

Local Impact of Glass Industry in Firozabad District, Uttar Pradesh: A Geographical Study

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Summary

Firozabad, a major industrial and cultural city in Uttar Pradesh, is renowned worldwide for its glass industry, particularly its glass bangle industry. It is also known as the "Glass City of India" because it is India's largest glass manufacturing center.

The glass industry not only defines Firozabad but also has a profound and complex impact on the city's economy, social structure, and environment. The objective of this study is to provide a comprehensive assessment of the geographical, economic, social, environmental, and cultural impacts of this industry.

The history of the glass industry in Firozabad dates back two centuries. This industry dates back to the Mughal Empire and gradually evolved into an organized industrial center. In the early days, local skilled artisans melted broken glass pieces in a traditional furnace called a "bhainsa bhatti" to create glass bangles and other products.

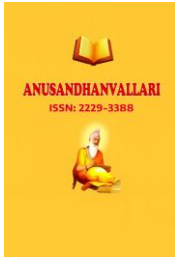
Over time, technological changes in the glass industry have led to increased product diversity. Now, the glass industry produces not only bangles but also household items, decorative glass, scientific labware, bottles, glass vessels, and industrial glass.

Geographically, the industry has spread across cities and surrounding rural districts in various development blocks, with over 11,000 glass manufacturing units now registered.

Keywords: Industrial, Cultural City, Glass City, Bhainsa Bhatti, Bangles, Development Block

1. Introduction:

Currently, India's industry is rapidly developing. Industry provides services and strengthens the economy. The glass industry has traditionally existed for a long time in Firozabad district, Uttar Pradesh. Currently, the industry manufactures various glass products and is a major source of employment and income. This industry is spread across the cities and rural areas of various development blocks of Firozabad district, with the highest concentration in Firozabad city. This industry produces glass bangles and various glassware products, which are exported to various parts of the country. These glass products also have a strong demand abroad. Glass products worth approximately ₹1000 crore are sold here every year. Firozabad district has approximately 11,000 glass factories, of which 5,218 are glass bangle and 5,812 are glassware units, employing approximately 5,60,634 people as of 2024.



2. Research Methodology:

This paper is based on secondary sources: state-level industry statistics, district and development block-level statistical reports, and more.

2.1. Nature of Research:

This research is a descriptive and analytical study. Its primary objective is to study the local impact of the glass industry in Firozabad district. Both secondary and primary data were used.

2.2 Study Area:

Firozabad district is located in the state of Uttar Pradesh. This district is part of the fertile and flat plains of the Doab region formed by the Ganges and Yamuna rivers. Its southeastern region consists of the new alluvial plains and ravines formed by the Yamuna river, while its northwestern and central parts are identified as the Bangar region, formed by older alluvial deposits.

Firozabad district is located in the southwestern part of Uttar Pradesh, which is situated in the northern part of India. The latitudinal extent of Firozabad district is from 26°54' North latitude to 27°30' North latitude, and the longitudinal extent is from 78°12' East longitude to 78°50' East longitude. The total area of Firozabad district is 2407 square kilometers, of which 2344 square kilometers is rural area and 63 square kilometers is urban area. Firozabad district has 9 development blocks: Firozabad, Tundla, Narkhi, Shikohabad, Makkhanpur, Araon, Eka, Hathwant, and Jasrana. Firozabad district has a total of 790 inhabited villages, 17 uninhabited villages, and 9 urban settlements.

2.3 Data Collection:

(A) Primary Data:

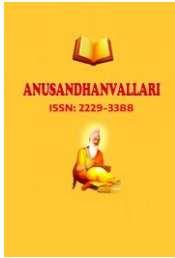
- Survey and Questionnaire: 50 glass industry units and 200 workers were selected from various development blocks in the district.
- The questionnaire included questions regarding the geographical conditions of the glass industry units, production, worker conditions, wages, technology used, and problems.

Oral Viva :

- Oral Viva were conducted with officials from the Industries Department and people at various levels working in the glass industry.

(B) Secondary Data -

- Annual Report of the Uttar Pradesh Industries Department.
- Data on glass industry units from the District Industries Center, Firozabad.
- Firozabad Glass Cluster Diagnostic Study Report - 2023-24
- Literature obtained from research papers, journals, books, and online databases.



2.4 Sample Selection

- Sample Size: 50 glass industry units and 200 workers
- Sampling Method: Stratified random sampling was used to ensure representation of various development blocks of Firozabad district (Firozabad, Shikohabad, Narkhi, Tundla, Hathwant, Makkhanpur, Araon, Jastrana, Eka).

2.5 Research Duration:

This research was conducted between January 2022 and March 2024, during which the primary survey, data collection, analysis, and report writing phases were completed.

2.6. Research Limitations -

- The study did not include industries from all development blocks.
- The authenticity of data relied on government reports and oral responses from workers employed in the industry.
- Industrial production, change and growth, and policy implications could not be comprehensively estimated due to limited resources.

3. Economic Impact

3.1 Employment and Economy

The glass industry in Firozabad is a key pillar of the district's economy. This industry provides direct and indirect employment to over 50% of the local population.

In 2024, approximately 560,634 people were employed in the glass industry, working as laborers, artisans, traders, and raw material suppliers. This increased from 331,432 in 2015. Employment has increased by 40.88 percent over these 18 years.

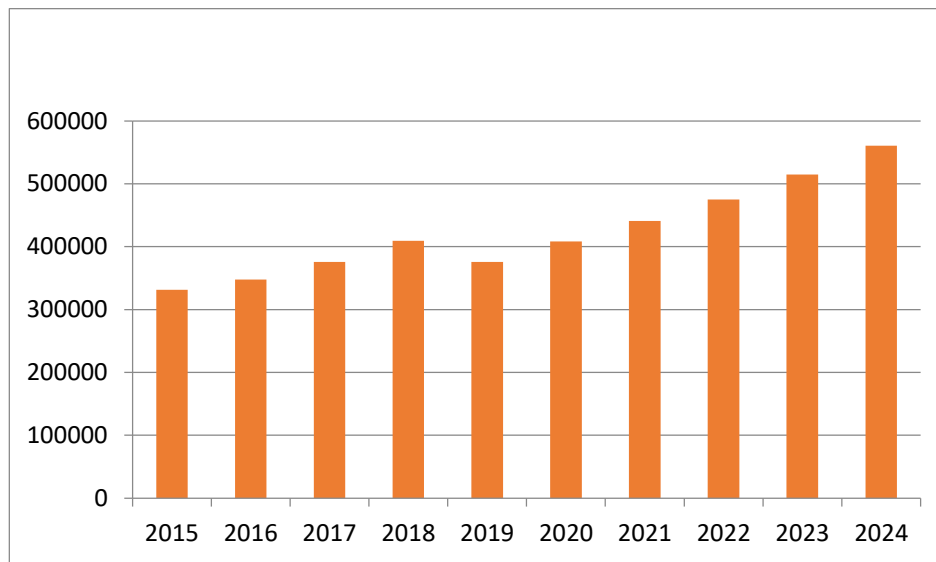
Workers employed in Firozabad District Glass Industries

S. No.	Year	Workers employed in glass industries	Workers engaged in allied/other industries	Total Workers	Increase/Decrease	Percentage
1	2015	135000	196432	331432	-	
2	2016	148600	198978	347578	16146	4.64
3	2017	167340	208431	375771	28193	7.50
4	2018	183226	226310	409536	33765	8.24

5	2019	190110	185646	375756	-33780	-8.99
6	2020	201315	206935	408250	32494	7.96
7	2021	211426	229468	440894	32644	7.40
8	2022	216762	258142	474904	94010	7.16
9	2023	226300	288671	514971	40067	7.78
10	2024	240120	320514	560634	45663	8.14

Source: District Industries Centre, Firozabad, Uttar Pradesh

Workers employed in Firozabad District Glass Industries

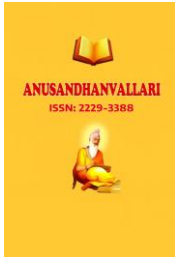


In addition to the bangri (bangles) industry, bottle manufacturing, glass decoration, and domestic glass production also generate employment in the region.

The glass industry's annual revenue potential is estimated in the many crore of rupees, producing glassware worth ₹1,000 crore annually. This strengthens the local economy. It not only boosts local trade but also serves as a valuable export source for the state and the country.

3.2 Impact on Local Trade and Agriculture

The glass industry has also stimulated intense trade activity in local markets. Retail, wholesale, and export networks for glass products drive economic activity in the district. Furthermore, agricultural products are linked to exports due to the consumption potential of local workers, creating economic linkages between agriculture and industry.



4. Social and Cultural Impact

4.1 Social Structure and Lifestyle

The presence of the glass industry has profoundly influenced local lifestyles. This industry has provided employment to people from various social groups, leading to changes in social mobility. Street vendors, artisans, color sellers, designers, and retail trade are all part of the social structure.

4.2 Family and Standard of Living

Families receive a stable income, but this income is often spent on areas such as health and education, as workers' incomes are often risky and unstable. Traditional artisan skills are passed down from generation to generation, preserving cultural identity and local crafts.

4.3 Cultural Identity

Firozabad's glass industry is not only an economic activity but also a source of social identity. It enhances the significance of bangles in traditional occasions such as weddings, festivals, and celebrations. Glass bangles have now become a symbol of Indian culture, an essential part of weddings and auspicious occasions.

5. Environmental Impacts

5.1 Air and Water Pollution

Glass industry processes use high-temperature furnaces, which contribute to air pollution. This can degrade air quality in surrounding areas, leading to health problems and environmental stress.

High risks of water pollution have been reported from industrial waste leakage into local water sources.

5.2 Workplace Health Problems

Glass production uses chemicals such as dyes, lead, cadmium, and mercury, which negatively impact workers' health. Furnace temperatures can exceed 1200°C, making heat-related illnesses and muscle problems common in the workplace.

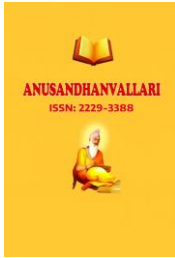
5.3 Impacts of Climate Change

Temperature increases due to climate change can increase the risk of extreme heat stress and health risks for industry workers, impacting production efficiency and work life.

6. Challenges and Limitations

6.1 Modern Competition and Market Changes

The glass industry is facing increasing competition from plastic and metal glassware and other glass products, leading to a decline in demand for traditional glass products.



6.2 Policy and Technology Changes

High production costs, rising natural gas prices, and government policies (such as T T Z regulations) impact industry growth. Over the past few decades, a significant portion of the industry has shifted toward bottle manufacturing, offering greater automation and new market opportunities.

6.3 Operational Structural Difficulties

Many glass industry units are in the informal sector and lack formal policy support, depriving them of modern technology, global standards, and financial support. This impacts export potential and production quality.

7. Future Directions and Policy Recommendations

7.1 Technological Innovation and Modernization

The glass industry should systematically adopt modern technologies such as advanced furnace controls, low-pollution equipment, and energy-efficient methods. This will not only reduce production costs but also reduce environmental impact.

7.2 Health and Safety Protocols :

Better safety measures, health insurance, workplace safety, and regular medical checkups are essential for employee health, improving workers' longevity, quality of life, and productivity.

7.3 Education and Skill Development

Providing expertise in traditional and modern glass manufacturing techniques to the local youth through training and skill development programs will ensure the long-term sustainability of the industry.

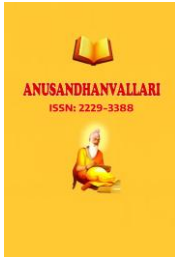
7.4 Export and Marketing Strategy

State and central governments should support marketing assistance, branding, and international exhibitions to promote exports of the glass and glass-bangle industry, making local products competitive in the global market.

8. Conclusion

Firozabad's glass industry is not only a major pillar of the local economy, but also a vital source of social identity, cultural heritage, employment, and external market connections. While environmental impacts and health problems raise serious concerns, appropriate policy changes, technological innovation, and social support can make this industry more sustainable and safe.

A geographical study of Firozabad's glass industry clearly demonstrates that this industry impacts nearly every aspect of local life, with both positive and negative impacts far-reaching. Only by adopting a more sustainable and supportive approach can this industry remain a strong anchor in Firozabad's identity and economic vitality for decades to come.



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