

CHAPTER – 5

CONCLUDING REMARKS

5.1 Analysis and Conclusion

The foremost purpose of this study was to understand and further rightly guide the people in society about prevailing skirmish due to the Electromagnetic Radiations (EMRs) from mobile towers. The research using secondary methodology has given an idea about how the EMRs are present all around us. Since the inception of earth we have experienced EMRs from the sun which is popularly known as sunlight and it is well known that life cannot exist without it. Earth, stars, galaxies everything emits EMRs that actually help us to know about them and their positions in the solar system and just like the light around us, radio waves are a part of the Electromagnetic spectrum.

With the development and innovations man started understanding EMRs and harnessed it for his benefits. Our innovations in the field of EMRs and new technologies have facilitated us with the gifts in all spheres of life whether in the medical field or in the field of communication. The only problem to a layman is radio waves are just like air, which is all around us but we cannot see smell or feel it. Though air can be felt through wind, breeze, odour or pollution around us but existence of radio waves are an exception that can only be realized through gadgets that we use to transmit & receive signals.

Today radio waves are used to send information through GPS units, radios, televisions, walkie-talkies, satellites and many other types of wireless devices. Biggest achievement of them all, has been the mobile phone, which has gained

its importance amongst all. The very basis of this advancement was the evolution of a particular type of technology. The technology that advanced from single connecting points for landline telephones to the use of multiple mobile tower sites, which enabled users to use mobile phones for connectivity as they travelled. These towers are now omnipresent in the world over, silently doing their job of keeping us connected. They route our calls, message and data via internet using radio frequencies. It's a complex process that these mobile towers achieve in a fraction of a second. It is proving a testing time for them now, as on one hand the subscribers of mobile phones are everyday increasing and on the other hand proportional increase of towers is now touted as a carcinogen.

To understand this issue, the study tried to review a few of the many researches and studies ranging from the year 2000 to the latest available, giving an overview of the entire era and from the Indian as well as international perspective. The study also tried to assess what is being said and done by major international bodies viz. WHO, ICRA & ICNIRP and by the Indian government in this context. It was a simple effort to understand as to what is being done by government to secure the people that they are not left alone with the fallacies of mobile communications. The guidelines and studies of DOT, TEC and TRAI in comparison to international standards of ICNIRP, WHO should work as an ointment on the open wounds.

As stated by TRAI in its Information paper, the guidelines for EMF radiations from BTS and mobile handsets in India are very stringent when compared to developed countries. The prescribed values are 1/10th the

ICNIRP guidelines and they are better than the standards adopted by some developed countries like USA, Canada, Japan and Australia.

Still some of the Indian researches and media news have been comparing Indian standards with the standards of some other highly developed countries like Austria, which are set much below the ICNIRP guidelines. This comparison may not always be correct because of difference in density of population.

Secondly, when the effects themselves are not established, setting very stringent norms may not be a very wise decision. Every such cautious approach requires costs and a developing country like India could very well use that money in other very important activities like health, education, etc.

On the other side, the awareness of effect on health in terms of this technology is still at a nascent stage. The most appreciable part, that is to be noticed is, ICNIRP sets the norms at a very high level compared to the levels of EMRs at which any harmful effects can be expected on any human beings. Current researches indicate that there are no established health effects from the low level exposure of EMRs from mobile phone base station antennas. Although subtle biological effects caused by EMRs emitted from mobile phones have been reported in some scientific studies, there is no established evidence that these effects lead to adverse health outcomes.

The most difficult situation of all, which unfortunately has developed with epidemiological studies involving electromagnetic fields, is a collection of studies with weak positive results, which however are inconsistent with each other. In that situation, scientists themselves are likely to be divided about significance of

the data. On the basis of above reason, most scientists and clinicians agree that any health effects of low level electromagnetic fields, if they exist at all, are likely to be very small compared to other health risks that people face in everyday life.

Another point which has been brought out in most of the studies by WHO, TRAI and various other researchers all over the world, is that the risk from mobile phone is much more than mobile towers. The ongoing researches and studies are also mostly concentrating on the effects of mobile phones rather than mobile towers. The question arises why so?

The first basic reason being, EMR reduces multifold with increase in distance. As mentioned earlier, it is reduced to $1/4^{\text{th}}$ if the distance from the antenna is doubled and to $1/9^{\text{th}}$ if it is tripled and so on. No matter how near the mobile tower be, it will always be farther from our personal mobile phones which are always radiating EMRs to connect to their base towers for signals.

Secondly mobile towers are just a part of the system by which smooth functioning of increasing number of mobile phones is possible. So who is the main culprit? Is it only the mobile towers or we who are ignorantly becoming slaves of the new technology?

It is true that inventions make our lives comfortable. They help us to work efficiently and reduce the time needed to complete various tasks. This eventually saves a lot of time to spend with family or in any other constructive activity. But ironically in the name of being with family, it is very common to see: a couple out at dinner but not interacting with each other and heads down focused on their phones. Our phones are constantly buzzing and their notifications have

permeated our lives. Without phones we feel stripped, insecure and alone. Are we really that lonely, sad and desperate for attention?

Time has taught man that “overuse of anything is bad”, but in the hands of technology we feel so helpless that we just keep our eyes shut. For example, gasoline once a boon had it been used within limits, has now turned into curse due to its rampant usage; pollution in Yamuna river has turned the holy river into a big drain; unplanned infra development and un-proportional deforestation are causing avalanches and floods. Such innumerable examples are ringing all around us. For this, is it the nature or the God to be blamed or the time or the technology? Is it not us, the common man, who are ignoring our set of duties?

To conclude, as per the researches till now, it is not clear that the EMRs from mobile towers cause any harm or not, but surely, whatever slight effects, if any, appear to be miniscule as compared to the mobile phone itself. It is important to step back & analyse the implications of mobile phones and strictly follow the guidelines of its usage.

5.2 Recommendations and Future Requirements

Mobile phones and their inclusion in the customer culture has become so significant that its judicious use can only be an alternate and its sacrifice all together cannot be anyone’s choice. Whether old or young, house maker or leader, rickshaw puller or business icon, mobile communication has tied them all. Usage and dependency of mobile phone varies from person to person. It can be leisure, boredom, safety, individuality, status, confidence, competence,

connectedness, amusement, confidentiality, planned life, time management, alarm clock, entertainment, apart from business and knowledge.

But along with it, the mobile users are advised to take following precautionary measures while using mobile handset, as suggested by DoT in its Handbook on mobile safety⁴²,

- Limit the use of mobile phones and the length of mobile calls
- If choice is available, use a landline (wired) phone, not a mobile phone
- Keep distance – Hold the cell phone away from body to the extent possible
- Use a headset (or ear bud) to keep the handset farther from head
- Do not press the phone handset against head. Radiation level is proportional to the square of the distance from the source – being very close increases energy absorption much more. Farther the brain is from handset better it is
- Use text as compared to voice wherever possible
- Put the cell phone on speaker mode whenever possible
- If the radio signal is weak, a mobile phone will increase its transmission power. Find a strong signal and avoid movement – Use the phone where reception is good
- Metal & water are good conductors of radio waves so avoid using a mobile phone while wearing metal-framed glasses or having wet hair
- Let the call connect before putting the handset on ear or start speaking and listening – A mobile phone first makes the communication at higher power

⁴² Government of India, Ministry of Communications & IT, Department of Telecommunications, *Mobile Communication – Radio Waves & Safety*

and then reduces power to an adequate level. More power is radiated during call connecting time

- When the phone is ON, don't carry it in a breast or pants pocket. When a mobile phone is on, it automatically transmits at high power every one or two minutes to check (poll) the network
- Reduce mobile phone use by children, as a younger person will likely have a longer lifetime exposure to radiation from cell phones
- People having active medical implants should preferably keep the cell phone at least 15 cm away from the implant
- Motorists should be strongly discouraged from using mobile phones while driving.

Public awareness about usage of mobile and above guidelines should be spread through Short Message Service (SMS) etc. along with information like dial *#07# to check the phone's SAR radiation level.

Although as a precautionary measure DoT has prescribed the use of above guidelines for mobile phone users but there is still need for new studies to confirm recent findings that mobile phones may cause changes in brain activity, reaction times and sleep patterns.

SAR guidelines for mobile phones to be strictly followed and public should be made aware about it. Testing process for it should also be readily available to general public. Process has to be developed and ensured that higher SAR value mobile handsets are banned. Hands free gadgets should be sold mandatorily with the mobile phones.

The guidelines need to be regularly reviewed and updated as and when necessary for mobile phones and towers. As mentioned by the Inter Ministerial Committee India specific studies should be further undertaken.

Taking additional precautions to cope with the remaining uncertainties may be a useful policy to adopt while science improves knowledge on health consequences. However, the type and extent of the cautionary policy chosen critically depends on the strength of evidence for a health risk and the scale and nature of the potential consequences. The cautionary response should be proportional to the potential risk.

Although the standards for mobile towers have been drawn, implementation guidelines have also been issued and TERM cells appear to be doing their job to check the norms but strict adherence to the norms has to be ensured.

While reviewing various India based researches the major concerns that were highlighted were very significant and need serious analysis e.g. the point by Prof. Girish Kumar⁴³, which needs to be realized is that people in multi-storeys living very close and in front of antenna may be at risk in case their exposure is higher than the standard set.

Secondly, as suggested by him, the point related to “have more number of towers with lesser transmitted power” can be good if it can be implemented properly. If not, the suggestion may boomerang with growing number of towers.

The local bodies need to involve themselves and realize their roles in approval of new towers. Consultation is required, with local authorities and the

⁴³ Kumar, Prof. Girish, *op. cit.*

public while setting up new mobile towers, taking into account aesthetics and public sensitivities. Open communication during the planning stages can help create public understanding and better acceptance of the facility.

The mobile service providers, apart from self-certification for compliance of radiation norms on EMF exposure, should measure the radiation level of prominent places in mobile network frequency range and have sufficient portable EMF measuring instruments for measurement wherever necessary for general public.

To develop public confidence, government can take some more actions like making the process of testing the exposure level accessible to common man directly or through a strengthened government cell with sufficient human resources and technology and with powers to take strict action on defaulting operators. This can be done by developing an all India level website where customers can log in their request. Reasonable charging of the request can be OK as this will weed out frivolous requests. The data of previous requests, their outcome money received through requests, action taken on operators and penalty levied & received from them – all these things can also be made available through this website. Once fully operational this site can be publicised through SMS etc.

The government should ensure early development of website for the general public to access and know about the actions being taken by government. This may include publishing the details of self-certified mobile towers being given by

operators, details of sample tests done by government and their results along with penalties levied & received from telecom operators.

Simple protective measures like proper signage and barriers around strong electromagnetic field sources can help preclude unauthorized access to areas where exposure limits may be exceeded.

An effective system of health information and communication among scientists, governments, industry and the public can help raise general awareness of programmes dealing with exposure to electromagnetic fields and reduce any mistrust and fears.

Last but not the least, society has to become aware of the ills of mobile and restrain itself. The public debate over electromagnetic fields focuses on the potential detriments of electromagnetic fields but often ignores the benefits associated with electromagnetic field technology. Without electricity, society would come to a standstill. Similarly, broadcasting and telecommunications have become a simple fact of modern life. An analysis of the balance between cost and potential hazards is essential.

It is rightly said 'too much of everything is bad'. So, to administer the advantages of the new technology, one has to have proper knowledge to enjoy the gratifications it offers to the consumer.