Watra one-day workshop on analogue to digital migration: Regional report

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1. Introduction

In 2006, at the ITU, the agreement that all countries should switchover from analogue to digital terminal browsing by 2015 was adopted. From that agreement several African counties started the march toward the realization of the 2015 deadline.

Digitization of broadcasting is the application of digital techniques to encode audio and video signals to transmit digital wave form to consumers rather than the current analogue transmissions.

In order to sensitize West African countries on the deadline for digitization and and access levels of preparedness, the Association for Progressive Communications (APC) and Balancing Act in collaboration with the Open Society Initiative sponsored a digital migration Workshop for WATRA Members in Accra on 4th June, 2011[1].

2. Opening Ceremony

Mr. Paarock Vanpercy, the Director General of the National Communications Authority (NCA) Ghana gave the first speech in which he welcomed participants. He assured members that given the importance of digital migration in our region, the country is ready to cooperate with other members and international organizations to help fast track the process. He expressed hope that members will outline the roadmap for the transition from analogue to digital.

The Executive Secretary of WATRA, Mr. Nnamdi Nwokike presented the second speech which gave a brief overview of the work programme for the workshop. He appreciated all members for coming. The contribution of APC for financing this workshop and Balancing Act for the technical expertise was highly appreciated by WATRA. The support of the Director General of NCA towards the successful hosting of the Workshop on Digital Migration Broadcasting was also extolled.

3. Attendance

The workshop was attended by all 15 member countries of WATRA and ECOWAS. There were 37 participants comprising, Regulators, Civil society, NGOs, Press, Ministerial policy expert, Broadcasters and Telecom operators.

1 One day workshop on analogue to digital migration at Alisa hotel, Accra, Ghana, 4th June, 2011

4. Commencement of Workshop

Four presentations were made during the workshop. These presentations were from experts and facilitators from:

Ghana-Edmund Fianko of National Communications Authority (NCA), Nigeria-Engr. Amana I. Edward of Kemilinks Nigerian and Member of the Presidential Advisory Committee on Transition from Analogue to Digital Broadcasting in Nigeria (PAC), United Kingdom by Russell Southwood of Balancing Act and South Africa – by Aldred Dreyer of Southern African Digital Broadcasting Association (SADIBA).

5. Major outlines of presentations by experts:

Presentation from Mr. Russell Southwood: The Digital Transition: Behind the issues

The facilitator, Mr. Russell Southwood from Balancing Act Consulting from the United Kingdom made the first presentation on the issues at stake and challenges regarding the passing from the analogical to the digital regime: Key benefits were outlined as follows:

- More efficient use of spectrum – Re-allocation with financial benefits
- Improving signal and picture quality
- Increasing the number of people who get access through enlarging the coverage area (power issues)
- Offering more diversity of content and improving quality, particularly local content
- Increasing investment and jobs in a larger TV sector (competition)
- Possibility of wider benefits (improved public broadcasting, wider access to media, better funding mechanisms and wider and improved power access). The digital transition also comes with the economic cost as a burden to consumers, especially those of the sub-Saharan countries with relatively income. These involve the cost of SET UP BOXES which amounts from $50-$100 as against an average of $46 in the UK.
- Sharing transmission will help reduce costs and increase coverage area – Separating content production & signal carriage. One or more signal carriers?
- Advertising or Pay TV subscription to support new channels? New Business models?

Technology issues

There are issues on standards to be adopted in order to fast track uniform penetration and access .E.g. ITU commitment to DVB-T. South Africa was looking at Brazil modified ISDB-T. Dilemma of DVB-T vs DVB-T2

- Edge of coverage area: Analog = signal snowy and blurry picture. Digital = No picture

- MPEG 2 vs MPEG 4

Policy and Regulatory Issues

Answers to numerous issues raised should be tackled by the policy makers and regulators. Questions regarding:

- Set Top Boxes – Proprietary or open access? Conditional access? Interactive?
- Set Top Boxes – Proprietary or open access? Conditional access? Interactive?
- Cost of Set Top Boxes – How many will not be able to afford? What can be done to lower costs?
- Waste disposal issues?
- Coverage area? SA – 60% to achieve "critical mass" Case for Universal access policy? Subsidy for UA policy? Link to power?
- Access to signal carriage – One signal carrier? Incumbent broadcaster? Separate agency? Access issues? KE vs TZ
- Public interest content – languages (SA, MU); channels (NG – Education), etc; new public interest structures?
- Additional channels – Who gets new channels? Who gets licences? New commercial opportunities

Mental barriers to implementation

Cost: The obstacle of persuading several million

Households to spend US$100 seem insuperable when we take into consideration the low standard of living of the masses in the Sub-Saharan Region. But balance the costs against potential financial benefits should be a motivating factor for policy makers and governments to provide incentives facilitating access to digital technology and equipments.

Approaches for the implementation of the digital transition were made as follows:

Approaches to STB subsidy

- Direct subsidy to those who can't afford: USA, UK and South Africa. Problems of administering in Africa. Direct subsidy to assembler or importer.
- Agree a subsidy that will lower cost to user.
- Tax regime to lower cost to user: Possible to reduce STB to an affordable level. Tax incentives to assemblers or importers

Some challenges were observed to this approach as the Tax on digital TVs for those who can afford: Slows up the process of achieving critical mass.

The challenge is to get STB to comparable price to low end mobile phone (US$30-50)

Setting objectives

- Increased coverage area:TV often just urban. So if it reaches 55% now, set goal to reach 70% in 5 years.
- Greater diversity of content: Both from existing broadcasters and new entrants. HD channels. Wider range on existing channels.
- Increased number of players: 2-3 channels to existing players but add opps (community & commercial). Use it or lose it. Not "more of same" Leave risk with investors
- Encouraging media as a job and wealth creator: Local content through quotas. So 7-11pm 40% or more programming has to be local. Not just news content.

Implementing the Road Map

- Early decision on standards to allow volume production (compare to neighbours)
- There has to be a "prize" for users (signal quality, better services like interactive, more and better channels, languages, etc)
- Critical mass of coverage (area by area and over key urban areas).
- Public campaign involving all broadcasters and Govt; carried by all the broadcasters
- Supporting strategy to encourage external investment by key players

Elements of a strategy for successful roll-out

- Effective strategy to deliver the cheapest possible STB and strategy to communicate it
- Agreed package of channels and a working EPG to demonstrate it
- Agreed signal carrier strategy with broadcasters
- Critical mass – Convincing no of channels and Coverage (60% of population)
- Agreed communications strategy, funded and agreed with broadcasters
- Early attention to lighting up rural or less well covered areas. Benefits for all

Working with partners – Task Force Approach

Private sector cannot do it alone. Needs leadership from Government and regulator

- Initiated with policy paper (setting objectives) from Regulator or Government. Agreed through consultation with stakeholders
- Task Force or Committee to create implementation plan and set timetable. Work back from switch off date.

- Involve civil society and consumer groups. Citizens need to understand benefits to be persuaded.

Some Keys factors justifying the push to digital transition to always remember are:

- More efficient spectrum allocation. Wider broadband from telcos. Funds from selling spectrum.
- Better picture and signal quality
- Increasing access to television through better signal carrier strategies
- Greater diversity of content, especially local content
- Increased jobs and investment in media
- Possibility of wider benefits (improved public broadcasting, wider access to media, better funding mechanisms, and wider and improved power access)
- Internal resources: Don't have enough money to do the policy work. Always can find money for priorities. Can also seek external help (ITU)

Country Report on Migration from Analogue to Digital Broadcasting in Ghana

The facilitator presented a brief overview of Ghana and the state of Broadcasting in Ghana which included the following:

- The Broadcasting Policy, Legal & Regulatory Environment
- The composition of the communication space by number in operation
- The telephony penetration rates 2000 – 2010
- Distribution of FM stations in Ghana 200 – 2010
- Distribution of TV stations in Ghana as at 2000 – 2010
- The overview of the existing Analogue terrestrial TV signals Distribution.

Major challenges existing in the current analogue regime in Ghana were identified as follows:

Poor Infrastructure sharing/Co-location

- Each broadcaster carries own signals
- Combined Network management costs for the industry are high
- Transmitters are located in varied directions for the same coverage target resulting in:

Poor reception conditions

- Use of a single directional antenna presents serious reception challenges:

- Ghosting
- Blurr images
- Lines across images
- Poor sound, etc

Environmental aesthetics are badly affected by the sight of long bamboo poles hoisting antennas.

In view of the challenges witnessed with the analogue regime, the Ghana Government decided to take advantage of the switch to the digital broadcasting with its gains. The major reasons for migrating are to:

- To comply with and adopt the tenets of the GE-06 Agreement.
- To rapidly adopt spectrum efficient methods in the management of the scarce RF spectrum
- To broaden its utility as a resource in the interest and benefit of stakeholders.
- To prevent dumping of obsolete analogue TV equipment into the country
- To enhance the quality and experience of TV viewers in Ghana

Strategy for the transition from analogue to digital broadcasting in Ghana

Governance/Leadership

- Overall Leadership provided by the Government of Ghana:
  - All policy decisions approved by Cabinet
  - All Legal instruments to be approved by Parliament
- Digital Broadcasting Migration Committee:
  - Chaired by Honourable Minister of Communications
  - Membership of 13 from all stakeholder institutions: Ministries, Parliament, Regulators, State Broadcaster, Private Broadcasters

Responsible for:

- policy implementation
- integrated planning
- budgeting
- communication with the public
- performance monitoring

Licensing Structure

- Authorised Services
  - TV Broadcasting Stations
  - Sound Broadcasting on DTT
  - Additional Services, eg. Teletext, etc
- DTT Transmission Network
  - Multiplexing
  - Network Management Services
  - Transmission / Signal Distribution

Free-to-Air TV Strategy

- Independent DTT Transmission Entity
  - Being established through Public Private Partnership
  - Ghana Broadcasting Corporation (GBC) and Ghana Independent Broadcasters Association (GIBA)
  - Preliminary discussions pointing to 50%:50% risk & reward
  - Discussions led by Public Investment Unit of MoFEP
  - RFP for DVB-T2 network under development in lieu of PPP

✓ Standards

- Transmission standard - DVB-T2 (EN 302 755)
- Television presentation formats:
  - standard definition (SDTV) until analogue switch off (ASO)
  - high definition after ASO
- Compression technology:
  - H.264/AVC/MPEG-4 (part 10) and
  - Advanced Audio Coding (AAC)
- Application Programming Interface (API) for additional and interactive services - MHEG-5

Conformance Strategy

- Appointment of test lab for STB Compliance testing
- Licensing of compliant STBs to use certification logo
- Logo would confirm to consumers that the receiver is Ghana DTT compliant.

- Publication of STB Manufacturers 'White' list.

In order to guaranty a successful transition from analogue to digital, the facilitator outlined the central role of involving the civil society through the followings:

The setting up of Public Education Strategy to:

- to raise overall awareness at the national level
- to increase awareness and promote understanding at the regional level
- to promote understanding and encourage action

And in order to insure success in the public awareness champagne, it is recommended that the message be:

- message should be simple and straight forward
- materials should be transmitted in at least the languages identified to be widely spoken in Ghana
- all media platforms should be used
- Outreach events to schools, churches, mosques, etc

A switchover time table draft is presented in table 1

Table 1

Switchover Timetable

Activity	Start Date	End Date
NDBMTC Final Report to Govt	13th Jan 2010	30th Aug 2010
Development of Legal Framework (Amendment of Electronic Communications Act)	Sept 2010	December 2010
Public Awareness Campaign	September 2010	December 2014
Establishment of National Digital Migration Implementation Body	January 2011	
Licences for Digital TV	3Q 2011	
Nationwide Roll-out of Digital TV (Simulcast Period)	2011	2013
Coverage of all Regional Capitals & environs	By December 2012	
Phased Analogue Switch-off	To be determined according to locations and conditions	
Completion of Switchover	31st December 2014	
Appraisal Report of Switchover Process	6 months after completion of switchover	

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Source:www.nca.org.gh, edmund.fianko@nca.org.gh

The presentation addressed the key issues of the necessity for migration. It qualified that first it was to meet the agreements of 2006.

Secondly, it was supposed to lead to efficient allocation of scarce resources of spectrum .

It will offer a more robust and effective deployment of digital broadcasting that will offer more choice to the consumer. There will be better quality of broadcasting in addition to more innovations in DVD-H and HSTV. Digitization will free bandwidths for other services like telecommunication to radio navigation services.

Case study on Presidential Advisory Committee (PAC) Report on Digital Broadcasting in Nigeria

The third presentation was made by Engr. Amana of Nigeria and was focused on the Nigerian Case study on Presidential Advisory Committee (PAC) Report on Digital Broadcasting. The report outlined the following recommendations:

Adoption of a new policy and regulatory framework in the broadcasting sector

1. Separation of broadcasting services from broadcasting signal distribution.

To maximize the utilization of broadcast infrastructure and improve on the quality of content creation, it is recommended that: a new broadcast model, which separates the functions of the Broadcaster (Content Provider), and the Broadcasting Signal Distributor be adopted.

The new Broadcasting Signal Distributor will, inter-alia, have the following responsibilities:

- to ensure better transmission coverage of signal and quality delivery of broadcasting services;
- to ensure that services to broadcasters are provided on an equitable, reasonable, non-preferential and non-discriminatory basis;
- to adhere strictly to licence conditions as may be stipulated by the regulator.

2. Single vs Multiple Broadcasting Signal Distributors

There are three basic options of licensing signal distributors, namely:

- Each broadcaster implements its own signal distribution network as is currently the case, thus creating a multiple broadcasting signal distribution regime;
- A number of multiplex operators are licensed, each of which will provide the broadcasting signal distribution for a limited number of broadcasters;
- A single broadcasting signal distributor is licensed to provide the signal distribution network for all broadcasters in the country.

For economic, commercial and security reasons, it is recommended that the Government should approve the establishment of a single Broadcasting Signal Distributor which will serve the function of a multiplex operator, with the proviso that the regulator at the appropriate time, will evaluate the market and take a decision as to when and how other Broadcasting Signal Distributors may be licensed.

The specific reasons for commencing with a single broadcasting signal distributor include:

- the frequency planning regime becomes easier and less cumbersome;
- spectrum efficiency is enhanced in the allocation of signals to the various operators;
- augmenting income from economically less viable areas with that of the more viable areas, and thus enhancing efficient national coverage;
- effective monitoring and integrity of signal distribution;

- easier enforcement of licence conditions thus enhancing compliance with approved transmitter powers and locations of transmitters in designated broadcast sites and minimising incidences of interference.

It is also recommended that the operations of the Broadcasting Signal Distributor should not have political, religious, or ethnic bias and should be strictly monitored by the regulator. Other existing regulations applicable to the present broadcasters as appropriate should be binding on the Broadcasting Signal Distributor.

3. Backbone of the Broadcasting Signal Distributor

It would be most efficient if the infrastructure of the Broadcasting Signal Distributor be established as soon as possible and at the least cost.

In order to maximise the existing broadcast infrastructure, it is recommended that the existing and massive broadcast transmission infrastructure owned by the Nigerian Television Authority (NTA), the Voice of Nigeria(VON) and the Federal Radio Corporation of Nigeria (FRCN) in the country should form the backbone for the new Broadcasting Signal Distributor, which must be able to absorb the transmitting infrastructure of other existing broadcasting stations.

Such stations will have to negotiate commercial terms for transfer of ownership of their infrastructure to the new Broadcasting Signal Distributor. The broadcasting regulator should be saddled with the responsibility to guide the process of valuation of this equipment.

4. Ownership Structure of the Broadcasting Signal Distributor

In light of the need to establish the Broadcasting Signal Distributor expediently, efficiently and reliably, three options of ownership structure were considered:

- Option A: (Public/Private Sector Partnership) provides for the establishment of a new Broadcasting Signal Distributor in which the Federal Government will own a majority stake (a minimum of 51% stake); the equity participation of the private sector portion of this new signal distributor should be offered through a bid process; this option will allow a buy-in for all industry stakeholders and also gives government a controlling influence to ensure neutrality in the operations of this distributor;
- Option B: provides for establishing a Broadcasting Signal Distributor that is wholly owned by the Federal Government but commercially operated; this option takes advantage of the huge investments government has made over the years in both the NTA, FRCN and Voice of Nigeria;
- Option C: provides for establishing a Broadcasting Signal Distributor that is 100% privately owned; the option will promote further deregulation in the industry and inject substantial private sector fund into the industry It is recommended that the

Broadcasting Signal Distributor should be wholly owned by the Federal Government and operate on a commercial basis.

The supporting reasons are:

- government has invested heavily over the years in the broadcast industry through the NTA, FRCN and Voice of Nigeria (VON) and their infrastructure can be used as the backbone for the establishment of the new Broadcasting Signal Distributor;
- the National coverage area of NTA and FRCN make the rollout of this service a lot faster given the aggressive deadlines for the transition;
- given the National security implications, the broadcasting signal distributor should be owned by government as aptly recognised by the 7 point agenda of the government and the government's vision for 2020;
- enhancing the image and culture of Nigeria requires more investment in local content development to achieve its intended objective, and it is more prudent for government to focus on investing in a common and optimized infrastructure whilst the private sector focuses on content development.

Furthermore, the broadcasting signal distributor in many countries are fully owned by their respective governments e.g. Algeria, Kenya, Rwanda.

5. Obligations of the Broadcasting Signal Distributor

Given the critical role that the Broadcasting Signal Distributor will play in the new environment, it is recommended that it should have, inter-alia, the following obligations:

- Provide services to broadcasters on an equitable, reasonable, nonpreferential and non-discriminatory basis;
- Adhere to licence conditions as provided by the Regulator;
- Provide quality delivery of broadcasting services as per contract between the Broadcasting Signal Distributor and the broadcaster; such contracts should be approved by the regulator;
- Ensure that it provides National coverage whilst ensuring that each content provider keeps to its assigned coverage area;
- Provide the regulator on a regular basis with information on the utilization of frequency channels
- In determining its tariffs, which should be subject to oversight by the regulator, the Broadcasting Signal Distributor will be required to take into account the different categories of broadcasting licences and the nature and technical parameters of the service provided to each licensee. This is to ensure that the different tariffs are appropriate to and commensurate with the various broadcasting services.

6. Restructuring of the licensing framework in the broadcasting sector

In order to respond to the challenges of the transition programme, it is recommended that the licensing framework in the broadcasting sector should be restructured along the following lines:

- There should be 2 categories of licence, namely, a broadcasting content licence with the authority to produce content, and a broadcasting signal distribution licence with the authority to provide network platform for all broadcasters;
- The duration for a broadcasting content licence should be five (5) years as is currently for all existing broadcasters;
- The duration for a broadcasting signal distribution licence, bearing in mind the heavy investment and highly capital intensive nature of such infrastructure projects, should be fifteen (15) years;
- All broadcast stations should be unbundled so as to separate the broadcaster's function from the signal distribution function; the latter will be provided by a separate company;
- The current 5 year licence duration of all broadcasters should terminate with the unbundling;
- All current licences should be converted to the new broadcasting content licence;
- Each of the new broadcast content licences should specify its coverage target within the following framework:
    - Community Content Broadcasters – a licence for members of a community aspiring to project the cultural aspirations of the community and with a coverage target within the geographical boundary of the specific community;
    - City Content Broadcasters – a licence with a coverage target within the geographical boundary of a specific city;
    - State Content Broadcasters – a licence granted to a State Government with a coverage target within the geographical boundary of the specific State;
    - Regional Content Broadcasters - a licence with a coverage target within the geographical boundary of a specific region (geo-political zones);
    - National Content Broadcasters – a licence with a coverage target within the geographical boundary of the country.

7. Regulatory Framework to Guide Licensing of DTT Services

With the commencement of digital broadcasting, there will be new challenges, which will require specific regulatory interventions. Such interventions may not be determined in a vacuum. Therefore, the regulator should have the capacity to study the trends before determining the nature of the regulatory intervention that will be

required for the industry.

Nevertheless, in order to ensure a clear regulatory environment for the smooth execution of the transition, the regulator should develop standard regulatory documentation such as licences and licence fee structure and publish comprehensive guidelines for the industry. The regulatory guidelines should include the following:

- Degree of flexibility afforded to DTT broadcasters - Broadcasters will be given enough flexibility in the services that are offered over the digital channel. They will be required to offer at least one free-to-air programme service;
- Requirements for high-definition or other types of services - During the transition period, the regulator will not impose any requirement that broadcasters offer HDTV;
- Pay services – Introduction of pay services in the digital environment will only be permitted by the regulator after the transition has kicked off but preferably at the end of the transition period and after analogue switch-off has occurred. The regulator will determine the licence fee structure for those offering pay services on the DTT platform;
- Dual Illumination - Requirements to carry the existing analogue TV programming on digital channels;
- Ensuring that there is no programming uniquely available on the analogue channel before the entire analogue channels have been accommodated on the digital platform. Should this happen, it may create a barrier to the cessation of analogue broadcasting at the end of the transition period;
- Transition plans and timetables - the basic transition plan to be followed should require stations to transit their analogue services to digital as soon as the Broadcasting Signal Distributor is in place. A deadline will be set by which all analogue channels will be required to have transited to digital;
- Goals and/or deadlines for cessation of analogue TV broadcasts;
- Mechanisms for effective monitoring and to enforce the licence conditions.

8. Reestablishment of the Public Broadcaster

Public broadcasting (fully/mostly funded by the public) no longer exists in Nigeria with the partial commercialisation of NTA, FRCN and other State Broadcasting Stations. Given the benefits of public broadcasting for effective National development, it is recommended that the Government should re-establish public broadcasting in Nigeria.

Towards this objective, it is recommended that:

- the planned commercialization of NTA and FRCN should be reviewed;
- Both FRCN and NTA should be restructured into two separate self accounting units;

- One unit, which would be publicly funded, will manage channels that are dedicated to public broadcasting;
- The second unit would operate the other channels as a commercial broadcaster;
- The two units should provide separate accounts to the regulator to avoid anti competition practices;
- The State owned broadcasting Stations should also be restructured in a similar manner.

Management of the Spectrum Dividend

The transition from analogue to digital broadcasting will result in the ceding of the 790-862MHz currently being utilised by the existing analogue broadcasters. This will result in a spectrum dividend of 72MHz to the Government. In order to achieve this, it is recommended that Nigeria should revisit the assignments in the ITU GE-06 Plan and optimize the assignments using a range of frequency planning tools and the latest propagation techniques.

Once the plan is revisited, this will affect the National radio-frequency band plan. Such plan will have to be revised and republished. Consideration of modification to the band plan will require coordination with neighbouring countries and subsequent filing with the ITU.

Furthermore, if in replanning the broadcast spectrum, all of television is accommodated within 470 to 790 MHz, there will be an additional 56MHz of spectrum dividend available from the VHF Band III (174 to 230 MHz).

The spectrum dividend that will accrue to the government is a total of 72 MHz. It is recommended that:

- the spectrum dividend of 72 MHz arising from the ceding of the 790- 862MHz currently being utilized by existing broadcasters should be available for a variety of competing new services including telecommunications, public safety and new broadcasting services;
- the additional spectrum dividend that will arise from the vacation of the VHF band by current analogue TV services should be used for new broadcasting services.

In order to ensure a fair reallocation of spectrum, the implementation committee for the digital transition must include a Spectrum Subcommittee, which will, in close collaboration with the National Frequency Management Council (the national spectrum manager) provide relevant advice on the management of the spectrum dividend.

A part of this spectrum dividend could be auctioned for some of the new services, and going by recent auctions of spectrum for telecom services, a revenue of about N10bn would accrue to the Government. It is recommended that in recognition of the huge revenue arising from

the transition process, government should consider allocating necessary funds for the implementation of the transition programme.

Single Frequency Network vs Multiple Frequency Network

There are two basic methods of achieving the signal distribution network:

- Multiple Frequency Network (MFN) – which is the method used in the current analogue system to achieve a particular coverage area and
- Single Frequency Network (SFN) – where a single frequency can be used to provide the same coverage

It is recommended that a Single Frequency Network, (a broadcast network where several transmitters simultaneously send the same signal over the same frequency channel) be adopted as it offers more advantages than Multiple Frequency Network.

The supporting reasons are as follows:

- efficient utilization of the radio spectrum, allowing a higher number of radio and TV programmes in comparison with traditional multi-frequency network (MFN) transmission;
- An SFN may also increase the coverage area and decrease the outage probability in comparison to an MFN, since the total received signal strength may increase to positions midway between the transmitters.

- **Convergence**

The concept of Convergence refers to separate technologies such as voice (and telephony features), data (and productivity applications) and video that now share resources and interact with each other, to create new efficiencies.

In practice, it is the interlinking of computing and other information technologies, media content and communication networks that have arisen as a result of the evolution and of the Internet as well as the activities, products and services that have emerged in the digital media space.

In the course of its work, the PAC considered the issue of Convergence and its relevance to the transition from analogue to digital broadcasting. The Committee is aware that the Nigerian Government, in recent years, has taken certain initiatives to address the issue of Convergence and its impact, but is yet to take a definite position. Given the relative importance, it is recommended that the Federal Government should accelerate its efforts on its consideration of issues relating to Convergence with a view to taking a final decision as soon as possible in the interest of the industry and the national economy.

Technical Standards

In order to ensure compatibility, it is important to define the appropriate standards for digital broadcasting in Nigeria. The approach adopted is to:

- identify existing digital broadcasting standards available worldwide;
- analyse them from a technical perspective and with reference to Nigeria and
- make recommendations on the choice of standards and the way forward.

It is recommended that Nigeria adopts the following standards:

- DVB-T (EN 300 744) as the national standard for terrestrial digital television in line with the resolution which was made at ITU RRC-06;
- The MPEG-4 AVC/264 as standard format for digital terrestrial television broadcasting standard in Nigeria;
- DVB-S (EN 300 421) for satellite broadcasting is recommended as the national standard for digital satellite television broadcasting in Nigeria, with transition to DVB-S2 as compatible decoders become available and operators are ready to transit;
- DVB-H mobile TV standard for mobile TV in Nigeria, more so that it is already successfully operational in Nigeria;
- IBOC system for use as the FM digital sound broadcast format for Nigeria, while the DRM standard is adopted for Medium and Shortwave radio broadcast standards.

Bearing in mind that currently there is no global standard for digital satellite sound broadcasting, and furthermore given that digital satellite sound broadcasting can be considered a complementary broadcasting service, it is recommended that the take up of digital satellite sound broadcasting in Nigeria be informed by market forces.

- Set Top Boxes

Given that DVB has been recommended as a standard on the transmission network side, it is advisable that Set Top Boxes comply with the DVB family of standards. The specification (e.g. free-to-air, conditional access, low-level entry, etc) needs to be determined as part of a broader policy discussion.

With a guaranteed market of more than 24 million viewing homes, translating into over 40 million television sets requiring Set Top Boxes, Nigeria presents a good case for local manufacturing of Set Top Boxes. This is good enough incentive to any manufacturer. It is therefore recommended that Government should provide appropriate incentives so as to attract potential manufacturers with a view to licensing a maximum of three (3) manufacturers of STB.

Such incentives should include:

- Tax holiday on manufacturing inputs;
- Zero import duty on manufacturing equipment;
- A government policy to protect the market through a moratorium on imports of similar equipment for a specified period of time;
- Adequate security needs to be assured;
- Provision of sufficient infrastructure, including electricity, water etc.;
- A maximum of three manufacturers should be allowed.

It is recommended that the regulator should manage the process for the selection of the 3 manufacturers of the Set Top Boxes.

The current open market price of a basic Set Top Box (STB) is about US$80.00 (eighty United States Dollars). If the above incentives are offered to manufacturers, prices could come down to less than 50% of the current market value. In Naira terms, that would translate to about N4,800.00 (four thousand eight hundred naira only) each, at the exchange rate as at the time of writing this report.

In order to ensure affordability for the Nigerian consumers, it is recommended that the end user price should not be more than two thousand Naira only (N2,000) at today's value of the Naira vis a vis the US$.

Development of the Content Industry in Nigeria

i. Intellectual Property Rights

There is currently a very serious problem of piracy afflicting the home movie industry which is a disincentive to potential content providers. When intellectual property rights are enforced, the revenue accruable from the sale of content will become more significant, encouraging investment. It is therefore recommended that the respect for Intellectual Property rights (IPR) should be increased by the enforcement of the copyright and related laws.

ii. Awareness Programme for the respect of Intellectual Property

A substantial number of people do not know the difference between an original copy and a pirated copy of an intellectual property or may not know the implications of purchasing pirated material. Increased awareness and easier access to the original works will encourage people to purchase originals rather than pirated copies. It is therefore recommended that

- the respect for Intellectual Property rights (IPR) should be increased by the enforcement of the copyright and related laws.
- the awareness programme for the respect of Intellectual property should be increased.

iii. Collaboration between agencies

Improved cooperation and regular exchange of information amongst the agencies responsible for various aspects of content development can lead to a multipronged approach to tackling piracy in the various outlets for the exploitation of these works. This will reduce the revenue loss owing to unauthorised exploitation.

It is therefore recommended thatcollaboration between the relevant agencies involved in content creation and production (such as the National Broadcasting Commission (NBC), Nigerian Copyright Commission, the National Film and Video Censors Board, the Nigerian Film Corporation(NFC) and the Trademarks and Patents Registry, etc) should be increased.

It is also recommended that the above agencies should increase their public enlightenment budget.

iv. Creative works at tertiary institutions

It is recognised that instituting a reward scheme for the creative arts will spur writers and theatre arts students to produce materials that may be developed into plays, movies and shows consumed by the broadcast industry. It is therefore recommended that the creative arts units/departments of Nigerian tertiary institutions should be recognized as a major source of local content and an endowment fund should be created to reward excellence in this field.

v. Establishment and Recognition of an Awards system

A credible awards system initiated by the regulator, in partnership with the private sector, that identifies producers/content creators who have excelled, is likely to serve as incentives to the continuous production of great content. These award recipients are then more likely able to attract investments for planned work. It is therefore recommended that an awards system should be setup to reward producers and broadcast content providers of outstanding/compelling content which will enable easier access to funds for such award-winning producers and broadcast content providers.

vi. Training and Capacity Development

6.1 Merging of Institutions

There is a need to harmonize the public training schools within the broadcast and film industry for better efficiency and to encourage increased specialized courses for the industry.

The training schools currently in existence may not adequately cater for the increased number of people who will need to be trained to satisfy the manpower requirements of a digital terrestrial transmission era. Digital broadcasting employs new technologies which in turn requires more training centres and specialized training courses to be developed.

It is recommended that:

- the NTA TV College in Jos, the FRCN Training School, Lagos, and the National Film Institute in Jos, should be merged under a National Broadcast and Film Institute, a multi-campus institution, working in collaboration with the NUC and the NBTE;
- The new institute should be dedicated to hands-on professional training and retraining for broadcasters and film makers, under a Board, appointed by the Federal Government, and adequately funded from the proceeds of the digital dividend;
- the new Institute should get its recognition from the National Board for Technical Education (NBTE);
- The members of the Board should be professionals in the industry;
- The Board should establish appropriate curriculum for the industry;
- The regulator should have a seat on the Governing Board.

The advantages of the merger include:

- promotion of institutional efficiency;
- Reducing wastage of resource by eliminating duplication of functions;
- Attraction of more finding from foreign donors in view of its formal structured status;
- Curriculum to be developed and streamlined to meet students' and

organizational needs.

6.2 Establishment of a Council for Registration of Broadcasters

There is a need to promote professionalism amongst broadcasters and to encourage high standard. It is therefore recommended that Government should create a Council for the Registration of Broadcasters and Film practitioners with the responsibility to admit practitioners and maintain ethics and standards among broadcasters.

6.3 Manpower Development Fund

In order to attract trading for the broadcast industry, it is recommended that:

- A Manpower Development Fund, managed by a Board of Trustees, such as the Universal Service Provision Fund in the telecom sector, should be created by government, to be funded by a percentage of the income of broadcast stations;
- The secretariat of the Fund should be domiciled at the regulator.

Additional funds can be sourced from Federal and State Governments, international donor organisations as well as corporate organisations among others.

The variety of sources of funds available to support capacity building in the broadcast industry should be fully explored. These sources include:

- Government educational Grants;

- . ETF (Educational Trust Funds);
- Donor Agencies – UNESCO, Goethe Institute, UNDP, World Bank;
- Foreign Governments (under bilateral, cultural, multilateral agreements);
- Private donations from foreign and local organizations;
- Corporate organizations.

➢ Consumer Awareness Programme

The success of the transition programme will be determined largely by the extent to which the Nigerian consumer is well informed on the key issues of the programme. It is therefore recommended that:

- The Regulator should embark on continuous sensitisation of the general public on the digital switchover as approved by the Federal Government;
- All national and international events should be encouraged to buy into this awareness programme;
- The sensitization programme should adequately inform all stakeholders (BON, Nigeria Customs Service, Federal Inland Revenue Service [FIRS], Electronic Market Groups such as Alaba International Market) on the various aspects of digitization.

The components of the awareness programme must include:

- Establishment of Call Centres/Help Lines throughout the country by the Regulator, using to the extent possible, the regulator's Zonal and State offices as well as accredited representatives;
- Sensitisation of the rural public through opinion and community leaders;
- Public enlightenment for the switchover by all broadcasters;
- Ensuring uniformity of all publicity materials by the Regulator;
- Clear emphasis on the advantages of digitization in all information materials as well as its limitations;
- Decisive action in ensuring that broadcasters are fully prepared for the switchover;
- Effective consumer programmes addressing public interest issues including protection, purchases and safeguards;
- Information on the end-user prices of Set Top Boxes and display units with digital tuners (digital TV sets), and antenna/aerial information.

Some ground rules should be established for the consumer awareness programme.These will include:

- All Stations should be required to implement a consumer programme, with materials furnished by the regulator as their own contribution to the programme;

- All broadcasting stations have to include information about the use of antennae as part of their DTV education awareness programme;
- Every Station should air viewer notifications for at least 180 days before the switchoff of the analogue transmission of that station;and
- Exploit other media to create public awareness

Consumer Protection

It is important to ensure that consumers have a simplified means of recognizing which type of TV receives they should buy.

It is therefore recommended that warning labels should be conspicuously placed on display units (TV sets) e.g. "this unit will not be able to receive TV signals within the Nigerian territory without a Set Top Box after 17th June 2012".

Environmental issues

Digitization will inevitably result in generation of additional e-waste; which is a serious concern that should be addressed.

- Nigeria should adopt the Switzerland model of e-waste disposal whereby all actors (manufacturers, wholesalers and retailers) are licensed;
- A token amount (an advance recycling fee) should be charged at points of purchase of every electronic equipment, while disassembling centres are established in order to achieve an organised retrieval and safe disposal of e-waste arising from digitization;
- The agencies responsible for e-waste should note this and make provisions to contain issues on e-waste arising from digitization;
- They should also ensure adequate public awareness;
- All importers of transmit and receive broadcast equipment should be licensed by the Regulator as Broadcast Equipment Dealers.

Regional Coordination

Nigeria should take a lead in encouraging a coordinated regional policy for the introduction of digital broadcasting.

This should be addressed through ECOWAS and the African Union (AU), taking into account the experience of the European Union that has succeeded in establishing a coordinated approach to the introduction of digital broadcasting in Europe.

In addition, it is recommended that the regulator should initiate a spectrum coordination meeting with the neighbouring countries in order to replan the GE06 Plan

New Legislations

The policy recommendations put forward in this report should be incorporated in an enabling Act for the digital transition project in order to ensure an effective implementation. This will require the amendments to existing legislation and enactment of new legislations.

In view of the proposed new policy framework for digital broadcasting in Nigeria, it is recommended that the National Broadcasting Commission Act No. 38, 1992 (as amended) be further amended to support this policy framework.

To this end, an amendment to the Act will need to be effected in the following areas viz:

i. Procedures for the grant of broadcast licence and Broadcasting Signal Distributor(s) amongst others;

ii. Conditions for the grant of the licences;

iii. Spectrum assignment, etc

In addition, with the proposed unbundling of NTA, FRCN and state broadcasting stations, the laws governing the organizations should be amended as appropriate.

In the same vein, there is the need to amend the existing laws of some agencies whose functions have some bearing on broadcasting, like the Nigerian Copyright Act amongst others, to bring them in line with the recent technological development in the broadcasting industry as well as domesticate the provisions of international conventions and treaties.

Optimization of existing infrastructure

Existing broadcasters should be allowed to enter into commercial arrangements with the Broadcasting Signal Distributor on how to dispose of their broadcasting infrastructure.

In order to reduce the cost of digitization, the existing designated transmitting analogue sites and infrastructure will be used for digital transmission.

Where signal distribution services do not penetrate to areas that are not commercially viable, the regulator will provide intervention as may be appropriate.

Funding Strategy

The transition programme requires substantial funding for successful implementation. Within the telecommunication sector, a Universal Service Provision Fund (USPF) has been established to support the sector's non-viable areas. Given that the telecom sector will benefit from the transition programme (spectrum dividend, provision of IP broadcasting [IPTV], Mobile TV services etc), it is recommended that the Universal Service Provision Fund should provide seed money for the implementation of the transition programme.

Switch-on date

Given that the switch-off date is known and has been announced (17th June 2012), it is recommended that the government should determine the "switch-on" date, and therefore the dual illumination period after having public consultation and considering the readiness of current licensees.

Setting up the Digital Transition Implementation Team (DigiTeam Nigeria)

The decision to transit from analogue to digital broadcasting requires strong political will and commitment to support and affirm when and how analogue switch off will take place. This will provide the necessary credibility to the process and help avoid unnecessary delays.

In order to ensure that the implementation of the transition is successful, it is recommended that a Digital Transition Implementation Team to be known as "DigiTeam Nigeria", be set up with the secretariat and leadership provided by the regulator. The Team should be responsible for implementing the programme.

DigiTeam Nigeria, should be made up of industry and Government representatives to manage the transition, ensure adequate and proper public information, and address issues of consumer interests before the final switchoff.

Review of the recent standard decision in Southern Africa and the opportunities and challenges of migrating directly to DVB-T2

The fourth presentation was made by Mr. Aldred Dreyer of the

Southern African Digital Broadcasting Association (SADIBA) focusing on the South African experience.

The major issues involved focused on the technical implementation of the transition from analogue to digital broadcasting. The key issues raised involved the followings:

- The Standards decision
  - DVB-T in the region
  - Standards debate
  - DVB-T2 trial broadcasts
  - The decision
- Challenges
  - Expanding knowhow and expertise
  - Time-line expectations
  - Regulatory
  - Content
  - Implementation planning
- Opportunities
  - Multichannel environment in one network
  - HD future secured
  - Greater dividend

The was a standards debate in early 2010 which saw strong lobby for ISDB-T across the region. The imbroglio led to the SADC Ministers meeting in May that established special committee on DTT standards.

Challenges

The key challenges in the digital transition in South Africa involves

- Implementation planning
  - Network deployment
  - STB standards revision
  - STB incentive schemes

- Local manufacture
- Retail
- Consumer information and Communication

Opportunities

Apart from the challenges involved in the South African experience, the digital transition will facilitate direct leap to latest technology which will include:

- More services possible at reduced network cost
- Multichannel environment in one network
- No need to service 1st generation STB base
- Avoid digital dual illumination
- Secured HD future
- Should migration time-lines stretch – DVB-T2 will remain current much longer than 1st generation standards

6. Summary of questions and answers session: questions from watra digital migration workshop – 4 June 2011

Ghana

Question 1: DVB-T provides for hierarchical modulation which can carry more channels on different modulation. There is also no change in frequency bandwidth (8 MHz) so why do we need to change to DVB-T2? What makes it DVB-T2 30-40% more efficient?

Answer 1: DVB-T2 is the second generation of DVB-T. The differences is depicted in figure 1.

- A higher order of modulation has been added: 256 QAM.
- 3 extra guard intervals have been added: 19/256, 19/128, 1/128.
- Bandwidth modes to operate in 1.7MHz and 10MHz have been added.
- The number of carriers used for modulation to select from have been increased: 1k, 14k and 32k.
- Forward error correction has been improved by adding Low density parity checks (LDPC) and Bose-Chaudhuri-Hocquenghem multiple error correction binary block code (BCH).

- There is an option to have multiple physical layer pipes which allow you to have signals modulated differently in the same 8MHz spectrum bandwidth – this is similar to hierarchical modulation in DVB-T. You can then have HD services modulated differently than your SD services being transmitted off the same transmitter.
- Rotated constellation allows for a more robust signal when using 256 QAM modulation.
- Due to the increase in the number of carriers used for modulation (for example – 32k mode) the signal edge of the 8MHz signal is much sharper, which allows one to extend the bandwidth a little more in order to carry more data, without interfering with adjacent channels.

Parameter	DVB-T	DVB-T2
Transmission Standard Number	EN 300 744	EN 302 755
Date first Published	March 1997	September 2009
Modulation	COFDM	COFDM
Modes	QPSK, 16QAM, 64QAM,	QPSK, 16QAM, 64QAM, 256QAM
Guard Interval	1/4, 1/8, 1/16, 1/32	1/4, 19/256, 1/8, 19/128, 1/16, 1/32, 1/128
Bandwidth (MHz)	5, 6, 7, 8	1.7, 5, 6, 7, 8, 10
Number of Carriers	1705, 3409, 6817	853, 1705, 3409, 6817, 13633, 27265
FEC	Convolutional Coding + Reed Solomon 1/2, 2/3, 3/4, 5/6, 7/8	LPDC + BCH 1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Coding	MPEG2 and MPEG4	MPEG2 and MPEG4
Increased payload delivered (ISDBT) (%)	2	30 – 67

Figure 1: Differences between DVB-T and DVB-T2.

Question 2: Why does SFN give you more ruggedness?

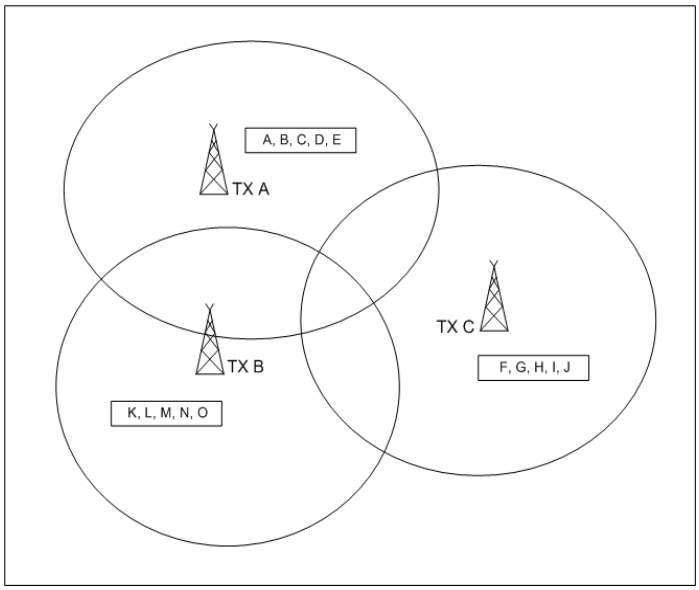

Figure 2: Multi frequency network topology.

Frequency spectrum is a scarce resource that needs to be managed carefully be regulators. One mechanism to employ is DVB-T and DVB-T2 is single frequency networks, which aid in using the available spectrum effectively.

Transmitter A, B and C in figure 2 are 3 transmitter sites needed to cover the areas depicted by the circles. A to O are the frequencies needed to have 5 different broadcast networks (for example SABC 1, 2, 3, e.tv and MNET). This is a multi frequency network configuration. In this configuration

you will need 15 different frequencies to create 5 different networks with the coverage depicted by the combination of the circles.

Figure 3 shows that the frequencies at transmitter site A, B and C is exactly the same. Here frequency A, at all 3 sites will form one network and operate on the same frequency. Therefore in a single frequency configuration only 5 frequencies are needed to form the same network coverage as in the multi frequency scenario in figure 2. Therefore, employing a single frequency network planning approach (in this scenario) is 300% more efficient. If an SFN topology is selected you have what is termed network gain, the signals from transmitter sites A, B and C add and collectively you can have up to 3db more signal available on your receive antenna than with a multi frequency approach. This make SFN networks much more robust than MFN networks.

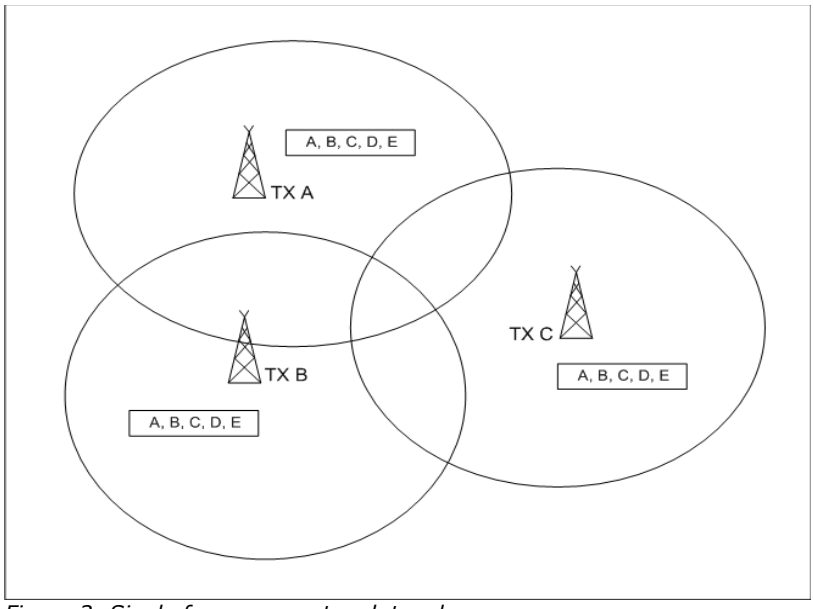

Figure 3: Single frequency network topology.

Senegal

Question 1: Organisation of stakeholders in the analogue broadcasting value chain consists of production, broadcasters, signal distributors and television set manufacturers. What changes in traditional value chain when you change to DTT?

Answer 1: In DTT the production, broadcaster and signal distributors remain the same. With DTT you will need a set top box (STB) in the home connected to your TV set in order to receive the digital signal and therefore it is the only addition to the value chain in DTT. In DTT the broadcaster or signal distributor (in many countries signal distribution is still done by the broadcaster) can do the encoding and multiplexing of the DTT signal. This is a new function that gets added to either the broadcaster or signal distributor. If the broadcaster does the signal distribution then the function of encoding and multiplexing will reside with the broadcaster. When you go DTT there is a demand for more content, so your production sector may grow once you go DTT.

Question 2: Do broadcasters keep their frequencies once they digitise? Will they be compensated?

Answer 2: Frequency spectrum is given to the broadcaster as part of its license conditions in analogue broadcasting. The frequencies always reside with the regulator, the broadcaster is given the right to use the frequencies in its broadcast license it owns. Once you move to DTT there is no need to use so many frequencies so the license for DTT will then only list the frequencies needed for DTT. In South Africa the regulator gave the broadcasters incentive channels on DTT as compensation for having to move from analogue to digital. I have attached a copy of the DTT regulations for further reading.

Question 3: South Africa (the whole of SADC) needs to switch off analogue broadcasting by December 2013. What progress has been made thus far?

South Africa has not yet launched DTT so no progress has been made. A commercial launch is expected to happen in quarter 3 of 2012.

Nigeria

Question 1: Concern with regards to the cost of the STB. What is the cost?

Answer 1: SA has decided to adopt HD as the minimum standard. Currently a basic DVB-T2, HD STB retails for ±60 GBP.

Question 2: Customer care is easier said than done. How will South Africa handle calls from customers? In Nigeria cellphone operators used to respond to calls immediately. Now they take up to 2 hours and still no answer. How do we sort this out?

Answer 2: This is a good question and unfortunately I don't have an answer for it. It is unacceptable for a call not to be responded to for so long. I will take back the question and ensure it is incorporated into our plans for consumer help. There will be various forms of help, call centres, sms, website. We have also recommended to the department of communications to have people that have been trained on DTT in the community that can help people with their questions concerning DTT. We have termed these people as "digital evangelists".

Gambia

Question 1: How do people qualify for the subsidy?

Answer 1: The subsidy will be based on a per household basis.
The qualification criteria is;

- Household earning less than R 4000 per month,
- Must have a SA identity document (must be a citizen),
- Must have a TV License.

Question 2: Do you have to possess all three to qualify? Are there expectations?

Answer 2: This is a concern that was raised in a workshop the department of communications had with the industry on 5-6 May 2011. The Universal Service and Access Agency of South Africa (USAASA) has been tasked with implementing the subsidy scheme. They have been requested to take this concern into consideration as they finalise the subsidy scheme.

Question 3: Using people in community to become digital evangelists – who pays them? If it is a private company what is the business model?

Answer 3: This was a recommendation that was made by the SABC at the workshop on 5-6 May 2011. The department of communications still needs to plan a help scheme. Nothing has been finalised yet. I suppose that the department of communications will pay the salaries of people that are digital evangelists.

Ghana

Question 1: Success of digital TV is universal access (universal take up of the service). Success of DTT is to ensure equal coverage to analogue and that people will adopt it. Technology is expensive that is needed for DTT. How do you guarantee success if people have choice to select between satellite, cable TV and mobile and IPTV?

Answer 1: SABC did some research that showed you need between 30-40 channels (mix of public service, private free to air and Pay TV) in order to ensure a good take up together with a low cost STB. Unfortunately competition will always be there and the success of your service vs another service (say satellite, IPTV and Mobile TV) is dependent on the quality of your service in terms of content and technical. I currently subscribe to a mobile TV service that is streamed over 3G and it does not work very well due to coverage and connection problems and the screen is very small to enjoy the show. This is one of the major reasons why it has not been a success in South Africa yet.

7. Recommendations

It is worthy to mention here that a big proportion of these recommendations are recommendations already proposed in the Report of the Presidential Advisory Committee on Transition from Analogue to Digital Broadcasting in Nigeria (PAC. Participants at the end of deliberations made the following recommendations.

Adoption of a new policy and regulatory framework in the broadcasting sector

Separation of broadcasting services from broadcasting signal Distribution.

To maximize the utilization of broadcast infrastructure and improve on the quality of content creation, it is recommended that New broadcast model, which separates the functions of the Broadcaster (Content Provider), and the Broadcasting Signal Distributor be adopted.

Governments should approve the establishment of a single

Broadcasting Signal Distributor which will serve the function of a multiplex operator, with the proviso that the regulator at the

appropriate time, will evaluate the market and take a decision as to when and how other Broadcasting Signal Distributors may be licensed.

Backbone of the Broadcasting Signal Distributor

In order to maximise the existing broadcast infrastructure, it is recommended that the existing and massive broadcast transmission infrastructure owned by Governments of respective countries should form the backbone for the new Broadcasting Signal Distributor,which must be able to absorb the transmitting infrastructure of other existing broadcasting stations.

Such stations will have to negotiate commercial terms for transfer of ownership of their infrastructure to the new Broadcasting Signal Distributor. The broadcasting regulator should be saddled with the responsibility to guide the process of valuation of this equipment.

The Broadcasting Signal Distributor should be wholly owned by the Federal Government and operate on a commercial basis.

Obligations of the Broadcasting Signal Distributor

Given the critical role that the Broadcasting Signal Distributor will play in the new environment, it is recommended that it should have, inter-alia, the following obligations:

- Provide services to broadcasters on an equitable, reasonable, nonpreferential and non-discriminatory basis;
- Adhere to licence conditions as provided by the Regulator;
- Provide quality delivery of broadcasting services as per contract between the Broadcasting Signal Distributor and the broadcaster; such contracts should be approved by the regulator;
- Ensure that it provides National coverage whilst ensuring that each content provider keeps to its assigned coverage area;
- Provide the regulator on a regular basis with information on the utilization of frequency channels
- In determining its tariffs, which should be subject to oversight by the regulator, the Broadcasting Signal Distributor will be required to take into account the different categories of broadcasting licences and the nature and technical parameters of the service provided to each licensee. This is to ensure that the different tariffs are appropriate to and commensurate with the various broadcasting services.

Restructuring of the licensing framework in the broadcasting sector

In order to respond to the challenges of the transition programme, it is

recommended that the licensing framework in the broadcasting sector should be restructured along the following lines:

- There should be 2 categories of licence, namely, a broadcasting content licence with the authority to produce content, and a broadcasting signal distribution licence with the authority to provide network platform for all broadcasters;
- The duration for a broadcasting content licence should be five (5) years as is currently for all existing broadcasters;
- The duration for a broadcasting signal distribution licence, bearing in mind the heavy investment and highly capital intensive nature of such infrastructure projects, should be fifteen (15) years;
- All broadcast stations should be unbundled so as to separate the broadcaster's function from the signal distribution function; the latter will be provided by a separate company;
- The current 5 year licence duration of all broadcasters should terminate with the unbundling;

- All current licences should be converted to the new broadcasting content licence;

Each of the new broadcast content licences should specify its coverage target within the following framework:

- Community Content Broadcasters – a licence for members of a community aspiring to project the cultural aspirations of the community and with a coverage target within the geographical boundary of the specific community;
- City Content Broadcasters – a licence with a coverage target within the geographical boundary of a specific city;
- State Content Broadcasters – a licence granted to a State Government with a coverage target within the geographical boundary of the specific State;
- Regional Content Broadcasters - a licence with a coverage target within the geographical boundary of a specific region (geo-political zones);
- National Content Broadcasters – a licence with a coverage target within the geographical boundary of the country.

Regulatory Framework to Guide Licensing of DTT Services

With the commencement of digital broadcasting, there will be new challenges, which will require specific regulatory interventions. Such interventions may not be determined in a vacuum. Therefore, the regulator should have the capacity to study the trends before determining the nature of the regulatory intervention that will be

required for the industry.

Management of the Spectrum Dividend

The transition from analogue to digital broadcasting will result in changes in spectrum usage allowing excess freeing capacity that result in a spectrum dividend to the Government. In order to achieve this, it is recommended that Governments should revisit the assignments in the ITU GE-06 Plan andoptimize the assignments using a range of frequency planning tools and the latest propagation techniques.

Convergence

The concept of Convergence refers to separate technologies such as voice (and telephony features), data (and productivity applications) and video that now share resources and interact with each other, to create new efficiencies.

Governments should accelerate efforts on the consideration of issues relating to Convergence with a view to taking a final decision as soon as possible in the interest of the industry and the national economy.

Technical Standards

In order to ensure compatibility, it is important to define the appropriate standards for digital broadcasting in the West African Sub region.

The approach adopted is to:

- identify existing digital broadcasting standards available worldwide;
- analyse them from a technical perspective and with reference to indivual countries make recommendations on the choice of standards and the way forward.

Set Top Boxes

Given that DVB has been recommended as a standard on the transmission network side, it is advisable that Set Top Boxes comply with the DVB family of standards. The specification (e.g. free-to-air, conditional access, low-level entry, etc) needs to be determined as part of a broader policy discussion.

With a guaranteed market of more than 90 million viewing homes, translating into over 200 million television sets requiring Set Top Boxes in West Africa.

Governments should provide appropriate incentives so as to attract potential manufacturers with a view to licensing a maximum of three (3) manufacturers of STB.

Such incentives should include:

- Tax holiday on manufacturing inputs;
- Zero import duty on manufacturing equipment;
- A government policy to protect the market through a moratorium on imports of similar equipment for a specified period of time;
- Adequate security needs to be assured;
- Provision of sufficient infrastructure, including electricity, water etc.;
- A maximum of three manufacturers should be allowed. It is recommended that the regulator should manage the process for the selection of the 3 manufacturers of the Set Top Boxes.

Development of the Content Industry in Nigeria

Intellectual Property Rights

There is currently a very serious problem of piracy afflicting the home movie industry which is a disincentive to potential content providers. When intellectual property rights are enforced,

the revenue accruable from the sale of content will become more significant, encouraging investment. It is therefore recommended that the respect for Intellectual Property rights (IPR) should be increased by the enforcement of the copyright and related laws.

I. Awareness Programme for the respect of Intellectual Property

A substantial number of people do not know the difference between an original copy and a pirated copy of an intellectual property or may not know the implications of purchasing pirated material. Increased awareness and easier access to the original works will encourage people to purchase originals rather than pirated copies. It is therefore recommended that:

- the respect for Intellectual Property rights (IPR) should be increased by the enforcement of the copyright and related laws.
- the awareness programme for the respect of Intellectual property should be increased.

II. Creative works at tertiary institutions

It is recognised that instituting a reward scheme for the creative arts will spur writers and theatre arts students to produce materials that may be developed into plays, movies and shows consumed by the broadcast industry. It is therefore recommended that the creative arts units/departments of Nigerian tertiary institutions should be recognized as a major source of local content and an endowment fund should be created to reward excellence in this field.

III. Establishment and Recognition of an Awards system

A credible awards system initiated by the regulator, in partnership with the private sector, that identifies producers/content creators who have excelled, is likely to serve as incentives to the continuous production of great content. These award recipients are then more likely able to attract investments for planned work. It is therefore recommended that an awards system should be setup to reward producers and broadcast content providers of outstanding/compelling content which will enable easier access to funds for such award-winning producers and broadcast content providers.

IV. Training and Capacity Development

Merging of Institutions

There is a need to harmonize the public training schools within the broadcast and film industry for better efficiency and to encourage increased specialized courses for the industry.

The advantages of the merger include:

- promotion of institutional efficiency;
- Reducing wastage of resource by eliminating duplication of functions;

Consumer Awareness Programme

The success of the transition programme will be determined largely by the extent to which the African consumer is well informed on the key issues of the programme. It is therefore recommended that:

- The Regulators should embark on continuous sensitisation of the general public on the digital switchover as approved Government;
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It is therefore recommended that warning labels should be conspicuously placed on display units (TV sets) e.g. "this unit will not be able to receive TV signals in respective countries without a Set Top Box after June 2012 (date to be adopted by each country)"

Environmental issues

Digitization will inevitably result in generation of additional e-waste; which is a serious concern that should be addressed.

- Countries should adopt the Switzerland model of e-waste disposal whereby all actors (manufacturers, wholesalers and retailers) are licensed;
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Switch-on date

Countries should determine their switch-off dates.

8. Conclusion

West Africa Countries have joined in the process of migrating from analogue to digital broadcasting even not in the same velocity as we identified at the Digital Migration Workshop. Obviously some countries have made significant efforts with clear and implementable roadmaps which they are pursing vigorously.

Ghana seemed to be ahead of the pack with an elaborate and actionable plan that has the political backing and will to migrate before the 2015 deadline. They have set 2013 as their country's deadline with a robust task force driving the implementation on course.

Nigeria also is working to meet the Geneva 2006 agreement with set up of a ministerial task team. 2013 deadline is the country's aspiration but as the years go by and the recent change of national government, Nigeria will need to redouble efforts to be able to make the set deadline.

Senegal, Burkina Faso, Benin, Niger and Gambia are equally working at different levels of Digital Migration. The workshop has sensitized all the 15 West African countries to re-energize their efforts and for those without a clear plan of migration coming to a realization that they should fast track the process.

The panelists submitted that the most important ingredient for the implementation of the Digital migration is the Political Will of each country driven by policy and consumer advocacy.

They opined that separate committee should be set up to galvanize buy-in and create awareness for the migration.

Digital Migration is ICT driven hence; there is need for skills upgrade on the practitioners and adequate technical institutions upgrade to handle the training in bridging the skills gap that already exist.

They also called for having clear policy with clear objectives and driving local content development to try to maintain target audience and overall all the regional efforts should be well coordinated by agencies like WATRA and published for countries lagging to appreciate what other countries are doing and manage frequency planning for effective deployment.