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Strategic And Sustainable HRM Practices In Manufacturing: An Integrative Perspective

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Abstract

The global manufacturing sector is in the process of a paradigm shift towards sustainability and the need to integrate green programs in the Human Resource Management (HRM) systems. The paper is a systematic review of the development of Sustainable Human Resource Management (SHRM) and Green Human Resource Management (GHRM), and their applications in the manufacturing industry, and their performance that applies to the emerging industrial centres like Pune in India. Based on extensive empirical and theoretical research in 2015-23, the review points out several practices, including green recruitment, environmental training, green performance management, and green intellectual capital, which are identified as the most valuable practices to facilitate sustainable organisational performance. The synergies between SHRM and Green Supply Chain Management (GSCM) and Industry 4.0 practices are also discussed as with regard to methodological novelty, the fuzzy multi-criteria decision-making techniques are identified as methods of SHRM evaluation. Such research gaps as the small number of regionalised studies, the lack of combined models, and the under-researched employee-level effects are the key ones. The paper ends with recommendations about further research and policy, stating the necessity of local systems, leadership involvement, and the overall sustainability approaches in the manufacturing industry.

Keywords

Sustainable Human Resource Management (SHRM), Green Human Resource Management (GHRM), Sustainability, Manufacturing Industry, Industry 4.0

1. Introduction

Sustainability has become a nearly essential term in the modern manufacturing and has become a construct of how industries think about development, competition and accountability in a world of diminishing resources. As environmental issues continue to increase and various regulatory requirements continue to mount, organisations are being forced to entrench sustainability in their strategic and operational cores. This has not just been limited to environmental management systems but human capital management, where the contribution of the workforce in the attainment of sustainability objectives has taken the center stage. Green Human Resource Management (GHRM) and Sustainable Human Resource Management (SHRM) have emerged to be significant frameworks to rationalise workforce policies, practices, and culture with eco-ecological, economic and social sustainability demands. SHRM incorporates sustainability at the whole

HRM life cycle, such as recruitment and training, appraisal and compensation, where all human resource decision-making activities would help to enhance the environment and organisational resilience in the long term. Particularly, GHRM focuses on the concept of environmental responsibility, which is supported by such practices as environmental training, green hiring, and performance management aimed at ecological results (Masri and Jaaron, 2017; Amrutha and Geetha, 2020). All of these frameworks redefine the strategic role of HR as a conventional administrative one into a transformational force of sustainable competitiveness.

The manufacturing industry is at the centre of this change, as one of the key contributors to the development of the world economy, as well as the industry with a high level of environmental impact. The merging of SHRM and GHRM in the manufacturing department is no more a voluntary approach of corporations but a strategic requirement that is provoked by the global sustainability agenda, the demands of investors, and the pressure of stakeholder activism. In emerging economies such as India where industrialization is still increasing, the challenge is two-fold as to maintain economic growth at the same time making sure that it is environmentally and socially responsible. Researchers like Mishra (2017) have claimed that sustainable HRM is not only an ethical endeavour but a competitive advantage, and it can boost productivity, innovation, and engagement. Green organizational culture enables manufacturing companies to become more efficient in their operations, minimizing waste, and recruiting talented people who care about the environment. Adoption of sustainable HRM practices can therefore be viewed as a compliance tool and a business model that facilitates innovation, sustainability and the credibility of stakeholders in highly competitive markets.

In this wider perspective, the example of Pune- a vibrant industrial city in India can demonstrate the increased applicability of sustainable HRM practices at the regional level. Having been famed for the concentration of auto, engineering, and electronics manufacturing, Pune can be considered a microcosm of the evolution of the Indian industry to sustainability. A large number of manufacturing companies in the region have started incorporating green practices in HR functions, which are based on green awareness, green innovation, and employee involvement in green programmes. Nevertheless, even though the global discussion on the subject of GHRM is growing, there is minimal empirical data on the topic that is particular to the industrial ecosystem of Pune. This is because the availability of localized studies is limited, and thus, policymakers and managers are limited to formulating contextual strategies that are consistent with the regional labour dynamics, the industrial structure, and cultural values. As such, there is an urgent necessity for both theoretical and practical studies that cover the possibility of changing SHRM frameworks based on the socio-economic and industrial realities of the city of Pune so that international standards of sustainability can be reconciled with local issues of operational viability.

This is where this review paper fills that gap, as it synthesises the global and regional research on SHRM and GHRM in order to offer the integrated concept of sustainable HRM activities in manufacturing. It analyses the development of the field, assesses the strategic and operational implications of introducing sustainable HRM frameworks, and outlines the new trends and issues. The synthesis identifies not only the environmental dimension but also the human-focused, i.e., employee motivation, well-being, and participation, on which the sustainability initiatives are dependent. In addition, it highlights how the concept of sustainability interacts with innovation and technology, especially in the conditions of Industry 4.0, and requires a digitally competent and environmentally friendly workforce. This paper seeks to add to the scholarly literature on sustainable HRM and to offer practical insights on sustainability to policy makers, managers, and researchers who ought to entrench sustainability in the human resource framework of the manufacturing industry.

2. Methodology of Review

This current review is based on the systematic qualitative approach to the study that is expected to synthesise the developing discussion on the topic of Sustainable Human Resource Management (SHRM) and Green Human Resource Management (GHRM) in the manufacturing industry. In order to achieve academic rigour and completeness, the review considered academic sources that were published since 2015 and included both empirical and conceptual research papers, as well as systematic reviews. Peer-reviewed academic databases like Scopus, ScienceDirect, Emerald Insight, and Taylor and Francis Online were visited to obtain scholarly, relevant literature. The inclusion criteria were the focus on the studies that covered either the implementation, results, or theoretical development of the practices of GHRM and SHRM in the context of manufacturing or industries. Only the works providing empirical validation, theoretical models, or

methodological developments were chosen in order to offer an all-inclusive perspective of the sustainability integration in HRM.

The last set of data comprised the major contributions to the field, including the works by Masri and Jaaron (2017), Yong et al. (2020), Khan et al. (2020), and Amrutha and Geetha (2020), among others. All of these works formed the basis of the investigation of such critical topics as green recruitment, environmental training, employee engagement, and the GHRM-Industry 4.0 and green supply chain management interconnection. Thematic categorization and comparative analysis of the review revealed prevailing trends, gaps in ideas, and methodological breakthroughs in sustainable HRM research. Such an analytical depth and validity were achieved through this structured and interpretive approach, which also made it possible to extract meaningful insights that might be used in the future to inform empirical and theoretical research on sustainable HRM practices within the global and regional manufacturing environment.

3. Review of Literature

3.1 Evolution and Conceptualization of SHRM and GHRM

The development and the ideation of Sustainable Human Resource Management (SHRM) and Green Human Resource Management (GHRM) show the drastic change in the philosophy of people management in the organizations. Conventionally, HRM was considered a functional discipline that is concerned with employee performance optimization, employee compliance, and management of organizational efficiency. Nonetheless, with the sustainability issue taking centre stage in business, HRM practices started taking a different dimension towards more environmental and social objectives. This development led to the emergence of GHRM, which introduces the aspect of environmental awareness into the HR policies, culture, and day-to-day operations (Ahmad, 2015). It is a move to strategic orientation in HR activities as opposed to the transactional focus, which aims at long-term ecological well-being in addition to productivity and profitability. Following Masri and Jaaron (2017), GHRM offers an organized process of adjusting human resource strategies to environmental goals, making sure that employees are not merely the instruments of the organization's success but active members of the sustainability initiatives.
This transformation highlights a paradigm shift between the management of reactive compliance to proactive sustainability-based leadership. The literature, including Yong et al. (2020) and Zaid and Jaaron (2020), has proven that GHRM does not limit its activity to environmental stewardship; it also produces economic and social value and improves employee engagement, corporate reputation, and organizational innovation. By enforcing green recruitment processes, environmental training, and sustainability in performance appraisal schemes, organizations end up producing a workforce that internalizes ecological values and applies them in their daily decision-making processes. This not only enhances the level of environmental responsibility but also creates a culture of collective responsibility. GHRM therefore puts human capital as a key factor in realizing triple-bottom-line results- economic growth, social equity, and environmental conservation, thus making HRM strategic in the sustainability of organizations.

Amrutha and Geetha (2020) also continued the discussion and proposed the connection between GHRM and social sustainability as one of the aspects of sustainability ignored in the initial models. They pointed out that an organization that is truly sustainable needs to consider inclusivity, equity, and well-being of employees, and implement these principles into recruitment systems, leadership development, and performance systems. GHRM helps not only to achieve the results of environmental features but also to the stability of ecosystems of organizations in the long term by promoting fairness, psychological safety, and diversity. This view is consistent with the notion that sustainable HRM cannot be confined to just the environmental performance but has to apply to the overall development of individuals and institutions. Hence, GHRM and SHRM as a whole reflect a joint philosophy of sustainability that at the same time cares about people, processes, and planet.

The theoretical framework of SHRM was extended by Piwowar-Sulej (2021) as the authors recognized the key elements of strategic alignment, stakeholder engagement, and continuous learning to be essential in the ongoing organizational development. She emphasized the fact that SHRM is not a single management activity but a systemic practice that incorporates sustainability throughout all ranks of corporate governance. It coordinates workforce practices with greater sustainability aspirations, whereby all HR activities are

geared towards environmental, social, and economic needs. All these contributions by scholars make SHRM and GHRM multidimensional models at the heart of sustainable transformation in industries. They transform the work of human resources as change agents, who can fit the corporate strategy and environmental ethics and build resilient organizations that are ready to face the dynamic demands of the modern industrial environment.

3.2 Empirical Evidence from Manufacturing Sectors

Empirical studies in various manufacturing environments continually reaffirm the vital place of Green Human Resource Management (GHRM) practices in improving the performance of sustainability and competitiveness of organisations. Initial studies, including those done by Khan et al. (2020), have found that green recruitment, environmental training, and employee awareness programs directly impact the sustainable performance of Malaysian manufacturing companies. These results indicated that employees who are trained on environmental awareness and sustainability capabilities will become the major agents of organizational change. Moreover, Zaid et al. (2018) empirically confirmed the synergy effect developed due to the combination of GHRM and Green Supply Chain Management (GSCM). Their research suggested that the combined adoption of green practices in the HR and supply chain frontiers has much better environmental and operational returns than those achieved when either of the two is adopted independently. These combined strategies make maximum use of resources, minimize waste, and enhance the ability of the organization to comply with environmental regulations and increase productivity and profitability.

Likewise, empirical trends have been observed in the research carried out in developing economies where manufacturing industries are under increasing pressure to balance economic growth with environmental friendliness. Oyedokun (2019) emphasized that the adoption of GHRM in the Dangote Group has contributed to the sustainable competitive advantage of the Nigerian company because the ecological innovation was connected to human capital strategies. His results highlighted that comprehensive or bundled GHRM practices, i.e., practices that involve recruitment, training, rewards, and appraisal, bring about stronger sustainability results as compared to fragmented or solo programs. Zaid and Jaaron (2020) also supported this point of view in their study of Palestinian manufacturing companies and demonstrated that organizational learning, employee engagement, and innovation are supported because of the collective application of GHRM bundles. These findings indicate that sustainability in manufacturing does not solely rely on environmental technology or infrastructure, but it essentially relies on human resource systems, which entrench green values and behaviors across the workforce.

Empirical research works in the Indian manufacturing environment indicate potential as well as ongoing difficulties in the implementation of GHRM. Mishra (2017) discovered the growing interest in the strategic topicality of GHRM but revealed the obstacles in the form of financial limitations, conservative managerial attitudes, and a lack of institutional support. Regardless of these limitations, the research proved that productivity, reduction of wastes, and image of the brand were improved among firms that practiced GHRM. In addition to it, Raut et al. (2020) examined the automotive service industry and discovered that green hiring and employee engagement are crucial determinants of the overall organizational performance. They stressed that the active participation of employees in environmental programs, energy-saving programs, recycling, green innovation, etc., makes the organizational attitude towards sustainability more rooted and more efficient.

3.3 Integration of GHRM with Green Supply Chain Management

Green Human Resource Management (GHRM) and Green Supply Chain Management (GSCM) integration can be seen as one of the most significant steps in the process of achieving sustainability holistically in the manufacturing industry. Both GHRM and GSCM focus on reducing the environmental footprint and maximizing operational effectiveness, but when applied together, the combination of the two methods stretches past the traditional functional processes by incorporating the concept of sustainability into each phase of the production and distribution cycle. Nejati et al. (2017) were also the early scholars to empirically show that aligning HRM operations with green supply chain operations can deliver better sustainability performance than viewing these systems in isolation. Their research conducted in the manufacturing companies of Iran found that engagement of employees, training, and environmental awareness are the

important enabling factors of successful implementation of GSCM. This way, by making sure that human assets have the competence and the impetus to pursue the green goals, GHRM will become the human capital generator that will make the supply chain performance sustainable.

The argument that GHRM and GSCM integration is not additive, but synergistic, has been enhanced in subsequent studies, such as Bon et al. (2018). The results of their study at the Palestinian manufacturing setting clearly showed that implementation of the green HR policies, like hiring practices that are environmentally friendly, environmental training, and sustainability practices that are performance-based, lead to organizations recording quantifiable gains in environmental performance, resource use, and cost-effectiveness. This two-fold integration creates an organizational culture of environmental stewardship extending throughout the entire supply chain, making sustainability more than a regulatory necessity, a value of the company. The study notes that human resource initiatives serve as the basis through which sustainable practices in the supply chain can thrive, a fact that supports the relationship of interdependence between the people management and operational systems.

The Saeidi et al. (2022) methodological contributions have also contributed to this discussion, as the use of advanced decision-making models, namely the extended Pythagorean fuzzy SWARA-TOPSIS, to determine Sustainable Human Resource Management (SHRM) within manufacturing companies. Their creative strategy has measured the performance of the firms based on the dimensions of sustainability and found that the companies, which effectively combine GHRM and GSCM practices, are more efficient in the environment and successful in general competitiveness. Such a methodological breakthrough explains the increasing acceptability of the concept of cross-functional alignment as a factor that defines sustainability excellence. Similarly, the applicability of quantitative, data-driven models of SHRM-GSCM integration also indicates the presence of a maturing research environment where theoretical and empirical rigor is deemed important in determining complex interactions between sustainability.

3.4 GHRM, Industry 4.0, and Technological Transformation

Industry 4.0 has significantly changed the environment of Human Resource Management (HRM), forcing organizations to change their people strategies and respond to an era that has been characterized by automation, artificial intelligence (AI), and digital connectivity. The fourth industrial revolution, commonly known as Industry 4.0, brings together cyber-physical systems, Internet of Things (IoT), robotics, and big data analytics into the manufacturing process, which fundamentally changes the relationships between technology, human labor, and sustainability. In this new paradigm, Green Human Resource Management (GHRM) and Sustainable Human Resource Management (SHRM) are acquiring a new meaning as organizations struggle with the need to ensure that technological effectiveness is balanced with environmental sustainability and human welfare. Agarwal et al. (2022) focus on the issue of SHRM in the Industry 4.0 disruption environment and found that automation and digitalization not only improved the performance of the operations but also presented new challenges in managing the workforce. They highlighted that the HR policies, instead of traditional administrative functions, should be changed to make technological progress in keeping with human-centered sustainability. Digital transformation should therefore incorporate sustainability, which needs HR professionals to become strategic agents of innovation and ethical accountability.

Another HR reconceptualization that has been necessitated by the digital transformation is in manufacturing setups. Mijatovic et al. (2020) emphasized that HRM can play a major role in improving the performance of manufacturing in digitally-driven ecosystems through the development of a workforce that can adapt to smart technologies and use data to make decisions. The paper highlighted the importance of organizations adopting Industry 4.0 to prioritize the creation of digital capabilities, the creation of a culture of learning, and the adoption of sustainability principles in performance management systems. Green training, digital upskilling, and incentives to eco-innovation are some of the GHRM practices that bridge the gap between environmental responsibility and technological advancement. Organizations can improve efficiency and environmental consciousness by incorporating sustainability into the digital HR systems, i.e. e-learning courses, online performance management and cloud-based collaboration tools. This two-fold concentration on technology and sustainability will see to it that automation does not undermine the human aspect of manufacturing; instead, it improves the facet of manufacturing through design-based consciousness and moral orientation.

In support of this viewpoint, Mukhuty et al. (2022) further endorsed the importance of socially responsible HR in the process of strategic sustainable development in the context of Industry 4.0. Their study revealed that HR functions play a critical role in order to ensure that digital transformation becomes congruent with corporate social responsibility (CSR) and environmental governance principles. Along with the digitalization of manufacturing, there is also an increase in the threat of disregarding the human and social aspects, including the welfare of the employees, their job security, and ethical labor relations. SHRM can resolve this dilemma by incorporating the concept of sustainability and responsibility in the digital transformation initiatives so that the implementation of technology is not merely about efficiency and profit but also the interests of society at large in terms of social equity and environmental preservation. Industry 4.0 and SHRM intersect; thus, they are a strategic opportunity to rethink the industrial progress as not only technologically advanced but also moral.

3.5 The Role of Green Intellectual and Human Capital

The nexus between green intellectual capital and sustainability is now a constitutive part of the discussion about Green Human Resource Management (GHRM) as a consequence of the increasing prevalence of knowledge and skills and innovation becoming the keystone of sustainable organizational performance. The formerly dichotomous intellectual capital, in its human, structural, and relational aspects, has developed to include the environmental values, which has led to the emergence of the notion of green intellectual capital. Yong et al. (2019) have shown that this capital not only increases the effectiveness of the GHRM practices but also forms a culture of ecological consciousness and learning in the organizations. When green competencies and environmental awareness are introduced into human capital, it turns into the driver of sustainable innovation and efficiency. Structural capital is in the form of systems, processes, and technologies, which offer the organizational infrastructure to execute sustainability initiatives effectively. The relational capital, which involves stakeholder engagement and collaborative networks makes ensures that the values of sustainability are not limited to the company but spread to the supply chain and community relationships.

Empirical findings also support the fact that green intellectual capital plays a significant role in turning GHRM policies into quantifiable sustainability results. Malik et al. (2020) discovered that companies that are utilizing intellectual capital, particularly through knowledge sharing and innovations, emerge as the best performers as far as the environment and economy are concerned. Their study stressed the fact that sustainability is not a lone managerial task, but a knowledge-based practice that relies on group learning and incorporation of green thinking in organizational practices. With the environmental knowledge that employees are empowered to make important decisions on sustainability, the employees become important agents of change. This intellectual empowerment not only increases metrics that track environmental issues like cutting on waste and energy consumption, but also increases organizational flexibility in adapting to external environmental sustainability issues.

The discussion was extended by Kanan et al. (2023), who found innovation as a mediating variable between GHRM practices and sustainable performance. Their results emphasized that creativity, lifelong learning, and proactive problem-solving of employees are key channels by which GHRM programs can be converted into tangible sustainability results. Green intellectual capital leads to an innovative attitude whereby employees regard environmental issues as a way to improve instead of as stumbling blocks. These innovation cultures can help organizations to come up with eco-friendly products, reduce energy usage, and come up with sustainable business models that are in tandem with the global environmental objectives. The innovative factor in between, thus, highlights the importance of creating a work culture where knowledge building, experimentation, and cross-functional cooperation are encouraged.

3.6 Sectoral and Regional Extensions

The fact that the Green Human Resource Management (GHRM) principles are increasingly spreading out of the manufacturing sector only helps to emphasize that they are becoming more and more general and versatile in terms of the industries that have different operational backgrounds and footprints. Although manufacturing has always led the pack with sustainability initiatives because of its direct effect on the

environment, service-based industries are beginning to understand the strategic value of GHRM in sustainable development goal realization. Yusoff et al. (2020) also showed that the hospitality industry is a highly resource-intensive sector with high levels of interaction with the customer, which is positively impacted by the introduction of green training, energy-saving processes, and environmentally friendly leadership as the GHRM practices. On the same note, Mousa and Othman (2020) visited the topic of GHRM at healthcare facilities where human-focused sustainability is prioritized by implementing the practices that not only minimize environmental waste but also enhance the well-being of employees and ethical governance. These papers show that sustainability, when incorporated using HRM systems, creates long-term sustainability in its operations, builds brand reputation, and engages in social responsibility- regardless of sectoral scope.

Tourism and extractive industry experience also enhances the cross-sectoral prospect of GHRM. Siyambalapitiya et al. (2018) suggested a GHRM model specific to the Sri Lankan tourism industry (with a focus on the role of HR in developing the eco-friendly behaviours and service novelty. Their results emphasized that the HR policies that support environmental awareness among the employees, even in non-industrial sectors, lead to a sustainable performance result. In the same vein, Obeidat et al. (2020) showed the effectiveness of GHRM practices in the oil and gas sector in Qatar, where the implementation of green HR practices along with environmental management systems has significantly enhanced the performance of organizations, as well as the ecological one. They depict that GHRM is not limited to a particular type of industry but is an all-purpose system that can be adjusted to the changing levels of intensity and organizational culture of the environment. The common denominator in these researches is that sustainability results will be determined by how well HRM internalizes the ecological values and translates them into a practical behavioral transformation among the employees.

Nevertheless, with this worldwide dissemination of GHRM research, there are few studies which are localized and contextualized, especially in the regional manufacturing ecosystems of India. The city of Pune, being one of the rapidly developing industrial centers of India, provides a rather interesting example of such contextual discussion. As a city of multiple automotive, engineering, and electronics industries, Pune is a place of complexity in terms of implementing sustainable practices in traditional and technologically advanced manufacturing. However, most of the current studies regarding GHRM in India have generalized the findings on the national level or concentrated on particular corporate case studies, and there is still a vast gap in the literature on the specific drivers, obstacles, and results in the regions. Since Pune has a distinct socio-economic structure, with a skilled workforce, schools, and industries located in a single region, it will offer the best opportunity to understand how sustainable HRM practices can be applied to local demands.

4. Research Gaps and Future Directions

Even though the literature on the topic of Sustainable Human Resource Management (SHRM) and Green Human Resource Management (GHRM) has been growing tremendously in the last ten years, there are a number of gaps that still restrict a comprehensive comprehension of the implementation of these concepts and their resultant effect. Most notably to note, there is a lack of empirical research dedicated to the manufacturing industry of Pune, which has specific socio-economic and cultural features that affect sustainability adoption. The available literature has a tendency to focus on global or national trends without taking sufficient steps to find out the specifics of the industrial ecosystems at the local level, as in the case of Pune. Also, contextual and cultural aspects such as a diverse workforce, managerial attitudes, and regional labour practices are hardly considered as factors that determine the success of SHRM. The combination of SHRM and other related models, such as Green Supply Chain Management (GSCM), should also be further empirically tested, especially in the Indian context, to learn how these systems can be integrated together in order to boost the environmental and operational performance.

The other unexplored field is on the internal drivers and enablers that define the success of sustainable HR practices. Areas like leadership commitment, regulatory support, and organisational culture are not well studied, particularly in terms of their impact on sustainability initiatives' consistency and efficacy. Additionally, to the extent that most of the existing studies emphasize environmental performance, little focus has been placed on employee-oriented aspects like motivation, engagement, and well-being-fundamental elements of social sustainability. As the technologies are evolving rapidly, the overlap of SHRM and Industry 4.0 is a promising area that can be explored in detail, especially regarding how digital

HR tools could be used to facilitate environmental goals and increase the flexibility of employees. By filling such research gaps, the understanding of the theoretical framework will not only increase, but it can also allow policymakers and industrial executives to develop evidence-based frameworks that can help to match human resource systems with the sustainability objectives, depending on the industrial environment in Pune and beyond.

5. Conclusion

Sustainable Human Resource Management is a visionary and radical concept that should be adopted by industries in their endeavor to achieve profitability without compromising on ethical, environmental and social responsibilities. With the changing face of manufacturing in the global sustainability issues, organizations are forced to incorporate human resource systems that will promote environmental awareness, responsible production and inclusive workplaces. SHRM is all about matching human potential and ecological concerns. The idea behind it is to promote green recruitment, environmental education and sustainable performance management. These measures will make employees internalize and not just know the value of sustainability as an organizational value. By so doing, HRM will have become a pillar strategy and will enhance competitiveness and social responsibility, ensuring that industries will survive the shocks of environmental limitations and emerging global demands.

This review confirms the fact that the combination of SHRM and Green Human Resource Management provides concrete avenues for long-term sustainability. The arguments reveal that organizations that have incorporated sustainability policies in their workforce management systems record an increase in their operational efficiency, innovation, and engagement of employees. The introduction of green activities across the HR processes, including recruitment to appraisal, will help to make sure that sustainability cuts across the entire organizational operations. Furthermore, the combination of GHRM and other supportive frameworks, like the Green Supply Chain Management, enhances the advantages through the establishment of cross-functional coherence. Such joint actions result in improved environmental performance, improved relationships with the stakeholders, and comprehensive sustainability that goes beyond the scope of departments or policies.

The growth of Industry 4.0 further re-established the standards of sustainable HRM as the industrial ecosystems become more and more digitized. The advent of digital transformation, automation, and data-driven decision-making requires new leadership styles and workforce flexibility that needs to be based upon the principles of sustainability. Digital sustainability has to become part of HR systems at organisations now, using technology to minimise the use of resources, encourage green innovation, and support the learning of employees via virtual platforms. The change of focus to knowledge-based and innovation-focused practices of HRM ensures that sustainability is not a stable policy but a process that changes with technological advancements. The change requires farsighted HR executives who can seamlessly combine ethical aspects, worker welfare, and intellectual performance into cohesive sustainability plans.

In the case of emerging industrial areas like the one in Pune, contextualization of the SHRM practices has a massive potential in realizing the sustainable growth of the industries. Local approaches that take into account regional features of labor, cultural dynamics, and resource limitations can contribute greatly to the effectiveness of sustainability efforts. Future studies should thus transcend the theoretical abstractions to the practical models with empirical data on the long-term effectiveness of sustainable HRM in various industrial settings. Finally, SHRM is not just a management model but is more of a moral and strategic promise that balances human potential with the stewardship of the environment. When sustainability is placed at the center of human resource systems, manufacturing industries will be able to make sure that their development is not only economically effective but is also environmentally friendly and sustainable, which will create a situation where the prosperity of businesses and the health of the planet will co-exist in a harmonious relationship.

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