



Telecom Regulatory Authority of India

Recommendations

On

Issues Relating to Private Terrestrial TV Broadcast Service

New Delhi

August 29, 2005

Table of Contents

Sections		Page No.
Chapter 1	Introduction	1-2
Chapter 2	Private Sector Participation	3-5
Chapter 3	Spectrum and Technical Issues	6-12
Chapter 4	Licensing	13-16
Chapter 5	Pilot Projects	17-20
Chapter 6	Summary of Recommendations	21-23
Annexure –I	International Status on Digital Television	24-30

CHAPTER - 1 : INTRODUCTION

1.1 Background

TRAI had circulated a consultation paper on issues relating to the introduction of Private Terrestrial Television Broadcasting Services in February, 2005. The purpose of the paper was to see if any recommendations could be made on the broad issue of allowing private broadcasters in the field of terrestrial television which has so far remained in the exclusive domain of Doordarshan under Prasar Bharti.

1.2 International practice

Most countries have a well-developed private terrestrial television broadcast service. In fact, this developed well before the cable and satellite television business. In contrast, in India there is already a well-developed cable and satellite television industry and according to latest estimates of the National Readership Survey a total of 61 million homes are connected through cable out of a population of 108 million television homes. This penetration of cable television is one of the highest in the world. In this context it needs to be examined whether there is a need and if yes, whether this is the appropriate time to open up terrestrial broadcasting to the private sector.

1.3 Convergence

During the process of consultation it emerged that apart from traditional television broadcasting, it may be possible to combine this service with other telecom services. This would provide a more efficient way of providing broadcast-cum-interactive services which could be rolled out in the future. This aspect has not been touched upon in the consultation paper and provides an additional argument for opening up terrestrial television broadcasting to private sector.

1.4 **Community Television**

Another issue that came out during the process of consultation is the need for community television. Several stake-holders have requested TRAI to make space for community television also.

1.5 **Outline of Recommendations**

Taking into account the inputs that have been received the Authority has come to the conclusion that there is a need to open up TV broadcasting to private sector and has made certain recommendations on throwing open terrestrial television broadcasting to the private sector. These recommendations have been made in the following chapters:

- Chapter-2 deals with the overall question of whether or not to open up terrestrial television broadcasting for participation by the private sector including the issue of community television.
- Chapter-3 deals with the question of whether this should be permitted only in analogue mode or whether it should be compulsorily in digital mode.
- Chapter-4 deals with the broad issues of licensing – limits of foreign investment, term of the licence, licence fee and whether the licence should be given on a national/regional or individual city basis.
- Chapter-5 deals with the question of whether pilot projects should be permitted and if so what should be the basis for the same, the period of such pilot licences and whether any licence fee should be charged for such projects.

CHAPTER-2: PRIVATE SECTOR PARTICIPATION IN TERRESTRIAL TELEVISION BROADCASTING.

2.1 Issues

The basic issue to be answered in this chapter is whether terrestrial television broadcasting in India should be thrown open for participation by the private sector. The related issue which came out during the consultation process is whether this should be allowed only on a commercial basis or whether it should also be permitted for community television.

2.2 Views of stake-holders

All the stake-holders have supported the entry of private sector into terrestrial television broadcasting, although some have emphasised the need to also open it up for communities and NGOs. It has been suggested that the policy for community television should be on the lines being announced for community radio. The arguments made in favour of opening up terrestrial television broadcasting to the private sector is to provide for greater choice and diversity, the observations of the Supreme Court in its judgment in 1995 on Airwaves and to provide greater competition to improve the quality of service to the consumers. It has also been stated that terrestrial television broadcasting should be thrown open to the private sector only with proper regulation.

2.3 Recommendations of the Authority

In the consultation paper a number of reasons were provided for allowing private sector participation in terrestrial television broadcasting. These are briefly as follows:

- i) In the light of the Supreme Court judgment of 1995 on Airwaves, no medium should be controlled by a monopoly either of the state or of any individual, group or organisation. Thus, it would be necessary to provide a private sector alternative to Doordarshan.

- ii) The private sector would complement public sector broadcasting and provide more resources for the development of this alternative.
- iii) Consumers would be able to view these channels in a Free-to-Air mode without buying a DTH receiver or paying subscription to the cable operator.
- iv) This may provide an alternative means of communication specially where cable and satellite have not penetrated.
- v) Terrestrial broadcasters may produce their own programmes and this could mean greater choice for the consumers specially coverage of local issues, events, music and culture.

Apart from the above the following arguments also came out during the consultation process:

- a) In combination with telecom networks private terrestrial broadcasting can offer new services such as interactive TV (gaming , contests, e-commerce etc.) delivery of internet and TV broadcasting for hand held devices like mobile phones in a rapidly converging technological world.
- b) Apart from commercial service, such a policy decision could also pave the way for community television.
- c) With the growing shortage of space on cable networks and the slow pace of digitalisation, terrestrial television offers an alternative means of carriage for broadcasting programmes.

After considering all these factors as well as the fact that private television channels are already extensively available through cable and satellite, it is considered that there should not be any bar on throwing open terrestrial broadcasting to the private sector. The question as to whether this would make business sense in a market with high cable and satellite penetration is of course a relevant issue. However, it is considered that this option should be really left to the market to decide. In addition there are the possibilities thrown open by convergence as well as community TV . As a policy there does not

appear to be any reason to bar the entry of the private sector for terrestrial television broadcasting any more.

Accordingly it is recommended that :

- i) Terrestrial television broadcasting in India should be allowed in the private sector also.**
- ii) This should be allowed also for community television.**

The conditions for commercial service are set out in the remaining chapters. These only cover the broad contours and other points of detail would be worked out after the Government has taken a decision on these broad parameters. Similarly, for community television also more detailed recommendations would be sent after this decision is taken and once the Government policy on community radio is also finalised.

CHAPTER-3 : SPECTRUM AND TECHNICAL ISSUES

3.1 The Issues

The main issues that have been considered in this chapter is whether private terrestrial broadcasting should be permitted in analogue mode or it should be compulsorily in digital mode. The related issues of availability of spectrum, technical standards and other technical issues are also dealt with in this chapter.

3.2 International Status

Due to the inherent advantages of digital transmission over Analogue most developed countries have adopted a time table for complete switch over from Analogue to Digital TV within the next 10 years. Details of these plans and the progress made so far have been indicated in the Consultation Paper on Digitalisation of Cable Television. This is attached as Annexure-I to this Recommendation for ready reference. It can be seen that several countries have proposed to completely switch over to digital broadcasting by dates ranging from 2008 to 2015.

3.3 Comments of the Stakeholders

Majority of the stake-holders have suggested that private terrestrial TV should be permitted in digital mode only. One stakeholder has recommended that digital TV should be the standard, provided Government subsidise the equipment/set-up. In the absence of support from the Government, the policy should be technology neutral. Another stakeholder has suggested that India should introduce the less expensive analogue mode of broadcasting for the rural population and by the year 2020 compulsory digital mode may be introduced. A third view is that the option may be left open to the licensee and the service provider will shift to the most efficient and effective technology.

3.4 Recommendations of the Authority

3.4.1 *Spectrum availability*

Before deciding on the choice between analogue and terrestrial broadcasting, an analysis has to be made of the availability of spectrum for broadcasting. The following spectrum is available for TV Broadcasting in the country.

Band	Spectrum	Number of TV Channels available*	TV Channel Number
VHF Band I	47-68 MHz	3	2 to 4
VHF Band III	174-230 MHz	8	5 to 12
UHF Band IV	470-582 MHz	14	21 to 34
UHF Band V	582-806 MHz 806-960 MHz	28 ---	35 to 62 ----

* in analogue mode.

TV broadcasting shares these bands with other users of spectrum such as fixed and mobile services. For example, in UHF band V, spectrum beyond 806 MHz has been extensively assigned to cellular mobile services etc. The RF bandwidth of TV transmission is 7 MHz in VHF bands and 8 MHz in UHF bands because in India Doordarshan has adopted PAL 'B' system for Analogue TV transmission in VHF bands and PAL 'G' system for transmission in UHF bands.

3.4.2 VHF Bands I and III

Presently Doordarshan has been assigned only one channel (No.4) out of three channels available in the VHF Band-I. Doordarshan is using this channel only in 10 cities and it has plans to change this channel from all the 10 transmitters to a channel in the VHF band III. *Thus, this band is presently highly under utilized and is expected to be completely free in the near future.* The Band supports large coverage areas but has a drawbacks such as large size receiving antennas, comparatively large man made noise and co-channel interference from long distance sporadic-E & anomalous propagation.

The VHF Band-III (174-230 MHz) provides a total of 8 numbers of TV channels each of 7 MHz bandwidth. Doordarshan has been assigned all the 8 channels in the country. A total of about 450 frequency assignments have been made to Doordarshan in this band. Since these frequencies can be repeated there is scope to install more than these 450 transmitters. Thus at different locations there would be a possibility to use some of the spectrum in this Band for establishing more transmitters. The VHF band III is considered the most optimum band for TV broadcasting all over the world due to the following reasons.

- A TV transmitter operating in this band can cover a large area than the one operating in UHF band.
- The Band-III is free from propagation impairments which are encountered in Band-I.
- The physical dimension of the receiving antennas are reasonable.
- The man-made noise is insignificant.

The Band has partial capacity to accommodate the requirements of private TV broadcasting

3.4.3 UHF Bands IV and V

There are 14 TV channels available in the UHF Band-IV (470 - 582 MHz) with 8 MHz channel bandwidth. Doordarshan has been assigned to operate about 330 transmitters in this band. Doordarshan's four digital TV transmitters one each at Delhi, Kolkata, Chennai and Mumbai are also operating on an experimental basis in this band. In addition, Doordarshan has received frequency earmarking for 3 more channels in Delhi, Kolkata, Mumbai and Bangalore to operate digital transmission. In Chennai, only 2 additional channels have been earmarked for digital transmission. It is understood that Doordarshan has no scheme in the 10th Plan to utilize the channels which have been earmarked for digital transmission. *Apart from non-utilization of these channels, the band has enough capacity for exploitation by private TV broadcasting. It may however be noted that TRAI has separately recommended allocation of 450MHz band for mobile services and therefore utilization*

of this band for broadcasting will require some co-ordination with mobile services.

Under UHF Band-V, there are 28 channels available with 8 MHz bandwidth in the sub-band from 582 to 806 MHz. Doordarshan has not been assigned any channel in this sub-band for analogue TV transmission. However, frequency earmarking has been made in favour of Doordarshan to operate a digital transmitter one each at four metros. Again Doordarshan has no scheme in 10th Plan to commission these transmitters. *Thus, at present, this is a virgin band so far as TV broadcasting is concerned. However use of this band will have to be co-ordinated with the requirements of the needs of other services as well such as wireless based telecommunication services.*

3.4.4 Analogue or Digital transmission

From the above discussion it may be seen that Spectrum would be available not only for digital services but also for analogue services. In considering whether digital transmission should be insisted on, the advantages and disadvantages need to be clearly spelt out.

Digital transmission has the following advantages over analogue transmission.

- A digital TV transmitter can easily carry five Programme Channels against one channel by an analogue transmitter
- Vastly superior and uniform quality of reception in the entire coverage area.
- The deterioration of video quality due to multi path ghosts is removed.
- Reception of TV/multi-media services even in fast moving vehicles is possible.

- Much lower power digital TV transmitter is required to cover the area previously served by an analogue TV transmitter.
- It is possible to dynamically allocate the bandwidth (bit rate) in real time to different programmes depending upon the requirement.
- The digital TV can also be used for data-casting services such as INTERNET, multi media etc.
- Digital TV is highly spectrum efficient. Large areas or a state can be served by using only one channel assigned to many low power digital TV transmitters operating in Single Frequency Network (SFN).

3.4.5 During the consultation process, many stakeholders expressed the view that TV broadcasting should be opened up for private players only in the Digital mode due to the several inherent advantages of digital over analogue TV. Another argument in favour of digital transmission is that since TV broadcasting for private participation has already been delayed as compared to many other countries, it is appropriate to leap frog the technology. The switchover to digital transmission is necessary in view of similar developments around the world. India will have to follow this trend to remain competitive in a global market and to avoid analogue technological obsolescence.

3.4.6 On the other hand, analogue transmission provides a ready market of 108 million TV households of whom only 61 million have access to cable and satellite TV (NRS 2005). It appears that analogue transmission will continue to grow in developing countries for another at least 10 to 15 years due to the legacy and high cost of Set Top Boxes required for reception of digital transmissions. Even in developed countries the upfront cost of the STB is becoming a hindrance to the growth of digital transmission. Consequently most of these countries have revised the deadlines for complete change over to 2012/2015. Thus although analogue transmission is not spectrum efficient it will continue to dominate the market for the next several years.

3.4.7 In view of the above, it is recommended that the licenses to private broadcasters to provide TV broadcasting may be issued for both analogue as well as digital transmission.

However, there is a need to adopt separate licensing process for analogue and digital transmissions due to the following reasons.

- a) The power of transmitters required for digital TV is several times lower than the analogue TV transmitters to cover the same area. In addition many other planning parameters are different from analogue TV. Consequently, separate network planning is carried out for analogue and digital TV.
- b) One of the special features of Digital TV which is different from analogue TV is that large parts of the country, for example, a state may be covered by using a number of small power transmitters using the same frequency. Such network is called Single Frequency Network or SFN. Thus SFN is highly frequency efficient as compared to Analogue TV where several channels may be needed to cover the same area. Thus SFN network is ideal for the linguistically homogeneous area.
- c) Analogue TV service is planned only for fixed reception by roof top antenna. On the other hand Digital TV, may be planned for mobile reception, portable reception inside the house apart from fixed reception.
- d) The degradation in the reception of analogue TV is always graceful or smooth i.e. the reception under adverse conditions may come down gradually i.e. a picture will still be received but with lower quality. On the other hand in digital TV the behavior is completely different. When the signal level decreases and the C/N or C/I fall below a given minimum value, the video disappears suddenly without any intermediate levels of quality. This behavior is referred as rapid failure characteristics of digital system. This behavior of digital TV is mitigated by planning the services for 95% or 99% location probability unlike analogue TV which is planned for 50% of location probability.

3.4.8 At some point of time in future when Government decides for complete change over from analogue to digital, additional channels

would have to be assigned to analogue TV broadcasters for digital transmissions for simulcasting purposes during the transition period. Most of the countries have followed this model without charging any additional fees from the analogue broadcasters. However, analogue broadcasters surrender the analogue channel spectrum back to the Government, once the transition period is over.

3.4.9 There are several other detailed issues relating to technology. These can be addressed once an in principle decision is taken to throw open terrestrial broadcasting to the private sector and if so whether this should be in digital mode only or in both analogue and digital.

3.4.10 **For the present the only recommendation being made is to allow both analogue and digital transmission at this stage. There will be sufficient spectrum to support a few players even in the analogue mode. Once a decision is taken on this recommendation, other details, including the sub allocation of spectrum between analogue and digital channels can be worked out in consultation with the concerned stakeholders.**

CHAPTER – 4: LICENSING

4.1 Issues

Since it is being proposed that private terrestrial broadcasting be thrown open to the private sector in both digital and analogue modes, there is need to lay down the policy for licensing. The major issues are:

- Eligibility conditions for grant of licence.
- Limits for FDI and portfolio investment.
- Term of licences.
- Issues relating to licence fee and
- Basis for grant of licence – national or regional or city.

4.2 Views of stake-holders

4.2.1 Eligibility

Stake holders have proposed that these should be defined in terms of the financial credentials of the applicant as well as past experience. One suggestion has been that only broadcasters should be allowed to participate in the auctions for their own use similarly universities only should be allowed to participate for community television. Another view is that this should be on the lines of a DTH licence.

4.2.2 Foreign ownership

Suggestions have ranged from keeping it the same as for DTH, i.e. a maximum of 20% to an FDI limit of around 49% to 50% as well as not keeping any restrictions at all. An alternative suggestion has been to review the limits on a holistic basis across the broadcasting and telecom sectors. For NRIs and PIOs it has been suggested that 51% or more should be allowed.

4.2.3 Period of licence

Generally it had been recommended that the period of licence should be 15 years to 20 years. For community television it has been suggested that the period of licence should be fixed taking into

account the initial capital investment and the time required to build an initial viewership.

4.2.4 Licensing

Most stake-holders have suggested an annual fee based on the revenue sharing system. One suggestion has been that this may be set at 2% of the annual gross revenue of the licensee as in the case of cellular mobile services. On the entry fee it has been generally suggested that this should be determined through a competitive process. One stake-holder has suggested that no such fee should be charged. For community television operations it has been recommended that there should be no licence fee at all or only a nominal one.

4.2.5 Area of licensing

A number of suggestions have been given on this issue. Some have suggested that licences should be issued on a citywise basis whereas others have suggested that these should be issued on the basis of regions. It has also been suggested that the policy should allow the option of single frequency networking so that the same frequency may be utilised across centres. An alternative proposal is that private bidders should be allowed to share the infrastructure of Doordarshan.

4.3 **Recommendations of the Authority**

The level of interest in private terrestrial television has been limited. It is possible that the level of interest would increase once the Government were to make an in principle announcement of their intention to throw open this area to the private sector. A more detailed consultation may then be possible on the various issues relating to licensing and the linked issue of the manner of awarding licences including auctions if necessary. **For the present some broad recommendations are being made without going into details.** Broadly these recommendations follow the pattern of FM radio and detailed reasons for the same have already been given. Some departures may need to be made in view of the large penetration of cable and satellite – such a parallel does not exist in the case of Radio. **Further details can be framed once an in**

principle decision is taken by the Government and it is known as to what is the extent of interest , at what locations and from what segments of business and the industry.

4.3.1 Eligibility

No detailed eligibility conditions need be laid for the present. However, the general disqualifications which have been adopted for Private FM Radio may be used for private terrestrial television broadcasting also. This would mean that the following would be disqualified from holding a licence :

- General disqualifications
 - Companies not incorporated in India;
 - Any company controlled by a person convicted of an offence involving turpitude or declared as insolvent or applied for being declared insolvent;
 - Subsidiary company of any applicant in the same centre;
 - Companies with the same management within a centre;
 - More than one inter-connected undertaking at the same centre.

- Religious bodies
- Political bodies
- Advertising agencies
- Trusts, Societies, Non profit Organisations controlled/associated companies.

4.3.2 Foreign Ownership

In the case of FM Radio no FDI was earlier permitted. The government have now permitted 20% FDI in this sector which would bring it on par with DTH. In the case of terrestrial TV a decision would have to be taken on this issue as there has been no such service in the past. This could be kept at 20% to be on par with FM radio since both involve terrestrial broadcasting and have wide reach. However it may be better to take a consolidated view of all media related sectors – in addition note would have to be taken of the likely convergence in this sector with the telecom services also.

Thus as has been recommended earlier by the Authority in the context of Private FM Radio, the rules regarding foreign investment need to be reviewed to bring about a greater consistency in the rules of various segments of the media sector. Given the interest of the telecom sector in this area, this review would also need to take note of the likely convergence in future between telecommunications and broadcasting.

4.3.3 Period of licence

The term for a licence would depend on whether it is being given for analogue or for digital. A longer term for digital licences may be given whereas for analogue the licences could be for a shorter period. However, the details of this issue needs to be decided after a view is taken by the government on whether analogue licences would at all be given or not.

4.3.4 Licence Fee

The structure of the licence fee should be the same as for Private FM Radio. There should be an entry fee which is related to the level of competition and size of the market and can be determined by an auction process similar to what has been decided in the case of FM Radio. The annual fee should be on the basis of a revenue share of the gross revenue of the licensee which could be at the same level as that proposed for Private FM Radio – 4%.

4.3.5 Area of licence

The licences could be for cities identified after an in principle announcement is made. However, in case there is interest shown in particular regions then those regions should also be allowed to be put on bid. In the case of FM Radio no networking was permitted. However, the case of television is different where there are already a large number of private channels having national coverage and viewership. Therefore, networking for television should be permitted to allow for competition with established national cable and satellite networks.

CHAPTER 5 : PILOT PROJECTS

5.1 The issues

5.1.1 Apart from regular TV Broadcasting technologies discussed in Chapter 3, there are other terrestrial technologies available for the delivery of TV Channels. Multi Channel Multi Point Distribution Service (MMDS) employs one such technology which can provide terrestrial reception of multiple TV channels. The service is normally encrypted to enable the service provider to control and bill his services. While regular terrestrial TV broadcasting utilizes VHF & UHF bands, the MMDS service is provided in the Microwave band mostly between 2.5 and 2.9 Ghz. . The service can be delivered both in analogue as well as digital modes. Subscribers of the analogue MMDS service are required to procure a small directional receiving antenna along with down converter to change the Microwave frequencies to VHF/ UHF Channels suitable to TV sets. In order to receive TV signals from digital MMDS service the viewers are required to procure a digital Set Top Box, which is presently expensive. The digital MMDS can also be used to deliver high-speed Internet service

5.1.2 A proposal has been received for delivery of multiple TV channels using analogue MMDS technology on a pilot project basis by installing transmitters at Kasauli in Himachal Pradesh. Since Kasauli is at a height, the service will cover large parts of Punjab, Haryana, Uttranchal and U.P. The pilot project will be at no cost to the Government. The issues for consideration are :

- Whether such proposals should be permitted as pilot projects or should these be examined in detail and regular licenses should be issued after laying down a policy?
- If allowed on a pilot basis what should be the period of license?
- On what basis should the permission for pilot projects be granted?
- Whether any license fee should be charged for issue of licenses for such pilot projects?

5.3 Comments of Stake holders

5.3.1 Most of the stakeholders have suggested that the policy and regulatory framework should be in place before any pilot project is allowed.

5.3.2 Department of Space (DOS) has commented that pilot projects are meant for testing the technology and end user objectives. Such proposals especially in broadcasting should not be permitted without an approved policy framework in place. Taking into account the advantages and disadvantages associated with allowing MMDS pilot project, it can be concluded that disadvantages outnumber the advantages. DOS has mentioned that the Broadcasting Satellite Service (BSS) presently in operation cannot share the spectrum between 2550 and 2630 Mhz with MMDS. In future DOS will continue to use this band for Satellite- Digital Multimedia Broadcasting (S-DMB) service. DOS has also mentioned that the period of pilot project generally needs a few months only. In the pilot project under consideration, the time period proposed (15 years) and the geographical area proposed to be covered (150 km) are not commensurate with the purpose of pilot project. Secondly, pilot projects are not run on commercial basis.

5.3.3 A stakeholder has mentioned that the allocation of spectrum, which is a finite resource to various services needs to be carefully evaluated so as to avoid the eventuality of such services having to be discontinued and customers inconvenienced in order to reclaim spectrum.

5.3.4 Another stakeholder has suggested that the period of license should be 5 years to be extended by another 2 years. Technical competence and investment ability should be the criteria for grant of permission for pilot projects. No license fee should be charged for pilot projects.

5.3.5 An alternative view is that licenses should be issued on a technology agnostic basis. The licensees may then take up pilot projects at their own risk. A digitalization plan must be formulated

for this sector also. This will help ensure that the operators undertake the best possible technologies.

5.4 **Recommendations of the Authority**

5.4.1 In TRAI's Consultation Paper on the subject, various advantages and disadvantages were identified for allowing pilot projects on MMDS. These are reproduced below.

Advantages

- Trying and testing new technology at no cost to the Government.
- Installation and commissioning can start right away.
- The technology can be assessed in Indian conditions.

Disadvantages

- Different pilot projects in different areas could lead to promotion of different standards in broadcasting technologies in the country.
- Hilly terrain gives the advantage of increased height of antenna and consequently a much larger range. A pilot project on hilly terrain does not establish the efficacy of technology on plains.
- Companies may set up operations in profitable locations only in the pilot projects and other areas may continue to remain uncovered.
- Quality of service – Without any verification of technology / quality of service standards on the part of the Government, consumers will have to bear with whatever is the quality of service provided by the service provider.
- The future of a pilot project is uncertain. It may not be permitted to continue after the initial trial / pilot period. Hence, the investment in buying the antenna etc., gets wasted.

- The pilot project is restricted to a very small area, in case a consumer shifts out of that area, the investment in buying the antenna etc. gets wasted.
- So far no private party has been permitted to undertake terrestrial TV transmission in the country. Allowing a pilot project without properly examining the merits and demerits may prove to be a hasty decision.

5.4.2 In the proposal for setting up a pilot project at Kasauli, it has been envisaged to use analogue technology. This technology is well established for over two decades in countries like USA and South America. The only advantage will be that it will be tested under the Indian conditions and provide a service not so far available. However for testing purposes the pilot project should be carried out in a typical coverage radius (20 to 50 km) instead of the abnormally large coverage radius (150 km) as envisaged in the pilot project proposal. Secondly, the duration of the pilot project should be small against the very long period (15 years) as mentioned in the proposal. There is another advantage of allowing such a pilot project - the service can commence immediately. However, if such pilot projects are allowed without the proper policy and regulatory framework in place, there is a possibility of haphazard development of the industry leading to chaotic conditions. The consumers may be the worst sufferer in the absence of uniform technical standards of down Converters/STBs, uncertainty about the continuity of the pilot service, quality of service parameters. Moreover existence of two kinds of licenses (one issued to pilot projects prior to regulatory framework and the second kind of regular licenses issued after the regulatory framework in place) may lead to litigation and resulting court cases. Finally for the project at Kasauli the spectrum required is 245 MHz to carry 31 channels. This is too large for one operator and for this reason also there is little justification for going ahead with a pilot project without a policy framework in place.

In view of the above, it is recommended that permission to run pilot projects on MMDS or other technologies should not be given before laying down a comprehensive policy and regulatory framework.

Chapter 6 : Summary of Recommendations

6.1 Private Sector participation in Terrestrial Television Broadcasting.

6.1.1 Terrestrial television broadcasting in India should be allowed in the private sector also.

6.1.2 This should be allowed also for community television.

6.2 Spectrum and Technical Issues

6.2.1 The only recommendation being made is to allow both analogue and digital transmission at this stage. There will be sufficient spectrum to support a few players even in the analogue mode. Once a decision is taken on this recommendation, other details, including the sub allocation of spectrum between analogue and digital channels can be worked out in consultation with the concerned stakeholders.

6.3 Licensing

6.3.1 For the present some broad recommendations are being made without going into details. Broadly these recommendations follow the pattern of FM radio and detailed reasons for the same have already been given. Some departures may need to be made in view of the large penetration of cable and satellite – such a parallel does not exist in the case of Radio. Further details can be framed once an in principle decision is taken by the Government and it is known as to what is the extent of interest, at what locations and from what segments of business and the industry.

6.3.2 Eligibility

No detailed eligibility conditions need be laid for the present. However, the general disqualifications which have been adopted for Private FM Radio may be used for private terrestrial

television broadcasting also. This would mean that the following would be disqualified from holding a licence :

- General disqualifications
 - Companies not incorporated in India;
 - Any company controlled by a person convicted of an offence involving turpitude or declared as insolvent or applied for being declared insolvent;
 - Subsidiary company of any applicant in the same centre;
 - Companies with the same management within a centre;
 - More than one inter-connected undertaking at the same centre.

- Religious bodies
- Political bodies
- Advertising agencies
- Trusts, Societies, Non profit Organisations controlled/associated companies.

6.3.3 Foreign Ownership

As has been recommended earlier by the Authority in the context of Private FM Radio, the rules regarding foreign investment need to be reviewed to bring about a greater consistency in the rules of various segments of the media sector. Given the interest of the telecom sector in this area, this review would also need to take note of the likely convergence in future between telecommunications and broadcasting.

6.3.4 Period of licence

The term for a licence would depend on whether it is being given for analogue or for digital. A longer term for digital licences may be given whereas for analogue the licences could be for a shorter period. However, this issue needs to be decided after a view is taken on whether analogue licences would at all be given or not.

6.3.5 Licence Fee

The structure of the licence fee should be the same as for Private FM Radio. There should be an entry fee which is related to the level of competition and size of the market and can be determined by an auction process similar to what had been decided in the case of FM Radio. The annual fee should be on the basis of a revenue share of the gross revenue of the licensee which could be at the same level as that proposed for Private FM Radio – 4%.

6.3.6 Area of licence

The licences could be for cities identified after an in principle announcement is made. However, in case there is interest shown in particular regions then those regions should also be allowed to be put on bid. In the case of FM Radio no networking was permitted. However, the case of television is different where there are already a large number of channels having national coverage and viewership. Therefore, networking for television should be permitted to allow for competition with established national cable and satellite networks.

6.4 Pilot Projects

- 6.4.1 The permission to run pilot projects on MMDS or other technologies should not be given before laying down a comprehensive policy and regulatory framework.

Annexure 1

International Status on Digital Television

The experience of the countries which have indicated a national timetable is briefly indicated below:

China

- Digital television production plans have been listed among China's 12 key projects for the 10th Five-Year Plan (2001-2005). The plan calls for the connection of all provincial or metropolitan cable TV networks to an optical two-way backbone network system that will enable the delivery of HDTV signals and data-broadcasting services.
- Digital cable TV broadcast trials began in 2001, and extended to 33 pilot cities in 2003, including the top tier cities of Beijing (2.4 million cable TV homes), Shanghai (3.5 million cable TV homes) and Guangzhou (3.1 million homes). The State Administration of Radio Film & TV (SARFT) has set itself ambitious targets: by 2005, it hopes to have 30 million digital cable or pay TV subscribers with cable operators in each of the 33 pilot cities scheduled to broadcast only in digital (i.e. analog to be shut down). Digital DTH satellite services are also scheduled to begin in 2005. By 2010, all TV stations and distribution networks (cable included) are scheduled to broadcast in digital. By 2015, all analog broadcasts will cease.

Hong Kong

- The government has directed terrestrial broadcasters TVB and ATV to begin simulcast broadcasting of both analog and digital TV (HDTV) in 2007 at the latest and extend the coverage of their digital networks to 75% of Hong Kong by 2008.
- The government plans to switch off analog broadcasting 5 years (2012) after the commencement of simulcast although it states that this is "subject to further market and technical

studies.” The government is indirectly paying for digital transmission upgrade by abolishing the 10% royalty on terrestrial TV advertising revenues it collected until 2003.

- Regarding cable TV, the sole cable MSO i-CABLE made a pledge to the government that it would complete network digitalization over a period of 3 years, a pledge it has adhered to. The company committed to capital expenditure of US\$60 million over the 3-year period (STBs costing US\$90 initially and reducing to US\$70-US\$80 after volume deployment).
- i-CABLE began its digital rollout in 2001 when it had 561,000 analog pay TV subscribers, part of a bid to combat piracy. It completed the conversion in August 2004 when its subscriber base had grown to 685,000 – all digital customers

Germany

- In August 2003, the Berlin & Brandenburg Authority became the first city in the world to switch off analogue terrestrial transmissions in favor of fully digital transmissions. The switchover was eased by the dominance of cable reception in the German capital, where penetration is 84% plus (satellite at 7%). Other regions are expected to follow over the next few years ahead of a proposed digital switchover date of 2010.
- In Berlin, in August 2003, as part of the 100% digital conversion, each of the stations involved, which had been broadcasting a single programming service, started transmitting a “bouquet” or multiplex of digital services. Both before and after the transition, all of the services involved were in standard definition (SDTV) format. Unlike the situation in the United States, Japan, Korea and China, no transmission or reception of high definition (HDTV) content was involved.

Japan

- In 1998, the Ministry of Internal Affairs & Communications (MIC) issued its timeframe and plan for national digitalization by 2010. With the market having begun digital communication satellite (CS) in 1996 and digital broadcast satellite (BS) services plus digital cable trials in 2000, the MIC focused on digital terrestrial with the emphasis on full

digitalization of terrestrial by 2011, including reception of digital terrestrial over cable systems.

- The criteria for switching analog off has been set as equivalent coverage to analog; and 85% take up rate, including reception over cable TV systems. The aim is to achieve this by 2010 and progress will be reviewed area by area every three years.

Korea

- The Korean government is committed to building a national infrastructure by digitizing broadcast-related networks as well as information- and- communications-related networks. In terms of broadcast-related networks, the government plans to complete digital transition by 2010.
- For the cable TV industry, the government has urged service providers to take the initiative in converting to digital broadcasting technologies, as is the case in other countries. The government has looked for the cable industry to transition at least 6 million – 9 million subscribers to digital by 2008, implying a 50%-70% conversion rate, based on the Korea's existing analogue subscriber base.

Taiwan

- In November 1997, the National Information Infrastructure (NII) under the Executive Yuan unveiled its timetable and plans for digitalization of the Taiwan broadcasting industry. The plan dictates that digital migration will complete by January 2008. Technical standards have been chosen as DVB and DVB-C for terrestrial and cable TV respectively.
- Since both digital cable and terrestrial penetration remain low, the Government Information Office(GIO) also decided, in January 2004, to award a digital cable TV license to telecom giant CHT to enable it to launch digital services in Taipei City and Northern Taiwan. The coverage may be extended to island-wide Taiwan in 2005, pending the GIO's approval. As it is a cable TV licensee, the CHT service is also regulated by

many of the restrictions that impact the cable MSO business. Due to low digital TV penetration, the GIO has been asked by the Executive Yuan to draft new laws by March 2005 to boost the island's digitalization plan.

U.K.

- In September 1999, the government announced its plans to achieve digital switchover. The Secretary of State said that digital switchover could start as early as 2006 and be completed by 2010 although the precise date would depend “on how the broadcasters, manufacturers and consumers behave”.
- The Government further announced that switchover would not take place until the following conditions had been satisfied:
 - Everyone who could watch the main public service broadcasting channels in analogue form could receive them on digital systems. The condition applied to BBC 1 and 2, ITV 1, Channel 4/S4C and Five.
 - Switching to digital was an affordable option for the vast majority of people.
- In 2001, the Government launched the Digital TV Action Plan. The plan has successfully carried out a large number of measures in preparation for switchover and has coordinated the activities of the various parties involved, including Government departments, regulators, broadcasters, retailers, manufacturers and consumer groups. The objective of the Action Plan was not to implement switchover; instead, its aim has always been to make the necessary preparations to allow the Government to make a decision on the exact timing at a later date.

The Office of Communication (referred to as Ofcom) published a report on the U.K. switchover to digital in April 2004. The main contents of this report are as follows:

- 100% switchover is desirable and achievable; it would substantially improve the structure of the broadcasting market and benefit the wider economy. Less than six years since its launch, more than half of UK homes have digital TV. In areas where there is a choice between free-to-view and pay digital TV, take-up is around 60 %. Ofcom expects digital take-up to continue to grow strongly over the next two years. Thereafter, its growth is likely to slow. Ofcom's projections suggest that digital take-up will level off at around 80% of households.
- The market alone will not deliver switchover. The UK digital TV project must change gear and move from planning to implementation. Greater certainty over the timing of switchover would be an important step. A new implementation body should be established. It should have the necessary funding, remit, leadership, resources and sufficient independence to encourage greater take-up of digital TV and to manage the challenging process of full switchover in the near future.

According to Ofcom, specific obstacles to market-led digital adoption are:

- Consumer take-up. At present, some U.K. consumers do not value digital TV. Surveys show that in 2003, some households (5 %) said that they would be willing to live without TV rather than convert their sets to digital. Some more (15%) perceive little value in the greater choice digital TV offers. Only a minority currently support the policy of full switchover. In addition, consumers are considerably less interested in converting secondary TVs than their primary TV set. In the absence of further initiatives, there may be as many as 35 million TVs that will remain analogue-only at the end of 2010.
- Broadcaster incentives and obligations. The public service broadcasters will need to have a clear and unambiguous commercial incentive to drive switchover. Commercial analogue broadcasters would benefit from the elimination of expensive transmission of both analogue and digital signals and new opportunities to expand channels and services. But

digital TV would also increase competition, reducing audiences and advertising revenues. The BBC has a different, but equally difficult trade-off. Switchover would reduce the BBC's transmission costs and extend coverage of its digital services to all households, but any net loss of viewers could reduce public support for the license fee.

- Free-to-view digital TV. Free-to-view digital terrestrial TV will be an important feature of the TV market for the foreseeable future, but its coverage will be far from universal before the signal can be boosted during switchover. Only about three-quarters of households are currently covered. Free-to-view satellite is not burdened by the coverage problems, but viewers cannot currently receive all the public service broadcasters on the satellite platform without a charge.

U. S. A.

- The Federal Communications Commission (FCC) has established a faster schedule for the introduction of digital TV than the rest of the world. According to this schedule, digital TV broadcasts were to begin 1998. Most Americans should have had some access to digital TV by 1999 and everyone in the U.S. should have had digital TV access (as opposed to direct reception) by 2002. At the same time, analog service will also continue until 2006. After the end of this transition period (December 31, 2006), broadcasters will transmit only digital TV.
- Starting April 1, 2003, broadcasters were required to simulcast at least 50% of their video programming on both analog and digital systems. The following year, the simulcast requirement was to climb to 75%. After April 1, 2005, the simulcast requirement will be 100%. After the transition period ends (31/12/2006), all analog broadcasts will end. However, this date (December 31, 2006) may be extended until most homes (85%) in a given area are able to watch digital TV programmes. Until the transition is complete, television stations are required to broadcast on both their digital and analog channels.
- The Balanced Budget Act of 1997, passed by the U.S. Congress, includes provisions that would extend the

continuation of analog service beyond the 2006 deadline if digital TV is implemented more slowly than expected. Specific conditions which would extend the transition period include the failure of one or more of the largest TV stations in a market to begin broadcasting digital TV signals through no fault of their own, or fewer than 85% of the TV households in a market being able to receive digital TV signals off the air, either with a digital TV set or with an analog set equipped with a converter box or by subscription to a cable-type service that carries the digital TV stations in the market.

- At end-September 2004, basic cable customers totalled 73.7 million, representing 68.1% of TV homes with premium cable subs at 51.9 million and digital subs at 23 million, 31% of total cable subs and 21% of total TVHH. U.S. cable platforms began digitalization at a time when five leading MSOs had just under 60% of total basic subscribers in the market in 1997, and each had ownership of the last mile. Having begun in 1995, the digital DTH market is thriving with more than 22.3 million customers as of end-Sept. 2004, 21% penetration of total TV homes.
- Broadband cable upgrade (to rollout both Internet and telephony) and digital cable rollout has been achieved at a cost over US\$80 billion, spread over 6 years, funded by equity and debt. Cable operators had a total of 17.8 million Internet subs as of end-September 2004 while VOIP cable telephony users reached 2.9 million, a fast-growing market.