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1993

Khushu, O. P. (1993). Satellite communications in Asia an overview. In AMIC Seminar on the Social and Cultural Impact of Satellite Broadcasting in Asia, Singapore, Feb 1-3, 1993. Singapore: Asian Media Information and Communication Centre.

<https://hdl.handle.net/10356/86928>

**Satellite Communications In Asia
An Overview**

by

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Satellite Communications in Asia - An Overview

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Introduction

Only a quarter of a century ago, practical use of satellites was little more than a vision. Today, these are an integral part of telecommunication infrastructures the world over, Asia-Pacific being no exception. As a result, the broadcasting industry in particular is experiencing a revolution of unprecedented magnitude.

The dramatic growth of satellite systems in broadcasting use has given rise to some highly sensitive issues, including control of information, preservation of cultural identities, and even the survival of traditional broadcasting.

In my paper, I will attempt to survey the status of satellite communications in the region with the focus on broadcasting applications, explore the regulatory environment, outline the main trends, and finally discuss the ways in which the broadcasting industry has been impacted with particular emphasis on the new opportunities which have been created for the industry by space technology.

Current Status and Future Plans

Satellite broadcasting in the Asia-Pacific region has come a long way in a very short time. There are at present six operational domestic systems employing 16 satellites, and three regional systems employing 5 satellites. These satellites carry domestic as well as international traffic. In addition, there are a number of extra-regional satellite systems which illuminate parts of the region. It has been estimated that the total number of satellites capable of providing a signal, in one or the other part of the region, exceeds 40.

A number of new satellite programmes have been announced and it is estimated that by 1995 the region will have 10 operational domestic programmes collectively employing 29 satellites and six regional systems employing a minimum of 9 satellites. This estimate does not include a number of programmes which are known to be in the planning stage, but have not yet been formally announced.

Let us take a country-by-country look.

Japan

Japan currently uses seven broadcasting and communication satellites, including two (BS series) DBS satellites. The national broadcaster - NHK - operates two DBS channels, and in July 1992 the number of DBS households had exceeded 4 million. This is by far the largest DBS service in the world and, on a rough estimate, accounts for 90% of the region's DBS market.

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NHK has also introduced the world's first operational satellite delivered HDTV service, called Hi Vision.

In addition, Japan Satellite Broadcasting (JSB), which shares the capacity of the BS series satellites, offers a pay-TV service which in August 1992 had achieved a million subscribers.

Japan has also introduced direct home delivery (DHD) broadcasting of TV and radio programmes from privately owned communications satellites and the Ministry for Post and Telecommunications has announced that it will award several licences for such services, mainly to provide a greater choice of specialised programming.

A point of interest is that out of the approximately 100 transponders aboard the seven operational satellites, as many as 30 are used for TV programme transmission, including programme distribution for CATV, and Satellite News Gathering (SNG).

Indonesia

Indonesia has been at the centre of regional satellite development since 1976 when Palapa 1A was launched. The Palapa system currently consists of three B series satellites, including B4 which was launched late last year. The system is also used by other ASEAN countries for domestic traffic, and part of the capacity has been leased to two American networks, ESPN and CNN, for regional distribution.

The first satellite in the successor C series is due for launch in 1995.

A unique satellite programme, named Indostar, has been announced that aims to provide integrated DBS services for both radio and TV. The system, which will eventually consist of a constellation of four satellites of the lightsat category, will be an optimised system for analogue and digital DBS. The first satellite is likely to be launched during the first quarter of 1995.

India

India has been operating a quasi-DBS service targeted to community receivers since 1982, using the domestic Insat system. The system currently consists of two satellites, including the indigenously built Insat 2A. Apart from a quasi DBS service to community receivers, the system is used extensively for transport of TV and radio programmes to retransmitting sites in the terrestrial networks.

In spite of the fact that India does not have a true DBS programme of its own, viewers have access to a number of international programme channels, including two which are customised for Indian audiences. One is a Hindi channel offered by Star TV for which programmes are produced by a Bombay-based company named Zee TV, and the other is a service offering from the Asian TV Network (ATN), which transmits to the sub-continent via a Russian Gorizont satellite.

China

A considerable portion of the capacity available on the three operational Dongfanghong (DFH) 2 series Chinasat satellites is used for television programme distribution, including educational television and a regional service to Tibet.

Australia

Three Aussat A series satellites (A1, A2 and A3) were launched between 1985 and 1987. The system is designed to carry and deliver traffic in Australia, New Zealand, Papua New Guinea and the islands of the Southwest Pacific. The first of the successor B series satellites was launched late last year.

The system is used extensively for distribution of television programmes, including services to isolated communities in the out back.

The national broadcaster, ABC, will soon launch an international television service (ATVI) targeted to East Asia, using a leased transponder in Indonesia's Palapa system.

Global and Regional Systems

Intelsat, the world's largest space segment provider, presently has four operating satellites in the Indian Ocean Region (IOR), and an equal number in the Pacific Ocean Region (POR). These satellites are used for TV distribution, public telecommunications, and business services.

The system has registered a traffic growth of 178% in POR and 69% in IOR over the last five years and a further increase has been projected. In order to meet the increasing traffic in the region, Intelsat has planned to launch a number of the new generation Intelsat VII and Follow-On-Satellites (FOS) in POR as well as IOR to replace the existing Intelsat V satellites. Intelsat VII and FOS will have significantly enhanced capabilities in terms of power, bandwidth, number of transponders and reconfigurable antenna coverage.

In addition to this replacement programme, Intelsat has initiated a registration process, with the ITU, for two new orbital positions which will enable it to create a fourth Service Region (in addition to IOR, POR and AOR). The aim is to provide more focused coverage of the Asian land mass.

Asiasat

Launched in April 1990, Asiasat is the continent's first commercially operated regional system. Its lone satellite, Asiasat I, has a footprint extending right across Asia, including the Middle East. The system is used by Star TV which provides a 5-channel service, including BBC's World Service Television (WSTV), and also by broadcasters in China, Mongolia and Pakistan for television programme distribution.

Encouraged by its initial success, Asiasat has decided to launch a second satellite, of larger capacity, in early 1995.

Arabsat

The system, owned by the League of Arab States, presently has two satellites, which include an S-band payload for Direct-to-Home (DTH) services. Coverage is optimised for the Middle East and North Africa, but also extends to South Asia. Plans have been announced for launching of successor satellites of larger capacity.

Extra-Regional Systems

Parts of the region receive coverage from several European systems, which include Eutelsat and Statsionar. Eutelsat II, which is owned by a 28-nation cooperative, has three satellites in orbit whose coverage includes the Middle East. Statsionar is the Russian global system which comprises a large number of satellites, at least four of which provide coverage in certain parts of Asia.

New Domestic and Regional Systems

In addition to the aforesaid plans to launch successor satellites with enhanced capabilities in India, Indonesia, China, Australia and Japan, as well as by Asiasat and Intelsat, a number of new domestic and regional systems have been announced. These are the following:

Republic of Korea

General Electric of the United States has been contracted to build two Koreasat satellites which will provide a range of services, including DBS television. Both are expected to be launched in 1995.

Malaysia

The 2-satellite Measat system will likely be launched in 1994. Formally a domestic system, it will also be used to support regional traffic, particularly in the ASEAN sector.

Thailand

A local telecommunications company has signed a contract to build two satellites, the first of which is expected to be launched later this year. Like the Measat system of Malaysia, Thaisat will be looking for both domestic and regional business.

Papua New Guinea

Plans have been announced for the Pacstar system which, in concept, will be used for domestic as well as regional services.

Philippines

A Request for Proposals has been issued for a feasibility study to ascertain the viability of building, launching and operating a domestic system.

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Islamic Republic of Iran

The country is planning a domestic system, but a formal announcement is awaited. The first launch is likely in 1995.

Hong Kong

A China-Hong Kong joint venture company has announced a commercial system named APSTAR, which will be a rival to Asiasat. It has been indicated that the system will not only lease transponders, but also engage in downstream business, including television broadcasting.

Extra-Regional Systems

Recognizing the emergence of a strong market, several American commercial ventures have announced a number of new Asia-Pacific projects. These include:

Alpha Lyracom (Panamsat)

The venture has won approval to launch a new satellite in the ORB-X constellation in 1994 for cross Pacific traffic. This will be part of a global system consisting of altogether four satellites.

Columbia Communications

Rights have been acquired to use NASA's tracking and data relay service satellite (TDRSS) for communication services across the Pacific. The satellite will enable end-to-end communication to be achieved from the Pacific Rim to North America and from there to Europe.

Unicom

This venture plans to use, in the first instance, two of the six orbital slots registered by Tongasat. Service is likely to begin in 1994.

TRW

TRW Space and Technology Group has planned a system named Pacificom. The first satellite is likely to be operational in 1994, with spot beams on Singapore and Hong Kong, in addition to the west coast of America.

Regulatory Environment

One can safely say that technology has left the Regulators way behind.

As an illustration, the International Telecommunication Union (ITU) still maintains a distinction between networks operating in the framework of the Broadcasting Satellite Service (BSS) and the Fixed Satellite Service (FSS), although technology has made both capable of delivering television services directly to home. Different sets of rules apply to the two, including those which concern permissible spillover beyond national boundaries.

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The irrelevance of ITU's regulations in the present circumstances is ominously illustrated by the fact that a commercial venture registered in a tiny Pacific country has successfully coordinated, with the ITU, a set of six orbital positions which have openly been put up for sale to potential investors!

At the regional level there has been no concerted move to harmonize telecommunications policies, including those which concern satellite delivery. This is in sharp contrast with Europe where there has been a concrete approach towards the adoption of an "Open Skies" policy, which was set out in the European Community's Green Paper on Satellite Communications. This policy aims to achieve full liberation of the space segment, free access to space segment capacity, and full commercial freedom of space segment providers, including direct marketing of capacity to users across the continent.

One would of course have to acknowledge that such western models of regulation are inappropriate and not likely to be emulated in the Asia-Pacific because of diverse political perceptions and economic structures. Yet it has to be recognized that in order to create an optimal environment for the use of satellite communications, it will be necessary to adopt cross-border regulations in respect of tariffs, network management and technical standards. This can only be achieved by mutual agreement between the key players in the industry.

At the national level, there has been considerable pressure from service providers as well as users for increasing deregulation. Response from the governments has varied from country to country.

A majority of the governments seem to hold that ownership of the space segment must rest exclusively with them. However, there are some exceptions, such as Japan, Thailand, Indonesia and Philippines, where concessions have been granted to local or joint venture companies to become independent service providers.

In regard to public use of satellite delivered television services, policy is not uniform across the region. Some countries forbid the ownership of satellite receivers, while others do not. However, given that satellite broadcasting has become a fact of life that can no longer be ignored, national Regulators will sooner or later need to re-evaluate their policies, especially as advancing technologies will make it extremely difficult to enforce restricting regulations. For example, receiving antennas of the future may appear to be no different from those used for reception of terrestrial broadcasts.

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Technology

It may be worthwhile to mention a few trends of technology which can potentially affect satellite development within the region.

Enhanced Capability of Satellites

Largely because of a limitation imposed by the capacity of commercial launch vehicles, most of the current satellites weigh between 2,000 and 3,000 kg at launch. It has been foreseen that in the future it will be feasible to launch bigger satellites, up to a mass of 5,000 kg, with a life expectancy of around 15 years. Such satellites will be able to carry multiple payloads and a larger number of transponders, with consequent reduction in cost per unit capacity. This will be particularly attractive for service providers who are unable to invest in dedicated satellites for the particular services offered by them, and may encourage cooperative ventures..

At the same time, it will remain possible to build lightsats, typically carrying up to 5 transponders. These can be placed into orbit with relatively small launch vehicles at considerably lower costs. Such satellites will allow system growth to be matched to market demand. It is noteworthy that at least one commercial venture in the Asia-Pacific region, namely Indostar of Indonesia, has announced its intention to adopt this solution.

Enhanced Capability of Receiving Apparatus

Presently the use of communications satellites (as distinct from broadcasting satellites) for DTH television applications requires the use of relatively large antennas (1.5 metre or more). It is foreseen that in the not too distant future, reception of such services will be possible with considerably smaller antennas, perhaps in the range of 30 to 60 cm. Such antennas will be physically inconspicuous and some may look no different from antennas used for terrestrial television.

Digital Compression

Digital compression is a technique which allows several full motion television signals to occupy a single satellite transponder. This technology will have the most profound impact on satellite broadcasting. Apart from capacity multiplication and resultant space segment cost saving, this technology will make it possible to trade bandwidth with power, so that if only one channel were to be used per transponder, wider coverage could be achieved with significantly smaller antennas.

Future Trends

- It can be assumed that the ever increasing number of launches of domestic and regional systems will continue into the future, even though a point has been reached where practically every country in the region is within the footprint of one or the other satellite.

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Curiously, even some very small countries of the region whose telecommunications and broadcasting needs could be economically met by terrestrial systems, are planning to establish satellite systems of their own. The motivation in such cases ranges from a region-wide business opportunity to a desire for political influence within the region.

While it may be expected that a majority of the future systems will be designed basically for domestic use, most will have the capability and will probably be used for regional traffic as well. This will certainly make better economic sense. An interesting point to note is that the planned Shinawatra satellite system of Thailand has already requested and gained approval to expand its service to Japan, India and China.

Space segment providers will see significant business possibilities in this region where telecommunications traffic is growing rapidly. That the traffic will continue to grow in the coming years is borne out by Intelsat's projection that the capacity requirement in 1995 will likely be up 30% in the IOR and 57% in the POR. Those who intend to invest in space systems are by no means engaging in a speculative gamble. There is no compelling evidence that a time will come in the near future when investments in the satellite industry will cease to be profitable.

- Following the lead provided by Asiasat, which is owned one-third by Star TV's parent company, Hutchison Whampoa, another upcoming regional system, namely APSTAR, has announced that it will engage in down stream business, including broadcasting. Merger in ownership of the space segment as well as the derived services yields significant transmission advantage with resultant financial benefits, and may therefore, be viewed as a trend for the future. This will of course necessitate that satellite operators enter into partnership arrangements with programme providers, just as Star TV has done with MTV and BBC.

- While it is expected that most of the new domestic satellite programmes will initially be driven by telecommunications needs, eventually their utilisation will likely be dominated by broadcast traffic. This has happened the world over. In Europe, for example, TV and video accounted for nearly 61% of the satellite carriers' revenue even in 1989 before any of the region's DBS satellites came to be launched. In the case of Intelsat, the growth rate of broadcast traffic has significantly out-stepped the growth of telecommunications traffic.

Two factors will probably lead to eventual dominance of TV usage:

Firstly, some of the high density telecommunications traffic will gradually migrate to optical fibre. O.F. cables are rapidly being established within the region (six already exist, and as many as 12 are expected to be in place by 1995). On the other hand, broadcasting applications will continue to be served by satellites as optical fibre is characteristically capable of supporting only point-to-point or point-to-multipoint distribution. Significant use of optical fibre for broadcast purposes will not be feasible until the materialisation of fibre-to-the-home (FTTH), and this is not likely to happen for many years to come.

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Secondly, satellites will provide an efficient means for transport of programming to cable TV systems - presently in a stage of infancy in the region - when these come to be established in large numbers.

- With progressive de-regulation, a rapid increase can be expected in DTH television penetration. A rough estimate (source: CIT Research) indicates that the number of dish homes in the region could increase to 12.7 million by the year 1996 and this is almost twice the number today. This does not take into account the multiplier effect of cable distribution which will occur in the coming years.

When significant DTH penetration is achieved, service providers will be motivated to introduce encoded services which will fetch them a significant subscription income in addition to the advertising revenue. It may be noted that Asiasat is already planning to introduce three such channels on top of the existing five free-to-air channels.

- One possible effect of satellite proliferation is the creation of a highly competitive climate. New services will likely be offered at market driven rates and at least one study has estimated that transponder prices could come down by 15% to 25% by the year 1996.

- Like domestic and regional space segment providers, international satellite operators are also seeing an excellent business opportunity in the region. Considering that the region is generally believed to be the economic engine of the future, many international operators will aim for a slice of the emerging market.

Among the major reasons why international operators are vying for the Asian market, one is that it is home to the world's two most populous nations, China and India.

- Many of the international satellite broadcasters are beginning to understand that it is extremely difficult to produce core programming that could appeal to diverse audiences across several nations. This has led, at least in some cases, to a particular effort to provide programming with country specific elements. An example is BBC's Asia Today (a component of WSTV) which is being re-designed to suit audiences in the Indian sub-continent. Another example is CNN, which has opened several representative offices in Asia to procure programming of local interest.

Recognising the importance of languages in broadcasting, some of the international operators have begun to look for regional language affiliates to promote their services locally. This again may become a trend setter.

Impact on Existing Broadcasters

The rapid growth of satellite broadcasts has imposed formidable challenges to existing broadcasters. Foremost among these is that community expectations have radically changed; Exposure to transnational broadcasts has stimulated demands for more sophisticated programming and for greater variety.

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Most national broadcasters, especially those with strong public service commitments, have found themselves largely incapable of satisfying these expectations.

The bottom line impact is that international broadcasters have siphoned off audiences and, with them, significant portions of advertising income.

The response of national broadcasters has so far been halfhearted at best. Some have merely cried foul. Some have effected administrative and management reforms to allow them to concentrate on their core business, which is programme making. Some have initiated new policies aiming to recover the lost income, if not the lost audience; These have included, in some instances, policies of questionable ethics such as relaxing the restrictions on what has traditionally been seen as objectionable advertising, such as advertising for tobacco products.

Most are still on the learning curve, trying to figure out strategies that would give them a better chance of surviving in the new climate.

Audiences have little concern for who is providing a service or how it is delivered, and have no predetermined commitments to particular service providers. They want quality and variety and are ever willing to migrate to new service providers who offer these.

The situation urges radical policy changes that might enable national broadcasters to face the competitive threat. Their strength comes from operating in home territory and hence a better capability to produce programming of particular value to local audiences. This is clearly not enough, and needs to be coupled with a determined effort to match the reach, quality, and choice offered by international service providers. But this requires new resources and capabilities. Satellite technology is one such resource that can enable them to find innovative and cost-effective answers to the difficult problems facing them.

The opportunities offered by satellite technology are numerous, and I will list the major ones:

Accelerated Extension of Coverage

Satellites enable coverage to be extended to rural and island communities, eliminating the high cost of bringing the service to such areas through terrestrial systems. In fact, the physical topography in many instances simply does not lend itself to terrestrial solutions outside the centres of heavy population concentration. Even where this is possible, long lead periods are required to implement the traditional solutions.

Programme Choice

Most national broadcasters operate no more than one or two channels, offering a mixture of programmes to audiences with diverse interests and tastes. There is only so much one can do with one or two basic channels. Often enough, the result is that national broadcasters are unable to satisfy a composite audience consisting of those who think that there is too much of a particular type of programming, and those who think there isn't enough.

Satellite broadcasting, especially when coupled with digital compression technology, offers a convenient solution for the delivery of plural services catering to different requirements, including narrow-casts to special-interest groups.

Access to Programme Resources

No national broadcaster can hope to be able to produce quality programming to fill the entire air time, either in-house or through contractual arrangements with local production facilities. Much of the programming can be acquired at relatively little cost from international broadcasters. It cannot be denied that many of the programmes they offer have a universal appeal. This opportunity is particularly attractive for specialised services, such as sports, where coverage can be acquired without the need to incur the high technical costs that they require.

International Reach

Satellites provide the means for national broadcasters to extend their reach to international audiences. Several broadcasters in Europe - RAI, BBC, ZDF and DW, for example, - have availed of this opportunity by initiating trans-continental DBS services.

Satellite News Gathering

Satellite technology enables television and radio news to be gathered in real time from remote locations which might otherwise be impossible. The technology also enables television stations to backhaul live feeds to the studios, regardless of the distance involved.

Programme Exchange

Programmes can be exchanged nationally and internationally unhampered by administrative procedures and the high costs that apply to terrestrial links.

Radio

Satellite delivery has much to offer to sound broadcasters as well.

A particular advantage of radio services is that they require very little capacity and can easily be fitted in as an adjunct to television services. Numerous audio channels can be delivered to widely dispersed audiences at relatively little cost.

With the advent of satellite technology, and the development of digital transmission methods, it can be expected that traditional AM and FM broadcasting may eventually be over-shadowed by a new system of transmission called Digital Audio Broadcasting (DAB), which can carry CD quality multi-channel broadcasts to the home, to portable radios, and to automobiles.

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It is not unlikely that satellite broadcasting will in the long run replace shortwave broadcasting for international services, with consequential enhancements in quality and reach.

The opportunities I have listed are not available only to those broadcasters who can possess dedicated satellite capacities. Several international systems, including Intelsat, offer domestic lease arrangements which allow service providers to meet their requirements on an incremental basis, enabling them to avoid the costs and risks involved in establishing dedicated systems.

Much creative thinking is, however, needed in using the opportunities of satellite technology to good purpose. Applications not carefully thought through could, in fact, create more problems than they might solve. To illustrate this, a television broadcaster in one of the Asian countries decided, many years ago, to establish a satellite-distributed national channel, which was basically conceived as a package of regional and local inputs from across the country. The channel eventually evolved into an offering, to a countrywide audience, of irrelevant programming produced entirely in the metropolis where the signal was uplinked. The result, as should have been expected, was disastrous. Evidently, what started as a good idea, ended up as a bad joke! It is pitfalls like this which need to be avoided in order to achieve the full benefits of this extremely useful technology.

Cultural Impact

A few words about the main theme of this seminar, namely the social and cultural impact of satellite broadcasting.

As mentioned earlier, the proliferation of transnational broadcasts delivered by satellites has raised several sensitive issues, including one of an apparent threat to preservation of cultural identity.

My own view is that this issue needs to be explored in the perspective of the ever increasing human contact in all forms, of which television is only one. These include international radio which has existed for decades, free flow of printed material and, at the inter-personal level, even international tourism.

While not wishing to be dismissive of the danger to preservation of cultural heritage, I believe that in the present age people are less prone to rigidly identify themselves around particular cultures. In the midst of an emerging global orientation, the strong parts of indigenous cultures have survived the information explosion through other media and there is no reason why it should be different with television. In any case, transnational broadcasters are learning that in order to survive in the international market, it is important for them to be sensitive to individual cultures and tastes.

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Political implications are, however, a different kettle of fish. It is widely acknowledged that international television has given rise to renewed nationalism and considerable destabilisation of political structures. The relatively recent events in Europe testify to this. Nearer home, political circles in India have blamed the current religious conflict in that country on international broadcasters who provided candid visuals of the events which triggered the conflict. This is, unfortunately, an inevitable consequence of our progress into the information age!

Conclusion

Like elsewhere in the world, space technology has revolutionised communications and broadcasting in the Asia-Pacific region. Nevertheless, the region is only just beginning to harness the vast potential of this technology. Much lies ahead, particularly for the broadcasting industry which can hope for a reach completely unrestricted by distance, or by national borders, and offer service options which were unimaginable in the past.

However, it is important to remember that satellites are only a tool. Whether or not this tool will be used to good purpose will depend on the ingenuity of service providers and their willingness to explore innovative solutions.

Will this happen throughout the region? Probably yes, but I would not put my money on it!