CHAPTER VI
RECOMMENDATIONS

INTRODUCTION

In most developing countries the constraints facing Information Communication Technology (ICT) and education are related to policy matters, insufficient financial resources, poor infrastructures and weak technical capacities and lack of skilled staff. Important parameters are the appropriateness of technologies, the suitability and quality of instructional materials and educational services made available, learning effectiveness and appropriation of new ways of work, and the cost benefit ratio. It is, therefore, important that policy makers are sensitized to the need for national plans for ICT in education at all levels.

RECOMMENDATIONS

The purpose should be to lay down specific policy matters regarding the broadcasting and telecasting networks. The electronic media being very powerful can influence the functioning of the individuals, community and nations as a whole.

Emphasis should be on science and technology education since this leads to overall progress of a nation. Popularization and creation of science are intimately related and unless due emphasis is given to them, the country would not progress. Especially India with illiteracy, superstition, blind faith, unhygienic conditions and poverty has to overcome them with education, and thus be on the road to socio-economic development.
“The role of State-funded broadcasters is being re-examined in many countries in light of recent developments such as the growth in the number of private broadcasters, satellite and cable technology, digital television. There is even greater need than ever for public service broadcasting as these market-driven developments have promoted ownership concentration and globalization with adverse implications for diversity and quality national programming.”

Educationalists and broadcasters need to be aware of the continuing technical developments and should constantly review their potential utilization. These following recommendations describe ways in which India can stimulate developments in utilizing new digital broadcasting technologies for education and training.

1. The Indian broadcasting authorities’ primary role should be to create awareness, disseminate good ideas and stimulate a research body that would ensure utilization of good practices by interactive TV learning services. To raise awareness, disseminate knowledge of technological developments and encourage co-operation, a series of workshops should be held.

Satellite communication technology has special advantages and its use in education brings new energy to education. It brings about educational reform and economic and educational development. Besides widening the teaching scale and contents of radio and television universities, it improves the development of training for primary, secondary teachers, vocational education and higher education.
An effective educational system needs a two way interactive communication system enabling the target audience to ask questions and obtain clarification.

2. It is essential to formulate a programming strategy that would compliment and supplement the offerings of higher education. For this satellite broadcasting would be appropriate to take higher education beyond the walls of colleges and universities and giving all those with access to TV, a window to a larger world.

This is being amply demonstrated in India by the INSAT series. Doordarshan, India’s public broadcaster has been doing commendable work in enhancing education. DD’s development communication division serves as a production house which meets the communication needs of various government departments and ministries. In 2001 this division undertook a countrywide campaign to highlight the various schemes of the rural development ministry. It has also undertaken media campaigns on HIV/AIDS, tuberculosis, and malaria for the Ministry of Health and Family welfare (ddindia.com). Yet observers of the Indian media are very pessimistic about the survival chances of a development mission in a new commercialized broadcasting landscape.

Foreign and internal competition forced Doordarshan in this new environment to be and sound more like its commercial competitors. In the process ideal concepts of development and nation building were sidelined and emphasis was on the elite, metropolitan consumer class and advertisers. Doordarshan favoured commercial broadcasting also due to the decline in government funding.
3. It is imperative that the government should give more than adequate funding for ICT and Broadcasting in particular, since Educational Broadcasting and Satellite communication have immense possibilities for upliftment of the society at large and thereby for socio-economic development. Development broadcasting has been a very successful part of developmental projects. Development broadcasting with a multimedia approach, followed by interpersonal systems is an important part of development communication. Edutainment, entertainment plus education has become one of the most promising strategies of development communication.

In India as in other developing countries the Policy makers placed great faith in education as an instrument of modernization. This is evident from the statement of the Report of the Education Commission that “the most powerful tool in the process of modernization is Education based on Science and Technology.”

For a proper appreciation of the role of education in modernization it is essential to distinguish between two levels of modernization that is institutional and attitudinal. Institutional modernization refers to the modernization of institutional structure of a society. Attitudinal modernization is concerned with the modernization of the minds of the people. Therefore Education has the potential to influence both the elements of society, institutions and attitudes. Thus a social change is brought about in the country. It is here that ICT and Educational Broadcasting play a vital role in creating awareness and are instrumental in bringing the desired attitudinal change.
In India, the benefits of space technology have extended to television broadcasts, education, industrial growth, environmental pollution, resource management, agriculture, health and entertainment, almost touching every facet of human endeavor (rao 1995 a). But despite these advances there are still glaring disparities dividing the masses, the rich and the poor, the have and the have nots.

Developing countries suffer from shortage of resources and capital, large scale illiteracy, lack of trained manpower, low agricultural productivity, industrial backwardness and exploding population. It is in this context that educational broadcasting can assume great significance by creating awareness and educating the masses. This can be followed up by interpersonal means in which the Department of Communication can follow up and bring about the desired attitudinal change and thereby the upliftment of the society and socio economic development of the country.

**BROADCAST POLICY**

_The Indian broadcast policy as a whole should include the following points:_

1. The programming should be in a manner so as to promote education, as well as formal education, and life long learning. It is in this context that programs that promote science and technology should be given emphasis.

2. Doordarshan and broadcasters in various developing countries should work towards the concept of broadcasting in the public
interest, with a commitment to development broadcasting. Only such a commitment will guarantee Doordarshan a special role and allow for different types of funding (e.g., government subsidies, memberships, grants) besides advertising.

3. A separate DD channel should be created for developmental broadcasting as a terrestrial channel and to ensure that cable systems also carry the same. Many of the poor are still illiterate and rely on terrestrial TV for education, information, and entertainment. This separate channel could target both rural and urban audiences with programming that is more relevant to their lives.

    This channel, Doordarshan development, should exclusively telecast educational and developmental programs relating to health, education, agriculture, science and technology. It should by its innovative programming create awareness and emphasize on the new inventions and scientific discoveries and how they could be utilized in daily life. An essential component of this channel should also be the feedback relating to various programs telecast and accordingly the program format should be changed.

4. Policy and decision-makers in broadcasting, education and training and the IT industry should consider that technology has raised the quality of individualized distance instruction and that electronic media have had an impact in a number of areas especially in technologically based distance education programs. Integrated type of development broadcasting in India will ensure its continued existence in the new global and commercialized socio-economic and media environment.
5. India’s broadcast policy should reflect India’s commitment to public service broadcasting and its role in the socio-economic development of the country. This can be amply demonstrated by relevant programming on Doordarshan, the national sole public service television broadcaster of the country.

Electronic media are very powerful and can influence the overall functioning of the society.

6. Programming should promote Science and Technology since India is a country which suffers from tremendous superstition and blind faith. In fact science at times has not progressed due to blind faith. The electronic media through its programming should not promote superstition, religious fears or lay emphasis on astrological forecasts.

7. Popularization and creation of science are intimately related. This gives us the illusion of being a superpower status, but unless science becomes a part of our religion, this concept of superpower may be a dream. This concept of science and religion being intimately connected can be publicized, with the masses being made aware of, and educated of the same by the electronic media.

Modern biotechnology opens up a broad range of potential applications in agriculture, industry, medicine, environmental protection and resource conservation. This technology is accordingly also expected to make a major contribution to solving problems in developing economies. On the other hand, there is also concern that
its use could further widen the technological and economic gap between rich and poor countries.

“Globally, biotechnology is providing powerful tools for sustainable development in an increasingly broad range of human activities including: agriculture, fisheries and forestry; human, animal and plant health; pharmaceutical, biochemical and food industries; and waste management, bioremediation and a range of environmental conservation endeavors. The biotechnology tools include in vitro culture; identification of candidate genes and gene isolation; bioengineering techniques that allow modifications to genes, biochemical pathways and organisms; molecular marker technology, which aids in accelerating breeding, ensuring sustainable systems of resource exploitation, traceability through DNA fingerprinting and developing methods of disease diagnosis.”

Our whole Science and Technology structure needs revamping. “Developing biotechnology based industries require the involvement of a wide range of expertise from a variety of disciplines. It requires expertise in genetics, biochemistry, microbiology and molecular biology and competence in the use of molecular biology tools; it needs entrepreneurial skills relevant to biotechnological industries; as well as knowledge on enabling policies such as policies on biotechnology, bio-safety and intellectual property rights. Furthermore, the ability to store, manipulate, manage and decipher information from very large genome based or protein based data sets or molecular marker data (bioinformatics) is imperative to function in a biotechnology enterprise. Other skills that are required are
engineering skills associated with developing fermentation systems or waste management systems or technology development and team skills.” These innovations and skills should be highlighted and the public and specific target groups should be made aware of these innovations and trained and educated accordingly.

“The universities in the region should aim at recruiting graduates from a broad disciplinary base (biologists, chemists, information technologists, social scientists, agriculturists, engineers, medical scientists and clinicians) into postgraduate programs that provide a flexible training environment that will provide the requisite grounding in a specific area and the team skills to function in a multi-disciplinary unit that can support biotechnology industry development.”

8. These innovations should be highlighted by the Electronic media in their programming and due emphasis should be given to Science and Technology since they are the very basis of the development of a country. Programs for colleges and higher institutions and the general public should be made innovatively by the programmers to sustain interest and thereby create awareness and bring about attitudinal change amongst the masses. Thus leading to the socio-economic development of the country.

9. A frontier of science, biotechnology offers enormous possibilities of its use as a premium precision tool for the welfare of the society and creation of wealth for sustainable commercial and socio-economic
development. These should be highlighted by the electronic media for their successful implementation.

Proponents of genetic engineering argue that this technology will provide a boon to public health through new medicines and increased food supplies. Critics, however, claim that we are destabilizing natural systems and creating organisms that provide threats to human health. Potential threats include antibiotic resistance, immune system dysfunction, increased exposure to herbicide, among other things. The uncertainties inherent in the technology of genetic engineering raise interesting public policy questions, especially how we decide about the potential harms and the benefits. The masses have to be educated and made aware of the implications of this technology.

Whether it's GM food, embryonic stem cells, cloning, climate change, sustainable development or the mysterious possibilities of nanotechnology, the public has to be aware of the challenges which current developments are bringing. Cloning though very interesting, has very disturbing ethical and social implications, which the public should be made aware of and they should realize the far reaching consequences it could lead to. It is in this context that broadcasting can play a positive role.

American scientists extracted stem cells from human embryos and have been able to keep them in "cell lines" which can in principle be converted into any type of body cell. The claim is this could result in revolutionary therapies for degenerative diseases which are otherwise untreatable. It would take many years to establish whether the scientific dream really would become a therapeutic reality, but it
also has serious and fundamental ethical questions about the nature and moral status of the human embryo and research with embryos. Scientists themselves have raised questions regarding the ethics and at times have involved the public regarding the morality and ethics of the research via the electronic media.

10. The aim should be to bring professional expertise to providing informed and penetrating comment for technologists, educators, media, the public - in fact anyone with an interest in how technology is affecting our lives, and the issues it raises.

Technology has brought many great benefits to society, which we often take for granted, but it can also pose big ethical dilemmas - not just unexpected risks and side-effects, but unintended social consequences and even changes in our moral outlook. The scientific developments in stem cells and cloning, was assessed, in the context of case studies on their potential use to treat Parkinson's, Huntington's and motor neuron diseases, diabetes and blood disorders.

Concern has been voiced that biotechnology might increase the risk of biological warfare, and some have speculated that biologists today are stepping into the shoes of the nuclear physicists. It is undoubtedly a daunting aspect of the deployment of biotechnology that will require continued vigilance.

It will be essential that such issues are aired in public debate as the technology develops. Many countries are actively reviewing the safety and ethics of biotechnology research and its applications. Some countries have already established research guidelines for
work on embryo transplantation, embryo research, and surrogate motherhood.

Scientists themselves, the very developers of the technology, were the first to recognize its potential risks and to call public attention to the need for evaluating them. Perhaps partly as a result, scientists were given more than the usual amount of responsibility for the early development of regulation in this area. Many people have voiced concern about biotechnology and genetic engineering. Scientists have considered the issue of safety over recent years.

The field of biotechnology has had a lot of beneficial contribution in the area of healthcare, agriculture, food production, manufacture of industrial enzymes, and appropriate environmental management. However, the advancement in this field has also lead to some concerns and controversies raised by a number of groups, regarding the ethical, legal, and social implications of biotechnology. As with any radically new technology, the consequences of using nanotechnologies can harm as well as help mankind. It is up to society to debate and develop total and durable solutions. Electronic media plays an important role in these debates.

The innovations and their implications should be highlighted by the Electronic media in their programming and due emphasis should be given to Science and Technology since they are the very basis of the development of a country.

11. The communication departments of the country should be geared up to face the challenges of illiteracy, superstition and blind faith, poverty, poor health and hygiene etc, by creating educative, informative, scientific programs on the electronic media followed by
inter-personal means. Thereby motivating the masses and bringing about attitudinal change.

12. Community viewing centers should be provided and strengthened in various areas. E-mail services and Fax services should be provided. Villagers should be familiarized with these services.

It is essential to have a different concept of development broadcasting beyond public service campaigns that includes a type of programming on all channels that makes the middle and upper class aware of the plight of the rural poor majority of the country.

In the case of broadcasting, programming has to highlight the plight of the poor and underprivileged in the country, for urban middle-class audiences. The latter aspect of creating an informed public is much more essential than Doordarshan's actual participation in development communication. Public consensus for these projects is meaningful for national integration and this is an essential condition for the survival of any commitment to development and social equality.

Globalization and commercialization have had an effect on almost every broadcasting system across the globe. Each country has its own infrastructure, media history and set of regulations, that necessitate specific, local solutions. For developmental and educational broadcasting to survive, it is for the media scholars to remind policymakers of the purpose of broadcasting and to ensure that the messages reach the grassroot levels so as to bring about an attitudinal change in the target audience.
The development of Science and Technology in the 20th century is the most important development for the survival of a nation. Bio-Technology, genetic engineering have appeared as Sun-rising Technology and these Biological revolutions have tremendous potential to transform society. “Modern biotechnology has far-reaching consequences for agriculture, environment, medicine and industry. In agriculture, several tools of modern biotechnology are used, such as tissue culture, molecular breeding, diagnostics and modern recombinant vaccine production. Through the use of tissue culture vast quantities of clean (pathogen-free) vegetatively propagated planting material can be produced as clones from a particular plant tissue. DNA characterization can speed up crop improvements through conventional breeding. Molecular diagnostics allow pathogens to be quickly and accurately identified.”

In the 1990’s specific genes were identified and in 1997, the world’s first clone, Dolly the sheep was cloned. It was in 2000, that scientists mapped the human genome and stem cells were harvested from human embryos. This led to widespread concern that humans would also be cloned and scientists would create designer babies.

Biotechnology has been hailed as a technology that would benefit developing and developed nations alike. Support to the application of biotechnology is essential and positive public perception would enable better understanding of the concepts related to genetic engineering and genomics. A frontier of science, biotechnology offers enormous possibilities of its use as a premium precision tool for the welfare of the society and creation of wealth for sustainable commercial and socio-economic development.
It is in this context that educational broadcasting plays a vital role in creating awareness, knowledge and comprehension of the relevant topic or innovation. In the field of Agri-biotechnology, simple application of tissue culture has helped farmers to get good yield and disease free quality plants. Banana plants produced by several companies are being planted all over the country and is an excellent example. Another example of genetically modified crops is Bt cotton. India has the potential to become a big producer of GM rice and vegetables shortly. The use of plants and bacteria as bioreactors is a new area of research application.

The farmers should be aware of these developments and this is possible only through educational broadcasting and through educators involved in programming of the programs and in interaction with the farmers and the community as a whole. Programs should be innovative with the participation of the farmers and the villagers.

The deciphering of the human genome, ability to manipulate genes using recombinant DNA technology and impart new characteristics to plants have opened up new frontiers of research leading to products useful in all spheres of life be it agriculture, energy, health, medicine or environment. Research has opened up new frontiers for the diagnosis and treatment of diseases. Biotechnology has been named as a technology that would benefit developing and developed nations alike. Positive public perception would enable better understanding of the various concepts.

The public at large including specific target audiences of farmers, health workers, students, educationists, engineers, technocrats, doctors, professionals and public at large have to be
informed, trained and educated regarding the developments that have taken place in every field of activity.

It is here that educational broadcasting, educationists and the departments of communication can play a vital role in creating awareness by producing relevant programs, area specific and targeting the specific audience. Programs on the relevant specific subjects should be made and telecast by experts in the field in collaboration with experts in the broadcasting and educational field. The programs have to be creative, entertaining and enlightening, sustaining the interest of the audience at large.

Electronic media have had an impact in a number of areas, especially in technologically-based distance education programs. Technology has raised the quality of individualized distance instruction.

Policy and decision-makers in broadcasting, education and training and the IT industry should take into consideration these points. Integrated type of development broadcasting in India will ensure its continued existence in the new global and commercialized socio-economic and media environment. India has to overcome the superstition, blind faith and illiteracy of its population via the medium of educational broadcasting and its use of skillful integration and manipulation of programming by the educators and experts in the broadcasting field.
REFERENCES

1. Abdul Waheed Khan Challenges of Distance Education

