

Broadcasting and Development

Options for the World Bank

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THE WORLD BANK
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PREFACE

This paper is a draft document that represents the views of the authors, it does not necessarily represent the views of the World Bank, its Executive Directors, or the countries that they represent. The primary authors of this paper Carter Eltzroth (consultant, Managing Director of Helikon.Net), and Charles Kenny, Economist, Global Information and Communications Technologies Department). The main source for this paper is Carter Eltzroth, “Media Options: Paper Prepared for the Policy Division of the Global Information and Communication Technologies Department” (2002). Much of this paper draws directly from that document. Parts of the paper draw directly from Charles Kenny, “Information and Communication Technologies for Poverty Alleviation: Costs and Benefits” in *Development Policy Review* (2002), and from Jeremy Grace, Charles Kenny, and Christine Zhen-wei Qiang, *ICTs and Broad-based Development* (2001). Material was also taken from a draft broadcast policy statement written by Charles Kenny and Erich Vogt. Thanks to Carlo Rossotto and Gareth Locksley for comments on earlier versions.

ACRONYMS AND ABBREVIATIONS

DTT	Digital terrestrial television
DVB	Digital video broadcasting
DVB-RCT	Digital Video Broadcasting—Return Channel Terrestrial
DVB-T	Digital video broadcasting—terrestrial
ECOSOC	[United Nations] Economic and Social Council
EU	European Union
GDP	Gross domestic product
GICT	Global Information Communication Technology
ICT	Information communication technologies
MDG	Millennium Development Goals
MENA	Middle East and North Africa
MHP	Multimedia home platform
MMDS	Multichannel multipoint distribution system
PC	Personal computer
PSTN	Public switched telephone network
RTE	Radio Telefis Eireann
UNESCO	United Nations Educational, Scientific and Cultural Organization
WDR	World Development Report
WTO	World Trade Organization

EXECUTIVE SUMMARY

It is increasingly recognized that broadcasting has an important role to play in development—as a widespread tool of information transfer, as a method to improve governance, as an important economic sector in its own right and as a potential access point to new information and communications technologies. Sector reform is long overdue, with the state dominating radio broadcast in approximately 75 percent of the world, for example. Reform in the broadcasting sector can have a significant development impact especially in improving governance and transparency. The World Bank has taken the lead in the reform of a range of other sectors. It is time for the institution to turn its attention to broadcasting, where many of the same lessons of reform apply, and where the unmet need for assistance is great.

The World Bank should take a more active role in policy and regulatory activities targeting the broadcasting sector because:

Broadcasting can have a significant part to play in the fight to reduce global poverty. At least 77 percent of the world's population is estimated to be within easy access of broadcast technology (compared to perhaps 4 percent for the Internet), broadcast services are easily accessible by the illiterate and those that speak minority languages. Broadcast operations have been proven sustainable even in low income rural areas. They can play an important role in information transfer (conveying crop prices and employment opportunities, for example). They have played an important role in a range of development projects—including interactive radio instruction, where they have been found to be a highly cost effective intervention. Access to broadcast technologies also has been found to correlate with improved access to government services.

Convergence of information and communications technologies (ICT) is allowing broadcast services to be provided over telecommunications networks and Internet services to use broadcast systems. Differentiating broadcast and telecommunications is becoming increasingly anachronistic, many countries are already moving towards a model of convergence regulation that encompasses both sub-sectors. For the World Bank Group to be involved in telecommunications while eschewing broadcast will frequently involve forcing our client countries into suboptimal policy and regulatory solutions. Further, the use of broadcast to provide Internet services is a potential development opportunity that should not be ignored by the Bank in its operations.

The broadcast component of the convergent ICT sector is a significant economic sector. In South Africa, for example, the creative industries may account for as much as 3 percent of gross domestic product (GDP) and shooting foreign commercials alone brings \$40 million a year into the economy.

Reform of the broadcast sector can have a significant development impact. As well as increasing investment opportunities in a dynamic sector, expanding the ownership of broadcast providers is directly associated with better political rights, higher life expectancy, lower infant mortality, and improved schooling outcomes. Bank support of broadcast policy reform will have a role in meeting targets such as the Millennium Development Goals, then.

Few other international development players are active in the broadcast reform arena. The United Nations Educational, Science and Cultural Organization (UNESCO) has played an important role, but has neither the institutional capacity nor the broad sector involvement of the World Bank Group. The Bank Group's long involvement in ICT sector reform gives it a strong comparative advantage.

Traditional reticence to address a sector that raises political sensitivities appears overblown. The Bank Group has begun to support media training, has been involved in numerous projects using broadcast technology, has created its own programming content and has involved itself in anticorruption efforts worldwide. Further, while the proposed approach does imply moving from a model of content control through ownership to content oversight through regulation, it does not necessarily imply any role in that content regulation.

The Bank Group's potential activities in the sector might include:

- *Basic reform*, involving the opening up of the broadcast sector to private and community involvement, and deconcentrating private media ownership. This is a major agenda in its own right. A recent 97-country survey showed that 60 percent of the top five television stations was owned by the state, with another 34 percent in the hands of a family ownership structure. For radio, 72 percent are in the hands of the state and another 24 percent controlled by family groupings. The reform agenda would include corporatization of public broadcasting networks and institutional arrangements to improve independence, issuance of licenses to private and community broadcasters, and putting in place the regulatory institutions and capacity to oversee a competitive broadcast sector.
- *Convergence regulation*, involving the harmonization and integration of regulations covering broadcast and telecommunications infrastructure.
- *Support for community radio stations* to improve access for the poor to the tools of information and communications technologies.
- *Pilot projects* involving digital television to assess the potential of broadcasting as a tool to widen access to the Internet.

BROADCASTING AND DEVELOPMENT: OPTIONS FOR THE WORLD BANK

Introduction

Broadcasting can be an important source of economic growth and poverty reduction in developing countries. The 2001/2 *World Development Report* (World Bank, 2001a) linked the broadcasting sector to outcomes including better functioning of markets and government institutions. The Bank Group's own sector strategy paper on information and communication technologies¹ supports an expanded role for the group in the broadcast sector. The United Nations has suggested broadcasting has a significant role to play in meeting the Millennium Development Goals. This paper lays out some of the evidence linking broadcast technologies to development, and options for a greater World Bank role in broadcasting.

The power of broadcasting technologies to promote social and economic advance is considerable. Radio, for example, is by far the most accessible ICT (perhaps 75 percent of the world is within easy access of a radio). Numerous studies suggest significant development impact (at low cost) of creative use of broadcasting for education, extension, and information transfer. This suggests the need for increased attention by policymakers to reform of the sector that allows for the maximum development impact of broadcast access.

New technologies make the opportunities presented by broadcasting even more attractive, the issues raised of wider importance, and the separation of broadcasting and telecommunications policy of diminishing practicality. For example, digital television is now commercially available, across a range of transmission means, in a number of developed states. These services (entertainment content and data casting) already spill over into developing countries, for example, in the Mediterranean basin. Digital video broadcasting (DVB) technology has developed a set top box, the multimedia home platform (MHP), which allows the viewer to have access not only to traditional broadcast content but also to Information Society services. Combined with the use of radio spectrum by telephone and Internet services, and the delivery of all of the above services over cable, this convergence in

1. World Bank (2001) *Information and Communication Technologies: A World Bank Group Strategy* Washington DC: World Bank.

information and communication delivery mechanisms suggests the anachronism of traditional separation of policy and regulatory institutions and decisions covering broadcasting and telecommunications.

Policy reform in the media sector can be approached incrementally (as “telecoms plus”), comprehensively, or as a recasting in the light of convergence.

- The rules adopted for infrastructure as part of telecommunications liberalization can now be broadly applied to broadcasting. A competitive, well-regulated regime in the broadcasting sector can increase consumer choice and development impact.
- Following on the work to date on the tie between media control and economic and social outcomes, countries can, as part of a program for comprehensive reform, revise laws on plurality and concentration, fostering competitive models for media.
- Convergence is a driving force behind an update of the package of telecommunications reforms advocated to developing countries. Broadcasting should be a part of this update, for example, folding media regulation into a single communications regulator.
- Countries should be considering the impact of the roll-out of new digital services. Digital television also offers a competitive alternative platform for the delivery of information society services. Those countries that fail to address digital television risk, over time, are being swamped by services from beyond their frontiers.

The World Bank has long focused on the reform of telecommunications in its work on information and communication technologies. A greater appreciation of the broader ICT agenda has led to the active incorporation of postal operations and the acceptance that broadcast reform may also have significant benefits for client countries. Further, with the advent of ICT convergence, it is becoming increasingly difficult to coherently separate broadcasting from the rest of the information infrastructure sector within Bank operations.

Clearly, the approach adopted in any client country should be molded to its stage of development and other factors. However, across a broad range of countries there is significant progress, involving considerable development impact, to be made. Extending the World Bank’s work in the broadcast sector not only is a necessity driven by technology change, but an opportunity for a number of new interventions in client countries with the potential for significant development returns.

Broadcasting and Development

Broadcast technologies have long been a powerful tool for development. Numerous examples of both television and radio being used as a highly cost-effective tool for information and knowledge transfer exist in less developed countries. This has been recognized by a number of development agencies and also the UN in its discussion of the Millennium Development Goals.² The power of

2. Most notably the resolution adopted by the General Assembly, in part III on “Development and poverty eradication”, commits states “to ensure that the benefits of new technologies, especially information and communications technologies, in conformity with recommendations contained in the [United Nations] Economic and Social Council (ECOSOC) 2000 Ministerial Declaration, are available to all [UN General Assembly], UN Millennium Declaration, A/res/55/2 (18 Sept 2000), para 20. The ECOSOC ministerial declaration to which the UN Millennium Declaration refers gives further detail on these technologies, including the place of broadcasting. The declaration states most notably in its paragraph 14: “These national programmes [for putting ICT in the service of development] could include, *inter alia*, . . . (j) promoting the digital enhancement of already established mass media; (k) developing strategies to link established technologies, such as radio and television, with new technologies, such as the Internet; . . .” UN Economic and Social Council, Development and international cooperation in the twenty-first century: the role of information technology in the context of a knowledge-based economy, E/2000/L.9 (11 July 2000). The objective of making available ICTs is now reflected in target 18 of the table of MDGs. The ECOSOC declaration speaks elsewhere of specific areas of concern, which broadcasting, together with other technologies, can address: the lack of infrastructure in less developed countries, the need to improve connectivity, the reduction of cost for access to information, and the promotion of “measures to increase the number of computers and *other Internet access devices* to the Internet within developing countries.”

broadcast technologies are based on their widespread accessibility, their ease of use and the utility of the broadcasting network for development.

Radios have a particular advantage over all other electric ICTs in their geographic coverage. Receivers are cheap (perhaps \$10 plus the cost of batteries, or a wind-up model, which does not need batteries, can be purchased for \$70 to \$100), they do not require an electrical connection and (unlike fixed line telephony, for example), they are stand-alone appliances. On the transmission side, programming and broadcasting are also relatively inexpensive. A low-power transmission system can cost as little as \$1,000.³ Digital sound recordings can be made on equipment that costs \$800 or less. In central Mali, a station supported by Oxfam is broadcasting information to 92,500 people a year at a cost of just 40 cents per person (www.oneworld.com).⁴ Because of this, both receivers and local radio broadcasters are relatively common in developing countries, even among the poor.

Sustainability is also less of an issue that with other ICTs because of low cost. San Salvador's Radio Cabal for example, was born as a nongovernmental organization with funding from the Danish Association for International Cooperation, but it is moving toward self-financing through advertising. Even in a country as poor as Liberia, local stations have reached profitability through advertising—people are willing to pay \$1 to have an obituary read on the radio, for example.

At the same time, radio programming in particular is cheap enough to be produced locally and in a range of languages. For example, in Latin America most radio is produced locally or nationally. In that region only 30 percent of television programming is locally produced, but the figure is much higher elsewhere—Central China Television typically only imports 10 percent of its total programming, for example, and throughout East Asia over 90 percent of top programming is produced locally (Langdale, 1997).⁵ Quechua, a language spoken by some 10 million people in Bolivia, Ecuador, and Peru is all but absent from the region's television screens (and completely absent from the Internet), but in Peru alone an estimated 180 radio stations offer programs in the language.⁶ In India, radio networks broadcast in 24 languages and 146 dialects (De Leon, 2002b).

While television is more expensive than radio to produce, transmit and receive, it remains cheaper than other ICTs, and has spread further as well.⁷ Broadcast signals can also provide information access to the illiterate—a significant issue given that adult illiteracy in low income countries in the developing world is 30 percent for men and 49 percent for women (including a far higher percentage of the poorest; Word Bank, 2000).

Because of affordability and ease of use, access to and use of broadcast technologies are more widespread than any other electronic media. Figure 1 suggests the approximate extent of access

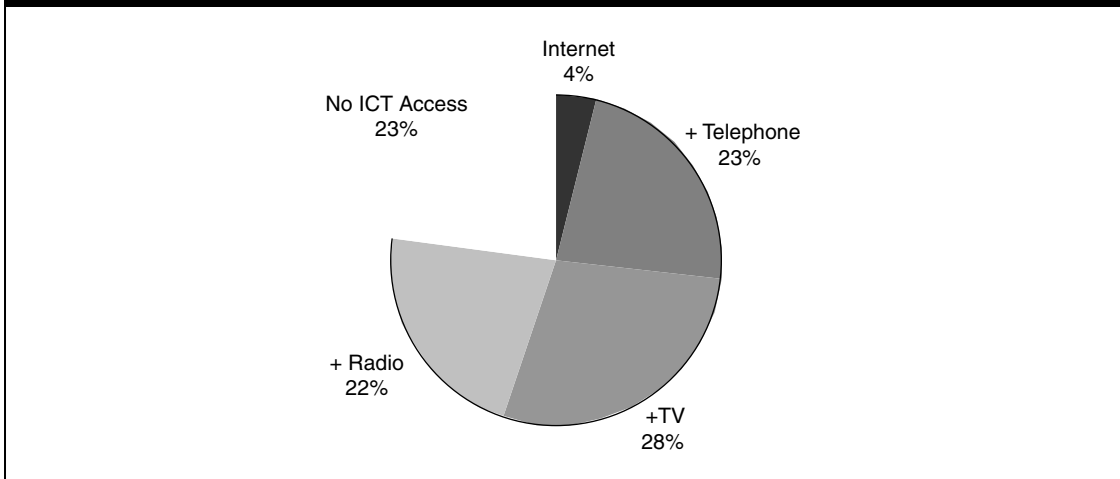
3. <http://www.nlgcdc.org/articles/cdcnews-695.html>.

4. It should be noted that creating quality, development-specific content can add to these costs (later footnotes).

5. <http://commons.somewhere.com/rre/2000/RRE.Radio.and.the.Intern.html>.

6. <http://commons.somewhere.com/rre/2000/RRE.Radio.and.the.Intern.html>. An Internet search found no web sites in Quechua, but one site, in Spanish, run by Peru's Red Científica, that discussed the Quechua language.

7. The build-out of cable (or its upgrade) dramatically drives up capital expenditure, both for analogue and digital, and places it on par with other delivery media for Internet services, such as the publicly switched telephone network. Cable undercuts one of broadcasting's lead attributes, the comparative low cost of reaching a population across a wide region. Nonetheless, cable cannot be ignored in urbanized regions, both as a franchised service and as SMATV. Some developing states have substantial cable networks, including, at year-end 2000, India (37 million households connected) and China (90 million, 2.5 million km of which 10 percent fibre optic). CIIED-SARFT (Zheng Youjing, Pipe, Charles, Eltzroth), *Extending the Benefits of E-Commerce in China through Cable Television* (Beijing, 2001).

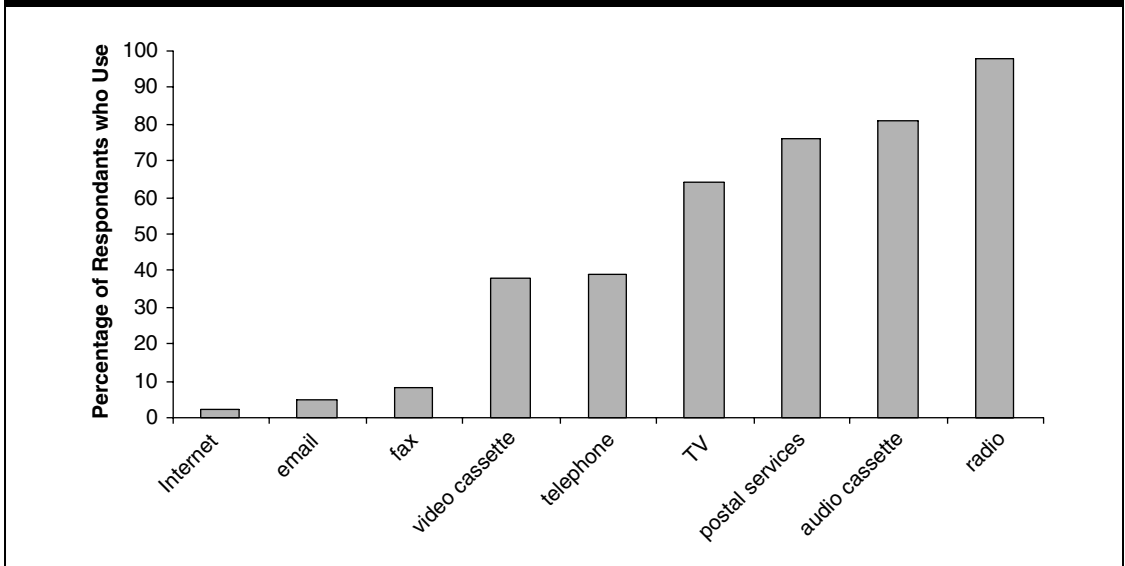
FIGURE 1: AN ESTIMATE OF GLOBAL ACCESS TO ICTs

to various ICTs worldwide. The method of calculation is approximate,⁸ but it suggests that, compared to around 4 percent of the world with Internet access, at least half of the world's population has ready access to television and about 77 percent has access to a radio.⁹ Figure 2, based on a survey of two villages in Uganda carried out by Samuel Kyabwe and Richard Kibombo¹⁰ at the time Internet-enabled telecenters were set up in the villages, suggests again that radio and TV have a much broader reach in less developed countries.

8. This figure is calculated from data in the World Bank's *World Development Indicators*, and should only be seen as a very rough estimate. It takes numbers for population, computers, telephones, television and radio worldwide from WDI (available for countries with a total population of 5 billion). One telephone per 500 is set as the 'universal access' level—for any country with more than 0.5 telephones per person, it is assumed that 100 percent of the population has access. One television per 400 and one radio per 300 is set as the universal access level for these ICTs (both are broadcast technologies, more widespread throughout countries, particularly in the case of radio that does not require access to electricity). At less than the universal access level of ICT units per person, access for telephones is calculated as double the unit density (30 telephones per 100 people would equal access by 60 percent of the population). For radio and television, access is 3.3 and 2.5 times the unit density respectively. For the Internet, access is estimated at 2/3 the computer density (30 computers per 100 people would equal Internet access by 20 percent of the population). These figures are added to give a global access total. Despite its back of the envelope quality, the figure jibes with a number of other statistics about access. Perhaps four percent of the world has accessed the Internet, with the great majority in developing countries. Telephones are far more widespread, but a good half of the world's population has never made a telephone call, let alone have simple, reliable, nearby access. Two billion people are reported to have watched soccer's World Cup final in 1998—or about 33 percent of the planet (<http://www.worldcuparchive.com/CUPS/1998/wc98index.html>). More than that are likely to be able to reach a television with some ease. But radio is listened to every week by as much as 80 percent of the populations of many developing countries, and radio sets are at least twice as common in developing countries as televisions (World Bank WDI and www.rfd.freeuk.com). In South Africa, around 65 percent of the country has access to television, but over 98 percent has access to a radio (www.comminit.com/interviews_archives5.html). In India the figures are 45 percent with television and 98 percent with radio (De Leon, 2002b).

9. It should be noted that lack of access to the radio is not the only issue—men, with larger disposable incomes, tend to buy batteries, and take them out of the radio when they are not listening. Wind-up radios are an important part of the solution here. From remarks by Kristine Pearson Executive Director, Freeplay Foundation, presentation at the World Bank, Thursday, 01/18/01.

10. For the IDRC, see http://www.idrc.ca/telecentre/evaluation/n/22_Buw.html.

FIGURE 2: ICT USE IN BUWMA AND NABWERU, UGANDA

At the same time, the radio is a powerful tool for improving equity through information access in developing countries. There are numerous cases of the radio being used to broadcast crop prices and information on employment opportunities, for example, as well as information on weather or government services. In addition to being the most accessible mass medium, community radio also fulfills a role as a “community telephone” with several hours a day frequently reserved for: broadcasting personal messages, birth and death announcements, invitations to parties, ordering food and supplies from the store in the next village, calling for emergency medical assistance, and receiving personal medical advice from the local doctor. This can be a major source of income for community stations,¹¹ and, as we have seen, allows radio stations even in poorer areas to become sustainable.¹²

The radio has wide application in official development programs, as well. Programs can be broadcast in a range of local languages, techniques can include educational radio or TV soap operas (including the introduction of new farming techniques, using the model of the United Kingdom’s (UK) radio series, *The Archers*¹³ call-in or write-in shows, and more traditional interview techniques. They can be part of a multimedia campaign, followed up with village-level discussions of the issue raised. Because of these advantages, radio is by far the most widely used electronic media in developing world distance learning programs.¹⁴

11. <http://commons.somewhere.com/rre/2000/RRE.Radio.and.the.Intern.html>.

12. It is very inexpensive to create and broadcast information via radio: an FAO study on rural-radio in the Philippines found that the cost of delivering radio content is approximately \$1.60 to \$3.10 per thousand. Conversely, reaching people through television cost \$32.80, through fliers cost \$38.50, and local print cost \$86.70 (FAO, 1999).

13. A television-based example is South Africa’s *Soul City* which educates audiences about issues including AIDS and domestic violence (De Leon, 2002c).

14. Tony Dodds’ 1996 50-country survey and 1999 update found that 55 percent of distance education programs surveyed used radio compared to 37 percent using audiocassette, 15 percent video, 7 percent TV and under 3 percent using computers (Dodds, 1999) *Non-Formal and Adult Basic Education through Open and Distance Learning in Africa mimeo*, Centre for External Studies, University of Namibia.

We have 40 years of successful experience regarding the use of radio in such development programs. Nwaerendu and Thompson (1987) report in a partial list that examines the impact of educational radio alone that the technology has been used in:

- Botswana, for civics education.
- The Dominican Republic and Paraguay, in support of primary education;
- Guatemala, in order to promote changes in farming practices and to improve production;
- India, for rural development;
- Mexico and Mali, for literacy training;
- Nicaragua and Swaziland, for public health;
- Nigeria, for management courses for the agriculture sector;
- The Philippines, for nutrition education;
- South Korea and Sri Lanka, for family planning;
- Thailand, to teach mathematics to school children, and for teacher training and other curricula; and
- Trinidad and Tobago, to promote knowledge of breastfeeding.

The amount of educational material presented can be significant. In South Africa, for example, South Africa Broadcasting Company radio broadcasts over 2,800 hours of educational programming (in all of the country's official languages) in 2001.¹⁵

Numerous evaluations attest to the efficacy of such techniques. For example, in the Philippines, a partnership program between UNESCO, the Danish International Development Agency, and the Government of the Philippines, is providing local radio equipment and training to a number of remote villages. The project is designed to ensure that programming initiative and content originates within the communities. According to UNESCO, the project has not only increased local business and agricultural productivity, but also resulted in the formation of civic organizations and more constructive dialog with local officials. (UNESCO Courier, 1997). Other studies reported by Nwaerendu and Thompson found similar results.¹⁶

A number of cost-benefit analyses and impact assessments of broadcasting have also been carried out. A survey of some of the 21,000 farmers enrolled in radio-backed farm forums in Zambia that 90 percent found programs relevant and more than 50 percent credited the programs and forums with increasing their crop yields (Dodds, 1999). Adkins' (1999) survey of seven cost effectiveness studies of educational interventions on farming performance suggest that, in terms of incremental improvement, the impact of a dollar spent on interactive radio instruction is nearly 70 percent higher than a dollar spent on purchasing textbooks and over eleven times higher than a dollar spent on teacher training.¹⁷

Beyond direct program or economic impacts, there is a correlation between the spread of mass media and a range of other measures of development (World Bank, 2001a). Stromberg (2001) links radio rollout in the United States (US) during the depression and TV rollout in the

15. De Leon, A. (2002) *The Creative Industries in South Africa*, mimeo, World Bank.

16. In another study sponsored by UNESCO, Paul Neurath studied the effects of a Farm Radio Forum project at Poona, India. According to Neurath (as reported in Nwaerendu and Thompson, 1987): "Radio farm forum as an agent for transmission of knowledge has proved to be a success beyond expectation. Increase in knowledge in the forum villages between pre- and post-broadcasts was spectacular, whereas in the nonforum villages it was negligible. What little gain there was occurred mostly in the nonforum villages with radio." (p. 105). Dodds (1999) also notes that a significant percentage of health workers in Uganda (54 percent of the total) and Kenya (20 percent of the total every year) have taken part in radio-backed training courses and there are consistent reports and surveys suggesting that these result in improved knowledge, attitudes and practices.

17. Adkins, 1999.

1950s with voter turnout and increased government expenditure.¹⁸ Openness and competition can play a particularly important role in increasing these wider development impacts. The World Development Report of 2002 carried out a statistical analysis of the impact of media competition on a number of market and governance indicators and concluded that

“the media can play an important role in development by affecting the incentives of market participants—businesses, individuals, or politicians—and by influencing the demand for institutional reform. Information flows through the media can create constituencies for change and institutional reform[,] promote competition in economic and political markets[,] empower people ..”

Besley, Burgess, and Prat report that both local language media and foreign-owned media can have a particularly powerful impact on government performance.¹⁹ Dyck and Zingales find that in countries where broadcast media is relatively free of censorship, intimidation and attacks on staff, the private sector is more responsive to environmental issues.²⁰

Broadcasting and the New ICTs

New ICTs such as satellite broadcasting and the Internet offer increased opportunities for using the Internet in development. The WorldSpace satellite beams 25 radio channels to the African continent, for example, many of which carry news, educational, and development programs. While receivers for WorldSpace transmissions are expensive for individuals, a community radio station can be used to re-broadcast the transmissions so that they can be received by standard radio sets.²¹

Rural radio can also benefit from the presence of the Internet. In Kothmale, Sri Lanka, a joint project between UNESCO, the Ministry of Posts, Telecommunications and the Media, the Sri Lanka Broadcasting Corporation, and the Sri Lanka Telecommunication Regulatory Commission uses radio as an interface between rural people and the Internet. A daily one-hour live radio program in which an announcer and a panel of resource persons browse the Internet at the requests of listeners, has proven to be capable of overcoming linguistic barriers in using the Internet by non-English speakers. The radio station adds value to the information by interpreting it into a local context, by broadcasting it in vernacular languages, and by providing a platform for feedback through local discussion and networks of local correspondents. In addition to the radio program, the Kothmale Community radio station is developing a rural database (<http://www.kirana.lk>), primarily by packaging public domain information often requested by listeners for off-line use. The radio station also functions as a mini Internet service provider by providing Internet access points at two public libraries located within the radio's target area as well as maintaining an Internet café at the radio station.

The Internet can further act as a distribution network among independent broadcasters. The Panos Institute's Banque de Programmes On Line,²² located in Mali, has correspondents in 20 francophone African countries, and Latin America's Agencia Informativa Pulsar is a similar initiative for Spanish-language programming.²³ Both of these projects provide radio content accessible by community stations worldwide for broadcast.

18. Stomberg, 2001, *Radio's Impact on Public Spending* mimeo, Institute for International Economic Studies, Stockholm. Stodholm controls for income and literacy. He finds that the impact of radio is stronger than television. Further, given recent negative advertising efforts being linked to declining turnout, the correlation may not hold in the US today.

19. The authors find that corruption is negatively correlated with foreign media ownership levels. They also find that local language media coverage is associated with better distribution of government food aid during periods of shortage, although it should be noted that they are using newspapers as their media measure in this case. Besley, T.R. Burgess and A. Prat (2002).

20. Dyck and Zingales. The authors find that newspaper circulation is correlated with improved general corporate governance.

21. <http://www.comminit.com/>.

22. www.oneworld.org/panos_audio/.

23. <http://commons.somewhere.com/rre/2000/RRE.Radio.and.the.Intern.html>, www.pulsar.org.ec.

Convergence

Perhaps the most important impact of new information and communication technologies on broadcast is the phenomenon of convergence. Broadcast content can be reduced to the same digital codes as other forms of communication. For this reason, broadcast content can now use distribution paths other than terrestrial transmission, including use of wireline and mobile telephony and broadband.

This is part of a broader trend of technology change that is blurring the distinction between telecommunications, the Internet, and broadcast services. A reformed broadcasting system can bring more competition in the telecom market. The experience of cable operators in providing basic telephony access, Internet access, and services in the United Kingdom, Europe, and the United States, as well as in developing countries such as Venezuela suggests that this can be an important vehicle for promoting last mile competition. Voice telephony is now offered by cable operators in a number of countries; indeed this service (and not television entertainment) is at times the leading reason for a new subscription. This competition has put pressure on the incumbent operator, for example in the United Kingdom, to reduce its pricing and offer other innovative tariffing. These networks are also commonly used to offer high speed Internet connectivity and related Internet services to households and businesses in competition with other services. At the same time, 3G networks offering content (including broadcast programming) to subscribers' screens are being rolled out.

Digital compression technologies are also permitting more content services to use the broadcast frequency spectrum. The comparative abundance of spectrum resulting from compression techniques could result in the surrender by broadcasters of excess capacity. Alternatively, other services could be delivered alongside broadcast content to the television receiver or radio, or could enrich the broadcast content. Convergence is likely to significantly change the economics of the radio spectrum.

Moreover, television infrastructure has become more complex. For example, in the case of European pay broadcasters, the addition of an installed base of set top boxes, conditional access technology and subscriber management systems, allows the viewer the possibility of a range of responses beyond being a couch potato.²⁴ Digital television has been introduced in several European territories, and virtually all the member states of the European Union (EU) 15 and other states within western Europe have announced dates for the launch of digital video broadcasting-terrestrial (DVB-T) services and the switch off of analogue. Virtually all report that they will have completed the transition early in the next decade. At the end of 2001, 27 million European households (18 percent) were receiving digital television in digital format; of these slightly more than two-thirds accessed digital services by satellite. Six hundred digital channels are available.²⁵ One potential launch, and its proposed mix of technology and services, is set out at some length in the annex. In addition to developed markets, digital terrestrial broadcasting, has been launched in countries such as India, Russia, Ukraine, and Vietnam. The technology is increasingly difficult to ignore in other developing countries as digital services are launched by satellite and cross state frontiers with or without prior authorization.

The technology of digital broadcast data delivery is far superior to the use, in analogue television, of the vertical blanking interval for transmission, for example, of teletext pages.²⁶ The data

24. Digital satellite transmissions have been available from BSkyB and Canal+ in Europe and from EchoStar and DirecTV in the Americas for some years.

25. Progress in the transition has been examined most recently in BIPE, 2002.

26. Teletext now offers a digital product, superteletext, based on the MHEG standard., ETSI EN 301 192 v1.2.1 (1999-6): *Digital Video Broadcasting (DVB); DVB specification for data broadcasting*; ETIS EN 101 202 v 1.1.1. (1999-2): *Digital Video Broadcasting (DVB): Implementation guidelines for data broadcasting*.

content conveyed on the DVB bit stream can respond to a number of purposes including Internet or similar connectivity.²⁷ To date, solutions have been developed, launched and marketed to cover the following activities:

- Provision of email, chat and t-commerce,²⁸
- Offer of selected HTML and other standard web content in a “walled garden” targeted to a set of user communities.²⁹

The Multimedia Home Platform (MHP) offers the provision, through the television receiver, of digital services to the viewer—Internet connectivity, e-commerce, and e-government services.³⁰ It enables digital content providers to address all types of terminals, ranging from low-end to high-end set top boxes, integrated digital TV sets and multimedia personal computers (PCs).³¹ Depending on the level of development of a particular country or region, the service provider could offer one or more these or more advance services. The walled garden may be suitable where the provider (for example, the state or a group of nongovernmental organizations) has the ambition to target particular populations or language groups to provide in a controlled environment a mix of health, education, agricultural, and market-information services.

For interactivity, one essential feature is the ability of the user to communicate back to the provider in order to respond to content or to select other content. In the developed world, this return loop is generally provided through the publicly switched telephone network.³² Where the public switched telephone network (PSTN) is unavailable or impracticable, technology may offer alternative return channels. The return loop is not required to offer the same capacity as the forward channel. In other words, an acceptable configuration can be

27. Data can also be used to provide program services such as electronic programming guide; enrich the audiovisual content by for example offering statistics and other information during sports programming; and add new entertainment capabilities such as video-on-demand and gaming. The distribution of broadcast content over IP networks is outside the scope of this paper.

28. Through a combination of data streams with normal AV streams; this interactivity may be associated with broadcast content.

29. Providing a range of information, communication and commerce services. On the Internet, a well known walled garden is AOL's, within broadcasting Sky Digital's. In addition there is the potential to offer more complex services: Internet content in addition to that offered in the walled garden, including streaming media; and use of the set top box as a media router/switch responsible for allocating content to a suitable device attached to the internal delivery network, for example, by redistributing IP-based content to a PC (*en clair*, in a household, telecenter or similar setting, the PC would be connected to the set top box).

30. Described slightly more technically, the MHP defines a generic interface between interactive digital applications and the terminals on which those applications execute. This interface decouples different providers' applications from the specific hardware and software details of different MHP terminal implementations. DVB Project (Eltzroth), *MHP Home Platform (MHP): MHP Implementation Arrangements and associated agreements*, DVB Blue Book A066 (Oct 2001).

31. MHP supports many kinds of applications including electronic programming guides, information services (“super teletext,” news tickers, stock tickers), applications synchronized to TV content (score cards, local play-along games) and e-commerce and secure transactions.

32. Where wireline is widely available (and dependable), the digital set top unit can be linked back to a call center by the publicly switched telephone network. This form of connection is now commonplace in the UK (with the Sky digital box) and France (Canal+): the digital signal is delivered by satellite and passes through the set top unit; the unit is polled (calls up the call center) periodically for usage, billing and security; the same connection is available for interactivity. While a PC could also be connected to the PSTN, the digital TV receiver is preferred for its ease of use, accessibility, attractive services, and download speeds in the forward channel.

asymmetric; the user's needs require a far slower bit rate. The return loop call might use mobile telephony.³³

There is not complete transparency in the pricing of digital set top boxes, in large measure because boxes are supplied or subsidized by service providers, such as pay television operators and cable operators.³⁴ For the MHP, the long-term pricing ex factory may fall as low as \$150. If this were to happen, clearly the MHP would be a comparatively inexpensive method for less developed countries' consumers to access the Internet, perhaps within the next five years (it may be not before 2006 that this is an available technology for developing countries, however).³⁵

Beyond cost, the rationale for looking to the TV as a vehicle for Information Society services is more compelling for emerging economies: comparative absence of broadband wireline connections; existing penetration of television receivers; ease of use and comparative low cost of television and its infrastructure. The exploitation of digital broadcast networks is attractive for delivery of data services because these networks, notably satellite and terrestrial, can avoid traditional last mile bottlenecks and provide uniform service to wide coverage areas.³⁶ (Given the worldwide rollout of digital consumer equipment, a developing country can benefit also from the prospect of profiting from the manufacture of set top boxes, converters, integrated digital television sets, and other products.)

33. Including second generation (GSM) and third generation (UMTS). Throughput levels (bit rates) may not be attractive for first generation and some 2.5G technologies. Work is advanced on a device which marries DVB-T and UMTS technology offering a number of service enhancements for mobile applications for a user group in a multicasting or unicasting mode (Reimers, *The Convergence of Broadcast & Telecommunications Platforms*, TM2465 rev 2, 02/15/02). The work is intended to respond to the corollary of the broadcasters' return loop problem: for mobile operators, the cellular approach does not provide a low cost delivery mechanism for downloading large quantities of data from a source. DVB can respond to this need in a hybrid or cooperating network. The work could result in an MHP-mobile platform, ranging from small-screen mobile and portable use to those with full-scale displays. The DVB Project has also developed a family of return channel standards for interactivity with its platforms. These include separate standards for satellite, cable, PSTN/ISDN, GSM, LMDS, terrestrial. On DVB-RCS (satellite), work has been oriented to amend the present standard to allow lower data rates, low cost terminals, and developments in satellite technology. The intended commercial objective for implementers of such a standard is to offer a service to corporate users, home office users and consumers that can compete with cable and xDSL. The profile of the future specification would offer a service level of a forward bit rate of 1 to 20 Mbps and a return bit rate of 250 kbps; an antenna size of 60 to 80 cm, at power levels of 0.5 to 1 watt (possibly with an internal power supply) at a terminal cost target of Euro 500. The price to the US consumer for comparable technology is roughly equivalent: Starband's offer is under \$200 for 60–100 cm dish, a satellite modem and cabling. Connectivity is provided for \$100/month for 12 months, \$70/month thereafter. (The price for equipment for consumers not taking the special offer is \$500; equipment and software for the office networked environment are priced higher to allow for multiple users.) A competing service, Directway, offers equipment at \$580.

34. In the UK a key retail price point was identified at around £200, but it remained largely untested because BSkyB and OnDigital engaged in a price war which brought the price to consumer to zero.

35. This will be influenced by the standardisation of the functionalities, the interoperability of MHP implementations (encouraging a horizontal market as a consumer electronics product), cross-platform compatibility with java platforms, the absence (to date) of royalties for patents, and the large scale adoption of the technology within and outside Europe. In one presentation by a senior Philips representative, his working assumption appears to have been that the cost ex factory per unit would be \$150. van Luijt, 2001.

36. At a time of doubt of the viability of many broadband networks from gross overcapacity, satellite offers a more certain delivery path precisely because in many cases its chief source of revenues remains TV distribution. See, e.g., Musey, 2002. Euroconsult estimates 70 percent of satellite sector revenues are attributable to DTH. Euroconsult Group, *Satellite Communications & Broadcasting Market Survey: 1999-2009*. Of course there can be no guarantee of commercial success. The US operator Starband recently filed for Chapter 11 Bankruptcy. In the developed world, satellite distribution of broadband may be less commercially attractive because of the overhang of excess optical fiber capacity, now very competitive because bankruptcy proceedings have stripped out the debt burden and many of the other costs.

Broadcasting as a Productive Sector

Finally, the broadcast sector is an important source of employment and output itself. The top seven global producers of information and entertainment (all major players in broadcast) had revenues of over \$100 billion in 1997. While all of these companies were based in developed countries, this suggests the importance of the broadcasting sector in the global economy.³⁷ Spending on television programming alone has been estimated at a global total of \$70 billion in 1989 (Langdale, 1997). The creative industries (film, television, music, broadcasting, theatre, and interactive media) accounted for as much as 3 percent of South Africa's GDP in 2000, and shooting foreign commercials alone brought in over \$40 million to the economy. In 1998, South Africa's film and television industry employed over 20,000 people (De Leon, 2002c). With economic growth and the spread of cable and satellite channels, broadcasting is a rapidly expanding sector in the developing world as well. In China between 1989 and 1999 the number of hours of content broadcast each year has risen from one to four million hours, involving over 1,300 channels (De Leon, 2002a).

The table below presents an inventory of the most prominent transmission media for broadcast services. (It does not include other methods, such as multichannel multipoint distribution system [MMDS], transmission to cell phones on 3G networks, and distribution of broadcast services over the Internet.) Of these, the paper tentatively concludes that analogue radio is the most promising radio technology for less developed countries at least in the short-term. For television, the focus of the paper is on the use of digital standards for satellite and terrestrial delivery of programming and other services (although in urban areas cable distribution may be more attractive).³⁸

Box 1: INVENTORY OF BROADCAST TRANSMISSION MEDIA³⁹

	Technology	Services	Territories today
Analogue radio	Long wave, medium wave (AM/FM)	Audio, mobile	Universal
Digital radio	DAB, proprietary	Audio, data, mobile	Worldspace, XM
Analogue TV terrestrial	PAL, SECAM, NTSC	AV, teletext, mobile	Universal
Digital TV terrestrial	DVB-T, ATSC, ISDB	MHP and precursors: AV, connectivity, mobile, return loop	EU (US)
Digital TV satellite	DVB-S, proprietary standards	MHP and precursors: AV, connectivity, fixed, return loop	Multiple territories
Digital TV cable	DVB-C, Open Cable	TV, data, telephony, easier return loop	

37. The top companies were Disney, Sony, Bertelsmann, Viacom, Time Warner, News Corp. and Seagram (UNESCO, 2000 World Communications and Information Report 1999-2000, Paris: UNESCO)

38. To a certain degree, the perception may be that the poorer populations will be trapped in analogue radio, an "inferior" technology without a way forward for participation in new technologies and e-commerce services. There would be a "lock-in" of technology and market structure. This perception is overstated: First the common experience in the developed world has been that radio has continued and indeed prospered while television has also taken hold as a communications means. Within the same country the state and market actors can pursue twin paths of fostering radio with off-the-shelf technology for poorer communities and different forms of connectivity for other populations. Second, there is a reverse risk: that a state may make an infrastructure choice (e.g., for DAB), unsuitable for a target population, locking the state today into a technology which it may later regret. Fostering the build-out of analogue radio does not strip the state of its flexibility for the future.

39. LMDS, MMDS and other microwave-based delivery systems are not widely used, but they have been commercially offered in Romania, Samoa, and the eastern landers of Germany. Digital TV trials using microwave are also present in the US.

The Government's Role in the Broadcasting Sector

Government responsibilities for broadcasting include: the allocation and management of radio-frequency spectrum; regulation of spectrum and content; universal service responsibilities and setting the obligations of public broadcasters; and meeting obligations under international treaties and conventions. How these responsibilities are carried out can greatly effect the development impact of broadcasting.

The evidence collected in the preparation of the WDR 2002 indicates the importance of the correct policy environment for broadcasting if it is to play a part in meeting development objectives. It notes that “control of the media by any single or concentrated interest can hinder [achieving these outcomes]. Privatization and relaxation of controls on the media (such as by allowing new private entrants) can, in many cases, enable the media to support markets better.” It also argues that overwhelming state ownership of the media “translates into more corruption, inferior economic governance, less-developed financial markets, fewer political rights for citizens, and poorer social outcomes in education and health”.⁴⁰ As well as increasing choice, and as with telecommunications, there is also evidence that an increased role for the private sector increases rollout of media technologies.⁴¹ The WDR suggests that policy reform over media should include allowing private entry, regulations on concentration, encouraging competition among media firms, eliminating restrictive media regulations and financing arrangements, ensuring open access to information, building journalistic capacity, and an effective judiciary and regulatory agencies.⁴²

Further, dominant public ownership of the broadcasting sector is not required to ensure public service broadcasting, to promote cultural goals or to limit inappropriate content. These goals can be achieved through suitable levels of content regulation (levels that do not detract from the transparency and governance impact of a diverse media). This regulation can be carried out by an independent regulatory body separate from that which covers information infrastructure and spectrum management.

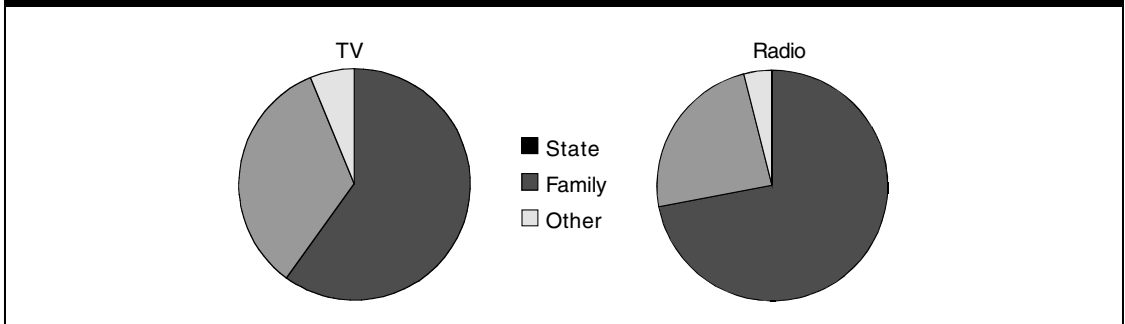
There is a significant amount of work to be done to spread broadcast media ownership in a manner that the WDR suggests is associated with improved governance, transparency and the functioning of institutions. Data from the WDR suggests that an average of 60 percent of the top five television stations in a 97-country survey was owned by the state, with another 34 percent in the hands of a family ownership structure.⁴³ For radio, 72 percent are in the hands of the state and another 24 percent controlled by family groupings. In some World Bank client regions the figures are even more concentrated—in surveyed countries in Sub-Saharan Africa, the figures for TV ownership was for 85 percent state control. In the surveyed Bank borrower countries of the Middle East and North Africa region, that figure was 100 percent.

40. Lower levels of state ownership of television is also correlated with lower scores on a measure of autocracy, higher scores on a measure of political rights, lower scores on a measure of risk of confiscation and improved health and education outcomes (Djankov, S., C. McLiesh, T. Nenova and A. Shliefer (2002) *Media Ownership and Prosperity in World Bank Institute* (ed) *The Right to Tell* Washington, D.C: The World Bank).

41. Dyck and Zingales (2002). The authors find that newspaper circulation increases when government ownership of the press falls.

42. For example, the European Parliament has fostered a long-running debate on media plurality and the EU merger regulation allows a separate track for concentrations impacting on the media. There is however doubt whether the US equivalent doctrine for a separate noneconomic basis for reviewing media concentration, as represented by the *Red Lion* case, is still viable.

43. Government ownership is a common feature in most countries in the World. A noticeable exception is the US, where private enterprise has an almost 100 percent share. A map of telecom ownership in the world 20 years ago would show a similar picture, of course.

FIGURE 3: AVERAGE OWNERSHIP OF TOP FIVE RADIO/TV BROADCASTERS, 97 COUNTRIES

Source: Besley et al. (2002).

A program of reform would clearly begin in many countries with institutional reforms to allow the development of a competitive broadcasting sector. In particular, this would suggest reform covering ownership, regulation and licensing.

Excessive concentration of media ownership control is detrimental to democratization and transparency, and so it is a priority to devise appropriate policy frameworks to ensure wide dispersal of media ownership and control. At the same time, such limitations will have an impact on the overall development of the broadcasting sector, and should be carefully designed.⁴⁴

Of particular importance is the issue of public ownership of broadcasting. Nearly all countries in the world have some level of government-owned broadcasting capacity. There are many strong public policy arguments for such a capacity. However, allowing significant private and community provision of broadcasting both widens choice and increases the development impact of the sector. The management institutions overseeing public broadcasters can be designed in such a way as to maximize the potential development benefits of public broadcasting.

To enable public broadcasting to fulfill its public service function, the broadcasting policy process should embrace three principles:

- The independence of public service broadcasters must be guaranteed through appropriate structures such as pluralistic and independent governing boards.
- Public broadcasting must be guaranteed adequate funding to fulfill its mandate, serve the needs and interests of the public, and to promote the free flow of information and ideas.
- Public broadcasting must be directly accountable to the public, especially with regard to the discharge of its mission and the use of public resources.

Public operators should operate under a statutory charter included in the broadcast law. This charter should place appropriate stress on the obligations of the broadcaster to provide a comprehensive service of wide geographic coverage and securing a wide range of audiences. The statutory charter should include provisions for access to this infrastructure by nongovernment entities (including the private and nonprofit sectors) for the purposes of creating and broadcasting content. The process whereby access will be granted should be transparent and equitable, under the control of an autonomous governing board.

Broadcasting regulations are central to ensure fair access to the airwaves. Broadcast authorities should enjoy the independence to implement broad policy directives in its regulatory activities in accordance with a transparent and equitable process. The functions of a regulator should include:

44. Market structure reform might also involve vertical separation of transmission and creation, as has occurred in the UK.

- planning the availability of segments of the radio-frequency spectrum on a national and area basis, including the preparation of a broadcast frequency allocation plan;
- prescribing the appropriate radio-frequency spectrum engineering characteristics of broadcasting services; designing licenses in accordance with broadcast law;
- granting and renewal of broadcasting licenses; the maintenance of a register of licensees; monitoring the technological developments and service trends in the broadcasting sector;
- monitoring license observance and responding to public complaints concerning broadcaster activities; and
- making regulations necessary to give effect to broadcasting policy through due public processes.

Licenses for broadcast signal distribution should be offered and granted to applicants under a transparent, equitable regime. Broadcast spectrum should be allocated to avoid interference but also to provide broadcast space to a wide range of operators and communities including previously underrepresented and disadvantaged groups; to ensure access for socially important activities such as the defense of the country, emergency and other communication services; and to meet international responsibilities.

Methods of private license issuance should involve transparent, competitive evaluation based on factors such as service coverage, public service commitments and price offered for the license. Methods of selection for community license issuance should be based on factors including the level of community involvement and interest, sustainability of business plans and public service and access commitments. Specific broadcasting license conditions can be applied (in a transparent and equitable manner) to private broadcasters to ensure that they make a contribution to social goals, through such requirements as programming or funding of educational and information programs, the production of indigenous program material, promotion of all ethnicities, languages, or the multicultural nature of the society.

Fostering community radio is another important method to increase access and local accountability. The development of an equitably distributed community broadcasting sector, in particular covering areas likely to be excluded from access to local private broadcast operators, should be a priority. As a first step, governments should legalize local radio and issue spectrum licenses to it. In Colombia, for example, over 1,000 new licenses were issued to community stations in 1995. In the context of community radio, the goal is to enhance the quality of services overall without sacrificing the ability to offer the key attributes of local content and local control.⁴⁵

Progress towards community broadcasting reform is mixed around the world. Community broadcasters are now well-established and/or tolerated in South and Central America—in Colombia for example. However, the first community station in the Caribbean went on the air only in 1995 in Haiti. Compared to 10 independent radio stations on the entire African continent in 1985,⁴⁶ there are 19 independent, rural or community stations in Mali alone, and Mauritania now boasts at least 4 independent rural radio stations, and South Africa has over 80. Nonetheless, in other parts of Africa and in Asia many less developed countries face government monopoly provision or very few local stations.

45. There is the danger of national conglomerates displacing local radio, but at the same time, it would be well to find an arrangement which does not frustrate the ambitions of national media entrepreneurship. Community radio licensing is a process ongoing worldwide. For example, in 1999, the FCC introduced a new low-power FM radio licences (100 watts) and requested comment on introducing a microradio class at 1-10 watts. (<http://commons.somewhere.com/rre/2000/RRE.Radio.and.the.Intern.html>).

46. Community media and the digital divide—The Radio Model Erich Vogt, FES, Bonn, Germany, mimeo, World Bank.

Beyond the basic broadcast reform agenda, the advent of digital technologies⁴⁷ requires a further reassessment of regulatory structures. Regulators have to address a number of issues, ranging from the treatment of new broadcast like services (such as the electronic programming guide), anticompetitive practices through the use of proprietary technology, to application of content rules to a bouquet of services, copyright and copy protection, and regulation of e-commerce alongside classic audiovisual programming.⁴⁸ There is an increasing recognition that stovepipe regulation—a regulatory regime covering a single part of the ICT sector—is no longer feasible. This is now reflected in the evolution of the telecoms policies of the European Union, for example bringing television infrastructure within the scope of the 2002 telecoms reform package. If there is an element which is separately regulated, it generally relates to the production and packaging of broadcast content.⁴⁹ Involvement in convergence regulation implies the need to support significant institutional change (as has been seen in the case of Malaysia's Multimedia Commission, and the recent UK decision to create OfCom).

Regarding digital TV, several emerging economies have adopted or are considering standards for digital terrestrial television (including Argentina, China, Iran, and South Africa) and common household platforms, such as the MHP (Brazil, Singapore). Others are in overspill territories, along the periphery of developed states, for example North Africa and the Central European states; digital reception equipment is “bleeding” into these territories without official sanction (from for example either national authorities or the programme rights holders).⁵⁰ Some developing countries have also recognized the potential of television as an alternate platform to access the Internet. The Brazilian telecommunications regulator, in its 2001 consultation on digital terrestrial television, refers to,

the significant penetration rates of open TV into Brazilian households, which will provide the population with access to new telecommunications applications made possible by digital technology, especially as relates to the potential employment of interactivity.⁵¹

This revolution in television requires, in middle-tier and more prosperous states, long-term planning for the introduction of digital television (and eventually the transition out of analogue); creating the right regulatory framework; and setting standards in areas such as MHPs. Further, all of this should occur at both at the national and regional level, to encourage digital investment and content creation.

47. While digital has been central, developments in transmission technology—the launch of satellite and cable distribution allowing the ability to transmit beyond Hertzian waves—have also been important to the reassessment.

48. While convergence undoubtedly makes regulation more complex, the answer is not to regulate to artificially preserve barriers. The China State Council decision in 1999 to prevent telecom departments engaging in radio and TV operations and vice-versa might be mistaken, then, and the fact that no official pronouncement has been made regarding this is to be welcomed (De Leon, 2002a.).

49. One notable feature of the arrangements for MHP is the drive within DVB to ensure that the middleware is open to all service providers and that implementations are interoperable. European regulators have recognized the dangers represented by multiple incompatible middleware technologies, but (for the moment at least) have let industry through the DVB develop the mechanisms to ensure openness. At least in one case (Singapore), MHP has been imposed by regulatory fiat.

50. One of the authors has heard reports that as high as 90 percent of Algerian households have a satellite dish.

51. Brazil, ANATEL, 2001. Similarly, the European Commission, in an e-Europe strategy paper, has indicated, “Digital television shows great potential to bring broadband access to a large number of potentially excluded households. By allowing broadband access via a familiar terminal which is already present in 97 percent of EU households, it enables those who may be reluctant to buy a computer to become part of the network, through a significantly cheaper investment. Member states should cooperate to facilitate the introduction of digital television services with Internet capabilities and promote interoperability within the framework of voluntary, industry-led standardization.” [European Commission], Green Paper on e-Europe (Brussels, 2001), para 3.2 .

The World Bank and Broadcasting

Because of broadcast's proven development impact, the World Bank has been involved in a number of projects that utilize the technology. For example, the Bank is helping to fund an innovative program to teach primary school children French over the radio in Guinea. Through a methodology called Interactive Radio Instruction, up to as many as 100 children in a class participate actively with the radio programs. Many others outside the school environment are also tuning in each day to the French and math lessons.⁵²

A number of other World Bank sectoral projects have included radio components, for example:

- The Second National Agricultural Support Services Program Project in Cote d'Ivoire includes a component that helps disseminate information on market/price, agricultural, and environmental issues by radio and television programs, installs rural radios, and funds technical assistance.
- The Ethiopia Education Sector Development Project basic education component includes informal education and radio programs.
- The Ghana National Functional Literacy Program Project uses radio broadcasting to strengthen capacity and the quality of non-formal education.
- The Lao People's Democratic Republic Health System Reform and Malaria Control Project strengthened the country's capacity to produce materials for key health programs. It provided printed materials, radio programs and television programs and videos, as well as establishing village broadcast systems, and mobilize traditional media (folk dance) for health promotion.
- The Mauritania Nutrition, Food Security, and Social Mobilization Project supports social mobilization through rural radio.

Freeplay inc., the largest maker of wind-up radios, believes that the World Bank is (directly or indirectly) its largest client thanks to such projects.⁵³ The World Bank is also widely involved in the provision of television content—not least through its own Global Development Learning Network and World Bank Television. *infoDev* has also supported the WorldSpace foundation to broadcast educational radio content over a digital satellite broadcast network.

At the policy level, however, the Bank group has played little role in support of broadcast reform projects that improve the environment for community radio, private broadcast networks and public service use of radio technology. The Global Information Communication Technologies (GITC) Department has periodically been indirectly involved in broadcast through its support for radio spectrum management. The 1995 Turkey telecommunications project, for example, had as an objective to maximize the productive use of the radio frequency spectrum and to improve frequency allocation criteria with a consequent increase in government revenues through an expansion of broadcasting and wireless communications services provision by the private sector. However, the project had no component linked to expanding access or pro-poor programming, and even this degree of involvement with the radio spectrum is the exception rather than the rule.

There has been some reticence to becoming directly involved in broadcast policy. First, broadcasting relates to the distribution of forms of expression, and intervention on broadcasting could arguably spill over to setting guidelines on content and involve the Bank in subjects related to domestic political issues. Because of this, offers of funding and proposed reforms, however meritorious, could encounter entrenched institutional sensitivities.

52. <http://www.freeplayfoundation.org>.

53. From remarks by Kristine Pearson, Executive Director of Freeplay Foundation, presentation at the World Bank, Thursday, January 18th, 2001.

However, there are a number of compelling reasons to become involved. First, of course, the activities of the World Bank Group have already included the broadcast sector. Further:

- Broadcasting has long been recognized by the Bank as a suitable tool to assist in development, for training, health education, and agricultural extension, and for meeting other objectives. As an institution dedicated to sustainable development, avoiding involvement in this sector will create missed opportunities to achieve this goal.
- Reform is important to maximize development impact in the sector. For example, there is a correlation between media concentration and competitive media markets and prospects for growth, and social and political outcomes for citizens. The World Bank has a strong comparative advantage in the field of ICT reform, and should use this advantage to maximum effect.
- Convergence has been identified as an important engine for growth in the developed world. Broadcasters are part of this transformation, and must be included in any package of assistance that claims to deal comprehensively with the ICT sector. Developing countries should consider the best practices now evolving elsewhere, including the regulation of all communications services, including broadcasting, under a single regulator. Ignoring broadcasting is an increasingly impractical option if the World Bank is to remain active in the broader ICT sector.
- The television receiver may become a more suitable means of access to the Internet than traditional technologies, especially among the Bank's client countries. The Bank should support efforts to extend Internet access, and broadcast technologies may well be an important part of this work.

Finally, other donor institutions exclude broadcasting, or have limited capacity to support reform efforts. The place of broadcasting in the International Telecommunications Union is largely limited to spectrum issues and technical standards. While UNESCO has played some limited role in advising governments about broadcast issues in the past, its resources and capacities are limited.⁵⁴

Media reform is not free from controversy.⁵⁵ Yet, reform can be achieved without delving into content and politics. It can focus on brightline targets—improving the commercial environment, increasing consumer demand, creating conditions for entrepreneurship in media, reconfiguring ownership, and the other goals identified in WDR 2002—on which there is little controversy.

A Role for GICT

There is an important role for GICT to play, here, both in guiding policy reform and investing in further access.

Broadcast reform. Encouraging regulators to consider placing the infrastructure elements of broadcasting under the same liberalizing regime as telecommunications, initially, for example, by

54. A number of other supranational bodies have ignored broadcasting, as well. The Annex on Telecommunications of GATS also explicitly states that it does “not apply to measures affecting the cable or broadcast distribution of radio or television programming” Id at s 2(b). The WIPO treaties on digital content does not provide for broadcaster rights. The initial work of the European Commission on convergence did not include broadcasters.

55. See for example, Lee Kuan Yew, *From Third World to First* (New York 2000) where the Senior Minister of Singapore argues, in his chapter “Managing the Media,” that the “US model is not universally valid. A partisan press [can help] politicians to flood the marketplace of ideas with junk, and confus[e] and befuddl[e] the people so that they could not see what their vital interests were in a developing country.” Freedom of expression and comparable rights are defined and exercised differently across states. Moreover, industrial states, as well as developing countries, often have struck a fine balance between political organs and media and may not welcome meddling. The tension over cultural goods, and their place in the current trade agenda, must be kept in mind.

folding broadcasting into a single communications regulator, or by splitting the infrastructure from program packaging and by opening the sector up to competitive and community provision.

Convergence. A new convergence reform package could be developed, adapting regulatory innovation to the Bank's client countries; this would for example replace telecommunications specific rules with broader competition policies (with obligations imposed on those exercising significant market power); the ability of the competition regulator to assess telecommunications markets would need to be reinforced. The role of the media regulator could be folded into a single communications regulator; alternatively it could be repurposed: Its competence would not include broadcast transmission, now part of the broader communications infrastructure, but it arguably could address licensing of channels, programme production and content protection. In addition, the package could include other components of the Information Society agenda: e-commerce and e-government; protection of intellectual property rights; consumer confidence issues (ADR, trust mark, data privacy); security of networks; treatment of harmful content. Given the significant need for analytical work and learning in this area, *infoDev* might consider funding a convergence regulation flagship.

As a complement to these activities, the experiences gained in these activities could be brought to assist the discussions in the Doha development round, for example, in ending the carve-out of broadcasting from treaty instruments. Over time, and once the comprehensive reform package has been proved to be successful in selected states, the Bank could consider advancing a global understanding on media, equivalent to the General Agreement on Trade in Services annex on telecommunications.

Digital TV. There could be technical assistance for feasibility studies of digital TV in client countries, identifying for example, the right mixture of (commercial) broadcast services and (state-supported) education and training services with an Information Society marketplace; further studies could specify the build-out of the infrastructure for digital TV.

Broadcasting investment. World Bank projects that involve spectrum and broadcasting components should actively encourage the licensing of private and community radio stations. There might also be a role for support of national public service radio channels (equivalent to the Public Broadcasting System in the US, or one national, six regional and two citywide public service channels in Colombia).⁵⁶ At the local level, there is a need for technical assistance in managing a station and the technical skills involved in broadcasting, as well as assistance in providing locally-relevant content.⁵⁷ A second role for the World Bank, beyond technical assistance, is that of small-scale investment support. For the approximately 23 percent of the world with no access to ICTs, a radio can be a vital tool. Donors, including the World Bank and the United Kingdom's Department for International Development, have supported carefully designed programs of providing communities with radios.⁵⁸

56. <http://www.comunit.com/>

57. This requires participatory listening and discussion of programs as well as community participation and careful design to ensure equitable access. In Kenya, for example, a DFID project in the Mount Kenya region produced several local language soap opera programs aimed primarily at women farmers. The content included agricultural advice intertwined with drama and humor in order to attract an audience. At the same time, the producers realized that they had to appeal to male listeners as well, as husbands retained control over the radio set and would turn it off if they found the programming to be irrelevant or threatening (O'Farrell, Norrish, Scott, 1999).

58. An example of a poorly designed program was that in Kosovo. Forty-five thousand radios were given away to individual refugees in Kosovo during the crisis. Four months later, a researcher was unable to find any of them. Unstructured distribution to refugees is not an effective method of increasing radio access, then. However, the Freeplay Foundation has had much greater success with structured distribution involving participatory approaches. The radio is given to a community, the community itself decides who will be responsible for it, and the conditions attached to that responsibility. From remarks by Kristine Pearson, Executive Director of Freeplay Foundation, presentation at the World Bank, Thursday, 01/18/01.

Box 2: PROJECT TOOLS

Tool	Project	Components
<i>Bank Advisory Lending/WPA</i>	Broadcast Reform	Support for regulatory and policy reform covering increased private and community participation in broadcasting, covering content and transmission regulation and licensing, market structure, spectrum allocation, institutional reform of public broadcasters including digital elements in current national broadcast planning (spectrum, towers, cable capacity, configuration, switch-over).
	Convergence Reform	Policy and regulatory support covering transition to content regulation covering media, broadcast, Internet/3G content, infrastructure regulation covering broadcast, cable, telecommunications.
<i>Bank Investment Support (to be packaged with policy reform)</i>	National Broadcast Infrastructure and Content	Rollout of basic infrastructure to underserved areas through OBA, creation of national emergency communications networks, support for pro-poor content development, station infrastructure and training (including media training).
	Support for Community Radio	Support for capacity building for community radio including networking through Internet, training, content and subsidy of basic station infrastructure.
<i>Pilot Projects/ Regional Programs</i>	Innovative Methods to Increase Broadcast Development Impact	Pilot programs including same language subtitling, repurposing archival materials for redistribution, set-top box systems for Internet through TV designed for developing country markets.
	Cross-Border Digital Standardization	Regional agreements covering cross-border spillover, support for regional standardization programs, encouragement of cross-border content provision.
<i>Knowledge Products</i>	Doha and Broadcast	Advice on issues and options for developing countries on bringing broadcast into the Doha round of the WTO.
	Information Packages for Regulators	Convergence regulation handbook and/or broadcast regulation handbook based on the model of the Telecommunications Regulation Handbook.
	Broadcast and Development Research	Empirical work on the link between broadcasting and development, broadcast reform and impact.
	Regional Broadcast Best Practice Note	Issues and options for less developed countries covering spillover and cross-border recognition issues.

Community radio stations also frequently need financial support, especially to cover start-up costs including equipment purchase. Suitable World Bank projects, along with *infoDev* grants, should be utilized to support locally-driven efforts to create community radio stations (The Bank's Ghana literacy project has set an example, here).⁵⁹ Again, community radio stations can

59. Two local FM stations were refurbished using project funds in return for 60 percent of air-time being dedicated to educational programming. The project also supplied 2,000 radio sets to classes, at a combined cost of \$2 million (recurrent costs were estimated at \$36,000). 250,000 adults enrolled in literacy classes in the regions covered by the radio stations were beneficiaries of this support, and surveys suggested that these students showed a significant indication of heightened learning, understanding and implementation of the functional themes on which the radio programs concentrated (Dodds, 1999).

benefit greatly from Internet access—it can provide news, information and programming resources. There might be a role to replicate the RadioNet project, supported by International Development Research Centre, which hopes to bring the Internet to some thirty regional stations within the next two years, opening communication channels and facilitating the exchange of programs.⁶⁰ Broader attempts to bring the Internet to rural and poor areas supported by the World Bank should also include support for rollout to community radio stations.

60. <http://www.idrc.ca/telecentre/evaluation/html/main.html>.

DIGITAL TERRESTRIAL IN IRELAND

The development in Ireland of a proposal for the launch of terrestrial digital television is instructive. Ireland lies at the periphery of highly developed western Europe. Long receiving regional support within Europe, it has recently made significant progress in its own economic development, including in high tech sectors. The launch of digital terrestrial services confronts a number of topographical, commercial and legal issues. It has the attributes of an economy in transition and is subject to occasional civil strife. Its broadcast sector is characterized by an overstaffed public broadcaster losing advertising revenues to a recently licensed commercial broadcaster, at the same time subject to the loss of viewers to non-Irish broadcasters with a terrestrial and satellite footprint over Ireland. It has an informal television economy of deflectors redistributing authorised and unauthorised broadcast signals.

Ireland has an analogue TV broadcasting, with three channels allocated to the public service broadcaster Radio Telefís Éireann (RTE) and a further channel to a commercial service TV3. There is significant overspill from the UK and satellite services. Its analogue services vary in transmission quality and a system of extra-legal community-based deflectors has been developed to boost and redistribute weak signals. As a result, Ireland's transmission network provides close to national coverage, to a population spread across remote rural areas and with mountain ranges.

In separate actions over the course of the past decade, Ireland has granted a licence to a commercial broadcaster (not owned by the state). It has decided to split the program content services offered by RTE from the transmission network operated by RTE. (In addition, as a further element of limiting vertical integration for the launch of digital services, it will initially offer a single licence for the transmission network and a single licence for a multiplex operator responsible for six multiplexes.) In addition, its regulators are considering whether to allow regional or locally based multiplexing and digital transmission, a range of services which would be attractive to those offering deflector services today (ODTR, 2001a).

Ireland has decided to focus on digital terrestrial services because new digital terrestrial television (DTT) services could be offered at prices lower than existing analogue multichannel service providers.

Nationwide, the capital cost per home passed might be as low as one-tenth of an equivalent service offered by modern cable or MMDS. In addition, the DTT service is guaranteed to reach at least 90 percent to 95 percent of the population from the launch of programming. To duplicate such a structure with an MMDS or cable infrastructure would be significantly more capital intensive and time-consuming, and not profitable for shareholders.

In addition to cable and MMDS, the RTE also ruled out satellite transmission as an attractive alternative:

While satellite distribution of digital TV is possible, this would not be in Ireland's national interest—since it would likely be controlled by foreign interests distributing foreign programming. Moreover, if the satellite platform were to be used as a vehicle for electronic commerce, it is likely that any electronic transactions would take place outside Irish jurisdiction and involve transfers out of the Irish economy.

The multiplex service provider will be authorized to allocate up to 20 percent of each multiplex to nonprogram services, such as email, E-commerce, Internet services, commercial data transportation such as store and stock records and private data. The return path is unclear from the regulatory documents. They refer to the obligation of the multiplex operator to obtain a telecommunications licence, suggesting that it would not be merely a customer of the PSTN (ODTR, 2001b). Ireland is participating in projects demonstrating the viability of the DVB-RCT return loop.

RTE has calculated its costs (and the costs to be borne by others) in the rollout:⁶¹

	Irish Pounds (millions)
Upgrade Tx infrastructure to digital	Ir£ 35–45
Convert and upgrade RTE facilities to produce and broadcast digital	Ir£ 28
Subscriber management facility to manage viewers' subscriptions	Ir£ 4–5
Broadcasting simultaneous digital signal until analogue switch-off	Ir£ 1.5/year (analogue transmissions Ir£ 3.5/yr)
Consumer DTT set top unit	(v satellite equipment)

The timing of the rollout is complex because Ireland has 12 main transmitter sites, 28 transposer sites and 50 further transmission low power sites. The ambition of the regulator will be to provide 65 percent coverage at launch, 95 percent coverage within five years, and 99 percent within 10 years. Analogue switch-off would occur when 98 percent coverage is achieved and there has been 85 percent to 90 percent take up digital services (ODTR, 2001b).

Ireland has been on the threshold of launching its digital terrestrial for some time. It is stymied because its principal proponent, RTE, is too weak financially (and perhaps politically) to see it through. As opposed to most developing countries, Ireland does benefit from alternative infrastructures for delivering information society services, including the PSTN, and digital television. These however do not resolve the internal Irish problem of providing access to these services throughout the Irish state (or of ensuring that its culture is not further marginalized by over-spill broadcast services).

61. These estimates are from 1998. Some of the amounts then proposed by RTE should be considered in the light of the discussion then in Ireland on the amount of the increase of the licence fee.

BIBLIOGRAPHY

- Adkins, D. 1999. "Cost and Finance" in A. Dock and J. Helwig (ed.s) *Interactive Radio Instruction: Impact, Sustainability and Future Directions*. Washington, DC: The World Bank.
- Besley, T. R. Burgess and A. Prat. 2002. "Mass Media and Political Accountability" in *The Right to Tell*. Washington, DC: The World Bank.
- BIPE. 2002. *Digital Switchover in Broadcasting*, a study prepared for the European Commission.
- Brazil, ANATEL. 2001. Public Consultation No 291 of 12 April 2001 on *Use of Digital Technology in Terrestrial Television Transmission*.
- De Leon, A. 2002a. The Creative Industries in China, mimeo, World Bank.
- De Leon, A. 2002b. The Creative Industries in India, mimeo, World Bank.
- De Leon, A. 2002c. The Creative Industries in South Africa, mimeo, World Bank.
- Djankov, S., C. McLiesh, T. Nenova, and A. Shliefer. 2002. "Media Ownership and Prosperity" in *The Right to Tell*. Washington DC: The World Bank.
- Dodds, T. 1999. "Non-Formal and Adult Basic Education through Open and Distance Learning in Africa." Mimeo, Centre for External Studies, University of Namibia.
- Dyck, A. and L. Zingales. 2002. "The Corporate Governance Role of the Media" in *The Right to Tell*. Washington DC: The World Bank.
- Eltzroth, Carter. 2001. *MHP Home Platform (MHP): MHP Implementation Arrangements and associated agreements*, DVB Blue Book A066 (Oct 2001).
- Euroconsult Group. 1999. *Satellite Communications & Broadcasting Market Survey: 1999–2009*.
- Langdale, J. 1997. "East Asian Broadcasting Industries: Global Regional and National Perspectives," *Economic Geography* 73, 3.
- Lee Kuan Yew. 2000. *From Third World to First*. New York.

- Musey. 2002. *Direct-to-Home—A Driving Force*, Via Satellite, May.
- Nwaerendu, Ndubuisi Goodluck, and Gordon Thompson. 1987. “The Use of Educational Radio in Developing Countries: Lessons from the Past.” *Journal of Distance Education* 2(2): 43-54.
- ODTR (Office of the Director of [Irish] Telecommunications Regulation). 2001a. *Licensing regional or locally based digital television delivery*, ODTR 01/97 (19 Dec 01).
- . 2001b. *Licensing digital terrestrial television*, ODTR 01/17 (23 Mar 01).
- Reimers. 2002. *The Convergence of Broadcast & Telecommunications Platforms*, TM2465 rev 2, 15 Feb 2002.
- Stomberg, D. 2001. “Radio’s Impact on Public Spending.” Mimeo, Institute for International Economic Studies, Stockholm.
- UN Economic and Social Council. 2000. “Development and international cooperation in the twenty-first century: the role of information technology in the context of a knowledge-based economy,” E/2000/L.9, 11 July 2000.
- UNESCO, 2000. *World Communications and Information Report 1999-2000*. Paris.
- van Luijt, Stienstra (Philips). 2001. *The Importance of MHP for Digital TV Services and Equipment*, Broadcast Asia 2001, Singapore.
- Vogt, Erich. 2002. “Community media and the digital divide—The Radio Model,” FES, Bonn, Germany, mimeo, World Bank.
- World Bank. 2001a. *Building Institutions for Markets: World Development Report 2002*. Washington, DC.
- . 2001b. *Information and Communication Technologies: A World Bank Group Strategy*. Washington, DC.
- . 2001c. *World Development Indicators*. Washington, DC.
- Zheng Youjing, Charles Pipe, and Carter Eltzroth. 2001. *Extending the Benefits of E-Commerce in China through Cable Television*. Beijing.