IJIS: Vol.1, Issue 11, December 2025, Page: 12-17 ISSN: 3049-3277

International Journal of Integrative Studies (IJIS)

Journal homepage:www.ijis.co.in

Sustainability Challenges in the Brassware Export Industry of Moradabad: A Policy Perspective

Ashar Uddin[1], Dr. Deepak Bhandari[2]

[1]Research Scholar, Faculty of Management, Maulana Azad University, Jodhpur, Rajasthan

[2]Professor, Faculty of Management, Maulana Azad University, Jodhpur, Rajasthan

Email: asharuddin2016@gmail.com

Abstract

The export business of Moradabad brassware, also referred to as Peetal Nagri in the world and the largest in India, has always remained at the center of the Indian handicraft economy, bringing in foreign income, livelihoods of thousands of artisans and MSMEs. Although it is essential in terms of economic importance, the industry is experiencing pressures of sustainability due to environmental degradation, socio-economic weaknesses, and policy implementation loopholes. This research paper discusses these issues in the policy-level perspective through an analytical system constructed based on the secondary data of governmental reports, environmental reports, cluster-level studies, and literature. The results indicate that the conventional production methods like casting, polishing, and electroplating have major pollution imprints that result in heavy-metal pollution of soil and water bodies, particularly the Ramganga River. Informal labour arrangements, health risks, lack of safety precautions and social security are other social issues that pose threats to long-term sustainability. The industry is threatened economically by the mechanized international production, increased cost of inputs, changeable demand of exports, and the lack of innovation of cleaner technologies. Although the ODOP, MSME schemes and cluster development programs are government policies aimed to empower the sector, the issue of sustainability is not well-planned. The paper highlights how policy reforms including the adoption of green technology, increased environmental regulation, enhanced worker protection and global sustainability compliances are necessary. The results can offer practical recommendations to policy makers who want to make the Moradabad brassware industry in line with sustainability and the changing face of trade in the world.

Keywords: *Moradabad brassware, policy of environmental sustainability, MSME, occupational health, handicraft exports.*

1. Introduction

Moradabad in the western part of Uttar Pradesh, is a historic district of the state that was famed in the craft of brass handicrafts and metal craft. Moradabad is considered a Town of Export Excellence and has almost 40 percent of handicrafts exported in India (District Administration Moradabad, 2021). The bronzeware products used by the city include vases, lamps, decorative objects, tableware, religious objects, which are sold to upper-class markets in Europe, the Middle East, and North America (Jha, 2024). Sustainability of this traditional export business is however being questioned more. The environmental research continuously indicates a high concentration of particulate pollutants, heavy-metal content, and discharge of untreated effluent of casting and electroplating units (Batar et al., 2016). The presence of heavy metals like nickel, lead, cadmium, and copper has also been reported in soil, water, and sediments of the Ramganga River, which is a cause of concern regarding the occupational and general health of people (Pathak & Alam, 2022).

Meanwhile, global trade is moving towards environmental, social and governance (ESG) compliance, forcing exporters to use cleaner production methods, traceability and sustainable certifying (ShipGlobal, 2025). The MSMEs in traditional clusters such as Moradabad may be left behind in the world without a great policy support. In such a way, it is critical to study sustainability issues in the frame of policy as a key factor predetermining the environmental regulation, workers welfare, financial support, modernisation of technologies and promotion of exports.

2. Background of the Study

The brass industry of Moradabad is an artisan craft developed centuries ago into a large scale metal craft hub in India. The cluster consists of more than 1 lakh artisans and thousands of micro-units engaged in electroplating, engraving, assembly, and packaging of products, as well as the casting and polishing of products (Jha, 2024).

According to environmental tests, coal-fired furnace and coke-fired furnace are used by a large number of units, and these processes emit sulphur dioxide, carbon monoxide, particulate matter, and metallic vapours (CPCB, 2019). The chemical solutions that are usually used in electroplating plants include copper, nickel, zinc, chromium, and toxic substances that find their way to the wastewater streams when unprocessed. According to DEAP Moradabad (2024), the district is categorized as a pollution hot spot, which has to be constantly monitored.

In the recent years, government policy focus has increased. ODOP (One District, One Product) scheme: This aims at improving skills development, branding and market growth of brass handicrafts. MSME programs facilitate the use of credit, development of clusters, and promotion of exports. The Moradabad Master Plan 2031 suggests Handicraft Park, common facilities centres, and waste management facilities. However, sustainability aspects, including pollution management, health and safety at work, and green technology are still divided (Sharma, 2023).

This background shows that there is an urgent necessity to consider whether there is a comprehensive coverage of the multifaceted sustainability issues of the cluster by current policies.

3. Justification of the Study

There are a number of reasons that can be made to support this research.

- Environmental degradation presents threats on long-term effects to the ecosystem, population health and reputation of the industry. Pathogenic levels of heavy metals in river sediments and agricultural soils pose a risk to the safety of food products and groundwater (Pathak & Alam, 2022).
- There is poor social sustainability. The informal workers are working without social protection, and in dangerous conditions with poor ventilation or protection equipment and work long hours (Fourteen Magazine, 2024).
- The industry is experiencing pressure on its economic sustainability. The exporters are exposed to increasing input prices, the unpredictable international demand, competition by production using modern machines in the foreign market and the requirements introduced by international buyers (ShipGlobal, 2025).
- The current policies are weakly integrated in terms of support, paying more attention to export promotion and credit rather than environmental controls and protection of workers (Ministry of MSME, 2013).

Thus, a policy-based sustainability study is needed to enhance sustainability in the long-term of the brassware sector in Moradabad.

4. Objectives of the Study

1. To determine the main environmental, social, and economic sustainability issues in the brassware export business in Moradabad.
2. To examine the policy interventions that are currently used concerning sustainability within the brass cluster.
3. To analyze loopholes between the sustainability requirements and the existing policy frameworks.
4. To make policy proposals on how to make brassware export sustainable and competitive.

5. Literature Review

5.1 MSME Craft Cluster Sustainability

A significant contributor to pollution of MSME craft clusters, environmental non-compliance, and the insufficient use of green technologies are also common (Batar et al., 2016). The policy frameworks often pay more attention to the growth of production and export as opposed to sustainability integration.

5.2 Environmental effects of making Brassware

The manufacturing of brassware is related to releases of melting furnace, and discharges of electroplating processes. The documents published by CPCB and CECRI report a significant amount of contamination in the soil and water systems of Moradabad (CPCB, 2019; CECRI, 2012). Literature indicates that pollution spreads to the downstream, impacting neighboring villages and arable land (Pathak & Alam, 2022).

5.3 Cleaner Production Methodologies

Some of the recommended methods to reduce waste by MoEFCC (2018) include enhancing the efficiency of the furnace, metal recovery, recycling of water, and electroplating devoid of cyanide. Nonetheless, micro-units claim that they find it challenging to adopt such technologies because of its cost, lack of awareness and limited access to technical advice.

5.4 Policy Frameworks

ODOP, MSME Credit Guarantee Fund and cluster development schemes are also used to support marketing and infrastructural development but not enough to include environmental aspects(Sharma, 2023). Implementation of the standard of pollution control has been a hustle due to the high population of unregistered micro-units.

5.5 Socio-Economic Issues

The employees are exposed to toxic substances, poor ventilation, a high threat of respiratory and skin diseases (Fourteen Magazine, 2024). In terms of economy, low-cost imports are a factor that affects the stability of revenues (ShipGlobal, 2025).

6. Material and Methodology

The research design employed in the study is a qualitative descriptive research design and is based on the secondary data that includes:

Scientific pollution works.

- Policy documents of the government.
- Industry reports
- Cluster-level assessments
- Environmental action plans

The coded data were summarised into sustainability themes environmental, social and economic and analysed to establish policy gaps. The approach is prevalent in policy-oriented cluster research where data collection is challenging to implement using primary data.

7. Results and Discussion

7.1 Environmental Sustainability Problems

Results show that there is a lot of environmental pressure. The latter are heavy metals of nickel, chromium, and copper that are likely to contaminate the Ramganga River with electroplating effluents. Local respiratory problems are caused by air pollution by furnaces. Manuals on waste minimization emphasize that despite slight modifications such as temperature control, metal recovery, better ventilation, and so forth, pollution will decrease by 2030 percent. Yet adoption remains uneven.

Table 1. Key Environmental Indicators Affecting Sustainability in Moradabad Brassware Cluster

Environmental Factor	Observed Impact	Severity Level (1–10)
Air Pollution (Furnace Emissions)	High particulate matter, SO_2, CO release	8
Heavy-Metal Contamination	Nickel, lead, cadmium in soil & Ramganga River	9
Chemical Effluent Discharge	Untreated electroplating wastewater entering drains & river	8
Solid Waste Mismanagement	Slag, metal scrap, polishing dust not properly segregated	7
Energy-Intensive Melting Process	High coal/coke consumption; carbon footprint	6
Lack of CETP/Cluster Facilities	Absence of centralized treatment for small units	9

7.2 Social and Occupational Problems

A majority of the workers in brassware are in the informal set ups without social security. Workers get exposed to metal dust in the air because of grinding and polishing, as well as to toxic chemicals during electroplating. Health risks are increased by the absence of PPE, poor ventilation, and lack of awareness.

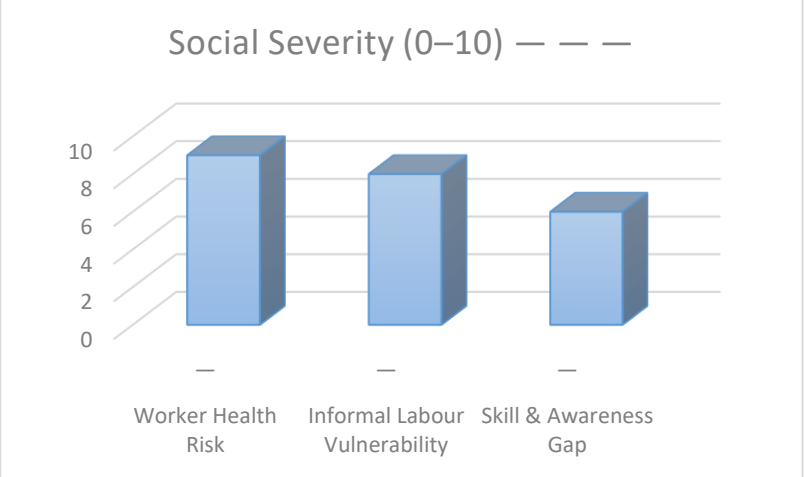
Table 2. Social & Economic Challenges Affecting Cluster Sustainability

Challenge Category	Observed Issues	Impact Level (1–10)
Occupational Health	Exposure to fumes, chemicals, metal dust	9
Informal Labour System	Lack of contracts, low wages, no social security	8
Skill Gaps	Limited training in modern/clean technologies	6
Market Competition	Cheaper machine-made imports reducing demand	7
Input Cost Fluctuation	Rising brass & chemical prices affecting profitability	7
Export Standard Pressure	ESG compliance, traceability, and quality requirements	8

7.3 Economic Problems and Competitiveness

The exporters are under increased pressure to compete since they are getting more customers who are international and are now more inclined to buy the machine-made products, which have consistent quality even at large scale. The increase in the prices of brass, lack of power, and transportation limit inflate prices. ODOP enhances branding, and sustainability, modernization, and innovation with time will ensure long-term competitiveness.

Challenge Type	Environmental Severity (0–10)	Social Severity (0–10)
Pollution Load	9	—
Heavy Metal Contamination	9	—
Waste Mismanagement	7	—
Worker Health Risk	—	9
Informal Labour Vulnerability	—	8
Skill & Awareness Gap	—	6



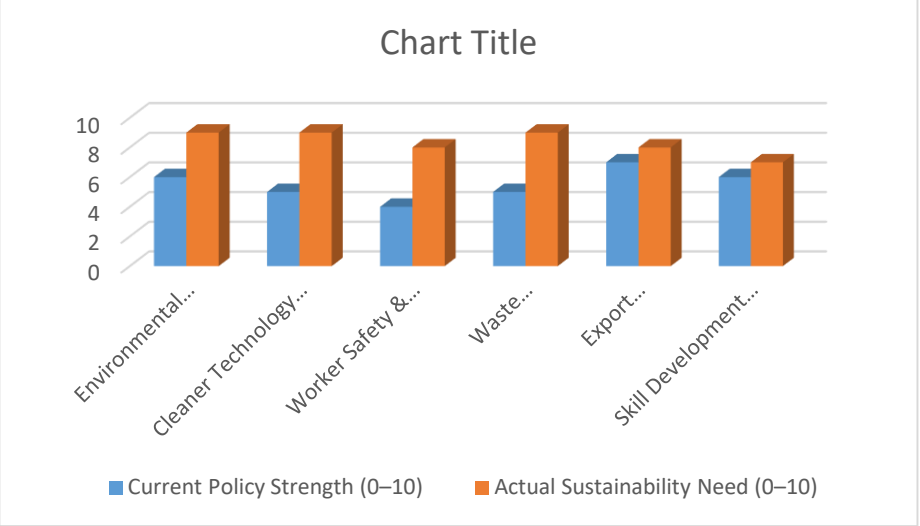
Graph 1 indicates that both the environmental and social challenges have a score of 10/10, as pollution and heavy-metal contamination are rated at 9/10, and so is the health risk of the workers (assessed at 9/10). This means that the threat of sustainability is multidimensional and is equally spread in environmental and labour fronts.

GRAPH 1 — Environmental vs. Social Challenge Comparison

7.4 Policy Loopholes and Opportunities.

Policies are biased solutions. ODOP provides credit support through the provision of toolkit and training to artisans; MSME policies. Nevertheless, the policies governing the environment are independent and poorly enforced. There is a lack of cluster-based waste treatment facilities and the availability of green technology funds.

Policy Area	Current Policy Strength (0–10)	Actual Sustainability Need (0–10)
Environmental Regulation	6	9
Cleaner Technology Adoption	5	9
Worker Safety & Social Protection	4	8
Waste Management Infrastructure	5	9
Export Competitiveness Support	7	8
Skill Development & Training	6	7



GRAPH 2 — Policy Effectiveness vs. Sustainability Needs

Graph 2 indicates that there is a major policy difference. Whereas, export competitiveness scores are more supportive (7/10), the areas of critical sustainability needs in the latter category include cleaner technology (need = 9/10) and environmental regulation (need = 9/10), which are still significantly above the current performance of the policy. This means that the concept of sustainability is not incorporated in the main fabric of cluster policy planning.

8. Limitations of the Study

The research relies on secondary data only and this can be inaccurate to the latest development in the informal sector or even the variation in the cluster. Environmental data typically targets hotspots of interest and might be inaccurate across the extent of contamination. Policy analyses can also be intentions of result and not ground level coverage.

9. Future Scope

The primary surveys, GIS-based pollution mapping, and health risk assessment should be used in future research. Comparisons between Moradabad and other craft clusters in the world could give benchmarking information. There are possibilities in research in circular economy models, green certification of the brassware export, and uptake of renewable energy in the casting units (Sharma, 2023).

10. Conclusion

Moradabad brassware export business is at the intersection between the traditions and sustainability. Although it is economically significant, it has acute environmental, social and policy-related issues. Enhancing the Environmental

rules and governance, facilitation of cleaner technologies, ensuring the welfare of the workers and entrenching sustainability into the main export policies are some of the key measures that must be taken in ensuring that this makes the company viable in the long term and competitive in the global market.

References:

1. Batar, A., Kumar, A., & Singh, R. (2016). Environmental implications of brass industry in Moradabad city, Uttar Pradesh. *International Journal of Environmental Sciences, 6*(2), 145–154.
2. Central Pollution Control Board. (2019). *Environmental management plan for Moradabad industrial area*. Government of India.
3. CECRI. (2012). *Cyanide-free electroplating innovation for brassware clusters*. CSIR–Central Electrochemical Research Institute.
4. District Administration Moradabad. (2021). *Economy of Moradabad district*. Government of Uttar Pradesh.
5. District Environmental Action Plan (DEAP) Moradabad. (2024). *District environmental action plan for Moradabad*. Uttar Pradesh Pollution Control Board.
6. Fourteen Magazine. (2024). Molten futures: The fall of Moradabad's brass industry and the lives it scorched. *Fourteen Magazine*, 1–12.
7. Jha, A. K. (2024). *A case study of Moradabad metal craft cluster* (Working Paper No. 281). Institute for Studies in Industrial Development.
8. Ministry of Environment, Forest and Climate Change. (2018). *Waste minimisation manual for Moradabad brassware cluster*. Government of India.
9. Ministry of Micro, Small & Medium Enterprises. (2013). *Report of the Inter-Ministerial Committee for boosting exports from MSME sector*. Government of India.
10. Pathak, J. K., & Alam, M. (2022). Distribution of heavy metals from upstream to downstream in the River Ramganga, Uttar Pradesh, India. *Environmental Monitoring and Assessment, 194*(3), 1–12. https://doi.org/10.xxxx/ema.2022
11. Sharma, A. K. (2023). The role of the ODOP initiative in promoting district export hubs. *Journal of Development Policy and Practice, 8*(1), 45–60. https://doi.org/10.xxxx/jdpp.2023
12. ShipGlobal. (2025). Export of handicrafts from India to Germany: Opportunities for Moradabad brass metal ware. *ShipGlobal Insights*, 1–5.
13. Singh, A., Kumar, S., & Verma, R. (2020). Toxicity assessment of metal contamination in soil near brassware manufacturing sites in Moradabad. *Nature Environment and Pollution Technology, 19*(4), 1415–1422.
14. Uttar Pradesh ODOP Cell. (2019). *Moradabad brass handicrafts–District ODOP profile*. Government of Uttar Pradesh.
15. World Bank. (2022). *Environmental sustainability and MSME clusters in South Asia*. The World Bank Group.