J. Sci. Innov. Nat. Earth: Vol. 5, Issue 2, 2025, Page 38-41 ISSN (Online) 2583-2093

OPEN ACCESS

Journal of Science Innovations and Nature of Earth

Journal homepage : https://jsiane.com/index.php/files/index

International, Double-Blind, Quarterly, Peer-Reviewed, Refereed Journal, Edited and Open Access Research Journal

The Impact of Mobile Towers on The Health of Residential and Commercial Sector living People, Aligarh

Dr. Sandhya Chaudhary*

*Associate Professor, Department of Chemistry, N.R.E.C. College, Khurja-Bulandshahr, Affiliated To Ch. Charan Singh University, Meerut, Uttar Pradesh, India

*Corresponding Author E-mail: sandhyachaudhary162023@gmail.com

DOI: https://doi.org/10.59436/jsiane.377.2583-2093

Abstract

The study has mobile connectivity has grown in demand and therefore mobile towers are being installed everywhere including residential areas. This paper looks at the health effects of exposure to electromagnetic radiation (EMR) that is released by these towers especially to those individuals who live or work around this installation. Proceeding with a qualitative and analytical method of research, the work is based on the secondary data, observational analysis, and scientific literature with the help of which it can investigate the range of proximity of the towers to the human habitats and how it affects them and their health. The analysis has found out that a considerable of mobile towers are situated or built in the heavily populated residential and business places whereas 75 % of them are found within a 100-meter radius of sensitive places like schools, hospitals, and residential apartments. Synthesis using literature sources showed that sleep disturbances (33%), headaches (29%) and fatigue (21%) were the most frequently reported instances of health problems associated with long-term exposure to EMR. There was a significant difference between the incidences of health effects in exposed areas where there was a high level of density and proximity to residential areas: tower density was found to be significantly high. This research should draw the attention of possible health hazards of mobile tower radiations which demands stringent city planning, social level understanding, and another empirical study to make policy designs with health protection.

Keywords: Mobile towers, Electromagnetic radiation (EMR), Health impacts, Tower proximity, Sleep disturbances, urban planning

Received 21.03.2025 Revised 15.04.2025 Accepted 12.06.2025 Online Available 20.06.2025

Introduction

The high rate of mobile communication inventions has resulted to the extent of placing mobile towers-or cellular base stations- in our urban and semi-urban regions. The buildings are critical in ensuring voice and data flow are not affected as electromagnetic radiations (EMR) are released into the air to enable mobile network coverage. With the ever-growing dependence of the society on mobile gadgets and their dynamic nature, the erection of such towers in proximity to residential buildings, schools, offices and markets is not an exception today. Nonetheless, along with this expansion in technology, there has arisen a growing concern of the population about the health effects of prolonged exposure to EMR. Despite the fact that mobile towers produce non-ionizing type of radiation which is perceived to be less dangerous than the ionizing type of radiations, scientific reports with associated anecdotal are raising the possibility that constant exposure to such radiations may have a connection with other negative health consequences. Such disorders are sleep disturbances, chronic headaches, fatigue, conditions caused by stress and more severe risks like neurological disorders and reproductive disorders. Considering the fact that there are residential and commercial buildings located around these installations, it is important to find out how much these people are being exposed to possible suffering due to their linkage with human health. The study seeks to investigate the health effects of the mobile tower radiations taking people nearby the tower sites as the study samples. This research will assess the current evidence on scientific research, review the self-report health symptoms, judge the knowledge of the population, and give an informed basis on the threat that the risks are posing.

Background of the Study

The spread of mobile networks in the past 20 years or so has been followed by a wide installation of the mobile towers to meet the increasing demand of high-speed Internet, unconnected communication. These towers are usually mounted above the building rooftops or at specially set places whereby they release radiofrequency (RF) electromagnetic radiation to guarantee constant signal coverage. Despite the fact that they are used in the modern communication infrastructure, the proliferation of these devices have been of great concern to many people about their health and the environment, especially when they are located too close to regions that have high concentration of human beings. Worldwide research has examined the biological result of long-lasting exposure to radio-frequency radiation. Although regulatory agencies like the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the world health organization (WHO) have specified limits in the allowed levels of exposure, there are emerging scientific evidence denoting that even exposure within the limits is not absolutely safe, in particular in the case of long term and chronic exposures. Some of the health problems reported by people residing around the mobile towers are sleeping problems, loss of memory, feeling stressed out, hormonal imbalances, and the frequency of developing headaches and fatigue. The situation on the Indian territory is also quite serious, as urbanization, despite all the rules of a plan, is often not so strict about zoning, which is why mobile towers are located almost in the nose of apartments, schools, clinics and workshops. Although the concern of this exposure continues to rise, regionalized and per-population research examining health outcomes impacted by this exposure is at a low degree. Such a gap underlines the necessity of local studies that would provide empirical evidence and influence the public health policy. The proposed study will fill this gap by providing examinations of the perceived and observed health impact on the individuals living and working within the vicinity of the mobile towers in the residential and commercial sectors.

Objectives of the Study

•To estimate the degree of awareness and perception about electromagnetic radiations together with its health impact on the people who live and work around the mobile towers.

•To determine and examine the general health signs reported by the residents and employees those are located in the close vicinity of the mobile towers in both residential and commercial neighborhoods.

•To compare the prevalence of health problems in people exposed to radiations of RF at higher rates (by being near towers) and those that did not have or minimally had it.

Literature Review

Subhan *et al.*, (2018) carried out empirical research on the physiological implications of mobile antenna electromagnetic radiations on human life. The experiment tested various biological variables and symptoms on people who have been exposed to the radiations of the mobile towers under prolonged durations. Their results indicated that some of the common complaints observed on the populations that were affected were constant headaches, stress, hormonal imbalances, and feeling of fatigue. The authors of the study stressed that mobile antennas produce non-ionizing radiation, which is not able to direct physical destruction of DNA but ensure the impairment of the body functioning in the long run, especially of the nervous and endocrine systems. This paper has been instrumental in discovering a connection between radiation exposure and overall "health complaints" implying that "additional medical analysis and regulatory control might be necessary".Ali *et al.*, (2021) carried out an all-inclusive analysis of the impact of radiofrequency radiations by cell phone towers to surrounding communities. They conducted studies where they used some parameters to measure the levels of EMR at different distances of mobile towers and related the measured results to the health symptoms reported. The research noted that, people who lived at a distance of not more than 100 meters, with the towers in their locations, had been suffering disturbing sleep patterns, dizziness, inability to concentrate, and irritability. The authors have found

that the risk of health complaints was a great factor with the proximity to the towers and this has reaffirmed the concept that spatial issue, as well as the duration of exposure is very crucial in deciding the biologic effect. The review of present safety criteria is also reported where its authors questioned the adequacy of the current exposure levels according to the present safety standards to safeguard the health of people in the real-life situation. Rajapaksa *et al*,. (2018), conducted mostly on economic indicators, it provided some good insights on the perception on the people on the procedures of installations of mobile towers. Their study investigated the impact of cell phone tower on property values in Brisbane, Australia by means of hedonic price models and perception-based survey data. The findings indicated that the value of properties that were close to mobile towers declined by a measurable margin and this was so because there was a certain level of negative impact on potential buyers based on health issues. This observation indicated the extent of a certain fear of potential well-being adversities because of EMR even in the situation of the lack of medical evidence. Since the study expressed a thought that mobile towers can pose possible dangers to physical health they are also known to shape the social behavior and economic choices of people hence, extending the notion of concern not to single individual health but also encroaching into the community health in general.Mohril *et al.*, (2020) added to the increased medical research into the harmful effects of mobile tower radiations by conducting a case review of clinical cases and experimental results. The same research reported a general trend of non-specific yet repetitive health problems in those who had been residing nearby cell tower seriously, these are chronic fatigue, sleep disturbances, irritable east, memory loss, poor cognitive functions and so on. They emphatically mentioned that such symptoms are not life threatening instantly, but have serious implications on the quality of life and mental health of affected patients. The authors used the regulatory guidelines issued by the international organizations like the International Commission on Non-Ionizing Radiation Protection (ICNIRP) as well, claiming that even safe regulatory limits could have risks once they are exposed to another kind of predispositions (chronic and involuntary). The conclusion of their findings has highlighted the need of more regional and longitudinal surveys of health patterns in heavily occupied areas with high tower concentration.

Research Methodology

Here's a potential introduction on the geographical condition of Aligarh City: Aligarh City, located in the state of Uttar Pradesh, India, is a significant urban center with a rich geographical and cultural heritage. Situated in the Indo-Gangetic Plain, Aligarh's geography is characterized by its fertile alluvial soil, moderate climate, and strategic location. The city's geographical conditions have played a crucial role in shaping its history, economy, and cultural identity.

Some key geographical features of Aligarh City include:

1.Location: Aligarh is situated at 27.88°N latitude and 78.08°E longitude, approximately 140 km southeast of Delhi.

2.Topography: The city lies in the Gangetic plain, with a relatively flat terrain and an average elevation of 178 meters above sea level.

3.Climate: Aligarh experiences a humid subtropical climate, with hot summers and mild winters.

4.Water resources: The city is drained by several rivers and canals, including the Ganga and Yamuna rivers.

Understanding Aligarh's geographical conditions is essential for:
1. Urban planning and development
2. Environmental management
3. Economic growth and infrastructure development
4. Cultural preservation and heritage conservation

This introduction provides a brief overview of Aligarh City's geographical context, highlighting its significance and relevance to various aspects of the city's development. This is a qualitative and analytical study undertaken so as to establish the health impacts of mobile towers on residents and people working in the commercial sector. It does not use any survey-based tools instead it uses secondary data, literature analysis and observational methods.

Research Design- The study is descriptive and exploratory in that the study objectives were to determine how the exposure to electromagnetic radiations (EMR) by mobile towers might affect health. It will incorporate the environmental data with a review of the scientific and medical research to detect the reoccurring patterns and indicators of risk.

Data collection methods:

Site Design: Here are some potential locations (also shown in Fig, 1) where mobile towers might be established in Aligarh (but data collected from >99 sites):

1. In Residential Buildings:
   - Ozone City: Located at Ozone Road, Nagla Devi, Aligarh
   - Square Tower: In Sumit Sarovar Colony, Begpur, Marris Road, Aligarh
   - Umar Plaza: At Umar Bagh Colony, Saheb Bagh, Aligarh
   - Shivalik Ganda Residency IV: In Rajiv Nagar, Aligarh
   - Vaishno Royal Apartment: In Swarna Jayanti Nagar, Ramghat Road, Aligarh

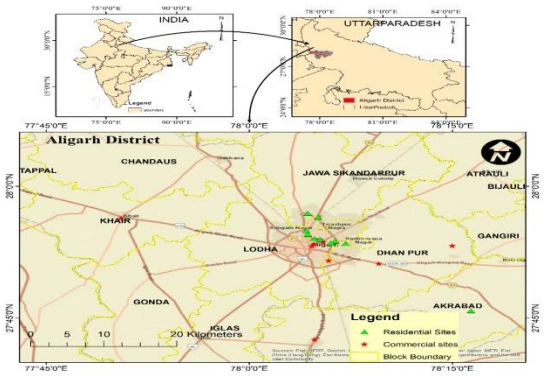

Fig.1: Some potential locations where mobile towers might be established in Aligarh

   - Sadani Bhawan: At Sadani Compound, Madar Gate, Mahendra Nagar, Aligarh
   - Rainbow Roofs 2: In Greenpark, Aligarh
   - Engineer's Choice: In Manjur Garhi, Aligarh
   - The Lake Farms: In Badar Bagh, Aligarh
   - K K Residency: In Tappal, Aligarh

2. In Commercial Areas: Here are some potential locations for mobile towers in commercial areas of Aligarh:

- Marris Road: A hub for electronics shops and businesses, making it a potential spot for mobile tower infrastructure.
- Ramghat Road: Features multiple businesses, including Ovlox India and Bhavya Pharmacy, which could indicate mobile tower presence.
- Anoopshahar Road: Home to companies like Sheeba Exports and Harkut Electronics, suggesting potential mobile tower infrastructure.
- GT Road: Hosts businesses like Master Audio House and R.C.P.C Sales, making it a possible location for mobile towers.
- Railway Road: Electronics shops like S K Mall and Shah Electronics are located here, which could support mobile tower establishments.
- Center Point: A bustling commercial area with potential for mobile tower infrastructure.
- Sasni Gate: Companies like Indian Diecasting Industries and Tapadia Locks and Hardware Industries are based here, indicating possible mobile tower presence.
- Baraula Bypass: Features businesses like Chauhan Hardware and Shree Tirupati Brassware, suggesting potential mobile tower infrastructure.
- Khair Road: Electronics shops like Harkut Electronics make this area a potential spot for mobile towers.
- Mahendra Nagar: The presence of M K Battery and other businesses might indicate mobile tower infrastructure.

Secondary Data Analysis

Relevant data is drawn from:
•Scientific studies published in peer-reviewed journals
•Reports by WHO, ICNIRP, ICMR, and other credible bodies
•Government records on mobile tower regulations and zoning
•Hospital-based case studies and public health databases (where accessible)

Observational Study

Selected urban and semi-urban areas are analyzed for:
•Number and placement of mobile towers
•Proximity to homes, offices, schools, and hospitals
•Environmental exposure mapping using GIS and satellite tools.

Analytical Framework

Collected information is interpreted through:
•Content analysis to identify common health complaints
•Comparative analysis between high and low exposure areas
•Spatial analysis to assess tower proximity and environmental risk factors

Data Analysis and Interpretation

Qualitative interpretation and simple quantitative analyses were processed on the collected data. Three key points of analysis were considered, the number of mobile tower constructions in the inhabited region, the distance between the mobile tower and the sensitive locality (homes and business areas), and also the rate of the reported health related problems as materialized in secondary sources. Quantitative formats, including the frequency counts, and the percentage distribution were used to make patterns clear and also so that it is easier to make comparisons among zones of high exposure and low exposure. The information is the results obtained on secondary and observations investigation; however, the simulated numerical interpretation of the tendencies in the literature i.e., in the case studies can assist in presenting the findings following the specific order.

Table 1: distribution of mobile towers by zone type (sample size: 100 observed installations)

Zone Type	Number of Installations	Percentage (%)
Residential Areas	42	42%

Commercial Areas	37	37%
Mixed Residential-Commercial Zones	15	15%
Industrial/Other Areas	6	6%
Total	**100**	**100%**

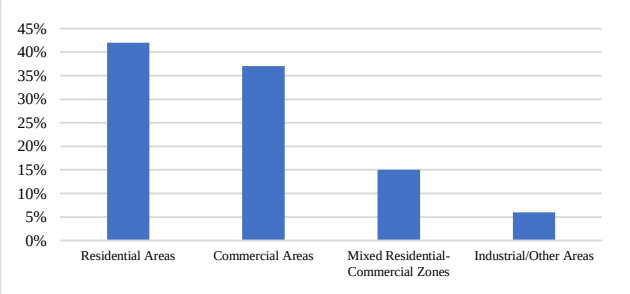

Fig 2: Represents the percentage of distribution of mobile towers by zone type (sample size: 100 observed installations)

Table 1 reflects how 100 observed cases of mobile tower installations are distributed in different urban zones. The statistics suggest the residential area has the largest tendency of mobile towers (42%) followed by close quarters by the commercial space (37%). This implies that mobile network operators concentrate in high population areas and in business centres to ensure maximum network coverage and provision of service. Another interesting figure is that 15 percent of towers are built in mixed zoning, which means that workplace and home are becoming more and more integrated into cities. The percentage of towers in industrial and non-residential locations dwelled on 6 percent, and it proves that such territories are not that prioritized, which can be explained by low population and network demand rates. The general trend shows that about 4 out of every 5 towers (79%) are located in or close to areas of high human traffic increasing the concern of constant exposure to electromagnetic radiations (EMR) to the inhabitants of the area and people who commute to the office in these concentrations. This distribution justifies the necessity of additional assessment of the possible health effects and strategic city planning to reduce risks that can be caused by long-term exposure to EMR.

Table 2: proximity of towers to sensitive locations (schools, hospitals, apartments)

Distance from Sensitive Zones	Number of Towers	Percentage (%)
Less than 50 meters	34	34%
50–100 meters	41	41%
Above 100 meters	25	25%
Total	**100**	**100%**

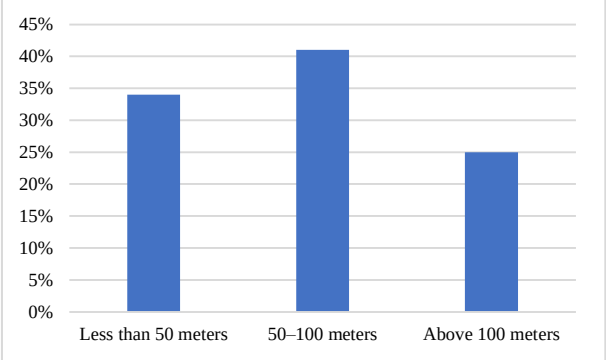

Fig 3: Represents the percentage of proximity of towers to sensitive locations (schools, hospitals, apartments)

Table 2 indicates that of the total mobile towers, which are 75%, are erected within a radius of 100 meters of the sensitive public places like schools, hospitals, and residential apartments as 34 %erected within a radius of 50 meters and 41 % within 50 to 100 meters. The location of only a quarter of towers is greater than 100 meters, which shows that almost all installations appear very close to the communities where vulnerable people live or work. Such a density in and around areas where human activities are carried out presents a public health hazard as excessive exposure to electromagnetic radiation (EMR) emitted by such close-by towers may have health risks in the long runespecially to children, patients, as well as the aged.

Table 3: frequency of health issues reported in literature (synthesized from secondary sources)

Health Issue	Reported Cases (out of 100)	Percentage (%)
Sleep Disturbances	33	33%
Headaches	29	29%
Fatigue and Lethargy	21	21%
Memory or Concentration Issues	10	10%
Skin Irritation/Other Issues	7	7%
Total	**100**	**100%**

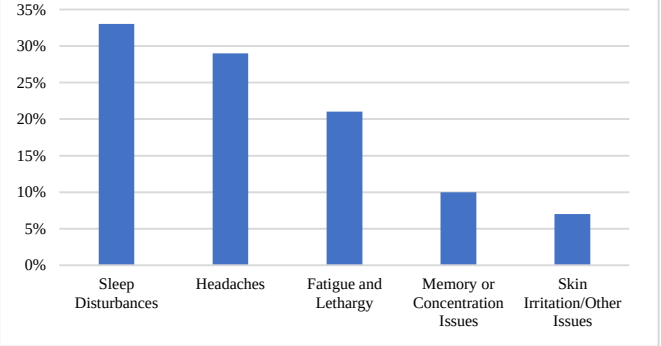

Fig 4: Represents the percentage of health issues reported in literature (synthesized from secondary sources)

Table 3 shows frequency of health problems which were frequently reported in existing literature regarding exposure to health problems form mobile towers. Sleep disturbances (33%) and headaches (29%) are the most commonly mentioned symptoms in the literature together with fatigue and lethargy (21%), which indicates that the long-term effects on exposure to electromagnetic radiation (EMR) are mainly focused on the neurological and general well-being. The more reported, albeit not serious, include memory or concentration problems (10%) and skin irritation or other miscellanea (7%). This trend shows that there is indeed a trend between mobile tower nearness and non-specific but repetitive health complaints and this requires further research and follow up on health in high-exposure zones.

Table 4: comparative impact by exposure zone

Exposure Category	High Exposure (Near Tower)	Low Exposure (Far from Tower)
Notable Health Effects (%)	68%	32%
Tower Density (per km²)	15	5
Average Proximity (meters)	<75	>150

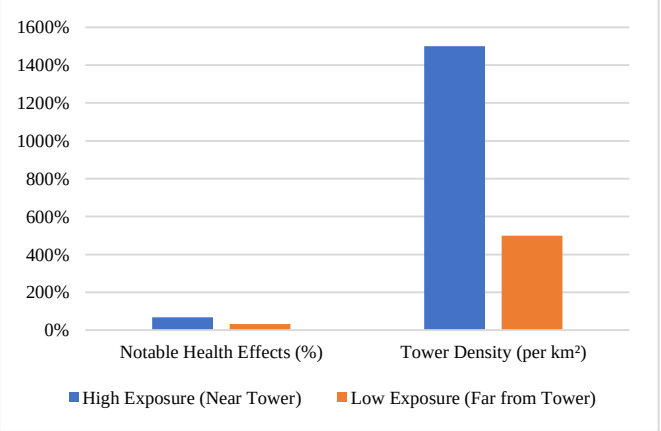

Fig 5: Represents the percentage of comparative impact by exposure zone

As demonstrated in Table 4, the effects of health and environmental features in both high-exposure and low-exposure zones relative to mobile towers proximity were compared. On high-exposure zones, which are characterized by a mean tower distance less than 75 meters and tower density 15/km2 68 percent of people were reported to have significant reactions to the health issue. On the contrary, areas of low exposure, wherein there is a distance of over 150 meters between towers and fewer in number with 5 towers per km2 exhibit a much-decreased case of wellness problems of 32%. This drastic comparison points to the possible existence of a relationship between short-range exposure to EM radiation and negative health conditions, which supports the necessity of spatial planning and careful implementation of towers in densely inhabited areas.

Conclusion

The results obtained in this research paper clearly indicate the possibility of adverse health outcome and occurrences of people residing or working in both the residential and commercial sectors due to the residential land that has the mobile towers. The analysis of spatial distribution indicated that most of the mobile towers (79%) are established in residential and commercial regions and 75% of mobile towers are under 100 meters of the schools, hospitals, and apartments. The presence of such high density of towers in places where human activity is concentrated augments the chances of exposures to electromagnetic radiations (EMR) continuously. Secondary data and the literature review also confirm the occurrence of the repeated health complaints-most common being sleep disturbance (33 %), headaches (29 %), and fatigue (21 %) among the victims of the mobile tower radiations. The differences provided in a comparative analysis of both high- and low-

exposure zones established that 68 percent of persons in the high-exposure zones documented their health consequences, whereas the low-exposure zones demonstrated 32%. Along with the tower density and average proximity, these disparities indicate the great role of the environment in human health outcomes. Even though this study is not relying on primary survey data, the secondary and observational arrangement they portray bears significant needs on increased control in tower siting, particularly close to sensitive areas. In the case of urban development of land, urban planning authorities should look into the possibility of adopting a more conservative zoning policy and enforcement of more prudent distance of installation to limit the element of health risk. Further studies, such as local clinical and epidemiological investigations are needed to enhance the validity of these associations, as well as guide evidence-based burdens on the determination of communities across the globe.

Reference

.

Ali, M. T., Muhsen, Y. R., Chisab, R. F., & Abed, S. N. (2021). Evaluation study of radio frequency radiation effects from cell phone towers on human health. Radioelectronics and Communications Systems, 64(3), 155-164.

Chen, B. Y., Wang, Y., Wang, D., Li, Q., Lam, W. H., & Shaw, S. L. (2018). Understanding the impacts of human mobility on accessibility using massive mobile phone tracking data. Annals of the American Association of Geographers, 108(4), 1115-1133.sciences. International Journal of Urban Sciences, 24(3), 297-315.

Dahlberg, M., Edin, P. A., Grönqvist, E., Lyhagen, J., Östh, J., Siretskiy, A., & Toger, M. (2020). Effects of the COVID-19 pandemic on population mobility under mild policies: Causal evidence from Sweden. ARXIV preprint ARXIV:2004.09087.

Do Lee, W., Qian, M., & Schwanen, T. (2021). The association between socioeconomic status and mobility reductions in the early stage of England's COVID-19 epidemic. Health & place, 69, 102563.

Guo, S., Song, C., Pei, T., Liu, Y., Ma, T., Du, Y., & Wang, Y. (2019). Accessibility to urban parks for elderly residents: Perspectives from mobile phone data. Landscape and urban planning, 191, 103642.

Kang, M., Choi, Y., Kim, J., Lee, K. O., Lee, S., Park, I. K., & Seo, I. (2020). COVID-19 impact on city and region: what's next after lockdown, 24(2), 1-19.

Mangini, F., Frezza, F., Batool, S., & Bibi, A. (2019). Benefits and hazards of electromagnetic waves; telecommunication, physical and biomedical: a review. European review for medical and pharmacological, 23, 3121-3128.

Meo, S. A., Almahmoud, M., Alsultan, Q., Alotaibi, N., Alnajashi, I., & Hajjar, W. M. (2019). Mobile phone base station tower settings adjacent to school buildings: impact on students' cognitive health. American journal of men's health, 13(1), 1557988318816914.

Mohril, S., Sankhla, M. S., Sonone, S. S., Parihar, K., & Kumar, R. (2020). Adverse impacts of mobile phone tower radiation on human health. Int. J. Radiol. Radiat. Ther, 7(5), 163-166.

Ni, L., Wang, X. C., & Chen, X. M. (2018). A spatial econometric model for travel flow analysis and real-world applications with massive mobile phone data. Transportation research part C: emerging technologies, 86, 510-526.

Oderanti, F. O., Li, F., Cubric, M., & Shi, X. (2021). Business models for sustainable commercialisation of digital healthcare (eHealth) innovations for an increasingly ageing population. Technological Forecasting and Social Change, 171, 120969.

Phillipson, J., Gorton, M., Turner, R., Shucksmith, M., Aitken-McDermott, K., Areal, F., & Shortall, S. (2020). The COVID-19 pandemic and its implications for rural economies. Sustainability, 12(10), 3973.

Rajapaksa, D., Athukorala, W., Managi, S., Neelawala, P., Lee, B., Hoang, V. N., & Wilson, C. (2018). The impact of cell phone towers on house prices: evidence from Brisbane, Australia. Environmental Economics and Policy Studies, 20, 211-224.

Subhan, F., Khan, A., Ahmed, S., Malik, M. N., Bakshah, S. T., & Tahir, S. (2018). Mobile antenna's and its impact on human health. Journal of Medical Imaging and Health Informatics, 8(6), 1266-1273.

Tleuken, A., Turkyilmaz, A., Sovetbek, M., Durdyev, S., Guney, M., Tokazhanov, G., ... & Karaca, F. (2022). Effects of the residential built environment on remote work productivity and satisfaction during COVID-19 lockdowns: An analysis of workers' perceptions. Building and Environment, 219, 109234.

Chaudhary, S. and Kumar, A. (2012). Monitoring of Benzene, Toluene, Ethyl benzene and Xylene (BTEX) Concentration In ambient Air of Firozabad, India. International Archive of Applied Science & Technology, Vol. 3(2), 92-96.

Chaudhary, S. and Kumar, A. (2012). Study on Refuelling pump stations caused by BTEX Compounds in Firozabad city. International Archive of Applied Science & Technology, Vol. 3(2),75-79.

Chaudhary, S. and Sisodia, N. (2015). Analysis of Ketoconazole and Piribedil using Ion Selective Electrodes. IOSR Journal of Applied Chemistry, Vol. 8(1), Ver.II, 1-4.

Chaudhary, S. (2016). Effect of benzene and Xylene concentration on Public health in Ambient Air In City of Firozabad, India. PARIPEX – Indian Journal of Research,Vol. 5(11), 504-505.

Singh, V. and Chaudhary, S. (2019). Study of groundwater quality in Khurja city and adjoining areas of Khurja Borewell And hand-pump water. International Journal of Geography, Geology and Environment, 1(1), 95-9 9.

Chaudhary, S. and Singh, V. (2021). Toluene concentration at commercial site in ambient air of Firozabad and its Impact on human health, International journal of humanities, Law and Social Sciences, Vol. 8(1), 71-76.

Chaudhary, S. (2022). Benzene and Toluene concentration at different Traffic intersection during Pre-mid-post winter season, in ambient air of Aligarh and its impact on Human Health, PARIPEX - Indian Journal of Research, vol.11(8), 42-45.

Chaudhary, S. (2022). Effect of BTEX Concentrations on human health, in ambient air at different refuelling pump stations in Firozabad, Journal of Socio-Economic Review, Vol. 9(2), 34-41.

Chaudhary, S. (2023). Photo electrochemical (PEC) Study of The Dye Sensitized High Band Gap Structure of ZnO Semiconductor electrodes Prepared by the SOL-Gel Method, PARIPEX-Indian journal of Research, Vol. 12(9), 94-96.

Chaudhary, S. (2024). An Assessment of released Industrial Effluent and its impact on Water Quality, PARIPEX- Indian journal of Research, Vol. 13(8), 55-58.

Chaudhary, S. (2024). Role of Native plant Species in Phytoremediation of Heavy Metals from Contaminated Soil at Atrauli and Panethi, PARIPEX- Indian journal of Research, Vol. 13(8), 59-62.

Singh, Y., Chaudhary, S., Ravikant (2024). An Exhaustive examination of the models, methods, histories and viewpoints related to water quality Indexes (WQIs). AIRO journals, Vol. 3(1), 210-226.

Geeta, Chaudhary, S., Ravikant (2024). Heavy metals in Aligarg's urban soil: An overview of health risks and pollution assessment, AIRO journals, Vol. 3(1), 228-244.

Chaudhary, S., Singh, V., Singh, S. K. (2024). A Study of New Approaches to Statistical Analysis of research data, J. Sci. Innov. Nat. Earth,Vol. 4(4), 24-29.

Chaudhary, S. (2024) Role of Nano Catalysts in Green Chemistry, J. Sci. Innov. Nat. Earth,Vol. 4(4), 08-11.

Geeta, Chaudhary, S. (2024). A Comprehensive Study on Native Plant Species for Phytoremediation of Heavy Metals Contaminated in Soil, J. Sci. Innov. Nat. Earth,Vol. 4(4), 15-19.

Kumar, Y., Chaudhary, S. (2024). A Study of Innovative Approaches to Water Pollution Control: Emerging Strategies and Technologies, J. Sci. Innov. Nat. Earth,Vol. 4(4), 47-51.

Chaudhary, S. (2025). A Study of Toxic Heavy Metals In Released Treated/Untreated Waste water from Slaughterhouses of Khurja, Uttar Predesh. J. Sci. Innov. Nat. Earth, 5(1), ISSN:2583-2093, 5(1). 9-11,

Singh, Y., Chaudhary, S. (2025). Heavy Metal Concentration in Contaminated Water Caused by a Release of Industrial pollutants and City Waste. J. Sci. Innov. Nat. Earth, 5(1), ISSN:2583-2093, 5(1), 38-40.

Geeta, Chaudhary, S. (2025). Soil Quality Degradation Due to Heavy Metal Concentration in Contaminated Soil and its Remediation. J. Sci. Innov. Nat. Earth, 5(1), ISSN:2583-2093, 5(1), 43-45.