

# IMPACT OF TECHNOLOGY ON THE HANDLOOM INDUSTRY IN DHARMAVARAM, ANDHRA PRADESH

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**Abstract:** Dharmavaram, A small town in Andhra Pradesh, India, part of a cluster well-known for its handloom industry, is a hub for the manufacture and sale of its famous brand of silk and cotton sarees. Dharmavaram Silk Sarees are known for their excellent weaving quality, rich look and feel. Also known as Rajwadi Sarees, Dharmavaram Silks are known for their broad borders and gold brocade embroidered pallus. They are available in a combination of soft color's, exquisite designs and varying patterns. The striking features of the Dharmavaram Silk saree are its muted colors, as well as, the shining or double-color outcome in the fabric. Technological improvements have presented chances as well as problems for the local handloom sector. This study examines how regional handicrafts worker and production processes in Dharmavaram's handloom sector are affected by technical enhancements in weaving, design, marketing, and sustainability. Along with the ways that automation, mechanization, and digital platforms are transforming the industry, we also look at the challenges of sustaining traditional craftsmanship, ensuring quality, and skill scarcity.

**Keywords:** Power looms, digital plat forms, weaving designs, marketing, sustainability.

## 1. INTRODUCTION

In the *Dharamavarm* (rural) areas, weaving is the primary occupation. In the Indian State of Andhra Pradesh, the town of *Dharamavaram* is located in the *Ananthapuram District*. It is the divisional headquarters of Dharmavaram Mandal as well as a Mandal. Cotton, silk weaving industries, leather puppets, and handloom silk sarees are the town's main exports. It is also known as the Silk City, Dharamavaram. A large portion of *Andhra Pradesh's* rural economy depends on handloom silk saree making and other crafts. However, the industry is undergoing significant transformation as a result of the introduction of contemporary technologies. Textile manufacturing, marketing, and consumption are changing due to automation, digital technology, and marketing breakthroughs.

The purpose of this article is to examine how technical advancements have impacted the handloom industry in Dharmavaram, highlighting both the benefits and drawbacks of this change. We examine the challenges that technology presents for preserving quality, preserving traditional craftsmanship, and removing barriers to artisans' access to technology, as well as how it has broadened market reach and boosted productivity.

## 2. HISTORICAL BACKGROUND OF THE HANDLOOM SECTOR IN DHARMAVARAM

In the history books, Dharmavaram has a place. After visiting *Chilamuttur*, *Sri Kriyasakthi Odeyar* Swamy, who had been residing in *Vudayagiri*, decided to construct a hamlet next to *Chilamuttur* after speaking with Karanam Thummala Mallarasu. He established the settlement in 1153-54, and the name Dharmavaram comes from "*Dharmamba*," the mother of "*Sri Kriyasakthi Odeyar*," who built the Dharmavaram tank in the area. Beginning in 1075 Satavahana Saka, the territory was ruled by *Vijayanagar Vidya monarchs* for around 500 years, according to historical evidence found in the inscriptions. Before it was taken by the British, Dharmavaram was also ruled by Tipu Sultan and Hyder Ali for a while. The murals on the roof walls of the Lepakshi temple also provide proof of the origin of Dharmavaram sarees. The temple was built between 1522 and 1538 AD and has 280 designs in all. A location known as "*Latha Mandapam*" features 144 distinct Dharmavaram saree designs on 36 granite pillars.

The primary weaving technique used in Dharmavaram is the pit loom, which involves artisans physically interlacing threads to create textiles. Families used to run the handloom industry, and weavers often used simple yet effective tools to work from home. The silk weaving business in Dharmavaram grew significantly during the 19th

and 20th centuries. However, as machine-made textiles became more competitive and the demand for mass-produced, less expensive materials increased, the number of handloom weavers in the region declined.

The growth of worldwide markets and growing customer demand for handcrafted and environmentally friendly textiles have led to a revitalized handloom industry in Dharmavaram in recent years. Concurrently, technology integration has played an important role in improving efficiency and commercial potential.

### 3. LITERATURE REVIEW

*Dr. Manas Ranjan Bhowmik, Shantanu Baidya (2024)* This research aims to examine the potential effects of mechanization, the use of ICT, and Artificial Intelligence (AI) on the handloom weaving industry. This research evaluates how contemporary technologies might be employed to tackle current issues of market accessibility, production inefficiencies, and financial limitations in the industry, while also highlighting the dangers of undermining traditional skills and displacing workers.

*Jothi Subramaniyabharathy (2021):* It has been established that the handloom industry makes a substantial contribution to the economy, both in terms of minor and big consequences. Particularly after the outbreak, it has a major effect on the country's employment, household income, consumption, and poverty rate. In the *post-COVID-19* context, weavers must embrace sustainable growth assumptions.

*Dr. M Kethan, Dr. Mohammed Khizerulla, S Chandra Sekhar, Dr. Mahabub Basha S (2022)* This research focuses on Rayalaseema and the Coastal Region of Andhra Pradesh, as there has been a decline in the handloom weaver population in the state. The research indicated that customers are interested in purchasing handloom and handcrafted items, but they lack the awareness of whether they are investing in authentic or imitation products. The presence of handloom and handicrafts in the fashion and textile industry has grown due to mobile applications, and the craft will evolve into a brand of its own with enhanced customer experience.

*Balakrishnan P (2020)* examined how technological progress could influence the handloom sector, including the productivity and earnings of handloom weavers. This study focuses solely on individual weavers and labourers within the power loom sector; it does not include master weavers, cooperative societies, or owners of power looms. The research finds that technology greatly affects the handloom sector, especially independent handloom artisans. Alongside technology, several other factors also influence the handloom sector.

*Sarkar, Partha, and Ramanuj Basak (2021)* The research reveals that digitalization has the potential to enhance the economic sustainability of handloom weaving in the NER, as long as the related challenges are tackled

through joint initiatives by policymakers, industry players, and the weavers

*According to Sanjay Shrivastava (2020),* Numerous examples of Kutch crafts utilize recycled materials or are environmentally sustainable in some manner. Moreover, the study highlighted the significance of craftsmanship in sustainable development and the ways Kutch crafts contribute to sustainable growth for a better future for India.

*S. Ramakrishna Chary and Prof. M. Usha (2021):* Observed that a serious labor shortage is providing a huge problem for handloom weavers, and that the handloom industry has been steadily declining over time. Globalization, power loom and mill rivalry, ineffective programme execution, unsystematic government policies, and changes in social and economic conditions are the main offenders.

### 4. STATEMENT OF THE PROBLEM

The demand for the handloom industry has been increasing over time, and it offers the greatest number of job possibilities in the nation. Even though the handloom industry is highly technologically advanced and in high demand, it is being displaced by the power loom or automatic power loom and mill sector, which requires less labor and requires less capital. Because other industries offer lower earnings than handloom, handloom weavers have not completely gone to them. The power loom industry's output rises due to technology and high demand, which also helps the economy grow. However, on the one hand, this has an impact on the handloom industry's output and the financial circumstances of handloom weavers, while on the other, it has no effect on the income levels of power loom workers. Because mill owners, power loom owners, and textile firms prefer the technology. Thus, this study attempts to evaluate this issue on a micro level.

#### *Objectives of Study*

- To examine the socio-economic profile of the selected sample respondents in the study area
- To analyses the technological impact of handloom sector as compared to power loom or automatic power loom sector among the sample respondents in the study area

### 5. METHODOLOGY

The research is mainly aimed at understand the impact of technology on handloom industry in *Dharmavaram Andhra Pradesh*. The research paper is an attempt of exploratory research, based on the primary sources and secondary resourced from journals, websites, book, and articles. The researcher adopted sampling techniques for convenience sampling and statistical tools percentage analysis. The sample sizes of the respondents are 100 handloom weavers.

## 6. DATA ANALYSIS AND INTERPRETATION

### 6.1 socio economic profile of the sample respondents

The table presents a *socio-economic profile* of weavers in the *handloom* and *power loom* sectors, showing data

across various demographic and economic factors. Some of the basic socio-economic conditions are analyzed and presented the results in *Table No. 1*

Table-1. Socio-Economic Profile

Socio-Economic Profile	Handloom Weavers	Percentage	Power loom Weavers	Percentage
	<b>Gender Group</b>			
Male	39	78	45	90
Female	11	22	05	10
<b>Total</b>	50	100	50	100
<b>Age Group</b>				
16 - 30	Nil	Nil	5	10
31 - 45	18	36	25	50
46 - 60	25	50	20	40
Above 60	7	14	Nil	Nil
<b>Total</b>	50	100	50	100
<b>Years of Experience</b>				
Below 10 years	10	20	25	50
11 - 20 years	14	28	20	40
Above 20 years	26	52	5	10
<b>Total</b>	50	100	50	100
<b>Marital Status</b>				
Married	43	86	38	76
Unmarried	7	14	12	24
<b>Total</b>	50	100	50	100
<b>Educational Level</b>				
Up to Primary	25	50	10	20
Up to High School	20	40	26	52
Degree and above	5	10	14	28
<b>Total</b>	50	100	50	100
<b>Daily working Hours</b>				
6 - 8	6	12	25	50
8 - 10	29	58	16	32
More than 10	15	30	9	18
<b>Total</b>	50	100	50	100
<b>Economic Causes for Weaving</b>				
Poverty	15	30	20	40
Unemployment	20	40	20	40
Family burden	5	10	5	10
Unskilled	10	20	5	10
<b>Total</b>	50	100	50	100

From table 1 it is seen that the socio-economic profile of handloom weavers and power loom workers in the study area is analyzed by using the percentage method.

- A higher percentage of male weavers are involved in both handloom and power loom industries, with power loom having an even more distinct gender gap.
- The age range of handloom weavers is more varied, with a notable proportion (14%) being over 60. This suggests that the handloom sector may employ older, more traditional workers. On the other hand, the majority of power loom weavers are between the ages of 31 and 45; none of them are older than 60. This suggests a younger workforce and perhaps a more modern or automated sector.
- In general, handloom weavers have more experience; more than half have worked for more than 20 years. In contrast, a large percentage of power loom weavers (50%) have less than 10 years of experience, indicating that the power loom business is drawing in younger or newer workers.
- The two groups have roughly similar marital status, with handloom weavers having slightly higher marriage rates (86% vs. 76%). The power loom industry may have a younger workforce, as seen by the larger percentage of single people working there.
- Handloom weavers have less education than power loom weavers; half of them have barely completed primary school. With a higher percentage (28%) holding a degree or above, power loom weavers, on the other hand, typically possess greater levels of education. This suggests that a workforce with greater education may be drawn to the power loom sector.

- Handloom weavers typically put in additional hours at labour—30% of them work more than ten hours a day. This could imply that weaving by hand requires more labour and has less flexibility with regard to working hours. In contrast, a larger percentage of power loom weavers (50%) work 6–8 hours, suggesting more efficient operations or possibly less taxing working conditions.
- The primary economic factors that motivate both groups to weave are poverty and unemployment,

with unemployment accounting for a substantial 40% of the total. With 20% pointing to unskilled labor and 10% referencing family hardship, the handloom weavers provide a more varied list of explanations. This implies that handloom weaving can draw undertrained people or those seeking employment because of family obligations. Even though unemployment and poverty are still major issues for power loom weavers, they report fewer instances of unskilled labor or family responsibilities.

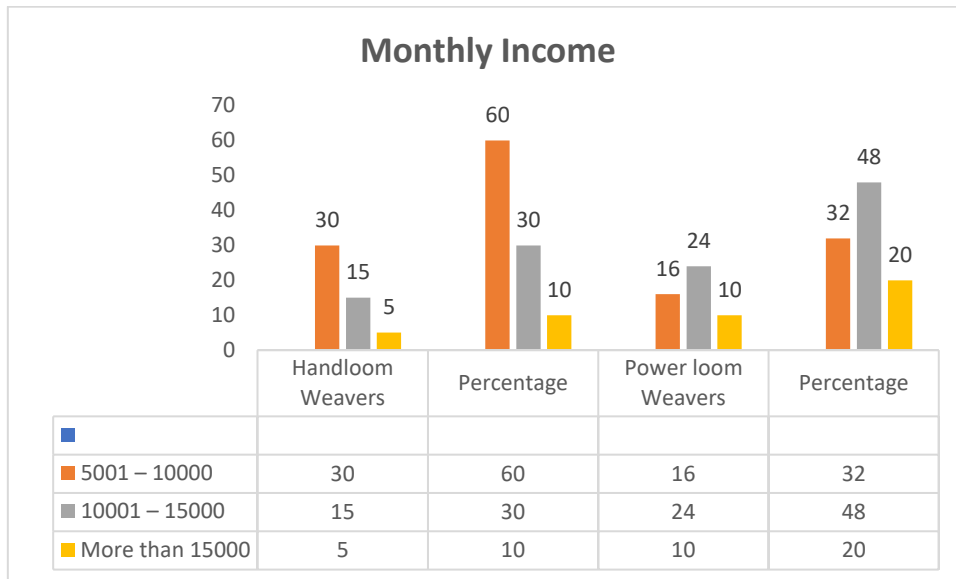


Figure-1. Monthly Income

From the table -2 and figure -1 analyzed the distribution of handloom weavers and power loom weavers based on their monthly income and compare their respective percentages.

**6.2. Handloom Weavers:**

- The majority, or 60% of all handloom weavers, make between 5001 and 10,000, which is a sizeable percentage of all handloom weavers.
- There is a smaller percentage of handloom weavers in upper income brackets: only 10% make over 15,000, while 30% make between 11,000 and 15,000.

**6.3. Power Loom Weavers:**

- Better income range preference: Power loom weavers often make more money, with 48% making between 1000 and 15,000 and 20% making over 15,000.
- A much smaller proportion of power loom weavers—only 32 percent—fall into the 5001–

10,000 income bracket, compared to 60 percent of handloom weavers.

**6.4. Comparison:**

- Income Distribution: The ratio of power loom weavers in the 10001–15000 and over 15000 income groups are larger than that of handloom weavers. Given that more automated procedures result in increased output and revenue, power loom weaving may have improved financial prospects.
- Handloom Weavers' Distribution: The majority of handloom weavers make between 5001 and 10,000, suggesting that their earning options may be more restricted. This is probably because handloom weaving requires labour-intensive and slower production procedures.

According to the data, a greater percentage of power loom weavers are in higher income brackets than handloom weavers, indicating that mechanized weaving may be more profitable than conventional handloom weaving. On the other hand, handloom weavers tend to be lower-income earners, maybe because of the nature of the craft, which demands more time and manual labor.

Table No. 3. Production in Units

	Handloom Weavers	Percentage	Power loom Weavers	Percentage
<b>Production In Units</b>				
5 TO 10	34	68	0	0
10 TO 15	12	24	38	76
More than 15	4	16	12	24
total	50	100	50	100

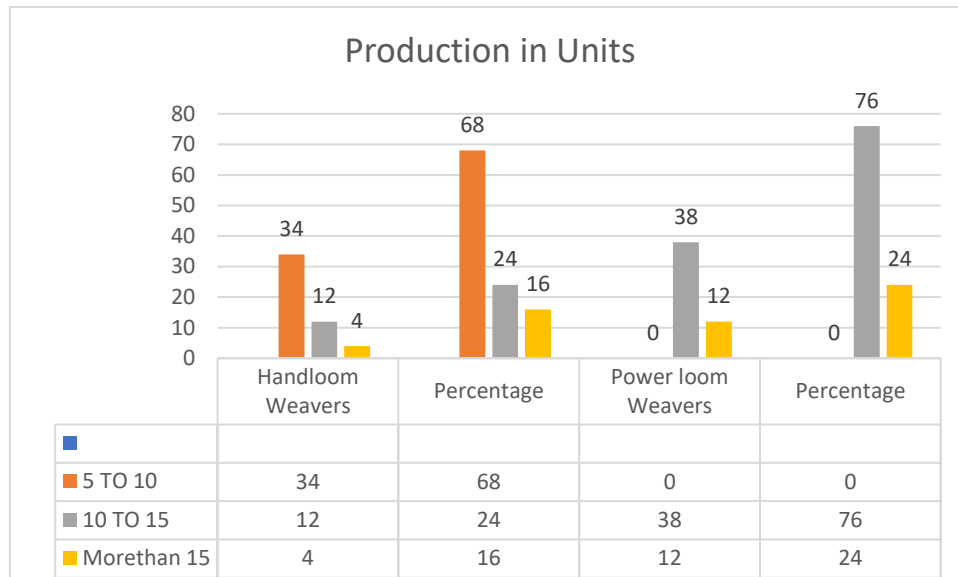


Figure-2. Production in Unit

**6.5. Handloom Weavers:**

- *Most generate between 5 and 10 units:* Sixty-eight percent of handloom weavers produce throughout this time frame. This suggests that handloom weaving is comparatively slower and requires more work, which results in a lower yield.
- *Smaller output ranges:* Just 24% generate 10–15 units, while 8% produce more than 15 units a negligible percentage. This shows that because handloom weaving is a laborious process, weavers may not be able to increase output.

**6.6. Power Loom Weavers:**

- *The majority generate 10–15 units:* A significant 76% of power loom weavers produce 10–15 units. This is far greater than that of handloom weavers, demonstrating the effectiveness and increased output of power loom weaving, which is quicker and more automated.
- *Smaller output at higher levels of production:* 24% of power loom weavers create more than 15 units, suggesting that some can scale production even further, however this is still less common than the range of 10 to 15 units.

**6.7. Comparison:**

- *Higher Production for Power Loom Weavers:* Weavers who use power looms often create between 10 and 15 units, which is more than those who use handlooms. This is a result of power looms' mechanization, which enables more rapid and reliable production.
- *Lower Production for Handloom Weavers:* The majority of handloom weavers produce five to ten pieces, indicating a significantly lower output capacity. This is probably because handloom weaving is a labor-intensive technique that involves longer procedures and more manual labor.

According to the research, power loom weavers can create a lot more units than handloom weavers. While handloom weavers are focused in the 5-to-10-unit range (68%), the majority of power loom weavers (76%) create between 10 and 15 units. This shows that power loom weaving, probably as a result of mechanization, is more productive and efficient. However, handloom weaving is still more traditional and produces slower results, which reflects the difficulties of manual manufacture.

## 7. CONCLUSION

The Dharmavaram handloom sector has seen a radical change as a result of technology, which has created chances for innovation, market expansion, and improved production efficiency. E-commerce, automation, and digital technologies have made it possible for Dharmavaram's weavers to expand their market reach, try out innovative patterns, and embrace more environmentally friendly methods. The possibility of losing traditional craftsmanship, skill gaps, and competition from mass-produced textiles are still major issues, though.

In the end, if technology is handled in a way that honors and maintains the town's unique weaving traditions, it can have a generally positive effect on Dharmavaram's handloom sector. Dharmavaram's handloom sector can develop in a cutthroat global market while upholding its cultural heritage with the support of a strategic, deliberate integration of technology that is aimed at increasing productivity, expanding market access, and encouraging sustainability.

In order to ensure that artisans have the skills they need and to preserve the artistic and culturally rich handwoven fabrics, Dharmavaram's handloom sector will need to successfully integrate technology with traditional methods. In a world that is becoming more digital and interconnected, the handloom sector in Dharmavaram has the ability to prosper with the correct regulations, education, and assistance.

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