

Wildlife around communication towers

The transmission/communication towers set up by mobile companies cause adverse impacts on humans as well as other fauna but the exact correlation between radiation from such communication towers and wildlife is not yet well established. The Ministry of Environment and Forests (MoEF), GoI, received Loka Sabha Starred question regarding the ill-effects of mobile towers on birds on 11 August 2010. An expert committee to study the possible impacts of communication towers on wildlife, including birds and bees was constituted on 30 August 2010 by MoEF, and the study report was recently published.

The 11-member expert committee including the representatives from the Bombay Natural History Society, Mumbai; Wildlife Institute of India; Department of Telecommunications; GoI; WWF, India; IISc, Bangalore; IIT, Delhi; University of Kerala; MoEF; Salim Ali Center for Ornithology and Natural History, Coimbatore.

In the absence of any policy on infrastructure development and location of cell-phone towers, the expert committee had five important directives; (i) to review all the studies done so far in India and abroad on the effects of mobile towers on animals; (ii) to assess the likely impacts of the growth in the number of mobile towers in the country; (iii) to suggest possible precautionary measures in this regard; (iv) to formulate guidelines for regulating the large-scale installation of mobile towers in the country, and (v) to identify the gap areas for conducting further detailed research. The committee studied all the peer-reviewed articles/journals published on the topic throughout the world. Also, detailed analysis was done to find out the impacts of electromagnetic fields/radiations (EMF/R) on wildlife, including birds and bees, whereas the gap areas for conducting further detailed research were identified.

According to this committee, studies on the impact of EMR on animal life are almost non-existent and pollution from EMR is a relatively new environmental issue in India. There is lack of established standard procedures and protocols to study and monitor the EMF impacts on wildlife, which often makes the com-

parative evaluation between studies difficult. In addition to the gap areas in research, the necessary regulatory policies and their implementation mechanism also have not kept pace with the growth of mobile telephoning in India. The current set of government guidelines on exposure limits to EMF needs to be refined since the International Commission on Non Ionizing Radiation Protection Standard currently followed in India is based on only thermal impact of radio frequency and is dismissive of current epidemiological evidence on impacts of non-thermal nature of chronic exposure from multiple towers. Meanwhile, the precautionary principle should prevail and we need to improve our standards on EMF to match the best in the world¹.

Majority of the studies primarily on the thermal impacts of EMR exposure on biological systems have neither succeeded in detecting statistically significant changes nor proved acute changes in animal health^{2,3}. In contrast, long-term studies have reported alarming observations, detecting negative consequences on immunity, health, reproductive success, behaviour, communication, coordination and niche breadth of species and communities⁴.

Impact on birds and bees appears to be relatively more evident where exposure to EMR is shown to evoke diverse responses varying from aversive behavioural responses to developmental anomalies and mortality in many of the studied groups of animals such as bees, amphibians, mammals and birds. Honey bees appear to be sensitive to EMF and their behavioural responses, if scientifically documented, could be used as an indicator of EMF pollution.

According to Ved Prakash Verma (Punjab University), honey-bee behaviour and biology have been affected by electro-smog, since these insects have magnetite in their bodies which helps them in navigation. There are reports of sudden disappearance of bee populations from honey-bee colonies, but the reason behind this is still not clear. When the performance of honey bees in mobile radiation exposed and unexposed colonies was compared, a significant decline in colony strength and egg-laying rate of the queen was observed in the exposed

colonies; the behaviour of exposed foragers was negatively influenced by the exposure. Reports of such colony collapse in nature in developing countries like India where EMR-based technologies are comparatively new are absent. It is possible that the electro-smog that prevails in the advanced countries of the world has not yet affected these countries. We are fortunate that the warning bells have been sounded and we now need to plan strategies to save all life forms from the ill-effects of such EMR.

According to F. Batellier (National Institute of Agricultural Research, France), when the effects of exposing fertile chicken eggs to a cell phone repeatedly calling a ten-digit number at 3-min intervals over the entire period of incubation were studied, it showed a significantly higher percentage of embryo mortality in the exposed eggs compared to the sham eggs in two of the four replicates. On comparison with the control group, additional embryo mortality in the exposed group occurred mainly between days 9 and 12 of incubation, but a causal relationship between the intensity of the electric field and embryo mortality could not be established, and further work in this area is required.

Other wildlife such as amphibians and reptiles also appear to be at high risk with possible interference from EMR, with regard to metamorphosis and sex ratios where temperature-dependent sex determination is operational. It should be noted that the report published by the MoEF is not a complete review of the impact of the EMR on all life forms, as the mandate of the committee was limited to birds and bees only.

1. Report on possible impacts of communication towers on wildlife including birds and bees, Ministry of Environment and Forests, Government of India, 12 October 2011.
2. Hoskote, S. S., Kapdi, M. and Joshi, S. R., *JAPI*, 2008, **56**, 980–984.
3. Mixson, T. A., Abramson, C. I., Nolf, S. L., Johnson, G. A., Serrano, E. and Wells, H., *Sci. Bee Cult.*, 2009, 22.
4. Levitt, B. B. and Lai, H., *Environ. Rev.*, 2010, **18**, 369–395.

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