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## The Role of Indian Pharmaceutical Companies in Promoting Health and Sustainability

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### Abstract

*Indian pharmaceutical companies are enhancing sustainability by reducing carbon footprints, improving waste management, investing in green technologies, and adopting eco-friendly production methods. They are also demonstrating ethical sourcing and social responsibility. Indian pharmaceutical companies are experiencing significant growth due to their innovative approach, cost-effective production, global market expansion, and increasing generic demand, all of which are supported by research, technology, and strategic partnerships. Despite its growth, the industry faces significant sustainability challenges, including high resource consumption, complex supply chains, and regulatory compliance. This chapter delves into major pharmaceutical hubs in India and also highlights top pharmaceutical companies in India by market capitalization. This chapter*

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*explores the roles and responsibilities of pharmaceutical companies towards environmental, social, and economic sustainability. The chapter identifies pharmaceutical businesses' crucial role in supporting sustainability. It highlights that pharmaceutical companies face several challenges in their journey towards sustainability. The chapter discusses the measures to overcome obstacles, such as investing in energy-efficient technologies, comprehensive waste management, and collaboration for sustainable innovation, ultimately contributing to a more sustainable and resilient industry. The chapter concludes that by addressing these issues and implementing strategic measures, pharmaceutical companies can enhance their environmental, social, and economic sustainability, thereby contributing to global efforts to create a healthier and more equitable world.*

**Keywords:** *economic, environmental, pharmaceutical companies, social, sustainability, waste management.*

## **Introduction**

The pharmaceutical sector in India is one of the country's most important and rapidly expanding industries, with an important impact on global healthcare. India, termed the "pharmacy of the world," is a major producer and exporter of generic medications, offering low-cost, high-quality drugs to over 200 countries. A solid network of R&D, trained experts, and a robust manufacturing base all contribute to the sector's success. With continued developments in biotechnology, medical research, and regulatory reforms, the Indian

pharmaceutical sector continues to grow, making a substantial contribution to both domestic and global health.

The pharmaceutical sector in India was valued at US\$42 billion in 2021 and is expected to reach \$130 billion by 2030. India is the world's largest provider of generic medications by volume, accounting for 20% of worldwide pharmaceutical exports. It is also the world's top vaccine supplier in terms of volume, accounting for more than 60% of global vaccine production. Indian pharmaceuticals are exported to a number of controlled markets, including the United States, United Kingdom, the European Union, and Canada.

### **Some of the Major Pharmaceutical Hubs in India are:**

- Hyderabad
- Mumbai
- Visakhapatnam
- Ahmedabad
- Vadodara
- Bangalore
- Chennai
- Sikkim
- Kolkata
- Aurangabad

In 1986, the Indian government established the Department of Biotechnology under the Ministry of Science and Technology. Since then, the central government and state governments have granted a variety of incentives to promote the industry's growth.

## **Top Pharmaceutical Companies in India by Market Capitalization**

- Sun Pharmaceutical Industries Ltd
- Dr. Reddy's Labs Ltd
- Lupin Ltd
- Alkem Labs
- Cipla Ltd
- Torrent Pharma Ltd
- Zydus Lifesciences Ltd
- Aurobindo Pharma
- Biocon Ltd
- Glenmark Pharmaceuticals Ltd.

## **Review of Literature**

**Celina Bade, et al., (2023)** in the Journal “**Corporate Social Responsibility and Environmental Management**” with paper titled: “**Sustainability in the pharmaceutical industry—An assessment of sustainability maturity and effects of sustainability measure implementation on supply chain security**” stated that pharmaceutical industry faces increased sustainability demands. The Environmental, Social, and Governance (ESG) framework is most widely accepted to discuss corporate sustainability, but little is known about the effects of ESG measure implementation on supply chain security. Understanding these effects is especially important in the face of drug shortages. This paper also leveraged a quantitative and a qualitative method based on a grounded theory approach, as aimed to investigate the state of ESG maturity of pharmaceutical corporations in Germany and

develop a perspective on the effects of ESG measure implementation on supply chain security. The findings suggested that ESG measure implementation can induce short-term supply disruption risks.

## **Pharmaceutical Companies towards Sustainability**

Pharmaceutical firms play an important role in environmental sustainability by using eco-friendly production methods. This involves using energy-efficient technology, conserving water, and limiting trash creation. Furthermore, these corporations are investing in green chemistry, which focuses on developing products and processes that decrease or eliminate the usage and production of harmful compounds. Pharmaceutical firms may dramatically reduce their environmental impact by emphasizing the use of sustainable materials and decreasing emissions, helping to create a healthier planet.

Pharmaceutical firms help to ensure fair access to necessary medications and healthcare services, which contributes to social sustainability. They take part in corporate social responsibility (CSR) projects such as immunization programs, illness prevention campaigns, and health education efforts. These activities are critical for improving public health, especially in underprivileged populations. Furthermore, ethical corporate practices, such as fair labor conditions and community participation, promote social fairness and improve the well-being of the people they serve.

Economically, pharmaceutical businesses promote sustainability by encouraging innovation and providing jobs.

Investment in research and development (R&D) not only results in the discovery of novel medicines and cures, but it also stimulates economic growth. These firms help consumers and governments save money on healthcare by offering cost-effective alternatives. Furthermore, sustainable business strategies such as ethical sourcing and supply chain transparency promote long-term profitability and stability. Pharmaceutical firms work together to create a more sustainable and resilient economy.

Pharmaceutical businesses play an important role in promoting sustainability through a variety of strategies, including responsible manufacturing methods, creative product development, ethical business conduct, and community participation. Pharmaceutical businesses play the following crucial roles in supporting sustainability. They are as follows

**1. Sustainable Production Techniques:** To minimize the carbon footprint in manufacturing, the adoption of energy-efficient solutions is crucial. Optimizing water consumption through recycling and conservation strategies can significantly conserve essential resources. Waste minimization methods, such as reducing, reusing, and recycling, are also effective in lessening the environmental impact, thereby enhancing the sustainability of industrial operations. Green chemistry plays a pivotal role in reducing the environmental impact of chemical processes by focusing on the efficient use of resources and the development of technologies that prevent pollution. The principles of green chemistry, which aim for the resource-

efficient and safer design of molecules, materials, products, and processes, align closely with the concepts of sustainable and circular chemistry. This field emphasizes creating safer, less toxic, and environmentally friendly chemical processes and products. Additionally, waste management is a critical component of sustainable production, encompassing all activities from waste collection to final disposal. Effective waste management strategies address various waste types, including solid, liquid, gaseous, organic, radioactive, biological, household, municipal, and industrial wastes. In the medical sector, it has been observed that over two-thirds of professionals have experience in managing pharmaceutical waste. Typically, cartons are used to sort and dispose of this waste in medical facilities, with open-air burning being a common disposal method.

## **2. Corporate Governance and Ethical Conduct:**

Governance involves establishing dedicated sustainability committees or assigning specific roles within an organization to ensure the effective oversight of sustainability initiatives. These teams are responsible for setting strategic objectives, monitoring progress, and implementing projects. They also facilitate collaboration among departments to integrate sustainability across all business operations. Regular reporting and evaluations conducted by these committees enhance accountability and foster continuous improvement. By prioritizing sustainability within leadership roles, organizations can more effectively address environmental and social issues.

This structured approach reinforces a strong commitment to sustainable development.

Ethical business practices involve ensuring ethical behavior in all business operations, which includes promoting fair labor practices, implementing anti-corruption measures, and upholding human rights. Business ethics encompass the application of appropriate corporate policies and procedures to address potentially contentious issues. Topics such as corporate governance, insider trading, bribery, discrimination, social responsibility, and fiduciary responsibilities are central to ethical discussions. While the law often provides a foundation for corporate ethics, merely meeting legal requirements is generally insufficient. Developing ethical practices and models can lead to increased revenue, profitability, and stock prices for a company.

- 3. Ethical Supply Chain Management and Sourcing:** Sustainable sourcing involves obtaining raw materials from suppliers who prioritize environmental and social responsibility. This practice includes adhering to stringent environmental standards, enforcing fair labor practices, and conducting regular audits to ensure compliance. Partnering with suppliers who are committed to sustainability helps establish a responsible supply chain, fosters trust, and supports the development of supplier programs. Collaboration on sustainable innovations further enhances the supply chain's role in promoting sustainability.



Supply chain transparency focuses on closely monitoring the environmental and social impacts throughout the sourcing and production processes. This requires detailed documentation and frequent audits to ensure that sustainability standards are met. Improved visibility within the supply chain helps in identifying and addressing potential issues early on, while also promoting accountability and maintaining high ethical standards across the entire supply chain.

**4. Product Development and Innovation:** Eco-friendly processes, often referred to as environmentally friendly processes, are marketing and sustainability phrases that apply to products and services, as well as laws, regulations, and policies that guarantee minimal or no damage to the environment or ecosystems. Using sustainable materials that have little impact on the environment is necessary to create eco-friendly products. Waste is decreased by the fact that these products are meant to be recyclable or biodegradable. In addition, the production processes aim for minimal emissions and low energy use. The goal of sustainable drug development is to provide medications with fewer adverse effects, which improves patient outcomes and safety. Establishing industrial methods that reduce their negative effects on the environment is also essential. These tactics emphasize the use of fewer dangerous substances and less energy. The environment and human health both benefit from this technique.

**5. Social Responsibility and Community Involvement:** Supports efforts to guarantee impoverished and

marginalized populations have cheap access to necessary medications, which in turn promotes social justice and global health. Funding immunization campaigns to increase public immunity is a necessary component of supporting community health initiatives. To assist reduce the occurrence of common illnesses, businesses should also engage in disease prevention initiatives. Programs for health education are vital for raising public knowledge of good lifestyle choices and practices. Businesses that take part in these initiatives can significantly raise the standard of living in their communities. Communities that are healthier and more resilient are the goal of these initiatives. Additionally, they foster goodwill and strengthen the company's standing as an establishment that values social responsibility.

**6. Training and Engagement of Employees:** To promote sustainable behaviors, education and training are crucial. Encouraging sustainable activities and increasing staff knowledge requires offering sustainability education and training programs. Workers need to be properly taught and educated on the value of sustainable practices. For every firm, the welfare of its employees is vital. It is always a top goal to provide a safe, healthy work environment and work-life balance.

**7. Research and Development (R&D):** Pharmaceutical companies must invest in R&D for sustainable technologies and processes, such as green chemistry and eco-friendly formulations. Collaborative Research is need of the hour to collaborating with educational institutions, research

organizations, and other stakeholders to advance sustainable pharmaceutical research.

**8. Transparency and Reporting:** Sustainability Reporting ensures regularly publishing sustainability reports that disclose environmental, social, and governance (ESG) performance and progress towards sustainability goals. Obtaining certifications such as ISO 14001 indicates a commitment to effective environmental management practices. These certifications demand compliance with globally recognized sustainability criteria. They establish a framework for ongoing improvement in terms of environmental effects. Companies must examine and adjust their processes on a regular basis to ensure compliance. This dedication to high standards increases confidence and trust among stakeholders. It also contributes to overall business sustainability goals by ensuring continuous environmental performance.

**9. Regulatory Compliance and Advocacy:** Compliance with environmental norms and standards established by governments and international organizations is critical for long-term operations. This guarantees that firms reduce their environmental effect while avoiding legal fines. Regular audits and practice updates assist to ensure that these criteria are met. Compliance also improves the firm reputation and stakeholder trust. It is vital to advocating for public policies that promote sustainability in the pharmaceutical industry and beyond.

**10.Environmental and Health Impact Assessment:** It is a regular practice for conducting thorough assessments of the health and environmental impacts of pharmaceutical products and operations. Companies identify, developing and implementing strategies to mitigate any negative impacts identified in the assessments.

By integrating sustainability into their business strategies and operations, pharmaceutical companies can contribute to global efforts to protect the environment, improve public health, and promote social equity.

### **Pharmaceutical Companies Face Several Challenges in Their Journey Towards Sustainability.**

1. Manufacturing processes often require raw materials, energy, and water making it difficult to reduce resource use.
2. Proper disposal of waste and treatment of pharmaceutical waste, including hazardous materials, is one of the major challenges.
3. Navigating varying environmental regulations across different countries is both complex and costly for pharmaceutical companies. Compliance requires extensive resources to understand and meet diverse legal requirements. This adds financial and operational burdens to their sustainability efforts.
4. In pharmaceutical companies investing in sustainable practices and technologies can be expensive, especially in the research and development phase.

5. Developing drugs that are effective yet have a minimal environmental footprint is very difficult in pharmaceutical companies.
6. Training the employees and engaging them in the company activities is very critical task.
7. Regulatory Compliance and Advocacy is crucial aspect in any pharmaceutical companies.
8. Building and maintaining public trust through transparent sustainability efforts can be challenging and also continuously innovating to be in competitive while also ensuring sustainability adds pressure.
9. Collecting accurate data and reporting on sustainability metrics requires significant effort and resources.

### **To Overcome the Sustainability Challenges Faced by Pharmaceutical Companies, the Following Measures can be Implemented**

1. Pharmaceutical companies must invest in energy-efficient technologies and water conservation methods to reduce resource consumption and also it is important to implement robust monitoring systems and work closely with suppliers to ensure adherence to sustainability standards.
2. It is vital to develop comprehensive waste management policies and plans, including recycling and safe disposal of hazardous materials.
3. Establish dedicated teams to stay updated on international regulations and ensure compliance, potentially using software tools for tracking. Allocate funds specifically for researching and developing sustainable technologies and practices.

4. It is important to providing sustainability training and education programs for employees to raise awareness and encourage sustainable practices.
5. It is vital to implement advanced data collection and analysis systems to accurately track and report sustainability metrics and also it must be a regular practice to partner with other companies, research institutions, and NGOs to share knowledge and resources for sustainable innovation.
6. Companies must examine and changes according to their processes on a regular basis to ensure compliance. This dedication to high standards increases confidence and trust among stakeholders.
7. Balance sustainable practices with cost-efficiency to keep drug prices affordable while maintaining profitability, creating products, and packaging minimize environmental impact.

## **Conclusion**

Pharmaceutical companies in India, as significant players in the global market, have a pivotal role in promoting sustainability. They can achieve this by integrating eco-friendly practices into their manufacturing processes, focusing on ethical sourcing, and ensuring transparent operations. Despite the challenges, such as high resource consumption and regulatory complexities, these companies can adopt measures like investing in green technologies and collaborating with stakeholders for sustainable innovation. Additionally, their involvement in corporate social responsibility initiatives, such as community health programs,

underscores their commitment to social sustainability. By addressing these issues and implementing strategic measures, pharmaceutical companies can enhance their environmental, social, and economic sustainability, thereby contributing to global efforts to create a healthier and more equitable world.

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