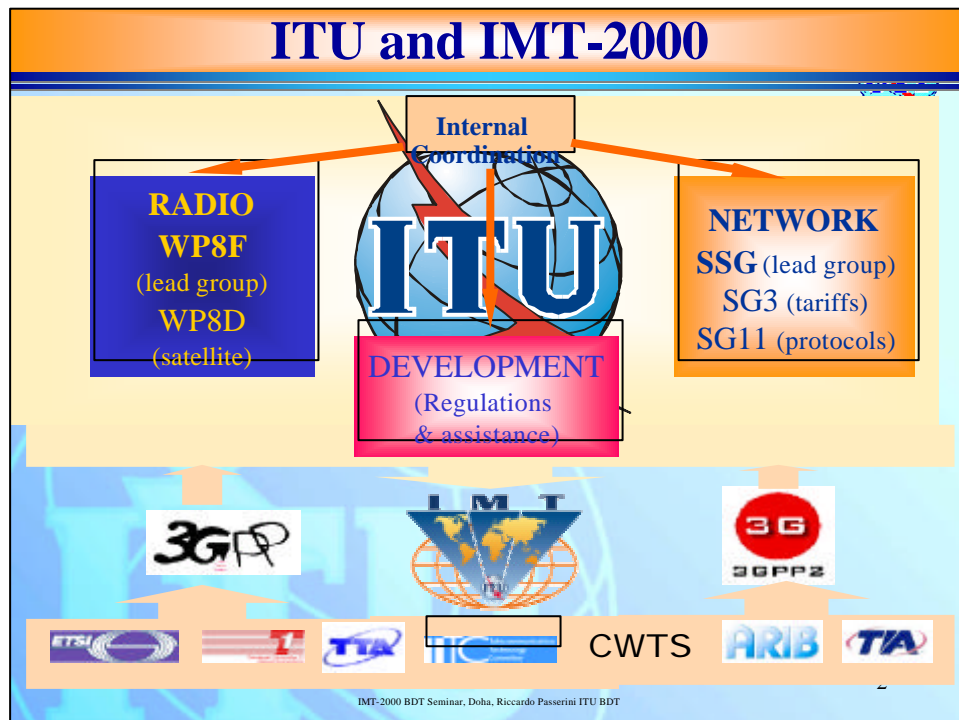**International Telecommunication Union**

IMT-2000 Activities in Support of Developing Countries

Riccardo Passerini

IMT-2000 BDT Focal Point

ITU and IMT-2000

Internal Coordination

RADIO
WP8F
(lead group)
WP8D
(satellite)

NETWORK
SSG (lead group)
SG3 (tariffs)
SG11 (protocols)

DEVELOPMENT
(Regulations & assistance)

CWTS

Latest results (ITU-D)

- **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 to be held during 2003
- **SG2**: meeting 2-6.9.02 (Geneva) and Q.18/2 Rapporteur's Group meetings
  - Definition of Guidelines for a Smooth Migration from 2G to 3G: end 2004
  - Definition of Workplan
- **Finalization of IMT-2000 Handbook**: end 2002 in close collaboration with ITU-T and ITU-R

3

INTERNATIONAL TELECOMMUNICATION UNION
Telecommunications Development Bureau (BDT)

Results of World Telecommunication Development Conference

Istanbul, 18-27 March 2002

4

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

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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:

7

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;

8

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,

9

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

10

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

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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.).

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

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.

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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

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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.

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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

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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*

BDT Activities on IMT-2000

- **A detailed Work Plan on the implementation of Resolution 43 has been finalised inside BDT for year 2003.**

- **The Objectives for 2004 –2006 are going to be 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**

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,.....)**

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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**

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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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Results of the studies on Question 18/2

- **The first Rapporteur's Group Meeting on Q.18/2, was held in Geneva, 24-25 June 2002.**
- **Second Rapporteur's Group meeting was held during ITU-D SG2, Geneva 2-6 September 2002**
- **Third Rapporteur's Group meeting was held in Geneva, 28-30 May 2003**
- **Electronic Meeting, 27-30 January 2003**
- **Fourth Meeting during ITU-D SG2, Geneva September 2003**

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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 prepared by mid-2004.

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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. 28

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

Workplan and tasks (1)

- **First draft of the guidelines (MTG): End June 2003**
- Send the first draft to translation : Early July 2003
- **Post the first draft guidelines on the web site Early July 2003**
- Send the first draft MTG to SSG, WP8A/8F:July 2003
- Meeting of the Rapporteur's Group 9 September 2003
- Comments on the first guidelines by Study Group 2: Sep.2003
- Send the conclusions of Study Group 2 meeting on the first draft MTG to SSG, WP8A/8F: October 2003
- Comments from SSG, WP8A/8F: January 2004
- Comments from the members of Study Group 2 on French and Spanish versions of the first draft guidelines: January 2004

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

Workplan and tasks (2)

- **Revision of the draft guidelines by all concerned authors (taking into account the comments received): February 2004**
- **Consolidation of the guidelines: March 2004**
- E-meeting: Mid-March 2004
- **Publication of the guidelines on the Web site in English (second draft): April 2004**
- Send the revisions introduced in the first draft to translation April 2004
- Meeting of the Rapporteur's Group (to adopt the future work plan after publication of the mid-term guidelines): Mai 2004
- **Adoption of the mid-term MTG: Study Group 2: September 2004**

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

Content of the MTG: See Index on the WEB:

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

Results of the studies on Question 18/2

Summary of the aspects being investigated during the progress of the work of Q.18/2:

- **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.**

Results of the studies on 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.**

Progress of Q.18/2 Studies: ITU-D SG2 meeting, Geneva 2-6 September 2002

Special needs for developing Countries:

- **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**

Progress of Q.18/2 Studies: ITU-D SG2 meeting, Geneva 2-6 September 2002

Special needs for developing countries

•**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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Progress of Q.18/2 Studies: ITU-D SG2 meeting, Geneva 2-6 September 2002

Special needs for developing countries

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

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

Progress of Q.18/2 Studies: ITU-D SG2 meeting, Geneva 2-6 September 2002

Special needs for developing countries

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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Migration techniques of existing Systems to IMT-2000

From Analog Systems (AMPS and NMT-450)

From cdmaOne (CDMA IS-95A/B) Systems

From TDMA Systems

From GSM/GPRS Systems

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Progress of Q.18/2 Studies: ITU-D SG2

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

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IMT-2000 BDT Seminar, Doha, Riccardo Passerini ITU BDT

IMT-2000 BDT Database

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

BDT Activities

- ITU BDT activities related to IMT-2000
- ITU Handbook on Deployment of IMT-2000 Systems
- Direct Assistance

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
- 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

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**
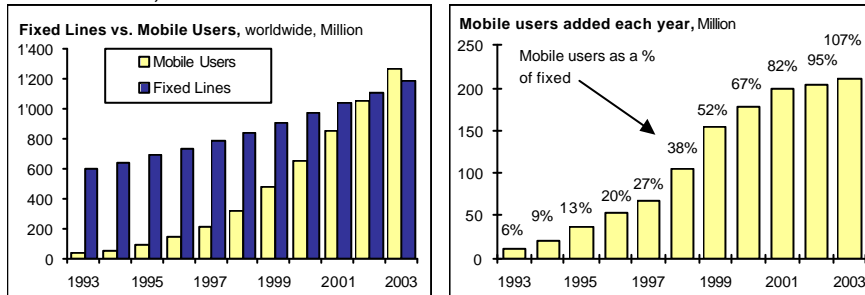

The growth of mobile cellular services

1993-1999 actual, with forecasts to 2003.

Fixed Lines vs. Mobile Users, worldwide, Million

- Mobile Users
- Fixed Lines

Mobile users added each year, Million

Mobile users as a % of fixed

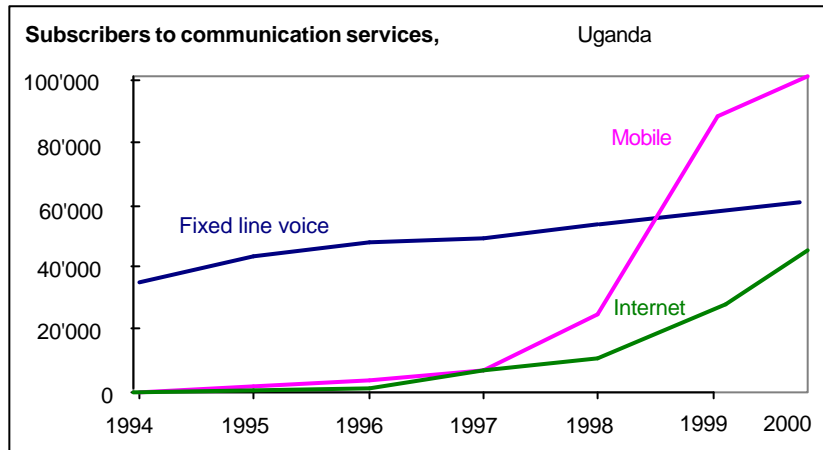6% 9% 13% 20% 27% 38% 52% 67% 82% 95% 107%

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

Mobile lines overtakes fixed lines in Uganda

Subscribers to communication services,   Uganda

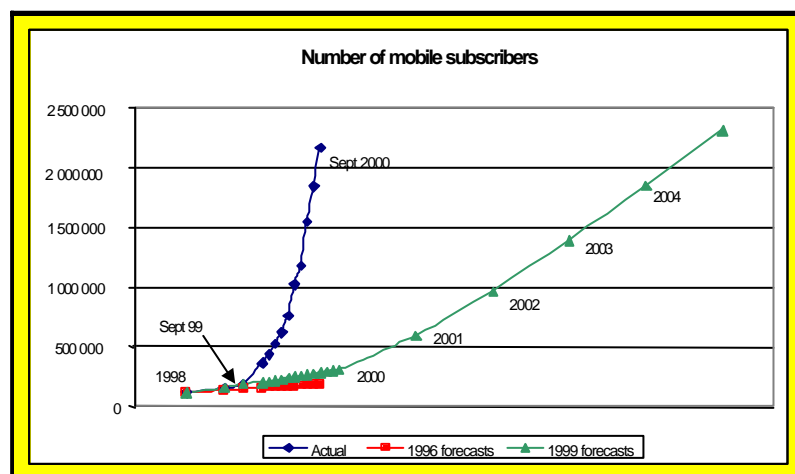*Source:* ITU, Uganda Internet Case Study, available at: http://www.itu.int/interconnect/case_studies.html

IMT-2000 BDT Seminar, Doha, Riccardo Passerini ITU BDT

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Growth of Moroccan mobile subscribers

Source: ITU Effective Regulation: Moroccan Case Study.

IMT-2000 BDT Seminar, Doha, Riccardo Passerini ITU BDT

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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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IMT-2000 BDT Seminar, Doha, Riccardo Passerini ITU BDT