

## SENEGAL (SEN) RESPONSE

TO

### WORKING PARTY 6A QUESTIONNAIRE ON SPECTRUM REQUIREMENTS FOR TERRESTRIAL TELEVISION BROADCASTING IN CONNECTION WITH WRC-15 AGENDA ITEM 1.2

- 1 a) What standards have you adopted for digital terrestrial television broadcasting?  
**Answer: DVB-T2, MPEG-4**
- b) Have you started introduction of digital terrestrial television services?  
**Answer: Some Member States have commenced trials with others even have implemented commercial services**
- c) If yes, please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use to inform WP 6A.  
**Answer: Kindly see annex 1**
- 2 a) Have you commenced analogue television switch-off?  
**Answer: Not as yet**
- b) If you have any such plans, when do you expect to have completed the analogue switch-off process?  
**Answer: Eastern Africa: Mid 2013, SADC: End 2013, Rest of Africa: Mid 2015**
- 3 a) What is the percentage of viewer uptake of terrestrial television in your country, including those whose service provider uses terrestrial broadcast re-transmission (e.g. in cable networks)?  
**Answer: Typically 70% population coverage accessed mainly via wireless terrestrial television. Note: This figure is not the actual viewers – which may be lower**
- b) If possible, please also provide details of the number or proportion of users who receive television primarily by terrestrial means.  
**Answer: Nearly 80% with 20% being accounted for by Satellite means**
- 4 a) Indicate how many analogue television transmitters use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution 232 (WRC-12)).  
**Answer: Typically up to 1**
- b) How many are in the remaining part of the UHF band.  
**Answer: Typically up to 4**

- 5 a) What frequencies/channels are currently used or intended to be used by digital terrestrial television broadcasting in your country? Please distinguish between those in use and those intended to be used.

**Answer: Typically up to 2 currently with 2 or more being planned for the future in line with the principle of minimum of 4 multiplexers per site**

- b) If allotments/SFNs are in use, a sketch map of frequency allocations could be included, with an accompanying table of allocations, as shown in Annex 2. Otherwise, it might be possible to show main transmitters and channels, grouped in layers, in a table.

**Answer: Typically none – many Member States has adopted MFN. In the few cases of SFN – the modified SFN has been adopted whereby multiple sites in a given area are given the same set of frequencies but coordinated and notified as MFN (with requisite declarations)**

- c) Please indicate how many digital television assignments/allotments use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution 232 (WRC-12), and

**Answer: Typically none – the ATU region has adopted a principle of using the 694-790MHz for mobile service primarily mobile broadband**

- d) How many are in the remaining part of the UHF band.

**Answer: Typically 4 as the agreed number of target number of multiplexers per any site**

- 6 a) Are those frequency bands also shared with other primary services?

**Answer: Typically none – the band 470-694MHz is designated exclusively for DTT and associated auxiliary services. In some cases, the band 790-862MHz has mobile service implemented already. The band 694-790MHz has been adopted for allocation to mobile service as envisaged by WRC-12 Resolution 232 for which the main proponent was the ATU region**

- b) If yes, please give details of those systems and their spectrum use.

- 7 a) Are those frequency bands also shared with secondary services such as PMSE (Programme Making and Special Events), radio astronomy or wind-profile radar?

**Answer: Typically none – same notes as Question 6 a)**

- b) If yes, please give details of those systems and their spectrum use.

- 8 a) Do you foresee the adoption or expansion of television services broadcast using second-generation systems such as DVB-T2?

**Answer: Yes – the ATU region has already adopted the DVB-T2, MPEG4 as the default standard for DTT**

- b) If yes, please give indicative details of the planned transition, including any simulcast period.

- 9 a) Do you foresee a requirement for new and enhanced services, including HD and 3D television, on the terrestrial television platform?

**Answer:** *Yes – all such premium services HD, 3G etc, shall have to be implemented within the designated/available spectrum bands 174-230MHz VHF and 470-694MHz UHF*

- b) If yes, please give indicative details of the number and nature of services planned, and if known, the expected timeframe for their introduction.

**Answer:** *No actual details are known at this stage in terms of number and nature. The expected timeframe is typically after the official Analogue Switch off in June 2015 as the focus now is the replace analogue transmission with digital before contemplating on premium services*

- 10 a) Are there plans in your country to launch more multiplexes in the future?

**Answer:** *Typically up to 2 multiplexers are currently implemented for trials and commercial service. It is planned that 2 or more being shall be implemented in future in line with the principle of minimum of 4 multiplexers per site*

- b) If yes, how many more and when? Please also indicate the expected timeframe for their introduction.

**Answer:** *No actual details are known at this stage in terms of number and nature. The expected timeframe is typically after the official Analogue Switch off in June 2015 as the focus now is the replace analogue transmission with digital before contemplating on expansion of coverage and introduction of premium services*

- 11 a) What is the amount of spectrum you foresee that will be required for terrestrial television broadcasting, if plans in Questions 8, 9 and 10 are to be supported, and services identified in Questions 6 and 7 are to be taken into account? Please indicate the modes of transmission that will be used, and timeframes.

**Answer:** *Kindly see annex 3*

## ANNEX 1

Presentation of reply to Question 1: *What standards have you adopted for digital terrestrial television broadcasting? Have you started introduction of digital terrestrial television services? If yes, provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use.*

Country	No of multiplexes	System & modulation	FEC	GI	Reception mode <sup>1</sup>	Capacity per multiplex (Mb/s)	Current percentage population coverage	Intended percentage population coverage	Content per multiplex	Total capacity (Mb/s)	Total spectrum bandwidth used or intended for implementation (MHz) <sup>2</sup>	Any additional comments (e.g. duration of licences)
ATU	<b>4</b> (minimum target)	<b>DVB-T2, [tbc]</b>  (mainly modulation that provides for smart balance between coverage and capacity)	[tbc]  (mainly FEC that guarantees coverage)	[tbc]  (mainly GI that guarantees coverage)	<b>Fixed</b>  (mainly)	<b>25</b>  [typical]	<b>70%</b>  [typical]	<b>70%</b>  (as initial Target representing coverage of current Analogue Terrestrial Tv)	<b>SD</b>  (mainly)	<b>100</b>  (typical)	<b>Gross total of 280MHz</b>  (224MHz UHF with additional 56MHz in the VHF)	Initial focus will be to replace current analogue transmission with digital and also expand coverage with the aim of covering 100% of population. Thereafter, premium services such as HD, 3D may be introduced but within the designated/available DTT spectrum from 470-694MHz UHF and 174-230MHz VHF.

<sup>1</sup> E.g. fixed, portable outdoor/mobile, portable indoor.

<sup>2</sup> Refer Sections 2 and 3 on page 1 of this circular.

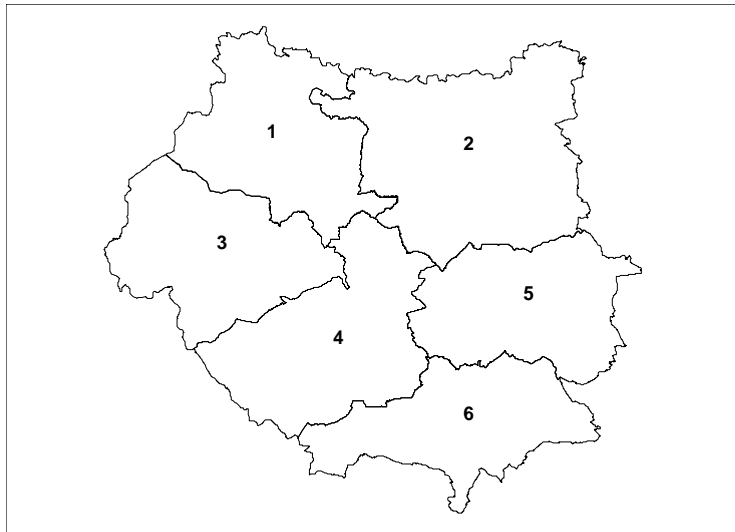
## ANNEX 2

Suggested presentation of reply to Question 5: *What frequencies/channels are currently used or intended to be used by digital terrestrial television broadcasting in your country? Please distinguish between those in use and those intended to be used.*

If allotments/SFNs are in use, a sketch map of frequency allocations could be included, with an accompanying table of allocations, as shown in Annex 2.

Otherwise, it might be possible to show main transmitters and channels, grouped in layers, in a table.

Please indicate how many digital television assignments/allotments use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution **232 (WRC-12)**), and how many are in the remaining part of the UHF band.



Area	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Layer 6	Layer 7
1	27	37	39	44	54	56	66
2	23	69	38	-	57	56	-
3	23	69	43	-	57	52	-
4	30	32	39	61	35	52	68
5	21	28	31	45	48	50	-
6	60	-	33	32	49	67	65

### ANNEX 3

Presentation of reply to Question 11: *What is the minimum amount of spectrum you foresee that will be required for digital terrestrial television broadcasting in Bands IV & V, if plans in Questions 8, 9 and 10 are to be supported, and services identified in Questions 6 and 7 are to be taken into account? Please indicate the modes of transmission that will be used, and timeframes.*

Country	No of multiplexes	System & modulation	FEC	GI	Reception mode <sup>3</sup>	Capacity per multiplex (Mb/s)	Intended percentage population coverage	Content per multiplex	Total capacity (Mb/s)	Total spectrum bandwidth needed (MHz) <sup>4</sup>	Any additional comments including time frames
ATU Region	<b>1</b> (VHF)	<b>DVB-T2, [tbc]</b> (mainly modulation that provides for smart balance between coverage and capacity)	[tbc] (mainly FEC that guarantees coverage)	[tbc] (mainly GI that guarantees coverage)	<b>Fixed</b> (mainly)	<b>10</b> [typical]	<b>100%</b>	<b>SD</b> (mainly)	<b>110</b> [typical]	<b>Gross total of 280MHz</b> (224MHz UHF with additional 56MHz in the VHF)	1 or more from 2015
	<b>4</b> (UHF)	<b>DVB-T2, [tbc]</b> (mainly modulation that provides for smart balance between coverage and capacity)	[tbc] (mainly FEC that guarantees coverage)	[tbc] (mainly GI that guarantees coverage)	<b>Portable outdoor/mobile</b> (in city core areas)	<b>25</b> [typical]	<b>90%</b>	<b>SD/HD</b>			2 as soon as possible, 2 or more from 2015

<sup>3</sup> E.g. fixed, portable outdoor/mobile, portable indoor.

<sup>4</sup> Refer Sections 2 and 3 on page 1 of this circular.