

The Impact of Green Computing on Human Resource Management Practices in the Private Sector

Sagnik Chakraborty*, Ritika Bhowmick**, Soumi Majumder***

**Department of Business Administration, Future Institute of Engineering and Management, West Bengal, India. Email: sagnik.chk@gmail.com*

***Department of Business Administration, Future Institute of Engineering and Management, West Bengal, India. Email: ritikabhovmik8@gmail.com*

****Department of Business Administration, Future Institute of Engineering and Management, West Bengal, India. Email: soumi.majumder@teamfuture.in*

ABSTRACT

Green computing refers to utilizing computers and technology in an environmentally friendly manner. Green computing pertains to eco-friendly computing methods, emphasizing the reduction of energy use, waste, and carbon emissions linked to IT activities. This paper examines the influence of green computing on Human Resource Management (HRM), emphasizing how organizations can integrate their HR practices with sustainability objectives. As companies place a greater emphasis on corporate social responsibility, HRM is essential in embedding eco-friendly initiatives within the organizational culture. This research explores how green computing affects the field of human resource management, highlighting how eco-friendly practices can improve job satisfaction and talent acquisition. Additionally, it addresses the execution of training initiatives that highlight sustainable methods among staff, nurturing a culture of environmental responsibility within the team. Recently companies are starting to use digital tools to reduce paper use, support online hiring and training, and allow employees to work from home. These steps help the environment and also make work more efficient. For conducting this research, we have collected responses from 52 respondents and this research focuses to understand the impact of Green Computing on Human Resource Management practices in the private sector, West Bengal, India.

Keywords—Green, Computing, Human Resource, Digital Tools, Eco-Friendly, Practices, etc

I. INTRODUCTION

Green computing, also known as sustainable computing, which is the use of computers and other computing devices in environmentally responsible and energy-efficient ways. Energy-efficient (CPUs), servers, peripherals, power systems, and other IT equipment are mostly utilized by modern businesses & organization which uses green computing process. They also emphasise preservation of these resources and proper disposal of e-waste. Green computing is an essential element of environmental, social, and governmental initiatives that emphasise the adoption of ethical and sustainable

business practices in many organisations. Additionally, it supports larger business sustainability projects that seek to set up businesses for long-term success through ethical corporate management and strategy. One of the main factors behind green computing methods is cost savings on IT and energy. Government policies pertaining to energy economy also inspire environmental projects. Thirdly driving the green computing movement are environmental responsibility pressures both inside and outside of the context of climate change.

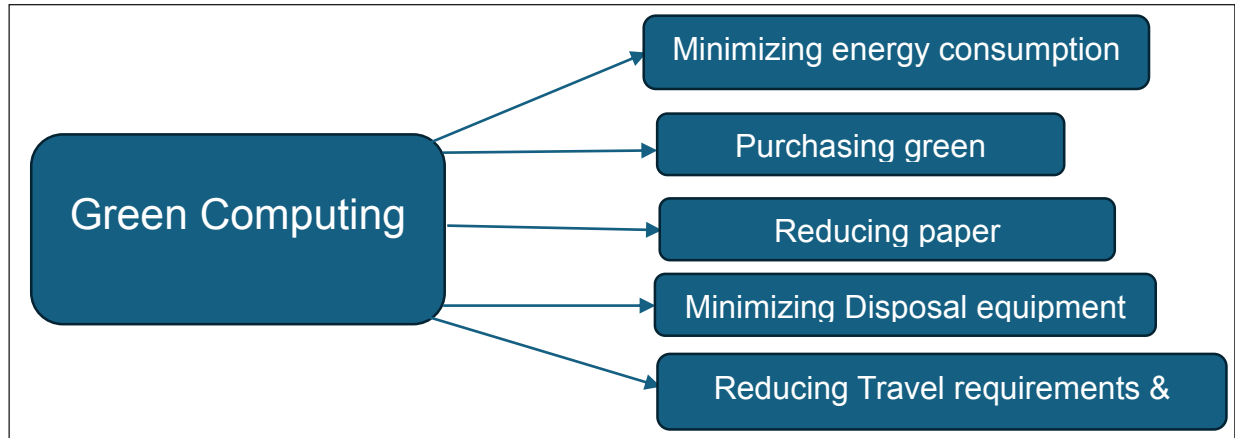
Green computing's main goal is energy consumption reduction. Not only does this lowering company energy costs, but it also reduces carbon footprints especially for IT

assets. Apart from the financial savings, green computing solutions can assist companies in regulatory compliance and maybe provide a marketing advantage over rivals with investors and consumers. The developments in energy management and energy conservation, IT systems and other computing tools are now quite energy efficient. New developments and improvements now heavily rely on green design of office space, data centres and other high-energy consuming facilities to make them more environmentally sustainable. Businesses have been paying more attention to the importance of goals and strategies that are good for the environment. The traditional financial and economic system has been substituted by the green HRM in the global economy because businesses are now more globalised. As the HR teams want to keep green workplaces and green practices to make the company culture more green, green human resource management is slowly turning out to be more important in the organisations. Green HRM is therefore a vital element of tactics for businesses seeking to go green to achieve their environmental objectives. Attracting talented employees with specialised knowledge and expertise in green resources is necessary for achieving this. Having reliable and efficient green human resources is one of the biggest hurdle in today's competitive business climate. Additionally, it is essential for service providers, whose success is directly related to the output of their employees. According to green HRM, the main element affecting environmental performance is also taken into account. In this study, literature review can be seen reported in section 2 as well as section 3 which has depicted research methodology, Data Analysis has been discussed in section 4, Findings and implementation of the study has been discussed in section 5, limitations of the study and conclusions are reported under section 6 and 7 respectively.

In human resource management green computing has totally been a very influential aspect of the organisation. Nowadays, every organization is keen to adapt green computing to streamline the processes and complex activities, and it also aligns with the goals of environment sustainability & corporate social responsibility. One of the major areas of green computing in HRM is by applying

digital transformation of HR processes. Traditional HR activities involve paper-based works, printed pay slips & physical onboarding are now totally transformed and replaced with cloud-based HR processes and systems and E-documentation. This change in the organisation not only increase the efficiency of the organization but also eliminates the carbon waste associated with paper usage. Virtual hiring, recruitment and training is another area which has immense impact of green computing. Increasing of online video interviews, online assessments & e-learning platform has completely reduced the travel and resource usage. It is very much beneficial for larger multi-national companies (MNCs) as online recruitment and onboarding eliminates the operational and other travel related costs. However, these practices promote and enables candidates to take part in the recruitment process. Further green computing place a huge role in performance management and employee engagement. The organization uses environment friendly cloud-based tools to monitor employee performance, conduct survey and provide feedback. It promotes real time data communication and develops a culture of continuous improvement. HR departments are introducing green policies into workplace culture to encourage and motivate employees to use energy efficient devices, reducing printing and recycle electronic waste. Green computing has a large part of contribution to branding and talent management. Job seekers who are focused on environmental initiatives and commitment to sustainability. It plays a key role in attracting and retaining top talent, especially those who gives importance to eco-friendly practices. The objective of the study is to assess the impact of Green Computing on HR Practices in the Private Sector (Kolkata, West Bengal).

By implementing green technologies and practices into HR practices of organisation not only reduces environmental impact but also makes a position of long vision for future. The below Fig.1 illustrates the usage of green computing in human resource management which helps in reducing energy consumption, minimizing the paper usage and other consumption, lower equipment disposal requirements, decrease travel requirements cost and purchasing of the green energy.



Source: Author's own creation.

Fig. 1: Green Computing in HRM

II. LITERATURE REVIEW

The review was performed to understand the Green HRM practices of corporate organizations which is totally based on the previous research of them. It was observed by (AlKetbi & Rice, 2024) that the relation between Green Human Resource Management (G-HRM) practices depends on number of outcomes, such as organisational performance, client satisfaction, employee behaviour, and employee mind sets towards green. They also looked at the structure of research on G-HRM practices and how it would affect the chosen results by them. According to their research, it was found that G-HRM practices has developed as an important part in fostering environmentally conscious behaviours among employees and contributing to enhance employee satisfaction & organizational performance with a strong focus on sustainability.

The study by (Miah et al., 2024) aims to identify the trends which are related to sustainability in Green HRM research. They also have done this study to understand the relationship between sustainability and green human resource management (GHRM). It was found by them that Green human resource management is a general term which is used to identify research related areas like environmental management and environmental sustainability. Their study also found that the application & implementation of Green HRM in organizations is very moderate.

(Zahrani, 2024) have performed a study which was fully focused to find out how both employee's performance and green innovation has affected the environment simultaneously. He inspected various variables which affects employee performance and green innovation. The findings revealed that employee performance exerts a positive and significant impact on organization's environmental performance in the public sector.

The study by (Prianto & Schneider, 2021) aimed to explore environmentally friendly human resource management practices which focuses upon employee behaviour and the surrounding workplace environment. It was found by them that there is a strong relation between the level of environmental and social concern for the organization which is reflected in environmental regulations.

The study by (Bazrkar & Moshiripour, 2021) investigated the impact of the practices on environmental performance. They examined widely used green HRM metrics. Due to environmental knowledge, they found that four green HRM practices significantly and favourably have affected performance.

The study by (Arzamasova & Esaulova, 2020) analysed all the scientific approaches to HRM which is related to organization's environmental sustainability linked with the implementation of Green Computing in HRM. Their research was divided into two parts: environmentally integrated, and environmentally oriented. It was found by them that the organizations HR processes are eased by implementing Green Computing HRM practices.

The study by (Ali et al., 2020) focused on understanding the concept of Green HRM and its practices which has been applied for managing the work of HR efficiently. It was found by them that the importance of Green HRM has a huge impact of usage of green computing in the organization.

The study by (Shafaei et al., 2020) aims to gather the data on the drivers of impacts of green HRM at the organisational level as well as its effects on individual employees. Their study also aimed to know the process by which green HRM would give good outcomes for employees. It was found by them that particularly, at the organisational level, green HRM has a positive correlation with the environmental performance of the organisation, and organisational environmental culture which is benefitted in the organization.

The study by (Yong et al., 2019) analysed the various scopes of Green HRM and the approaches involved in it. It was found by them that there is a rise in the understanding of the new practices and focuses in the Green HRM discipline.

(Vankayalapati & K, 2020) have done the study which depicted that it is an emerging and new idea in management called “green HRM” that describes how an organization’s HR department can apply eco-friendly practices to get long-term, sustainable growth. He found that Green HRM practices has increased the employee retention.

III. RESEARCH METHODOLOGY

In this present study both primary data and secondary data have been utilized to enhance the quality and depth of the research. Primary data refers to the type of data which is collected directly from the field while secondary data is collected from existing sources like books, journals, reports, online databases, etc. In this study we have used probability random sampling technique. The data was collected by preparing questionnaire survey from 52 respondents (from IT, healthcare, education, real estate etc. in Kolkata, West Bengal). The data collection period was from February to March 2025. Cross-sectional data is the type of data which is collected from multiple subjects or sources within specific period of time (Paul

et al., 2023). Here we have used cross-sectional data. Descriptive statistics refers to summarize and describe the characteristics of a dataset. In research it is used to simplify complex information into easily understandable way to know the use of green computing on HRM practices, the dataset has been analysed through descriptive statistics (e.g.- pie chart, bar graphs).

IV. DATA ANALYSIS

In data analysis section we have used descriptive statistics (Nwankwo et al., 2021). We have depicted bar graph and pie charts to show the usage and utilization of green computing in different functions of human resource management,

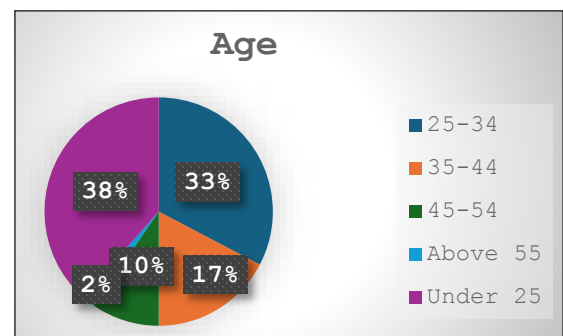


Fig. 2

From the above Fig. 2, it is seen that 38 % respondents lie under age 25, 33% from age 25-34, 17% from age 35-44, 10% from age 45-54 and rest 2% is above 55 ages.

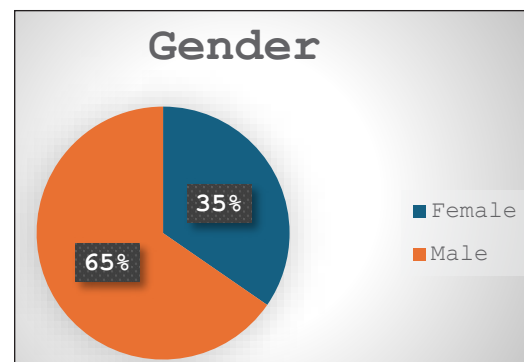


Fig. 3

From the above Fig. 3, it is seen that 65% respondents are male and 35% are female.

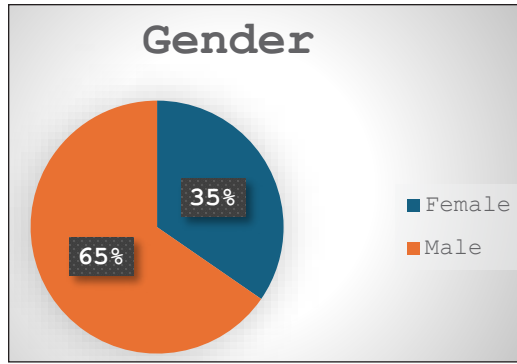


Fig. 4

From the above Fig. 4, it is seen that 52% respondents are post graduate, 38% are Undergraduate, 8% are from Professional and technical course and rest 2% have done Ni course.

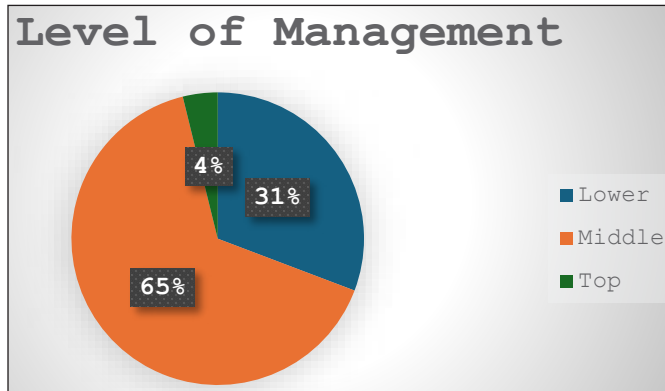


Fig. 5

From the above Fig. 5, it is seen that 65% respondents are from middle level management, 31% are from lower level management and 4% from top level management.

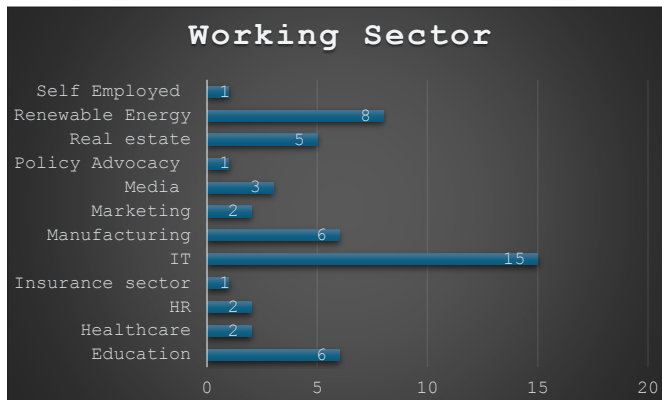


Fig. 6

From the above Fig. 6, it is seen that 15 respondents are from IT sector, 8 respondents are from Renewable Energy Sector, both manufacturing and education sector consists 6 respondents each, 5 respondents are from Real estate sector, 2 respondents each from marketing, healthcare, HR sector, 3 respondents from Media sector, and 1 respondent each from policy advocacy, insurance and self employed.

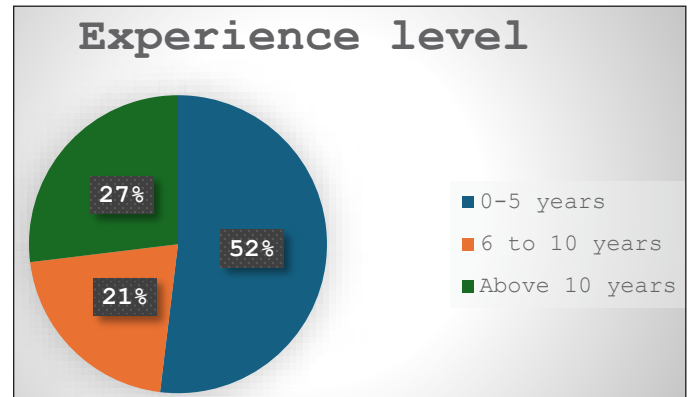


Fig. 7

From the above Fig. 7, it is seen that 52% respondents has experience between (0-5) yrs, 21% has (6-10) yrs of experience and 27% are having experience above 10 yrs.

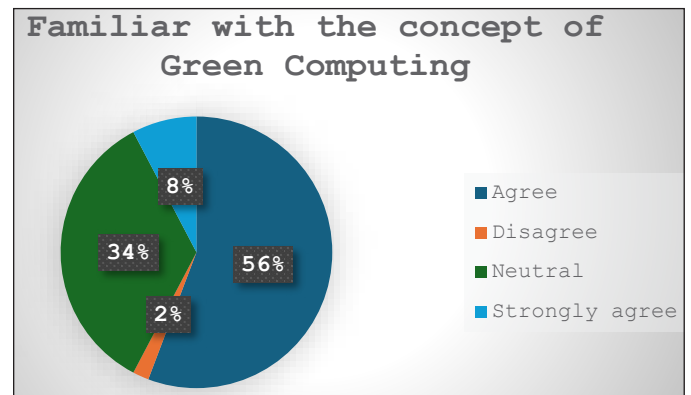


Fig. 8

From the above Fig. 8, it is seen that 56% respondents agree that they are familiar with the concept of green computing, 34% respondents are neutral, 8% respondents are strongly agreeing and 2% respondents are disagreeing.

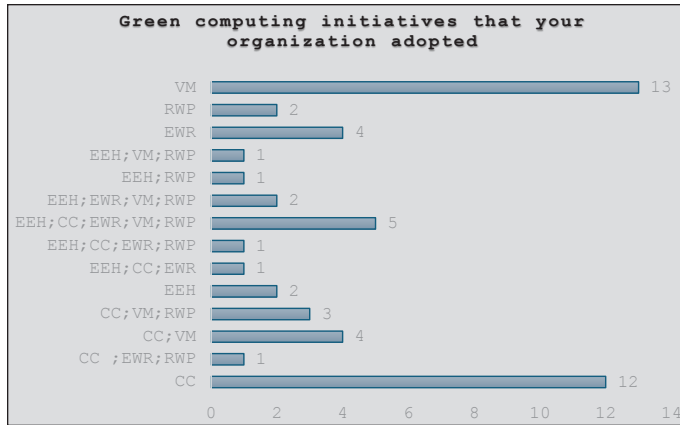


Fig. 9

Abbreviation	Full Form
CC	Cloud – computing
VM	Virtual meetings
RWP	Remote – work places
EEH	Energy efficient hardware
EWR	E-Waste Recycling

From the above Fig. 9, it is showing different perception of respondents regarding the most used Green Computing initiatives such as Cloud Computing, E-waste Recycling, Remote Work Places, Virtual Meetings and Energy-Efficient Hardware that has been implemented in their private sector organization to streamline their tasks efficiently and also to promote sustainability in the organization.

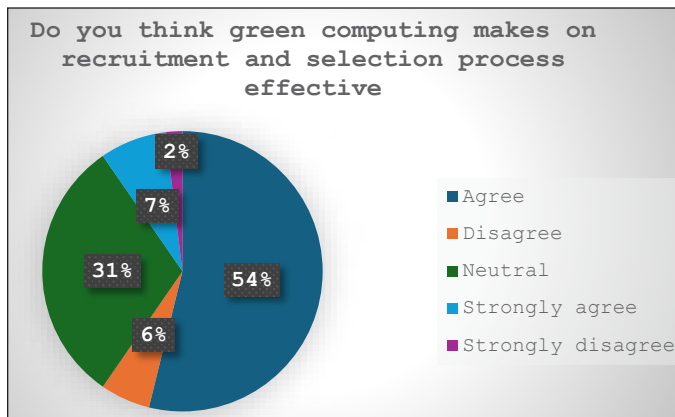


Fig. 10

From the above Fig. 10, it is seen that 54% respondents agree that green computing makes on recruitment

and selection process effective, 31% are neutral, 7% strongly agree, 6% are disagreeing and 2 % are strongly disagreeing.

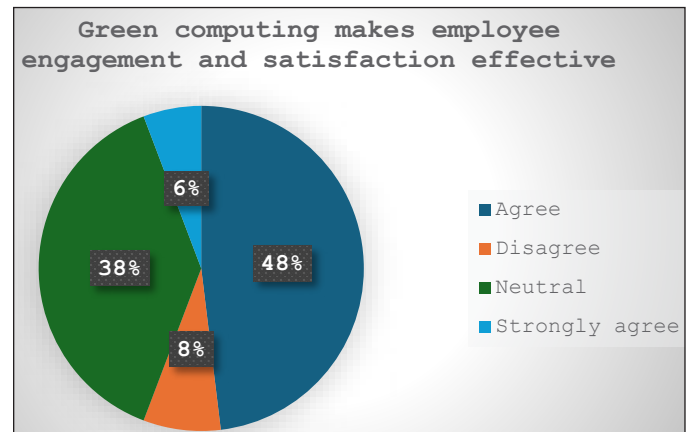


Fig. 11

From the above Fig. 11, it is seen that 48% respondents agree that green computing makes employee engagement and satisfaction effective, 38% are neutral, 8% disagree that green computing doesn't make employee engagement and satisfaction effective, 6% strongly agree with green computing makes employee engagement and satisfaction effective.

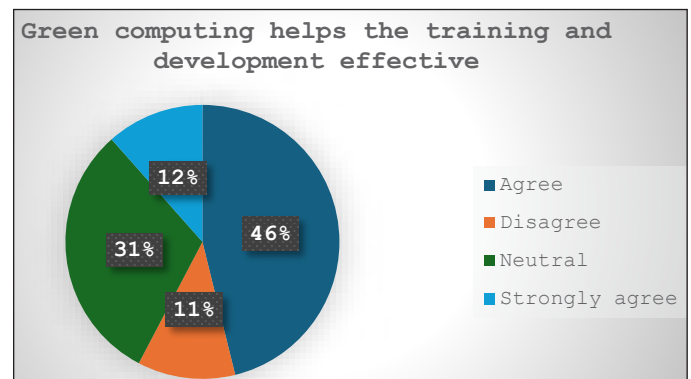


Fig. 12

From the above Fig. 12, it is seen that 46% respondents agree that green computing helps the training and development effective, 31% neutral, 12% strongly agree that green computing helps the training and development effective, 11% disagree that green computing doesn't help the training and development effective.

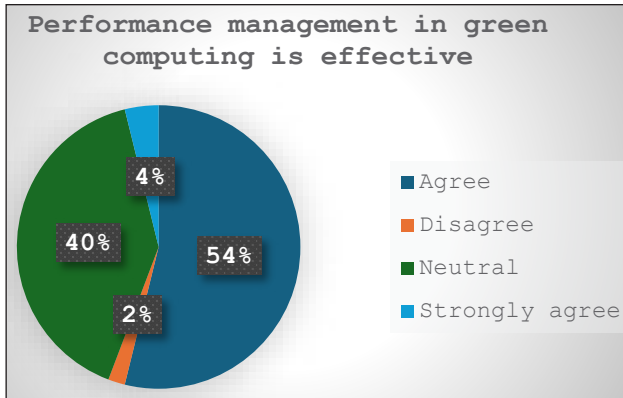


Fig. 13

From the above Fig. 13, it is seen that 54% respondents agree that performance management in green computing is effective, 40% are neutral, 4% strongly agree that performance management in green computing is effective, and 2% respondents disagree that performance management in green computing is not effective.

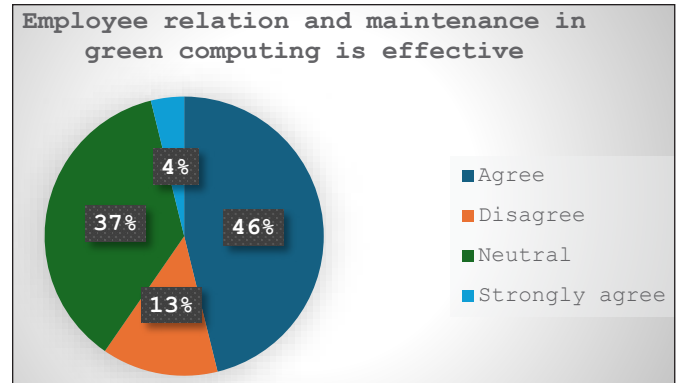


Fig. 15

From the above Fig. 15, it is seen that 46% respondents agree that Employee relation and maintenance in green computing is effective, 37% are neutral, 4% respondents strongly agree that Employee relation and maintenance in green computing is effective, 13% respondents disagree that Employee relation and maintenance in green computing is not effective.

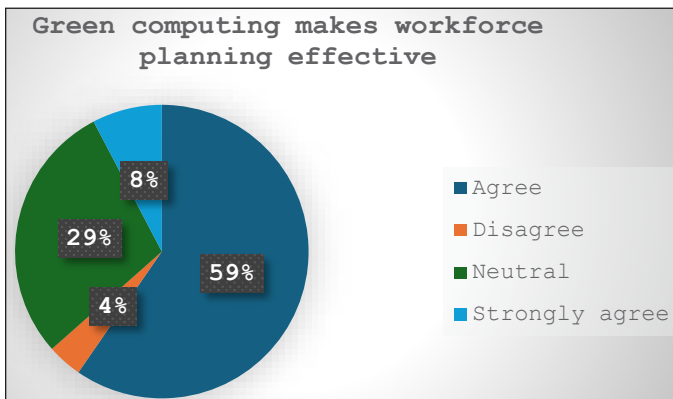


Fig. 14

From the above Fig. 14, it is seen that 59% respondents agree that green computing makes workforce planning effective, 29% are neutral, 8% respondents strongly agree that green computing makes workforce planning effective, 4% respondents disagree that green computing makes workforce planning effective.

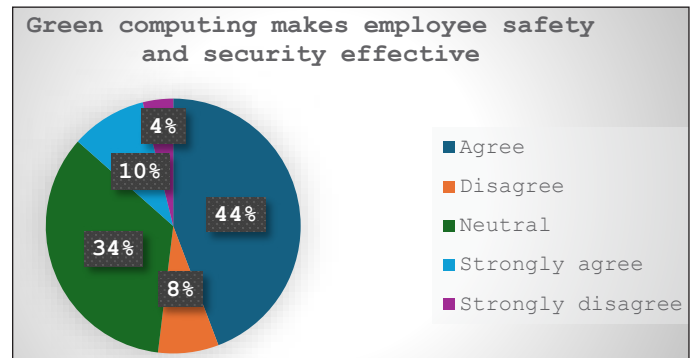


Fig. 16

From the above Fig. 16, it is seen that 44% respondents agree that green computing makes employee safety and security effective, 34% are neutral, 10% strongly agree that green computing makes employee safety and security effective, 8% respondents disagree that green computing doesn't make employee safety and security effective, 4% respondents strongly disagree that green computing doesn't make employee safety and security effective.

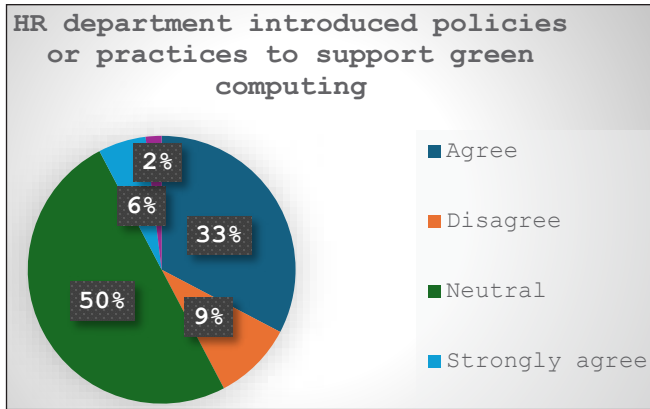


Fig. 17

From the above Fig. 17, it is seen that 50% respondents are neutral, 33% agree that HR department introduced policies and practices to support green computing, 6% respondents strongly agree that HR department introduced policies and practices to support green computing, 9% respondents disagree that HR department have not introduced policies and practices to support green computing, 2% respondents strongly disagree that HR department have not introduced policies and practices to support green computing.

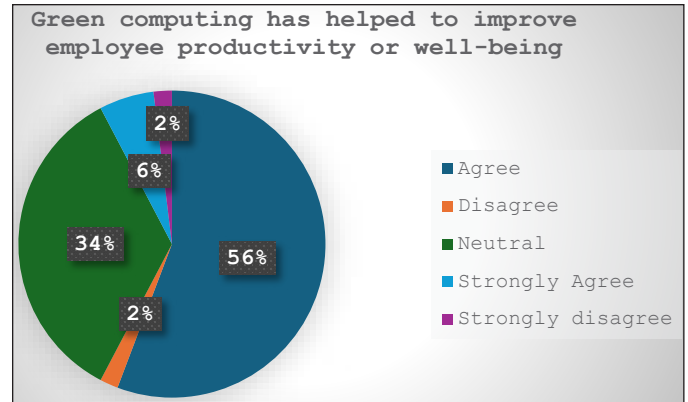


Fig. 19

From the above Fig. 19, it is seen that 56% of respondents agree that green computing has helped to improve employee productivity and well-being, 34% are neutral, 6% respondents strongly agree that green computing has helped to improve employee productivity and well-being, 2% respondents disagree that green computing has not helped to improve employee productivity and well-being, 2% respondents strongly disagree that green computing has not helped to improve employee productivity and well-being.

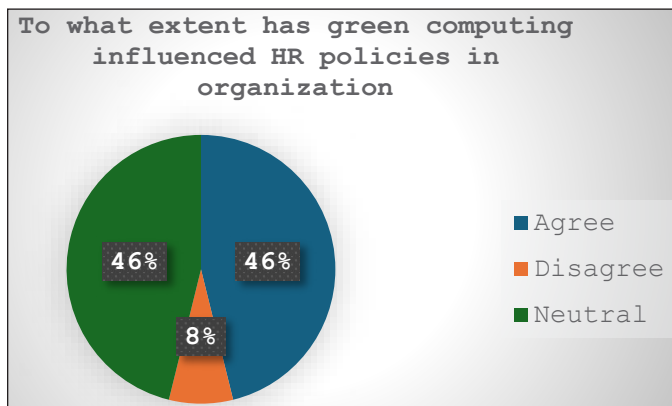


Fig. 18

From the above Fig. 18, it is seen that 46% of respondents are both neutral and also agreeing that green computing influenced the HR policies in their private sector organisation, 8% disagree that green computing hasn't influenced HR policies in their private sector organization.

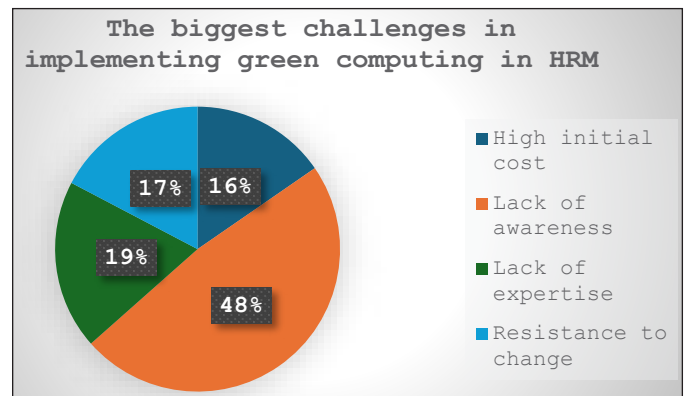


Fig. 20

From the above Fig. 20, it is seen that 48% of respondents have found that lack of awareness is the biggest challenge in implementing green computing in Human Resource Management, 19% have found Lack of expertise as a challenge, 17% have found that Resistance to change as a challenge, & 16% have found High Initial cost as a challenge.

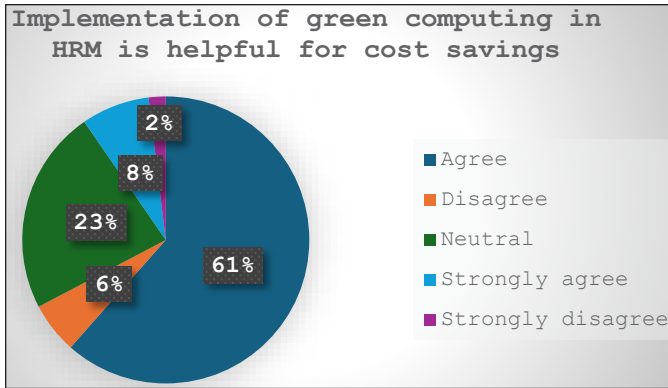


Fig. 21

From the above Fig. 21, it is seen that 61% of respondents agree that Implementation of green computing in HRM is helpful for cost savings, 23% are neutral, 8% respondents strongly agree that Implementation of green computing in HRM is helpful for cost savings, 6% respondents disagree that Implementation of green computing in HRM is not helpful for cost savings, 2% respondents strongly disagree that Implementation of green computing in HRM is not at all helpful for cost savings.

V. FINDINGS AND IMPLEMENTATION OF THE STUDY

From the above we get to know that 56% of respondents are familiar with the concept of green computing. Majority of respondents selected virtual meetings as the most used green computing initiative in the private sector organization, majorly 54% of respondents have agreed that green computing makes recruitment and selection process effective, 48% of respondents agreed that green computing has a huge impact in employee engagement and satisfaction, 46% of respondents are agreeing that green computing helps the training and development effective, 54% of respondents are in favour that performance management in green computing is effective, 59% of respondents have agreed that green computing makes workforce planning effective and efficient, 46% of respondents have support that employee relation and maintenance in green computing is effective, 44% of respondents has approved that green computing makes employee safety and security effective, 50% of

respondents are neutral with their decision of introducing policies and practices that support green computing in HR department, 46% of respondents are neutral and also agreeing that green computing influenced the HR policies in their private sector organisation, 56% of respondents has approved that green computing has helped in improving the employee productivity and well-being, 48% of respondents have found that lack of awareness is the biggest challenge in implementing green computing in Human Resource Management (HRM), 61% of respondents have agreed that implementation of green computing in HRM is helpful for cost saving. Green computing is the ability to balance technology use with social responsibility, economic efficiency, and environmental sustainability. For human resources professionals, this involves incorporating sustainability into business culture and encouraging a green awareness among the employees. Green computing encourages the creation of HR regulations that facilitate energy-efficient workplace procedures, paperless work, and ecologically friendly personnel management. Furthermore, it helps company to establish its image as a sustainable company, which brings in eco-aware skills and encourages worker engagement. Today, green computing is the most popular trend for a number of reasons. Governments and organisations have been forced to look for greener technology in order to meet the pressure to tackle climate change and environmental issues on a global scale. Additionally, there is a natural trend towards more eco-friendly and energy-efficient computing solutions as remote work and digital transformation become more widely used. Green computing becomes not just a technological decision but also a strategic HR decision as both customers and employees support companies that show their commitment to the environment.

VI. LIMITATIONS OF THE STUDY

The limitations of the study is that the research is based on Kolkata, West Bengal in a much-composed manner. In future the research can be done in a much broader way which is an extension of the study in respective to the other states for getting the full overview of the impact of Green Computing on Human Resource Management.

VII. CONCLUSION

The results of this research on green computing highlights the importance of sustainable organizational practices, including those shaped and managed by human resource management. It shows that implementing green computing into practice leads to better electronic waste management, lower carbon emissions, and higher energy efficiency. Businesses are increasingly using cloud-based software, virtual conferencing tools, and energy-efficient hardware to lower their environmental impact and save money. According to this research, remote work policies, electronic documentation, and eco-friendly training programs are some of the ways that these solutions are being integrated into HR procedures.

REFERENCES

- AlKetbi, A., & Rice, J. (2024). The impact of green human resource management practices on employees, clients, and organizational performance: A literature review. *Administrative Sciences, 14*(4), 78. doi:https://doi.org/10.3390/admsci14040078
- Miah, M., Szabó-Szentgróti, G., & Walter, V. (2024). A systematic literature review on green human resource management (GHRM): An organizational sustainability perspective. *Cogent Business & Management, 11*(1), 2371983. doi:https://doi.org/10.1080/23311975.2024.2371983
- Zahrani, A. A. (2024). The influence of green human resource management practices on organizational environmental performance: Mediating roles of green innovation and employee performance. *Cogent Business & Management, 11*(1), 2387378. doi:https://doi.org/10.1080/23311975.2024.2387378
- Prianto, E., & Schneider, C. (2021). Green sustainable human resource management in Malaysia. *Splash Magz, 1*(2), 21-24. doi:http://dx.doi.org/10.54204/splashmagzvol1no1pp21to24
- Bazrkar, A., & Moshiripour, A. (2021). Corporate practices of green human resources management. *Foresight and STI Governance, 15*(1), 97-105. http://dx.doi.org/10.17323/2500-2597.2021.1.97.105
- Arzamasova, G. S., & Esaulova, I. A. (2020). Green human resource management a concept of human resources management of environmentally responsible business. *Vestnik NSUEM, Issue 2*. doi:http://dx.doi.org/10.29141/2218-5003-2022-13-3-4
- Ali, M. C., Islam, K. A., Chung, S., Zayed, N. M., & Afrin, M. (2020). A study of Green Human Resources Management (GHRM) and green creativity for human resources professionals. *International Journal of Business and Management, 4*(2). doi:https://doi.org/10.46281/ijbmf.v4i2.857
- Shafaei, A., Nejati, M., & Yusoff, Y. M. (2020). Green human resource management: A two-study investigation of antecedents and outcomes. *International Journal of Manpower, 41*(7), 1041-1060. doi:https://doi.org/10.1108/IJM-08-2019-0406
- Yong, J. Y., Yusliza, M. Y., & Fawehinmi, O. O. (2020). Green human resource management: A systematic literature review from 2007 to 2019. *Benchmarking: An International Journal, 27*(7), 2005-2027. doi:https://doi.org/10.1108/BIJ-12-2018-0438
- Vankayalapati, R. K. (2020). Green cloud computing: Strategies for building sustainable data center ecosystems. Available at SSRN 5079773. doi:https://dx.doi.org/10.2139/ssrn.5079773
- Paul, S. G., Saha, A., Arefin, M. S., Bhuiyan, T., Biswas, A. A., Reza, A. W., ... Moni, M. A. (2023). A comprehensive review of green computing: Past, present, and future research. *IEEE Access, 11*, 87445-87494. doi:https://doi.org/10.1109/ACCESS.2023.3304332
- Nwankwo, W., & Chinedu, P. U. (2021). Green computing: A machinery for sustainable development in. *Green Computing Technologies and Computing Industry in 2021, 93*. doi:http://dx.doi.org/10.5772/intechopen.95420