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Work-From-Home and Its Impact on Environmental Sustainability

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Abstract

This is an empirical research paper to study Work-From-home (WFH) culture and its impact on environmental sustainability. A quantitative research design was used, and primary data were collected through a questionnaire administered to 50 individuals. The data obtained was analysed using descriptive statistics and analytics. The findings showed that work-from-home practices significantly contributed to reduce daily commute, lower fuel consumption, and reduced greenhouse gas emissions. However, the study also documented that there is an increase in residential energy usage that partially diminishes the environmental benefits. Overall, these results suggest that the WFH culture has a net positive effect

on environmental sustainability, provided it is complemented with energy-efficient household practices. The research offers useful lessons that can be utilized by organizations and policymakers when designing suitable models of work that strike a balance between flexibility and environmental responsibility.

Key words: Work-from-Home, environmental sustainability, greenhouse gas emissions, residential energy usage

I. INTRODUCTION

The COVID-19 pandemic has caused a significant structural change in the way people work. Many companies and employees have begun to adopt a work-from-home (WFH) approach that has created many new questions about how this change will affect environmental sustainability. Although WFH has resulted in a drop in fuel use and GHG emissions because of the elimination of the daily commute to work, it has also contributed to increased residential energy consumption which may or may not offset some of the positive environmental effects associated with WFH. This empirical study will attempt to better understand the net effects WFH may have on environmental sustainability by exploring the benefits and challenges of the evolving WFH culture.

Objectives of the study

The primary objectives of the study are to quantify the effects of WFH on the environment through an analysis of changes in commuting, fuel use, GHG emissions, and residential energy use. Additionally, to identify the conditions that may enable WFH to facilitate the most effective environmental benefits, including the widespread implementation of energy-efficient household practices.

1. To study the impact of WFH on business sustainability
2. To understand employee productivity and work-life balance
3. To analyse cost efficiency and operational continuity
4. To examine challenges faced by organizations in WFH adoption

Secondary Objectives:

1. Employee satisfaction under WFH
2. Role of digital tools in remote work
3. Sustainability outcomes of hybrid models

Scope of the study

The research scope of this study will consist of a quantitative analysis of primary data collected through the use of a questionnaire completed by a selected sample population currently working from home. The study will focus on quantifying these environmental indicators that are directly impacted by a shift in

work location and will emphasize commuting patterns and household energy usage. There is a growing need for this research, given the increasing number of individuals, businesses, and governments is adopting and promoting WFH arrangements.

1. Study focuses only on Work From Home practices
2. Concentrates on productivity, cost, and sustainability
3. Sample limited to employees working remotely
4. Emphasis on business and employee perspective
5. Wide study within organizational sustainability

Need for the study

There is an emerging need for this research owing to the rising popularity of flexible work patterns around the world and, accordingly, the need for research-based inputs for organizations and policymakers. Environmental sustainability factor plays an important part in understanding the overall impacts of WFH and then structuring work patterns accordingly.

1. Paradigm shift in work culture
2. Business continuity during crises
3. Employee flexibility and retention
4. Cost efficiency and resource optimization
5. Environmental sustainability

Limitations of the study

The drawbacks of the study are that it is dependent upon self-reported data, which might have certain biases, and the data isn't measured for long-term changes concerning the environment and behaviour. Moreover, the study has a geographical and demographic constraint concerning its generalizations for different areas.

Review of Literature

Sustainability Implications of Working-From-Home (WFH): A Systematic Review of the Travel Behaviour Literature

Tmnit Hailu Halefom, Magnus Moglia, Christian (Andi) Nygaard, and Dorina Pojani

Hale form et al. (2024), Moglia et al. (2024) , Nygaard et al. (2024) and Poland et al. (2024) examine the impact of working-from-home (WFH) on travel behaviour within the working population and evaluates the associated environmental, social, and economic benefits. Analysing 48 peer-reviewed articles in accordance with PRISMA guidelines, their study distinguishes between evidence collected before, during, and after the COVID-19 pandemic. They also found out that while WFH

can yield various benefits, achieving them is complex due to existing urban patterns not designed for WFH. A decrease in travel distance tends to occur primarily when employees work from home three or more times a week.

The paper also highlights the challenges posed by potential lifestyle changes that could negate the positive impacts of WFH, such as increased commutes if workers relocate away from their jobs. Hence, understanding WFH's role in sustainable development.

Impact of remote working on employee productivity and work-life balance in Indian IT companies

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Tripathi et al. (2025) and Goyal et al. (2025) examine the impact of remote working on employee productivity and work-life balance in India's IT sector, a shift accelerated by the COVID-19 pandemic. Utilizing a mixed-methods approach, the study surveyed 150 employees from top tech cities, revealing that 72% reported increased productivity due to flexible hours and fewer commutes. However, 58% of respondents struggled to maintain work-life balance, leading to heightened stress and potential burnout, particularly among female employees and caregivers.

The research identifies key factors such as managerial support and organizational culture as significant mediators of employee satisfaction. It concludes with recommendations for hybrid arrangements and mental health programs to enhance the sustainability of remote work practices in Indian IT companies.

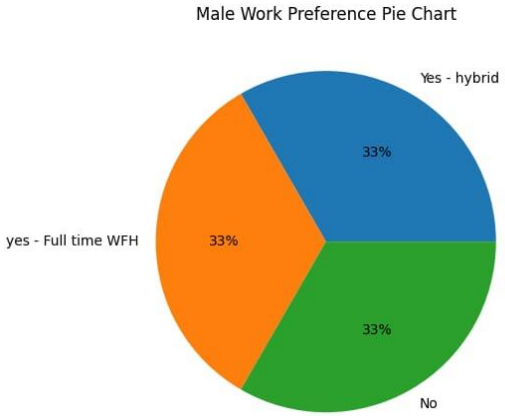
Methodology

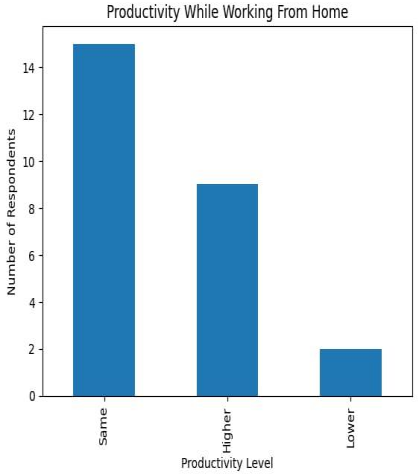
The current research study adopts a descriptive research approach to examine the effects of the Work-From-Home culture on business and environmental sustainability.

The sample size for the research study includes 50 respondents, who were chosen using the convenience sampling technique, which allows easy and rapid access to working professionals who adopt the WFH culture.

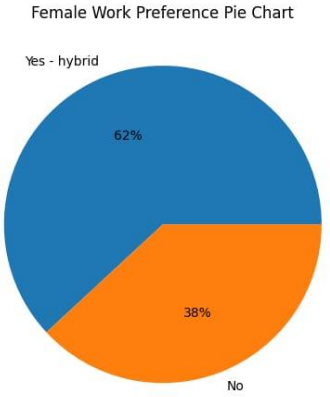
The research study is conducted using both primary and secondary sources of data. The primary sources of data were collected using a structured research questionnaire. The secondary sources of data were collected from research journals, articles, company reports, and relevant websites.

The collected data was analysed using research questionnaire responses and relevant statistical analysis, such as percentage analysis and basic descriptive statistics using Microsoft Excel.





The graph highlights how respondents feel about work from home. A large number of participants have marked it as "Best" or "Like," showing that most



people have a positive view of working from home. This clearly reflects that employees value the flexibility, comfort, and better work–life balance it offers.

At the same time, some respondents have chosen a neutral option, suggesting that while they do not dislike work from home, they also experience certain challenges. These may include less informal interaction with colleagues and weaker team bonding. Only a small number of respondents have expressed negative opinions, indicating that dissatisfaction is minimal.

Overall, the graph shows that work from home is widely accepted by employees. However, to make it more effective and sustainable, organizations should focus on improving communication, employee engagement, and team connection.

Findings

1. Long-term sustainability of a business can be achieved through the implementation of work-from-home (WFH) policies that allow for greater operational flexibility.
2. WFH reduces both operational and infrastructure costs such as office space, utility bills, and maintenance expenses.
3. Employee job satisfaction and retention levels were higher with flexible work arrangements than with traditional work arrangements.
4. WFH has been shown to provide an improved level of work-life balance, which reduces stress and increases productivity.
5. Environmental sustainability can also be achieved through the reduction of commuting via telecommuting; thus, minimizing fuel use and carbon emissions.
6. A hybrid work model, or a combination of remote and on-site working, was found to be the most sustainable and beneficial method for organizations and their employees.

II. CONCLUSION

The global work structure is undergoing a major transformation due to the new Work-from-Home (WFH) setup, which presents a substantial chance for organizational and environmental sustainability. Commuting will cease, leading to a considerable decrease in the total amount of gasoline consumed, as well as the total amount of carbon (CO2) gas emitted. However, the net gain of this change will depend largely on whether or not the "rebound effect" associated with greater amounts of energy used in the home can be mitigated.

For many, WFH has become a successful way for the business to keep operational continuity while minimizing costs. Long-term sustainability of the remote workers will depend on balancing both productivity of employees as well as

their mental health. The Hybrid Model has been identified as the most sustainable option available, combining the environmental advantages of remote work with the collaborative and social advantages of traditional office locations.

Suggestions

To gain the maximum benefit from WFH and Hybrid arrangements, organizations should consider the following actions:

1. Set up guidelines around communication hours to avoid employee burnout and help establish healthy boundaries between work and personal time.
2. Optimize Office Footprints
3. Downsizing large and/or underutilized offices will reduce fixed overhead as well as total Company energy consumption.
4. Provide training on how to effectively use digital tools for the purpose of keeping collaboration high without experiencing "Zoom Fatigue".
5. For hybrid days, promote public transit or electric vehicle (EV) usage to further minimize the carbon footprint of "office days."

III. REFERENCES

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