

.....
**ITU-D Regional Development Forum for the Americas Region:
"NGN and Broadband, Opportunities and Challenges"**
Santo Domingo, Dominican Republic, 25-27 November 2009

Frequency allocation and spectrum management requirements

Nelson MALAGUTI
Counsellor, ITU Radiocommunication Bureau (BR)
E-mail: nelson.malaguti@itu.int



.....
Committed to connecting the world

ITU overview

Committed to Connecting the World 

191 Member States
>700 Sector Members
and Associates

ITU

Helping the World Communicate

ITU-T

Telecommunication
standardization
– network and
service aspects



ITU-R

Radiocommunication
standardization and
global radio
spectrum
management

ITU-D

Assisting
implementation and
operation of
telecommunications
in developing
countries

.....
ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges"; Santo Domingo, Dominican Republic, 25-27 November 2009

Radio-frequencies and satellite orbits are increasingly in demand for a large and growing number of radio systems such as mobile phones, digital television, space research, emergency telecommunications, global positioning systems, and environmental monitoring.

- ✓ **The ITU-R plays a vital role in the global management of radio frequencies and satellite orbits, aiming to ensure rational, equitable, and efficient use of the radio-frequency spectrum by all radio systems.**

Role of the ITU-R

- **Spectrum management** - Ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services.
- **Radiocommunication standardization** - Carry out studies without limit of frequency range, adopting Recommendations (standards) on radiocommunication matters.

Spectrum management

Committed to Connecting the World



- **Radio waves do not recognize political borders.**
- **the global nature of the problem requires international cooperation and coordination.**
- **All parties: governments, manufacturers, service providers and users want interference-free communications.**
- **management of the radio spectrum is a necessity.**

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

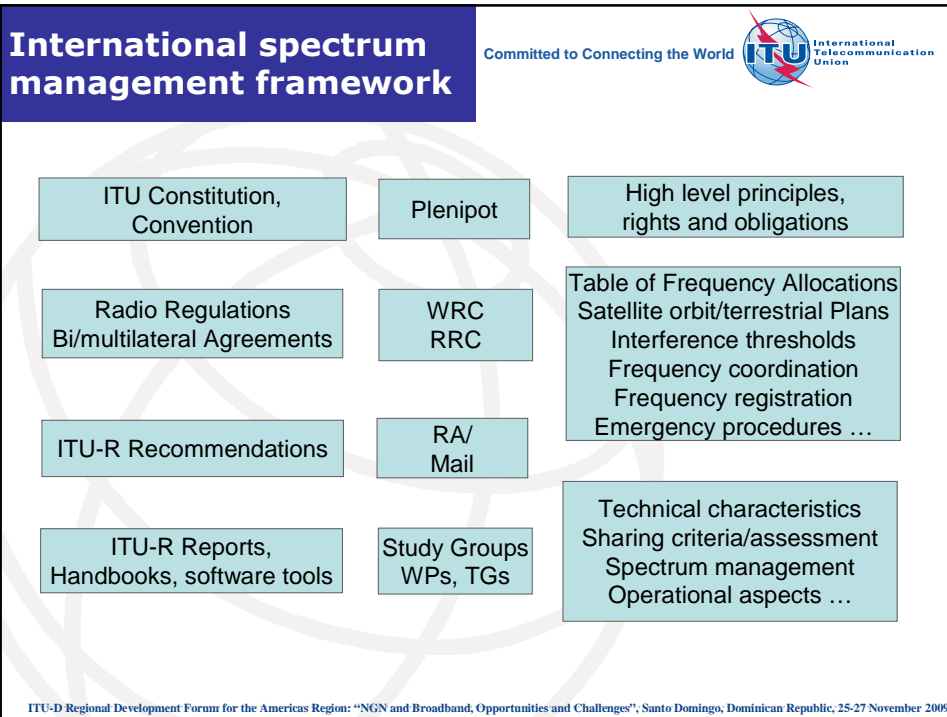
Challenges for spectrum management

Committed to Connecting the World




- **Facilitate equitable access and rational use of the limited radio frequency resource.**
- **Protect essential services – distress and safety.**
- **Prevent/resolve cases of harmful interference.**
- **Facilitate effective operation of radio services.**
- **Accommodate the ever-increasing demand**
– More users, new technologies, new applications, higher data rates.

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009



ITU Constitution and the Radio Regulations


 International Telecommunication Union
 Committed to Connecting the World

CS 195 (PP-02) (RR No. 0.2)
To limit the number of frequencies and the spectrum used to the minimum essential to satisfy the necessary services.
Apply the latest technical advances as soon as possible.

CS 196 (PP-98) (RR No. 0.3)
Radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources.
Must be used rationally, efficiently and economically.

CS 197 (PP-98) (RR No. 0.4)
All stations must be established & operated in such a manner as not to cause harmful interference to the radio services or communications of other Member States or of recognized operating agencies, or of other duly authorized operating agencies.

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

International regulatory framework & National Spectrum Management

Committed to Connecting the World



➤ Regulatory framework for national spectrum management:

- Based on international principles to govern the spectrum use and on bi/multi-lateral agreements using ITU instruments (CS, CV, RR, ITU-R Recommendations, etc).
- Need also for regional harmonization and standardization (APT, ASMG, ATU, CEPT, CITELE, RCC).
- Linkage between international and national regulations (allocations, assignments, licensing, monitoring, interference) preserving States' rights and obligations.
- Need for national legal framework/regulation to take account of national specificities (geographical, geopolitical, cultural, social, economical, etc).

See [Report ITU-R SM.2093](#)

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

National spectrum management

Committed to Connecting the World



➤ Key elements of spectrum management:

Spectrum: Engineering – Planning – Economics

- International coordination
- Frequency assignment (table)
- Licensing/authorization
- Frequency registration
- Spectrum monitoring (use/efficiency), inspection & investigation

See [Recommendation ITU-R SM.1047-1](#)

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

Some WRC-12 related issues

Committed to Connecting the World



- Frequency spectrum congestion, mainly in urban areas, is prompting **development of new radio technologies (e.g. software defined radio and cognitive radio systems)**.
 - ⇒ **technical and regulatory considerations.**
- Study of the **impact on radio services** of the increasing use of **short range radio devices (incl. ISM), proliferating across various frequency bands.**
- **Growing demands of new applications based on a convergence of radio technologies**, combining elements of different historical radio services.
 - ⇒ **need to review and enhance the international regulatory framework.**
 - ⇒ **would have also significant impact on national spectrum management.**

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

Committed to Connecting the World



TRANSITION FROM ANALOGUE TO DIGITAL TERRESTRIAL BROADCASTING



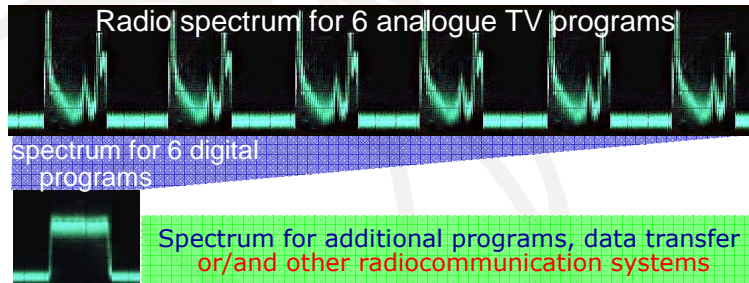
ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

Advantages of Digital Broadcasting

Committed to Connecting the World



➤ more effective use of radio spectrum



➤ extension of volume/list of services – «digital dividend»

«Analogue» «Digital»

➤ high quality (picture and sound), high definition TV (HDTV)



➤ complying with GE06 Plan for 120 countries in the World

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009



Committed to Connecting the World



170

ITU activities for transition to digital broadcasting

- ITU developed:
 - **International legal basis for transition:**
 - Plan GE06 for VHF/UHF Digital Broadcasting for 120 countries;
 - "Transition period" for switching to digital broadcasting – 17 June 2015.
 - **Technical standards, reports and roadmaps for digital broadcasting:**
 - Recommendations of Radiocommunication and Standardization Sectors (ITU-R and ITU-T);
 - Reports, Handbooks of ITU-R and Roadmaps by Telecommunication Development Sector (ITU-D).
 - **Software:**
 - Package for compatibility analysis in VHF/UHF bands;
 - Spectrum Management System for Developing Countries (SMS4DC).
 - **ITU's practical assistance to Administrations:**
 - Radiocommunication Bureau (BR) carries out compatibility analyses of VHF/UHF frequency assignments submitted by Administrations;
 - Telecommunication Development Bureau (BDT) implements projects in several countries.

Switchover to Digital Broadcasting

Committed to Connecting the World



Challenges:

- **Political and legal issues:** licensing (1 radio channel used by several broadcasters), broadcasters' rights and obligations, ratio between public and commercial broadcasting, date of analogue switch-off, etc.
- **Technical:** basic standards for broadcasting and compression (e.g. ATSC, ISDB-T, DVB-T, MPEG-2/MPEG-4), additional spectrum during transition period, network architecture (Single- and/or Multifrequency networks – SFN/MFN) and planning, production/purchase of Set-top boxes for users.
- **Economical:** public broadcasting financing, economical model for new services/systems, incentive of equipment production and switchover to digital broadcasting, subsidizing vulnerable people, etc.
- **Strategy for the use of the digital dividend.**

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

Steps for switchover

Committed to Connecting the World



- Development of national program;
- Making decision on transition strategy (nation-wide or phased approach) and assigning additional spectrum for transition period (for analogue and digital simulcasting);



- Development of national regulations for the use of «digital dividend» and new services;
- National frequency planning and network planning, ensuring, as a minimum, reception in existing service areas;
- Realization of transition in accordance with national Plan;
- Provide sufficient information to viewers on the switchover program, timing and concrete steps.

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

Spectrum identified for IMT

Committed to Connecting the World



- Spectrum identified prior to WRC-07:
 - 806 - 960 MHz
 - 1 710 - 2 025 MHz
 - 2 110 - 2 200 MHz
 - 2 500 - 2 690 MHz
- Spectrum identified at WRC-07:
 - 450 - 470 MHz
 - 698 - 960 MHz
 - 2 300 - 2 400 MHz
 - 3 400 - 3 600 MHz
- Some of these bands are subject to national or regional restrictions, may need to be shared with other services and applications, and therefore might not all be available everywhere.

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

FSS frequency allocation

Committed to Connecting the World



- WRC-07 concluded that the responses to the studies requested in Agenda item 1.19 have been provided in Recommendations ITU-R S.1782 and ITU-R S.1783. The identification of specific FSS frequency bands for internet applications will not improve, nor will it facilitate the provision of these applications;
- FSS frequency allocations can be used in the short, medium and long term for the global provision of high-speed Internet services;
- Internet applications are being developed and implemented today in the 4/6 GHz, 11/14 GHz and 20/30 GHz FSS allocations. It is expected that this use of the bands will continue to grow and will accelerate as requirements are defined, and also that new satellite systems dedicated to broadband internet access could evolve in existing FSS allocations.

ITU-D Regional Development Forum for the Americas Region: "NGN and Broadband, Opportunities and Challenges", Santo Domingo, Dominican Republic, 25-27 November 2009

Thank you