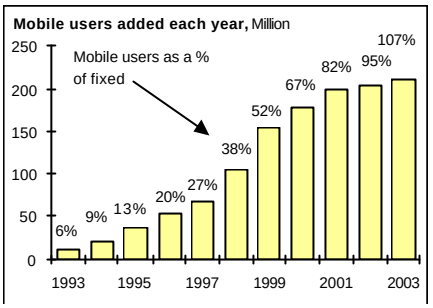
ITU and IMT-2000



The growth of mobile cellular services

1993-1999 actual, with forecasts to 2003.





Source: ***ITU World Telecommunication Indicators Database and ITU forecasts in Trends in Telecommunications Reform, 2000-2001: Interconnection Regulation*.**

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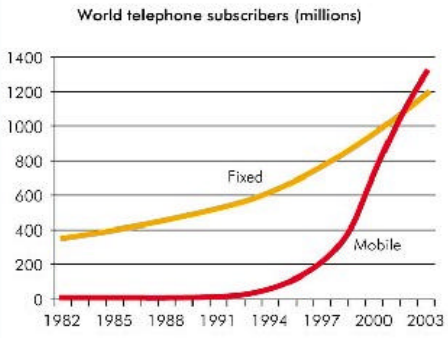
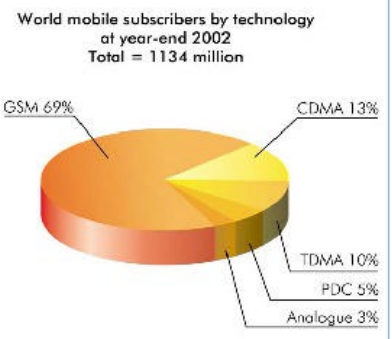
The growth of mobile cellular services

Figure 1 — Mobile overtakes fixed

Number of fixed and mobile telephone subscribers worldwide (1982-2003) and distribution of mobile subscribers worldwide by technology (December 2002)





Source: Left chart: ITU World Telecommunication Indicator database.
Right chart: ITU adapted from GSM Association.

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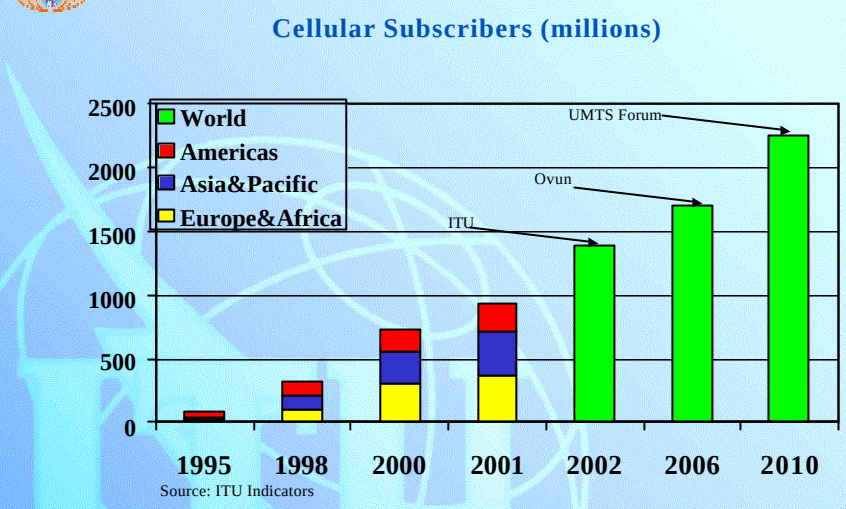
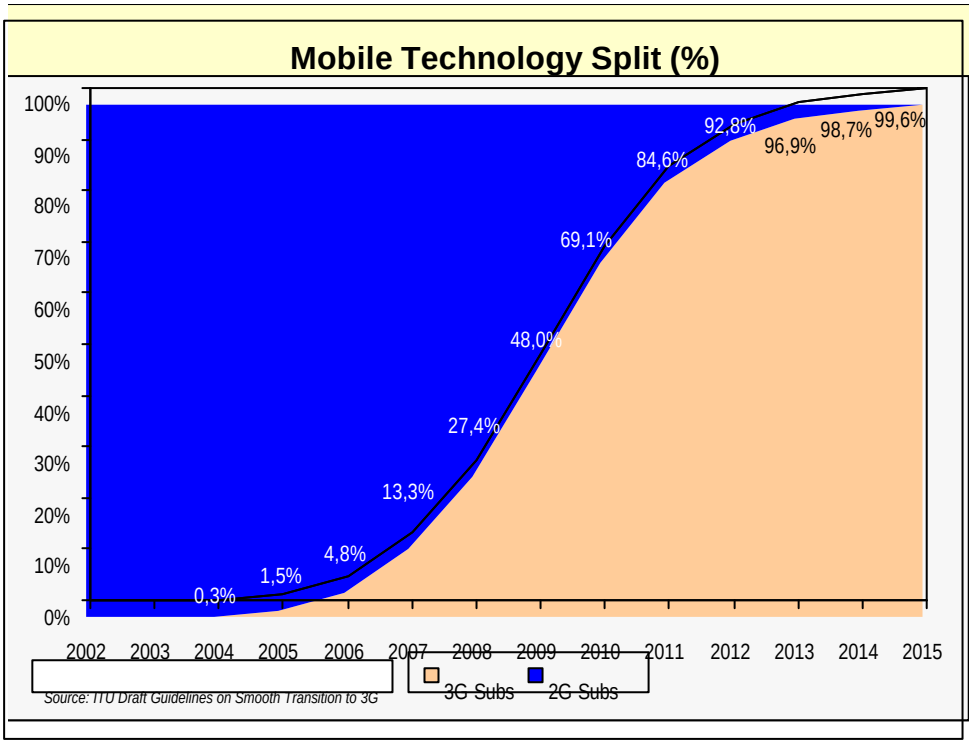
Trends – Mobile Growth (worldwide)



Number of mobile subscribers already greater than fixed



IMT-2000 Activities in Support of Developing Countries

- **WTDC-02 (Istanbul, 18-28 march 2002):**
  - **Res.43: ITU assistance for IMT-2000 implementation**
  - **Question 18/2: migration towards IMT-2000**
  - **Action Plan (Program 2): activities defined for 2003**
- **Regional Seminars: Abidjan, Moscow and Sofia (year 2002), Doha and Ljubljana during 2003**
- **SG2: meetings 2-6.9.02 (Geneva), and 8 -11.9.03 (Geneva)**
  - **Definition of Guidelines for a Smooth Transition (Migration/Evolution) from 2G to 3G: end 2004**
- **Finalization of IMT-2000 Handbook: end 2002 in close collaboration with ITU-T and ITU-R**

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INTERNATIONAL TELECOMMUNICATION UNION
Telecommunications Development Bureau (BDT)

Results of World Telecommunication Development Conference

Istanbul, 18-27 March 2002

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Results of WTDC-02 related to IMT-2000

The recent ITU World Telecommunication Development Conference WTDC-02 (Istanbul, 18-27 March 2002), approved the following texts related to IMT-2000:

- **Resolution 43** (WTDC-02): Assistance for implementing IMT-2000
- **Question 18/2**: Strategy for migration of mobile networks to IMT-2000 and beyond
- **Programme 2, point 1.4**: Mobile terrestrial communications

Resolution 43 (WTDC-02): Assistance for implementing IMT-2000

The World Telecommunication Development Conference (Istanbul, 2002),

•*considering*

a) that, at the request of the Member States, the Americas Regional Preparatory Meeting for this conference identified IMT-2000 as a priority to be included in the next action plan of the Telecommunication Development Bureau (BDT);

b) the need to promote IMT-2000 throughout the world, and in particular in developing countries,

Resolution 43 (WTDC-02): Assistance for implementing IMT-2000

•*noting*

the work of the ITU-T Special Study Group on IMT-2000 and Beyond and ITU-R Working Party 8F, and taking into account the need for close coordination with all related initiatives within ITU,

•*resolves*

to include support for implementation of IMT-2000 as a priority in the action plan adopted by this conference,

•*instructs the Director of BDT*

in close collaboration with the Directors of the Radiocommunication Bureau (BR) and the Telecommunication Standardization Bureau (TSB), as well as regional telecommunication organizations:

Resolution 43 (WTDC-02): Assistance for implementing IMT-2000

1 to encourage and assist countries to implement IMT-2000 systems in the frequency bands identified in the ITU Radio Regulations, using the relevant ITU recommendations, when adopted, for harmonized frequency band implementation;

2 to provide direct assistance to countries in using the relevant frequency band plans, when adopted, the radio technologies and the standards recommended by ITU in order to meet their national requirements for the implementation of IMT-2000 in the short, medium and long term;

3 to provide information on strategies which can be used for the evolution of first-generation and second-generation mobile systems (cellular/PCS) to IMT-2000;

Resolution 43 (WTDC-02): Assistance for implementing IMT-2000

4 to develop means to facilitate the implementation of fixed wireless access applications which allow use of IMT-2000 technology and infrastructure;

5 to provide assistance to administrations on the use and interpretation of ITU recommendations relating to IMT-2000;

6 to promote training on strategic planning for the introduction of IMT-2000, taking into account specific national and regional requirements and characteristics,

Resolution 43 (WTDC-02): Assistance for implementing IMT-2000

•*encourages Member States*

to review, as necessary, their regulatory framework (e.g., licensing, type-approval and customs arrangements) in order to facilitate global circulation of IMT-2000 terminals, taking into account the relevant ITU Recommendations

Question 18/2: Strategy for migration of mobile networks to IMT-2000 and beyond

1 Statement of the situation

While it seems clear that the migration to third-generation networks will be universal over time, it will not progress evenly in all countries, in particular developing countries. ITU-D can play an important role in assisting Member States and Sector Members in developing countries with a smooth migration of their existing first - and second-generation networks into third generation and beyond, both technically and economically

Question 18/2: Strategy for migration of mobile networks to IMT-2000 and beyond

2 Question or issue proposed for study

Identify the economic impact and development aspects for such migration, with particular attention to cost affordability for the end-users, as well as identification of migration techniques taking into consideration the experience of developed countries and the special needs of developing countries (e.g. sparse population, low traffic density, propagation conditions, and the need for a low-cost national IMT-2000 network). Examine The possibility of using first and second generation mobile spectrum for IMT-2000 and beyond.

Question 18/2: Strategy for migration of mobile networks to IMT-2000 and beyond

3 Expected output

A guideline for smooth migration, including system interoperability among third-generation technologies, with proper collection, analysis and periodic dissemination of relevant data from relevant groups within ITU and those outside (operator groups for mobile services, etc.).

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Question 18/2: Strategy for migration of mobile networks to IMT-2000 and beyond

4 Timing

The course of the next ITU-D study period with a mid-term guide by early 2004.

5 Proposers/sponsors

This Question has been requested by ITU-D Study Group 2 and developing countries

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Question 18/2: Strategy for migration of mobile networks to IMT-2000 and beyond

6 Sources of input

1. **Collection of related technical progress in both ITU-R and ITU-T.**
2. **The ITU handbook on IMT-2000 and beyond.**
3. **Visions of national and/or regional organizations in developed countries (e.g. ETSI, TIA, ARIB, etc.).**
4. **Experiences of smooth migration by administrations of developed and developing countries.**

Question 18/2:Strategy for migration of mobile networks to IMT-2000 and beyond

7 Target audience

	Developed countries	Developing countries	LDCs
Telecom policy-makers	X	X	X
Telecom regulators	X	X	X
Service providers/operators)	-	X	X
Manufacturers	X	-	-

a) Target audience - Who specifically will use the output

Telecommunication operators, policy makers and regulators

b) Proposed methods for the implementation of the results

Operators will directly implement the results of this work

Question 18/2: Strategy for migration of mobile networks to IMT-2000 and beyond

8 Proposed methods of handling the question or issue

a) How?

Within a study group:

A core group of voluntary and BDT experts should be established and tasked with the timely proposed outputs for consideration by the study group in its yearly meeting. The core group should be composed of mobile services experts, preferably from mobile operators and manufacturers, with geographical balance between developed and developing countries.

b) Why?

The Question output needs a multi-year period to achieve its objectives, being mainly based on future work progress achieved by ITU-R and ITU-T and those national and/or regional organizations concerned in developed countries.

Question 18/2: Strategy for migration of mobile networks to IMT-2000 and beyond

9 Coordination

The proposed expert core group should take into consideration (and without duplication of activities):

- **output from the study groups in ITU-T and Working Party 8/F of ITU-R;**
- **any regional study for such migration, especially by regional operator groups (e.g. ETNO, mobile operator groups, etc.);**
- **output from those involved in dual-mode operations for the mobile services (terrestrial and satellite modes).**

10 Other relevant information

Data related to IMT-2000 licensing regimes

Programme 2, point 1.4: Mobile terrestrial communications

In addition to Resolution 43 and Question 18/2, the Istanbul Action Plan for the ITU Telecommunication Development Sector adopted by WTDC-02, in its Program 2 (Technologies and Telecommunication Network Development) point 1.4 dealing with "Mobile terrestrial communications, states that:

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"1.4 Mobile terrestrial communications

Mobile communications tended to be developed and implemented at the national or regional level, with little thought for global interconnection. The result is a wide range of technical standards which use many parts of the radio-frequency spectrum - analogue and digital cellular phones, pagers, cordless telephones, mobile data systems, wireless local area networks and the new breed of satellite-based mobile telephones, to name just a few. Incumbent mobile operators do not want to have to discard their entire existing infrastructure; rather, they prefer a new system, which can coexist and interoperate with the present one and act as an adjunct to it. Therefore, because of both the explosive growth of second-generation mobile systems, network development and migration to third-generation networks (IMT-2000) and beyond, high priority will be accorded to mobile communications within this programme. Information will be also provided on mobile systems operating below 600 MHz, which are of particular interest to some developing countries."

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INTERNATIONAL TELECOMMUNICATION UNION
Telecommunications Development Bureau (BDT)

BDT studies and Activities on the evolution and migration towards IMT-2000

- ***Resolution 43,***
- **Programme 2, point 1.4**
- ***Question 18/2***

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Implementation of WTDC-02 Resolution 43

- Resolution 43 is supposed to be implemented within the Programs and Direct Assistance as approved during last WTDC-02.

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Implementation of WTDC-02 Resolution 43

- **Seminars and Workshops**
- **Production of Handbooks and Guidelines**
- **Cooperation with Regional Organizations**
- **ITU-D SG's Activities**
- **Direct Assistance via BDT Unit/Field Offices will be part of the BDT Work Plan to implement Resolution 43**
- **Implemetation of a BDT Web site on IMT-2000**
  http://www.itu.int/ITU-D/imt-2000/index.html

IMT-2000 BDT Database

Home : ITU-D : **http://www.itu.int/ITU-D/imt-2000/index.html**

BDT Activities

- ITU BDT activities and Seminars related to IMT-2000
- ITU Handbook on Deployment of IMT-2000 Systems
  - Structure and Content
  - On-sale publication
- Direct Assistance on mobile communications
  - Third GSM License in Kenya

ITU-D Studies and Activities

- Question 18/2 (ITU-D SG2 – Strategy for migration of mobile networks to IMT-2000 and beyond
- List of documents: Question 18/2
- List of documents: ITU-D SG2
- WTDC-02 Results – Resolution 43

Policy and Regulations

- Licensing

Other IMT-2000 Activities at ITU

- IMT-2000 ITU Homepage
- Radiocommunication Bureau (ITU-R)
- Standardization Bureau (ITU-T)
- ITU Strategy and Policy Unit (SPU)

Operations

- Status of IMT-2000 Deployments

Related Links

- Useful Links

Case Studies

Programme 2: BDT Activities on IMT-2000

- A detailed Work Plan on the implementation of Resolution 43 has been finalised inside BDT for year 2003 and it is going to be finalised for year 2004
- The Objectives for 2004 –2006 have been finalized as well.
- Studies on economics of migration/evolution to IMT-2000 with particular reference to developing countries: available on the IMT-2000 BDT WEB site, early 2004
- Project: Mobile Network Transition from 2G to 3G: Case Studies, Business Cases and Direct Assistance to the Countries

Program 2: BDT Studies on economics of migration/evolution to IMT-2000 with particular reference to developing countries

- Market trends
- Benefits of migration and associated costs
- Network migration aspects and associated costs
- Affordability for end users
- Business plan and analysis: General aspects and case studies
- Licensing vs. economics
- Other consideration (technologies, Spectrum,.....)

Program 2: Project - Mobile Network Transition from 2G to 3G: Case Studies, Business Cases and Direct Assistance to the Countries

•Start date: January 2004

•End date: December 2007

•Government and Cooperating Agencies:Ministries of Communications, National Regulators, Policy Makers, Telecommunications Operators

Program 2: Project - Mobile Network Transition from 2G to 3G: Case Studies, Business Cases and Direct Assistance to the Countries

- Brief description

A key step in the process of finalizing the IMT-2000 deployment strategy is represented by the economic evaluation of the revenues expected from the investments over the economic life of the system, including the license acquisition costs.
This evaluation bases on the (cost of the) options for the syste m implementation and on the assumptions about the evolution of demand and service penetration as well as tariff trends and policies.The implementation of a financial model is normally conceived so that further information on specific aspects may be obtained by increasing the level of detail in the description of the network infrastructure and/or network components.

- Expected Output

Implement a financial model where all of the described aspects are properly taken into account, specially designed tools are normally used. Running the model generates the technical and financial outputs driven by geographical data and service demand. Provide objectives, background information and guidelines to facilitate policy makers, regulators and Operators the development of their respective strategies for the transition (evolution/migration) from pre-IMT-2000 Networks to IMT-2000. Increase awareness and knowledge of the economics leading the migration/evolution process from 2G to 3G Mobile Networks. Identify special needs (technical and economical) for developing countries concerning migration/evolution of Mobile Networks to IMT-2000. Increase awareness and knowledge enabling decision makers, including mobile operators, service providers and regulators, in selecting options and strategies for the timely introduction of IMT-2000 systems in a harmonized basis throughout the world. Assist the regulators in developing countries to set up a regulatory/legal framework minimizing the network deployment cost while facilitating the provision of an extensive network coverage and of specific social service and applications Assist the countries during the licensing process for migration/evolution process from 2G to 3G mobile generation.

- Project Actions/Action Contents and Timetable

The Project will be articulated in three Phases interacting each others:
- **Studies**: Case studies and Business Cases (2004-2007)
- **Exploitation of results of the Studies and other related activities**: Key meetings, Seminars, Direct assistance (2004-2007)
- **Direct Assistance**: Assist the Countries for the Transition (Migration/Evolution Process) from 2G to 3G Mobile Networks (2004-2007).

Results of the studies on Question 18/2

Progress of the work

-Initial Promotion of the work is done by the BDT Administrative Circular CA/10, 5 July 2002

-A living document prepared by the BDT Secretariat in consultation with the ITU-T and ITU-R Sectors and listing documents/recommendations/deliverables and texts related to IMT-2000 is maintained being updated and supplemented whenever is necessary

-Draft guidelines for a smooth Transition for mobile networks to IMT-2000 and beyond will be adopted during the next Study Group 2, Geneva September 2004

Guidelines on the smooth Transition of existing mobile networks to IMT-2000 and beyond for Developing countries

Scope

•The **MTG Guidelines** provide the target audience of **telecom operators, policy makers and regulators** with information to **facilitate development of their respective strategies** for the migration/evolution of existing mobile networks to the more advanced technologies of IMT-2000.

•The primary focus of these Guidelines is **to supplement the "Handbook on Deployment of IMT-2000 Systems",** in which more detailed technical information can be found.

•The MTG guidelines present **an objective and technology neutral view of the issues** to be addressed in migrating/evolving existing mobile networks to IMT-2000.

Results of Studies and Activities of Program 2 and Question 18/2

Summary of the aspects being investigated during the progress of the work

- **Identification of special needs of developing countries regarding migration/evolution**
- **Identification of migration/evolution techniques**
- **Cost of network migration/evolution for the operators**
  - **using of existing infrastructures**
- **Cost affordability for end users**
- **Experience of developed countries when choosing current or future migration paths. There might be no unique solution for migration for developing countries. Migration might be different than for developed countries due to, among other reasons, the penetration levels of mobile networks.**

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Results of studies and Activities of Program 2 and Question 18/2

- **Possibilities of using first and second generation mobile spectrum for IMT-2000 and beyond**
- **Interoperability among first and second generation mobile system and IMT-2000 systems and beyond**
- **Interoperability among IMT-2000 technologies**
- **Extension of IMT-2000 services regardless of the access system**
- **Lawful interception and common access to emergency services.**

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Results of Studies and Activities of Program 2 and Q.18/2

Special needs for developing Countries (1)

- **Available market for the new mobile services ?**
- **Level of Rural coverage (FAO opinion)**
- **Areas primarily coverage-limited (rural, sparsely populated and/or very low traffic density) Spectrum below 1 GHz allowing big coverage per single cell may be interesting for developing countries**
- **Traffic capacity per cell is constant, larger the cell lower per user traffic**

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Results of the Studies and Activities of Program 2 and Q.18/2

Special needs for developing countries (2)

- **Areas primarily capacity-limited (dense urban areas): cities growing so quickly that fixed lines should be installed fast to meet the demand**

- **Wireless systems such as IMT-2000 may be cost effective and flexible for operators that want to expand their network as demand for voice/data services increases: less expensive, faster deployment, handling of both fixed and mobile traffic, voice and data services providing high speed connectivity to be used by clinics, schools, libraries, governments, telecenters and others**

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Results of Studies and Activities of Program 2 and Q.18/2

Special needs for developing countries (3)

Cost affordability for end user: cost of handsets is a critical factor

Service cost affordability: critical regulatory issue (interconnection rates, tariffs, etc)

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Results of Studies and Activities of Program 2 and Q.18/2

Special needs for developing countries (4)

Dispersed population: Sharing Network resources, speedy deployment of new technologies, lower costs to the Operators, lower costs to the subscribers (Regulatory aspects)

MVNO's: Scarcity of spectrum, Sharing Network resources, speedy deployment of new technologies, lower costs to the Operators, lower costs to the subscribers (Regulatory aspects)

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Results of Studies and Activities of Program 2 and Q.18/2

Opinions expressed by developing countries

- **Timing (when) and specific method (how) of migration for their operators is considered crucial**

- **IMT-2000 technologies can help to meet their special needs by bringing internet and other advanced solutions to developing countries particularly in an era of convergence**

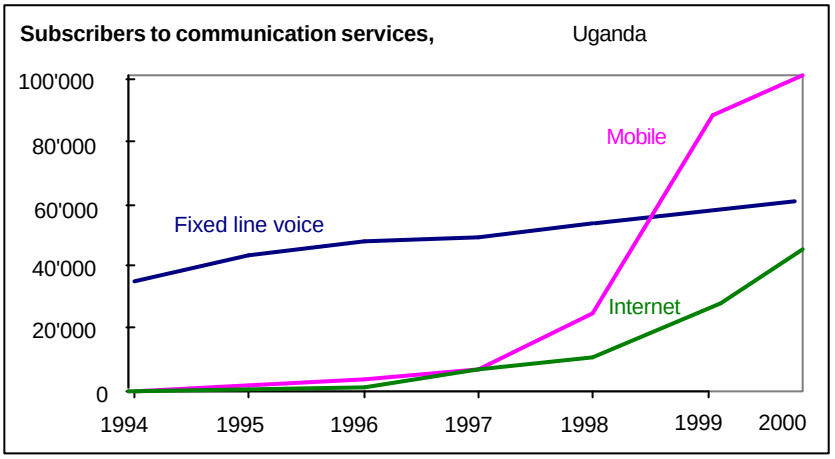
- **Availability of an information bank consisting of experience of countries having finalized the authorization process of IMT-2000**

IMT-2000 Relationship with NGN

- **For developing countries, "mobile"networks are becoming de-facto unique networks as it is cheaper to install (less cost due to wireless access)**

- **BDT activities are helping developing countries to evolve/migrate to IMT-2000 networks**

Mobile lines overtakes fixed lines in Uganda



Source: ITU, Uganda Internet Case Study, available at: http://www.itu.int/interconnect/case_studies.html

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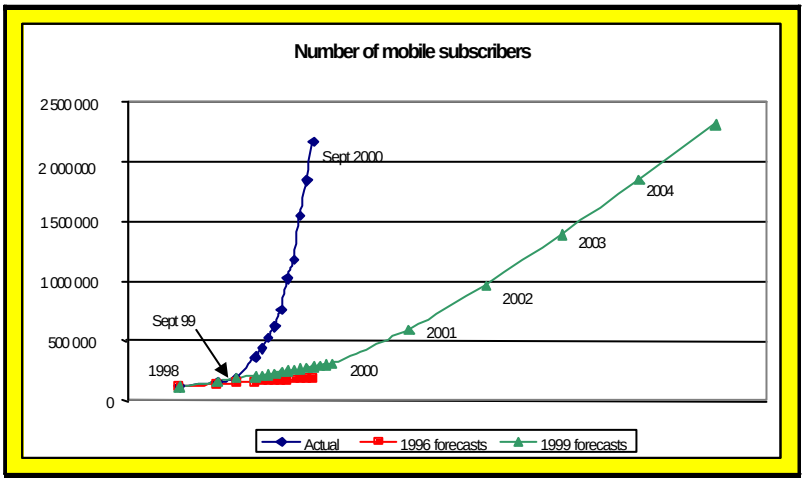
Growth of Moroccan mobile subscribers



Source: ITU Effective Regulation: Moroccan Case Study.

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IMT-2000 Relationship with NGN

- **NGN can be regarded as a natural evolution of IMT-2000 (and beyond systems)**

•NGN activities in ITU-T, studying the principles and requirements of Convergence of Fixed and Mobile Networks, have to take Developing countries needs into account delivering them the benefits of NGN, particularly to bridge the digital divide.

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