

The Role of Learning Orientation, Green Innovations, and Sustainable Business Practices in Sustainable Firm Performance: A Study in the Context of Industry 5.0

***Prof Tharageswari Soundarapandian,**

Assistant Professor, Institute for Future Education, Entrepreneurship and Leadership iFEEL,
Lonavala, tharageswari@ifeel.edu.in

Prof. Sagar Bhadange,

Associate Professor, Institute for Future Education, Entrepreneurship and Leadership iFEEL,
Lonavala, sagar.bhadange@ifeel.edu.in

Prof Harsh Shah,

Assistant Professor, Institute for Future Education, Entrepreneurship and Leadership iFEEL,
Lonavala, harsh.shah@ifeel.edu.in

*Corresponding Author

Abstract

Rising firms in Industry 5.0 should balance output, speed, and care. New goals call for firms to learn quickly, act green, and work carefully. Many gaps - waste, bad links, high cost - result from poor skill, old ways, or weak steps. These gaps could be reduced by firms which shape a strong learning path, build green concepts, and follow safe work plans. They create value and trust with the correct mix of steps. Learning goals help individuals see trends, spot risk and take green measures. Green innovation adds intelligent use of safe parts - less harm, more gain. Indian firms use solar links, low waste tools and clean pack lines now. These steps satisfy rules, build brand trust and reduce harm. But they must also connect these steps to long goals. When staff do not know the value, use drops. Consequently, firms share the things that work, track what fails and plan what grows. Blend of smart learning, green ideas and clear work plans keep firms ahead. Industry 5.0 asks businesses to think broad, act quickly, and be fair. Those that link green work with concrete goals will create much more than output - they create long trust and long gains.

Keywords- Learning Orientation, Green Innovation, Sustainable Business Practices, Sustainable Firm Performance, Industry 5.0

Introduction

Indian firms today must compete in dynamic global markets while maintaining responsible growth demands. In Industry 5.0, human-centered & sustainable value creation are new priorities. Whereas earlier models were about speed, scale and automation, current pressures include climate impact, circular design, ethical sourcing and community connections. In response, firms must reconsider how they learn, produce, and lead. Thus, a firm's long term value is no longer based on output alone but in the way it adapts, the way it learns and how it treats the world in which it works. Several firms in manufacturing, retail and consumer goods now consider that short term gain from old models is inadequate. Water waste, inadequate supply checks and unsafe job systems damage brand and output.

Wang et al. (2022) demonstrated that Firms which disregard these lose trust, face rules or miss market entry. In response, firms seek green innovations - products, procedures or plans that reduce harm and increase value. They include energy shifts, waste cuts and supply checks that record effect over time. But tools alone aren't tools for change. Firms should learn to use them, when to act, and why change helps real gain. That is exactly where learning orientation will come in. Learning orientation means that a firm wants to grow from every step not only from targets. It creates systems for tracking gaps, testing new paths and repairing what does not work. Firms which build this way aren't fixed: they change. They learn from fail steps, user talk & peer moves. This provides them with the basis to act on green ideas fast, test plans and shape new work models. They train teams, check results and link small gains to large goals. Those firms also tend to act early. They spot law shifts, plan for user requirements and modify tasks for wider aims. This eventually results in stable growth. Figure 1 presents various aspects of sustainable firm performance that the organisations consider maintaining and implement.

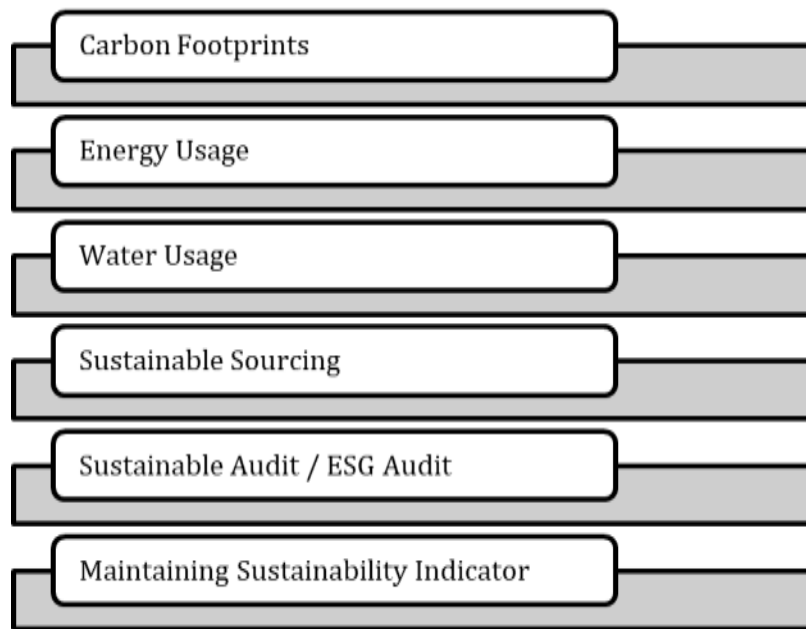


Figure 1 Factors Determining the Sustainable Firm Performance

However, learning isn't sufficient, Firms should act. That is exactly where green innovations come in. These aren't new tools but steps which rethink how work is done. Some companies use plant-based wraps, intelligent waste sorters or low energy machines. Other folks shift to local supply loops or shared use plans. These actions cut harm, but they cut waste. They save cost, build brand trust and make rules easy. Firms which behave this way usually find that one change opens the path to others. A waste cut plan could make safer jobs. A pack shift may be low cost and boost user trust. But each step must fit the firm's work, goals and field.

Building on this, Su et al. (2020) emphasized that Firms that act on green objectives must also create new ways of working. Here comes sustainable business practice. Those include fair pay, safe websites, clear source checks and open share of impact information. These acts establish trust - with users, staff members, buyers and the general public. Eventually, they help firms become rooted. A firm which treats water well, gives fair work and tracks its harm might lose less staff, gain more peer links and win lengthy deals. They're not small gains. They impact how a firm grows and remains. Firms that link learning, green plans and sound practice don't act by chance. They guide steps with data, staff notes, peer viewpoints and trend checks. They make loops. A plan is written, fixed, checked, shared. They inquire about what works, what failed and also what helped. This loop forms the next plan. Additionally, it influences staff

thinking. A team that understands its step means less waste is proud. A team seeing its check raise trust feels heard. This connects action to value and produces strong teams.

Similarly, Frempong et al. (2021) explored the impact A firm that trains, asks and listens will see steps. Staff who share notes, raise flags and repair gaps make the firm act faster. This human part makes sense, cares about, and views the change. Tools help, people shape. A smart meter tracks use but a staff member who sees a leak fixes it. This tool - team mix creates real gains. Nevertheless, the path isn't flat. Some firms consider cost first. A green step might be slow or tools costly. Others worry about rule mix or data gaps. Some staff might not trust new checks. Those are real gaps. However they could be solved. Firms that test in one team, learn from usage and gain see more steps that work. People who share notes, fix pain points and act with care gain more trust. They don't rush - they plan.

Tools help too., Smart checks show energy peaks. Data tools shows which site wastes more. Track maps show which pack steps slow work. Those viewpoints help firms act right, not fast. They illustrate where a small fix may save money, harm, and time. Some firms link shop tools to waste scores. Others link pack size to user note scores. These cross-checks connect green steps to real gain. These gains of this model aren't short. A firm which goes solar saves in ten years. One company which trains in reuse sees cost drop. A firm which tracks staff voice sees fewer leaves. These gains acquire firm value. Additionally, they help firms win in global maps. A firm which takes clean steps could enter new markets. A firm that meets new law early may receive fast checks. A shared impact firm could win peer trust. All these help the firm grow/stay.

Firms also must stay open. What works now might not work next year. A law could shift. A user view might change. A tool could get old. So, firms have to keep up. They must test, check and shift. They must train staff to spot, flag and fix. This forms a system which grows in time as opposed to breaks it.

Several firms also link with peer groups. They share best use, join test sites or build group steps. These links help us all grow. For one firm, gain may guide another. One waste cut step in one shop might save another. These links add firm value and field trust.

Le (2022) investigated that The rise of Industry 5.0 is a change and not really a pattern. It's asking firms to act with mind and care. It connects tech to team, gain to green and output to

value. In this shift learning, green steps and strong ways of working are core not extras - they are core. Firms which act now, test measures and develop care will lead. They won't remain - they are going to shape the next field. Firms must not regard such acts as cost. They're build steps. A learning firm expands. A green firm stays. A firm that produces fair wins. Those links are now clear. Those who miss this could fall. People who act late may pay more. Those that wait may lose more than deals - they might lose their path. The path is open. That gain is real. The tools are here. But the step must begin. Firms must learn, plan, act and remain. The time to shift is right now, not next.

Literature review

How firms understand change is shaped by learning orientation. It produces a mindset of reflection, experimentation and sharing of knowledge internally. Firms with high learning orientation don't regard problems as disruptions. They look at them as opportunities to question today's practices, test alternatives and revise goals. This helps them remain open to new methods of working. Consequently, when confronted with external pressure - like resource limits, regulatory shifts or market expectations - they adjust internal strategies rather than resist change.

In line with this, Habib et al. (2020) argued that In Industry 5.0, where the smart systems intersect human insight, learning orientation is central. Firms change materials, production tools and supply chain methods often. Technologies like collaborative robotics, artificial intelligence and digital twins require adoption and constant adjustment. Learning orientation enables firms to learn early lessons at each new implementation stage. They collect insights from user feedback, process performance and failure points. This feedback loop reduces waste and drives regular upgrades in operations. Firms also tie learning to sustainability objectives. Firms test green processes using learning practices as pressure mounts to lower carbon emissions, bring down water use and manage waste better. They track which methods cause less harm without increasing cost. Consequently, they design green innovations which meet both regulatory needs and long-term cost objectives. Learning becomes a means to link short term process control with long-term business planning.

Making learning a firm-wide habit creates systems that absorb change. They do not wait for outside forces to coerce action. Instead, they model action through active review of performance and also by teaching teams how to match daily work with strategic results. By doing this, learning orientation directly supports firm performance under Industry 5.0 and sustainable development demands. Sustainable business practices define how firms maintain relationships with important internal and external stakeholders over time. Firms which create clear policies to manage waste, bring down emissions, and use resources carefully signal intention to operate with accountability. These practices go beyond environmental targets. They also impact how employees, suppliers, clients and investors rate the firm's goals. Firms which consider sustainability an ongoing process - instead of an isolated activity - build trust by demonstrating that values and actions coincide.

Adding to the conversation, Shahzad et al. (2020) that An age of Industry 5.0 where human values guide the application of advanced technologies, sustainable practices take on new meaning. Firms should balance innovation with impact. When they use smart systems and data tools to monitor resource use or energy output they achieve operational efficiency improvement and record-keeping. These records enable stakeholders to evaluate if firms achieve stated objectives. Over time, that transparency generates faith in the firm's willingness to change. In most sectors customers expect businesses to demonstrate the way they reduce harm throughout the supply chain. Firms investing in sustainable packaging, energy-efficient methods and local sourcing meet these expectations more directly. They explain choices through sustainability reports & product labelling/open communication. This straightforward link between what the firm says and also what it does can alter customer behaviour, improve loyalty and encourage repeat customers.

Investors and partners also assess risk via sustainability records. Firms which improve steadily in environmental and social outcomes appear better positioned for future regulation or resource shortages. Eventually, this readiness is infused into the firm's brand value. It attracts new contracts, retains talent and also delivers on policy goals with less delay. As these benefits compound, sustainable practices support both reputation and long-term firm performance.

Le et al. (2022) showed that When learning orientation, green innovation and sustainable business practices operate together in the context of Industry 5.0 they lay the groundwork for long-term business. Firms with strong learning orientation track the new green method effects

on cost, productivity and compliance. They collect feedback from daily operations, evaluate failures without blame and convert insights into training programs or system modifications. This habit of continuous review allows green innovations like energy saving machines, bio-based materials or closed loop systems being tested, scaled or adjusted according to observed effect. Eventually, this feedback loop closes the gap between idea and execution, making sustainability a policy goal turned operational habit. As firms standardize their product design, procurement and logistics with green standards, they design supply chains that gratify consumer demand and compliance requirements. These changes optimize resource use and bring down emissions, and help firms avoid risks related to climate events or raw material shortages. Nevertheless, sustainable practices develop relationships with employees, regulators and investors who value accountability. These effects reinforce one another and also enhance the firm's position on the marketplace and its resistance to external shocks. Industry 5.0 adds another layer by putting human objectives in the center of digital transformation.

According to Guo et al. (2020), Firms which blend these values with learning systems and green innovations also gain an advantage in technology use and culture and trust. Together, these drivers form firm-level systems supporting long-term survival, environmental improvement and business performance. Companies which incorporate sustainability in their primary business approach go far beyond compliance to develop systems that adjust to uncertainty, supply chain disruptions and resource pressures. Instead of approaching sustainability as an added or optional activity, these companies embed environmental objectives in planning, operations, procurement, and even stakeholder engagement. This integration reduces dependency on scarce inputs and also exposes risks in sourcing, transport or production which otherwise would remain unknown until they cause delays or losses. Firms applying sustainability frameworks frequently redesign processes to reduce material waste, reduce energy use and also adopt inputs with higher long-term availability. These adjustments improve process efficiency and decrease price variations related to fossil fuel markets or water scarcity. Simultaneously, they help firms meet regulatory standards which are likely to tighten under global climate targets. Since they're incorporated into the strategy, they become part of regular business decisions instead of becoming reactive adjustments in crises. Supply chain mapping and relationship management also support resilience.

Zhang et al. (2018) examined how organizational learning interacts with green innovation, and found that Firms that place sustainability first usually track environmental risks with suppliers, plan for disruptions jointly and devise backup sourcing. This coordination enables them to handle shocks from weather, trade policy or logistics failures. It also creates trust throughout the supply network to allow stable delivery, better pricing and shared innovation in packaging, transport or waste reduction. In an Industry 5.0 environment where automation and data support decision making, firms track performance in real time and alter operations instantly. Such digital systems coupled with sustainability-driven planning allow firms to meet customer expectations while reducing vulnerability. The result is a visibility, management and long-term approach to resource usage & value development which supports the business position.

By showing consistency between values and operations, sustainable practices help companies gain trust with stakeholders. They include reducing waste, reducing emissions, enhancing energy use and also applying ethical sourcing. If firms apply such methods across product design, manufacturing and distribution they demonstrate that long-term impact informs their decisions. This consistency bolsters the view amongst customers, vendors, staff members and investors that the firm will act carefully under pressure. So, firms gain trust from those directly involved and from broader audiences like regulators, advocacy organisations and community members.

Albort-Morant et al. (2016) proposed a model in which learning capabilities In markets shaped by Industry 5.0 where customers demand both technology and human benefit, sustainable practices drive operational credibility and brand value. Firms which show they reduce harm, treat employees fairly and support environmental objectives attract the interest of buyers considering ethics in their options. They might indicate this effort via product labelling, third-party certification or transparent reporting. These actions help customers to make educated choices and reward firms which act with accountability. Eventually, this process produces brand loyalty based on common values instead of on convenience or price by itself. Employees also react to cues of responsible behaviour. Firms which invest in workplace safety, fair pay and resource efficiency retain staff longer, boost team dedication and lower the cost of hiring. These internal gains translate to external performance via better management of systems by trusted personnel who can confidently represent the firm.

By integrating sustainability with the requirements of external and internal stakeholders, firms attain competitive advantages in reputation, talent retention and market stability. When created, these effects reinforce one another and create conditions under which customer loyalty results from functional discipline, common purpose and transparent reporting at all levels of the business. Firms that adopt green innovations generally meet regulatory requirements more easily because their processes already match key environmental standards. This kind of innovations might comprise energy efficient equipment, nontoxic inputs, closed loop waste systems or digital monitoring tools which track emissions in real time. By incorporating these features into their everyday operations, firms avoid making last minute adjustments during audits or inspections. This lowers the chance of penalties, delays or manufacturing stoppages due to non-compliance. Additionally, it reduces reputational and legal expenses related to breaches of environmental norms by companies.

In the context of newer green entrants, Cheng (2020) found that With regulations tightening under global climate agreements and national policies, green technologies delivered early give companies a leg up on future rules. For example, firms which already use low emission transport or energy saving machinery might not require big investments when laws change. This avoids sudden financial stress or workflow changes. Additionally, as they currently record environmental impact via digital tools, these firms can submit reports to authorities faster and more accurately.

In an environment of Industry 5.0 where companies merge human insight with intelligent systems, green innovations are also easier to track, refine and share. Firms who train staff to interpret data and adjust performance reduce errors and increase compliance across departments. They also create internal cultures where environmental goals are considered shared duties, not the domain of one team. This facilitates early detection of risks and faster response.

In emerging economies, Larbi-Siaw et al. (2022) analyzed the interaction between eco-innovation, performance, and market turbulence. They discovered that As firms demonstrate consistent environmental compliance, their reputation with customers, regulators, and investors improves. This positive perception allows finance access, lower insurance fees and opens markets that need strong environmental credentials. As time passes, green innovation turns into a tool for compliance but also a driver for firm-level credibility, performance and stability.

Industry 5.0 brings human understanding and creativity back alongside advanced automation, robotics and data systems. Unlike earlier models which emphasized efficiency and speed, this new approach requires firms to match technological methods with environmental and social outcomes. As firms deploy artificial intelligence, cobots and intelligent sensors, they have to also support responsible production, fair labour use and resource efficiency.

This automation - sustainability alignment occurs not by default. It requires firms to evaluate how each technology impacts material flows, energy use, working conditions and waste output. For instance, a robotic process might be quicker but use up more energy unless redesigned for resource control. Similarly, an automated logistics system might lower costs but add more packaging waste unless followed with clear environmental policies. Industry 5.0 calls on firms to apply sustainability goals not just to products or results but to the core logic of system design, process flow and supply network coordination. Firms which align well usually use structured learning processes to test, refine and adapt their use of new tools. They train staff to use machines, examine data patterns and modify settings to reduce error and material loss. These actions promote a culture of responsible innovation where technology doesn't replace human skill but enhances it for operational management and social influence.

In this particular setting, firms also must measure and report how technology use impacts environmental goals.

Tu and Wu (2021) focused on how green innovation enhances Transparent communication establishes trust with regulators and customers who expect proof that digital tools contribute - not harm - sustainability. Consequently, brand new machines aren't the sole component needed for Industry 5.0 to be successful: technological integration also allows - instead of hinders - a continued focus on long-range ecological and human objectives. Sustainable business practices as waste reduction, energy optimisation and resource efficiency directly affect firm performance by lowering operating expenses, method inefficiencies and developing long-term process stability. These practices aren't isolated projects but core methods that shape how firms design, produce, and provide goods. When applied consistently they support cleaner workflows, fewer delays and less reliance on scarce or expensive inputs. Firms which integrate such practices into their everyday operations frequently identify hidden losses (excess material use, idle energy or inefficient transport routes) which can be taken out and therefore boost capacity and production.

Waste reduction starts with product/process design. Firms which examine the full production chain - from raw input to post-sale use - can get rid of non-essential material, reuse process by-products, and bring down defect rates. These modifications bring down landfill output and lessen the need for elaborate disposal systems. They simultaneously lower cost per unit and enhance predictability of supply chain flows. In the similar manner, energy optimisation efforts such as for instance demand based lighting, smart heating and machine level power control reduce energy waste without affecting output. These upgrades lead to substantial reductions in energy bills and increased firm control over production conditions.

Finally, Jiang et al. (2018) took dynamic capabilities Within the context of Industry 5.0 these practices are made stronger by digital tools. Sensors monitor resource use live, and analytics software identifies patterns and flags anomalies. Workers use this data to set machines, modify maintenance timing and respond to faults before they escalate. This feedback loop transforms sustainability into a performance tool instead of a compliance measure. Eventually, such improvements improve a firm's financial and operational position. They enable cleaner cost structures, more dependable delivery and better agility under external strain. Consequently, sustainability is no longer a standalone objective but a core input to better firm performance.

Conclusion

In the new economy of Industry 5.0, firms must move beyond basic growth models to adopt a trio of brand new strategic imperatives: Learning orientation, green innovations and sustainable business practices. Together these elements form adaptive, resilient and ethically grounded organizations. Learning orientation allows firms to constantly enhance and react to changing environmental and market needs. Green innovations offer tools and systems to reduce harm while keeping efficiency and value creation. Nevertheless, sustainable business practices develop long-term, transparency, and trust stakeholder involvement. This integrated approach improves firm performance and positions businesses for future regulatory, social and resource challenges. Indian firms paving this transformation with solar energy, waste reduction and ethical sourcing show just how sustainability can develop public trust and competitive advantage. Finally, the successful firm of Industry 5.0 learns with purpose, innovates with care, and acts with integrity - turning responsibility into strategic strength.

References

1. Wang, C., Zhang, S., & Zhang, X. (2022). How to embrace sustainable performance via green learning orientation: a moderated mediating model. *Sustainability*, *14*(13), 7933.
2. Su, X., Xu, A., Lin, W., Chen, Y., Liu, S., & Xu, W. (2020). Environmental leadership, green innovation practices, environmental knowledge learning, and firm performance. *Sage Open*, *10*(2), 2158244020922909.
3. Frempong, M. F., Mu, Y., Adu-Yeboah, S. S., Hossin, M. A., & Adu-Gyamfi, M. (2021). Corporate sustainability and firm performance: The role of green innovation capabilities and sustainability-oriented supplier-buyer relationship. *Sustainability*, *13*(18), 10414.
4. Le, T. T. (2022). How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance?. *Journal of Cleaner Production*, *362*, 132228.
5. Habib, M. A., Bao, Y., & Ilmudeen, A. (2020). The impact of green entrepreneurial orientation, market orientation and green supply chain management practices on sustainable firm performance. *Cogent Business & Management*, *7*(1), 1743616.
6. Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., & Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. *Journal of knowledge management*, *24*(9), 2079-2106.
7. Le, T. T., Vo, X. V., & Venkatesh, V. G. (2022). Role of green innovation and supply chain management in driving sustainable corporate performance. *Journal of Cleaner Production*, *374*, 133875.
8. Guo, Y., Wang, L., & Chen, Y. (2020). Green entrepreneurial orientation and green innovation: The mediating effect of supply chain learning. *Sage Open*, *10*(1), 2158244019898798.
9. Zhang, Y., Sun, J., Yang, Z., & Li, S. (2018). Organizational learning and green innovation: Does environmental proactivity matter?. *Sustainability*, *10*(10), 3737.
10. Albort-Morant, G., Leal-Millán, A., & Cepeda-Carrión, G. (2016). The antecedents of green innovation performance: A model of learning and capabilities. *Journal of business research*, *69*(11), 4912-4917.
11. Cheng, C. C. (2020). Sustainability orientation, green supplier involvement, and green innovation performance: Evidence from diversifying green entrants. *Journal of Business Ethics*, *161*(2), 393-414.

12. Fernando, Y., Jabbour, C. J. C., & Wah, W. X. (2019). Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: does service capability matter?. *Resources, conservation and recycling*, 141, 8-20.
13. Larbi-Siaw, O., Xuhua, H., Owusu, E., Owusu-Agyeman, A., Fulgence, B. E., & Frimpong, S. A. (2022). Eco-innovation, sustainable business performance and market turbulence moderation in emerging economies. *Technology in Society*, 68, 101899.
14. Tu, Y., & Wu, W. (2021). How does green innovation improve enterprises' competitive advantage? The role of organizational learning. *Sustainable Production and Consumption*, 26, 504-516.
15. Jiang, W., Chai, H., Shao, J., & Feng, T. (2018). Green entrepreneurial orientation for enhancing firm performance: A dynamic capability perspective. *Journal of cleaner production*, 198, 1311-1323.