

# Annex J: Outline for Bhutan DTV Road Map

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## *A Guide for the Working Committee*

*This is an outline of a possible form of a final report of the Working Committee, which could then easily be converted to the Roadmap after decisions are made by simply updating the document to reflect the agreed strategies. It is provided to serve as a guide for the Working Committee and the various sections can be used as the Work Plan and responsibility assigned to various members of the Committee to compile the necessary information in advance of Working Group Discussion which would then be documented into the report as the work progresses. The order of headings can be changed to suit the need and some of the headings may not be relevant. Information to populate some of the headings will be found in the First ITU Consultancy Report delivered in January 2010. Some guidance on other parts is contained in the Second Report (the Consultant's Field Visit Report dated April 2010). The work of the Committee and its deliberations should generally follow the logical flow given in this outline which will then allow the Committees deliberations, and arguments to be easily captured. The usual way to progress is to take a heading and develop the fact base, such as the Technology or Policy Options, to write up the possible alternative and arguments and then to discuss these in the Working Committee to determine if all of the options have been covered and the pros and cons and then to reach a recommendation on a way forward. Note that where there is a lot of detail, this should be put into a supporting Appendix to the Report and the headlines mentioned in the body of the report along with any particular observations as to how the facts might assist or hinder the work.*

## **1 Introduction and Purpose**

Explain the reason why Bhutan is considering DTV Migration and the background to creation of the Working Committee, its functions etc. In other words why is this Road Map/Report being written?

## **2 Current State of Television Broadcasting Development**

This section explains the current situation for Television and sets the framework against which migration must be considered. All aspects should be stated in summary form. The details can go to Annexes but in the ideal this should become a reliable repository of factual information about the infrastructure, costs and ways in which television is currently delivered, the programming and limitations etc and the way it is distributed.

It should include mention of current concerns such as DTH etc as these are things for which solutions might be easier in the wider context of DTV.

### **2.1 Free to Air**

This will be about BBS Television Delivery, but could include issues about trans-border terrestrial if there is any relevance .

#### **2.1.1 Transmitter Locations and estimated Coverage and Channel Allocations/Spectrum Used**

#### **2.1.2 Transmitter Input Arrangements**

How are the transmitters feed with program (eg satellite, wireless link, optical cable)

### **2.1.3 Other Delivery Arrangements**

Information about special arrangements for remote villiages (such as communal TV viewing, from DTH or cable feed such as those installed for the Election and Coronation in the 176 locations without TV should be mentioned here.

### **2.1.4 Transmission Hours**

### **2.1.5 Program Content**

### **2.1.6 Costs and possibly current investment and remaining life of the infrastructure**

### **2.1.7 Any Current Developments (service extensions planned or proposed or in train)**

## **2.2 Cable**

As cable is an important means of delivery in Bhutan, it will be important to the DTV delivery as well. This section will document what is known about the cable systems so that the plans can take into account the public dependence on this means of delivery.

### **2.2.1 Description of Cable Arrangements Locations and estimated Coverage: Subscriber Numbers**

### **2.2.2 Cable Technology in Use (eg Fibre, Coaxial, Digital or Analogue)**

### **2.2.3 Costs and possibly current investment and remaining life of the infrastructure**

### **2.2.4 Any Current Developments**

### **2.2.5 Concerns (pirating content??etc)**

## **2.3 DTH**

Given the concerns mentioned to the Consultant, this seems an important question to be considered along with DTV so it should be mentioned in this background data repository of issues.

### **2.3.1 Description of current arrangements including BBS distribution if it is available DTH**

### **2.3.2 Current situation and Developments**

### **2.3.3 Costs (if relevant)**

Could include here the costs incurred in BBS distribution of its program to transmitters.

## **3 Current Concerns and Related Developments**

This section should describe any current matters or concerns that may need to be taken into consideration by the Working Committee during its deliberations and which might shape the recommended outcomes.

### **3.1 Any particular concerns about existing TV arrangements.**

### **3.2 Related ICT Developments**

As DTV is an important component of the ICT landscape, it can be put into context here and any relevant developments mentioned. One of the most important ones is the roll-out of Optical Fibre Cable across the county.

#### **3.2.1 Optical Fibre Roll-Out and Capacity**

## **4 Policy Objectives/options relevant to DTV**

Some of the points listed below may already be clear or might need early decisions to allow the DTV Migration strategy to be adequately shaped. Hence as the work progresses these might change from being questions to MoIC to agreed policies that are documented as foundational to the work. As policy confirmation may take some time, the Working Committee should make recommendations and then use the recommendations as the way to move forward. If there is a change later than the assumption can be changed and the other conclusions adjusted if necessary.

### **4.1 DTV Objectives (SDTV/HDTV/Emergency Broadcast...)**

What do we want to do with DTV and what types of services should be considered by the Committee in its system and service planning choices. This might include SDTV, possible numbers of channels, future HDTV and so on. It might set out the strategy of moving from one to the other as economic conditions and community needs change.

### **4.2 Target Coverage**

What do we expect to cover and over what time frame with DTV, and how will the balance be addressed

### **4.3 Competition**

How and when might competitive private broadcasting services be introduced. Should they be digital only, should any new services be delayed until Digital is in place. etc

### **4.4 Access**

If infrastructure is shared (and some must be irrespective of the solution) then what arrangements should be in place to ensure level playing field and at the same time appropriate charges for shared facilities.

## **4.5 Content**

Are there any desired content outcomes for DTV (eg Educational Channel, Government Information Channel, which could use some of the new capacity provided by DTV at very low marginal cost.

## **4.6 ??Mobile Television?**

Is this a concern or aspiration. Different technologies have different ways of delivering this. Some need separate infrastructure. What the committee needs to decide or know is this relevant to Bhutan and how would this sit in relation to future mobile telephony etc. There would be cost for mobile DTV that needs to be factored into the decisions

## **4.7 Spectrum**

Are there any compelling spectrum issues to be addressed such as Digital Dividend (as Bhutan does not use any of the bands ITU expects to clear by 2015 and there is no pressing demand for alternative use of the spectrum then it may not be a relevant concern. That should be mentioned. At the same time it might be relevant to mention agreements as to long term preservation of particular bands etc.

## **4.8 Arrangements for New Services in the Interim?**

If there are new services would they be allowed to start on Analogue, and if so what rights would they have to migrate, simulcast etc.

### **4.8.1 Requests from Private Operators?**

How are requests for private channels going to be handled while the DTV migration work is in train, and before commencement of DTV.

### **4.8.2 BBS Extensions**

Are further extensions for BBS to continue on Analogue or should new transmitters in areas not currently served go immediately to Digital?

## **5 Relationship with Other ICT Policies**

The headings are a guide as to possible policy areas of relevance that should be considered by the Committee

### **5.1 Access**

### **5.2 Education**

### **5.3 National Development**

## **6 Digital Television Standards**

In this section the options should be considered for the Bhutan Standard. It may be useful to list the various world standards and some of their characteristics (see the ITU Report on Digital Migration ITU Rep 2140 for summarized details)

## **6.1 Special Considerations (eg following lead of India??)**

This may impact on timing and choice and so is a relevant factor

## **6.2 Analysis of Options**

This depends on how strongly the preference already is for DVB as to whether there needs to be much said about the other systems. It would be pertinent to mention and analyse things like whether to adopt DVB-T or DVB-T2, MPEG2 v MPEG4. Guidance is contained in the Consultants Field Mission Report for Bhutan.

## **6.3 Preferred Option**

### **6.4 Arrangements to formalize the standard in Bhutan**

What are the arrangements to make this a National Standard, and how will the nation specific components and tables within the standard be documented (eg through the National Standards Body, By Government Proclamation.....)

#### **6.4.1 Availability of Equipment**

Consumer and Professional production/transmission/distribution equipment.

#### **6.4.2 Commentary on preferred configuration of the system?**

How should the preferred system be set up. Eg service data rates, number of channels in the multiplex, type of sound system to be used, error correction, Electronic Program Guide, allocation of data capacity, preferred data rates for channels, Use of Wide Screen formats and arrangements to accommodate viewing of 4:3 receivers etc.

## **7 Spectrum Consideration**

What channels should be used and what are the planning concerns if any for implementing the recommended standard. For example are DTV services to be in the same frequency band as existing analogue transmitters, how far away should they be spaced in frequency (eg adjacent channel or one channel removed in VHF, two in UHF) see second consultants report for commentary on this.

### **7.1 Proposed Spectrum to be used for DTV**

### **7.2 Preferred channel assignments and why**

## **8 Proposed Delivery Model**

Shared or stand alone multiplexer

### **8.1 Multiplexer Arrangements**

How channels on a shared multiplexer will be managed, who should “own” the multiplex, how do others get access, arrangements for access etc.

### **8.2 Mix of Terrestrial, Cable, Satellite in delivery of DTV**

How do other delivery means fit into the model once the DTV broadcast system is determined

### **8.3 Industry implications (cable industry etc and switchover to digital)**

How and when should cable start moving to a digital delivery model, how will DTV services appear in the cable channel line up, will the complete multiplex be carried transparently or will it have to be recoded etc.

### **8.4 Possible transition and development of DTV reach over time**

Clearly it would not be sensible to start everywhere at one time, Therefore there should be a plan that will see DTV start in one or two major centres and then expand over time. Just how far should the plan to reach before it is no longer reasonable to deliver the signal terrestrially

## **9 Infrastructure Implications**

What does it mean for towers, etc.

### **9.1 Transmission Towers and Facilities**

### **9.2 Electric Power**

### **9.3 Distribution System for DTV signal**

Will this be via the optical fibre cable or via satellite. In some cases it will be a mix.

### **9.4 Studio/Production Implications**

What investment is required for encoding, multiplexing, presentation of new channels if any and so on. Who should be responsible for establishing, operating, maintaining etc.

### **9.5 Possible Industry Incentives to support Transition**

Discuss possible incentives, such as exemptions from duties on imported equipment, direct financial subsidy, licence fees and any other option and arrangements and suggest what might be needed and the likely costs.

## **10 Content Opportunities**

Discuss new and current possibilities that DTV might deliver for new content that advances GNH and national development. What might such initiatives cost and how could they be phased over time

### **10.1 Education**

### **10.2 Local Production**

### **10.3 Information Services**

### **10.4 Etcf**

## **11 Regulatory Impacts**

What changes or additions are needed to existing rules and regulations to enable the preferred solution.

### **11.1 Changes to existing Legislation?**

### **11.2 New Regulations?**

## **12 Timing Considerations**

When should all of this happen. What makes sense from an economic and practical point of view. This section should discuss options and arrive at a considered solution. It can't be considered in isolation from economic aspects mentioned in the next section so drafting may require a few cycles once the overall cash flow, and options are considered. The arrangements for roll-out over time also impact on this.

### **12.1 Options for rolling out DTV and eventual Analogue Switch Off**

### **12.2 Proposed Roll-Out Timetable**

### **12.3 Determining appropriate schedule of Analogue Switch Off**

What factors might be relevant to switchoff. Are there specific targets to be achieved, or should there be a prescribed date to aim for.

## **13 Consumer Impacts**

Discussion of ways of receiving DTV, (eg integrated receiver, set top box), issues related to 4:3 analogue displays v 16:9 in modern wide screen. Supply of receivers etc.

### **13.1 How Consumer can access DTV**

### **13.2 Receiver Supply**

### **13.3 Possible Assistance to some viewers?**

What assistance may be needed for low income groups, how might this be managed, what would it cost etc.

#### **13.3.1 FTA options**

#### **13.3.2 Cable?**

#### **13.3.3 Satellite?**

## **14 Economic Considerations**

### **14.1 Costs**

#### **14.1.1 Government**

All costs for Government, including regulatory costs, incentives etc.

#### **14.1.2 Broadcaster**

#### **14.1.3 Cable Operators**

#### **14.1.4 Public**

### **14.2 Benefits**

Many of these will be qualitative rather than quantitative or very difficult to assess in hard terms. However, this is not a new problem on public policy and in this section the benefits should be summarized in whatever form is appropriate and might cover things like improved access to information, improved literacy, entertainment choices in Bhutanese languages....etc

### **14.3 Estimated cash flow requirement**

Against the proposed plan what cash would be needed when. If there are options then these should be set out as alternatives (eg a more or less aggressive roll-out will have significantly different cash flows)

### **14.4 Funding Arrangements**

Where might the funds come from? What are the possibilities?

## **15 Post Switchover Spectrum Considerations**

Will any of the spectrum be cleared or earmarked for other uses at the end of the migration (it could perhaps occur earlier where spectrum is vacant)

### **15.1 National Band Spectrum Planning Considerations**

## **16 DTV Implementation**

In this section we look at rolling out DTV against the plan. What has to be done? Who will do it? When will they do it? What are the specific tasks to be performed.

### **16.1 Responsibilities for Implementation amongst various Stakeholders**

### **16.2 Switchover Principles and Arrangements**

#### **16.2.1 Simulcast?**



### **16.2.2 Roll-out of Digital Only Services to Unserved Communities?**

### **16.2.3 Switch Off of Analogue**

### **16.2.4 How will the change be managed**

## **16.3 Communications Strategies**

How and when will consumers and industry start to be informed of the changes.

### **16.3.1 How will industry and community be informed about the changes**

### **16.3.2 When should communication campaigns start**

## **17 DTV Recommendations and Proposed Timetable**

### **17.1 Summary of Recommendations from Above and Decisions**

In the draft stage this section will set out what needs to be done to make it happen, what decisions Government has to take etc. When the decisions are made, the document could be updated to reflect the decisions taken so that it becomes the model against which the developments will occur.