TECHNOLOGICAL UP-GRADATION IN TAMIL NADU HANDLOOM SECTOR: A REVIEW OF LITERATURE

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ABSTRACT

Handloom weaving is an essential craft-based activity of India and comprises the largest cottage industry in the country. Indian handloom sector is struggling with various problems such as obsolete technologies, skill upgradation, product development and diversification, unorganised production system, low productivity, and standard product range. Technology is the backbone of any manufacturing industry. Technology up-gradation has become obligatory for the survival of the industry. The technological up-gradation is a must for the new market opportunities and fulfill customer demands, which leads to improved business opportunities. The state and central governments have taken various measures to enhance production, productivity, and efficiency of the handloom sector and enhance the income and socio-economic status of the weavers. This article aims to present the government efforts through various schemes for the technological up-gradation of the handloom industry of India and Tamil Nadu in particular.

Keyword: - textile, handloom, loom, production, technology, technological up-gradation, government schemes, cloth

1. INTRODUCTION

Handloom weaving is an essential craft-based activity of India and comprises the largest cottage industry in the country. It is a part of our country's cultural heritage and symbolises the skill of weavers, who produce intricate artistic and fascinating products using handlooms. Handloom is exceptional in its flexibility and versatility, permitting experimentation and encouraging innovations. Millions of looms across the country are engaged in weaving a range of products using cotton, silk, and other fibers. There is hardly a village where weavers do not exist, each weaving out the traditional beauty of India's own precious handloom products.

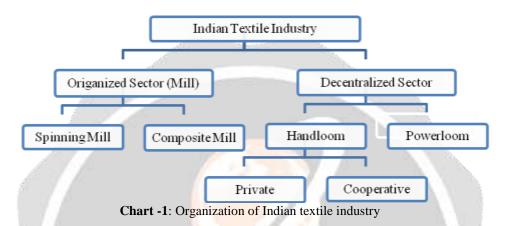
India has a long tradition of excellence in making superior quality handloom products with amazing skills and craftsmanship, which has a glorious past from the time immemorial. The available records show that the Indian handloom sector supplied the world's most exquisite and elegant clothes at very cheap rates to other countries until the middle of the 17th century. The industrial revolution which began in Britain in the 18th century and extended till the 19th century ruined the entire handloom industry of the county. In the early 1950s, the problems of Indian handloom industry worsened.

Indian handloom sector is struggling with various problems such as obsolete technologies, skill up-gradation, product development and diversification, unorganised production system, low productivity, and standard product range. Another major hurdle faced by this industry is the competition from mill and power loom sectors. The state and central governments have taken concerted efforts through various schemes and programmes to enhance production, productivity, and efficiency of the handloom sector and enhance the income and socio-economic status

of the weavers by technology up-gradation, upgrading their skills and providing infrastructural support and essential inputs. This article aims to present the government efforts through various schemes for the technological upgradation of the handloom industry of India and Tamil Nadu in particular.

2. ORGANIZATION OF INDIAN TEXTILE INDUSTRY

Indian textile industry can be broadly classified into the organized sector and decentralized sector. The organized sector can be further classified into spinning mills and composite mills. The decentralized textile sector can be further classified into the handloom sector and powerloom sector. The handloom sector works in private or cooperative fold.



3. PRESENT SCENARIO OF HANDLOOM INDUSTRY

Indian textile industry plays a vital role in the economy of the county. The uniqueness of the industry lies in its strength both in the hand-woven sector as well as in the capital dense mill sector. This area provides the largest source of employment for millions of rural and semi-urban people. Indian textile industry manufactures versatile products suitable for both domestic and export markets. It is the 2nd largest manufacturer and exporter in the world, after China. Textile industry contributes 7% of the industry's output in terms of value, 2% of GDP of India and 15% of the country's export earnings.

Indian handloom sector is one of the largest unorganized economic activities after agriculture and it is an integral part of rural and semi-rural livelihood. It is a decentralized sector and weavers are primarily from the weaker sections of the society, who weave for their domestic needs and contribute to the production in the textile sector. The weavers of this industry are struggling hard to keep the traditional craft alive. The level of artistry and depth of hands gained in handloom fabrics is unique and there are still some special weaves/designs are outside the scope of modern machines. The handloom industry is concentrated in three distinctive areas of the county the rural, classical and tribal.

Indian handloom sector contributes about 15% of the country's cloth production and adds to the country's export income. India meets the 95% hand-woven fabric requirement of the entire world. From the year 2004-05 (except the year of recession in 2008-09), it v has been found that a considerable growth in production of handloom products. Production recorded a figure of 7990 million sq. meters in the year 2017-18. The export of handloom items during 2017-18 was Rs.2280.19 crore and during the year 2018-19 (up to Nov.2019) is Rs. 1554.48 crore [1].

 Table - 1: Indian handloom export targets and achievements

| Year | Target | Achievement | |
|---------|---------|---------------|----------|
| Tear | O | Rs. In Crores | In MUS\$ |
| 2013-14 | 602MUSD | 2233.11 | 369.11 |

| 2014-15 | 460MUSD | 2246.48 | 367.41 |
|------------------------------|---------|---------|--------|
| 2015-16 | 421MUSD | 2353.33 | 360.02 |
| 2016-17 | 450MUSD | 2392.21 | 357.53 |
| 2017-18 | - | 2280.19 | 356.66 |
| 2018-19 (up to Nov. 2019) | - | 1554.48 | - |

Source: Annual Report, Ministry of Textiles GoI – 2018-19

Handloom weaving is an essential craft-based activity of India. As per fourth all India handloom census, this industry provides direct and indirect employment to about 35.22 lakh weavers and affiliated workers, and it is an integral part of rural and semi-rural livelihood. Out of 30.53 lakh handloom workers, 23.56 lakh (77.2 per cent) handloom weavers work in rural areas and out of 4.68 lakh handloom works, 3.17 lakh (67.8 per cent) handloom weavers work in urban areas. Tamil Nadu handloom industry is one of the largest and most ancient among the other industries and has 2.09 lakh handloom households in the state positioning itself fourth among the other states of the country [2].

Table - 2: Number of handloom workers by type in India

| Type of Worker | Rural | Urban | Total |
|----------------|-----------|------------------------|-----------|
| Weavers | 23,56,127 | 3,17,764 | 26,73,891 |
| weavers | 77.2% | <mark>67.</mark> 8% | 75.9% |
| Allied | 6,97,564 | <mark>1,5</mark> 1,057 | 8,48,621 |
| Ameu | 22.8% | 32.2% | 24.1% |
| Total | 30,53,691 | 4,68,821 | 35,22,512 |

Source: Fourth all India handloom census – 2019-20: Ministry of Textiles

3.1 Looms

Across India, 27.01 lakhs handlooms were reported in the fourth all India handloom census, out of which 24.51 lakhs were in rural areas and 2.49 lakh were located in urban areas. Handlooms are mostly located in handloom weaver households (95.6 per cent) which signify that weaving on handlooms is primarily a household-based activity. The census report shows that out of 24.51 lakh handlooms reported in rural India, 41.1 per cent (10.07 lakh) of the looms are pit looms, 31.9 (7.81 lakh) per cent are frame looms, 15.8 per cent (3.86 lakh) are loin looms and 11.3 per cent (2.76 lakh) are of other types of looms. Further, out of 2.49 lakh handlooms reported in urban areas, 53.7 per cent (1.33 lakh) are pit looms, 28.2 per cent (0.70 lakh) are frame looms, 7.1 per cent (0.17 lakh0 are loin looms, and 11.1 per cent (0.27 lakh) are other types of looms [2].

Overall, 42.2 per cent of handloom weavers own pit looms, followed by 31.5 per cent of them own frame looms. 57 per cent of non-household weavers also own pit looms and 32.5 per cent of them own frame looms. The report shows that 55 per cent of master weavers own frame looms over other types of looms. Out of all looms, 67.3 per cent pit looms and 32.6 per cent frame looms found to be fitted with dobby or jacquard mechanism. This shows the higher usage of modern technology in the handloom industry [2].

Table - 3: Number of looms in weaver households by type in India

| Type of Looms | | Rural | Urban | Total |
|---------------|---|----------|----------|-----------|
| Dit looms | Pit looms Pit Loom with Dobby/Jacquard; Other Pit Looms | | 1,33,838 | 11,41,057 |
| PIT IOOIIIS | | | 53.7% | 42.2% |
| Frame | Frame Loom with Dobby/Jacquard; Other Frame | 7,81,604 | 70,379 | 8,51,983 |

| Looms | Looms | 31.9% | 28.2% | 31.5% |
|------------------|-------------|-----------|----------|-----------|
| Loin Looms | Loin Looms | 3,86,514 | 17,588 | 4,04,102 |
| | Loin Looms | 15.8% | 7.1% | 15.0% |
| O ₄ 1 | Other Looms | 2,76,342 | 27,596 | 3,03,938 |
| Other | Other Looms | 11.3% | 11.1% | 11.3% |
| Total | | 24,51,679 | 2,49,401 | 27,01,080 |

Source: Fourth all India handloom census - 2019-20: Ministry of Textiles

Tamil Nadu accounts for 2.43 handlooms across the state. Overall, 1.35 lakh (79.8 per cent) handloom weavers and 0.34 lakh (20.2 per cent) allied workers are from rural areas. 0.61 lakh (84.4 per cent) handloom weavers and 0.11 lakh (15.6 per cent) allied workers live in urban areas. The state accounts for overall 1.97 handloom weavers. There are 55.4 per cent (1.05 lakh) other pit looms and pit looms fitted with Dobby /Jacquard mechanisms. The survey also reveal that there are 26 per cent (0.49 lakh) frame looms and frame looms fitted with Dobby / Jacquard mechanisms. The state also has 18.6 per cent (0.35 lakh) other types of looms [2].

Table - 3: Number of looms in weaver households by type in Tamil Nadu

| Type of Loc | Type of Looms | | Urban | Total |
|----------------|---|-----------------|--------|-----------------|
| Pit looms | Pit Loom with Dobby/Jacquard; Other Pit Looms | 79,899 62.3% | | |
| Frame Looms | Frame Loom with Dobby/Jacquard; Other Frame Looms | 25,689 20.0% | | 49,531 26.0% |
| Other | Other Looms | 22,677 17.7% | | |
| Total | | 1,28,265 | 62,451 | 1,90,716 |

Source: Fourth all India handloom census - 2019-20: Ministry of Textiles

3.2 Production

Indian handloom industry produces a variety of products for its domestic and export market. 6.83 lakh (22.9 per cent) handloom worker households involved in sarees production. Tamil Nadu plays a major role with 58.7 per cent (1.06 lakh) handloom weavers involved in saree production. 5.80 lakhs (19.5 per cent) handloom worker households weave products such as angavastram, dhoti, sarong, and lungi. Tamil Nadu is a major dhoti, lungi, and angavastram producing state with 13.3 per cent (0.24 lakh) handloom worker households involved in this activity. Products such as towel, napkin, duster, and gamcha are woven by 4.91 lakh (16.5 per cent) handloom worker households in the country. 5.8 per cent (0.10 lakh) Tamil Nadu handloom worker households produce these items. Other widely produced handloom items in the country are dress material. In Tamil Nadu, 0.9 per cent (0.02 lakh) handloom worker households produce bed sheet and furnishing items in Tamil Nadu [2].

Table - 4: Distribution of weaver households by the production of major fabrics in Tamil Nadu

| Products | Rural | Urban | Total |
|--------------------------------|--------|--------|---------|
| Dhoti, Sarong, Lungi, | 14,318 | 9,717 | 24,035 |
| Angavastram | | | |
| Saree | 72,028 | 34,402 | 106,430 |
| Dress material, Suiting, | 999 | 651 | 1,650 |
| Shirting, Long Cloth | | | |
| Towel/Napkin, Duster/ | 6,233 | 4,230 | 10,463 |
| Gamcha | | | |
| Bedsheet, Furnishings, Blanket | 13,318 | 7,110 | 20,428 |
| Shawls/ Mekhla Chadder/ | 2,439 | 73 | 2,512 |
| Loi/Stole/ Scarf/ Muffler | | | |

| Durries, Rugs, Mats | 2,263 | 354 | 2,617 |
|----------------------------|----------|--------|----------|
| Others (including Bandage) | 11,795 | 1,280 | 13,075 |
| Total | 1,23,393 | 57,817 | 1,81,210 |

Source: Fourth all India handloom census - 2019-20: Ministry of Textiles

4. IMPORTANCE OF TECHNOLOGICAL UP-GRADATION

Many factors influence the survival of the industry namely, technology innovation, new design and processes, quality, productivity, enhanced production, and service, etc. This new set of factors dictating global competition has been radically changing the role of technology. Technology is not only regarded as something coming along with new products and processes but is taken as the means and results of the communication process between different functions like R&D, production and market. Thus, technology has an important bearing on industry performance and growth [3].

Technology is the backbone of any manufacturing industry. Technology up-gradation has become obligatory for economic development, growth, more flexible responses, strategic self-reliance and sustained competitiveness of an industry. The technological up-gradation is a must for the new market opportunities and fulfill customer demands, which leads to improved business opportunities. Without continuous technology up-gradation, no enterprise can ever remain competitive and the basis of technology creation and up-gradation is research and development [4]. Adoption of technological up-gradation that enhances the competitiveness of the firms has become one of the most important responsibilities of industry [5]. Technology and its management are critical for the successful and efficient performance of an enterprise on a long term basis. Thus, technology up-gradation has become mandatory for economic development, industrial growth, improved organisation performance, enhanced industry image, more flexible responses, strategic self-reliance and also for sustained cost-effective competitiveness of an enterprise [6].

Many authors in their studies reported that the problems of the handloom industry are due to the competition from powerloom and mill sectors. They also expressed the importance of modernising handloom production techniques for the sustainability of the handloom industry [7, 8, 9, 10, 11, 12, 13]. Shailaja Naik and Padhya (1996) [14] in their study recommended that appropriate technology should be made available to handloom weavers for the revival of this sector. They believed that it would positively impact the industry and give due recognition and the state government should play an important role in assisting this industry.

Soundarapandian (2000) [15] in his occasional paper on "Growth and Prospects of Handloom Sector in India", studied the problems of the Indian handloom industry and noted that weaving is a traditional and hereditary based occupation. Weavers follow the conventional method of production and traditional designs due to lack of exposure, lack of awareness on changing technology, methods and requirements. Government policies prompted the weavers to become more dependent than to be independent entrepreneurs. He felt that the attitude of the weavers should be changed. They should be trained in their skills, knowledge and technology to ensure product quality. He proposed to set up a national level handloom research centre for conducting research, developing designs, and weaving technology, raw materials, etc. Bhavani T.A. (2002) [16] in her study mentioned that the poor adoption of technology in the industry obstructed the development of the handloom industry and forced the industry to heavily depend on human resources.

Ojha (2003) [17] outlined the technological development in the handloom industry in his article on "Technological development in the handloom sector". He specified that the major reason for technology development in the handloom sector is due to the challenges faced by the advanced technology-based power looms and mill sectors. The author recommended that for the improved productivity, quality and upliftment of the handloom industry, the technological up-gradation should be provided in the form of skill up-gradation, weaving and processing.

Bhabesh Hazarika et al. (2015) [18] opined that technological up-gradation is important for the handloom sector to tolerate competitiveness, cost-effectiveness, and quality production. The authors listed down that Among the available modern handloom technologies in India, the use of high-speed jacquard, dobby machines, pit looms, sophisticated reeling machines, network drafting, pattern weaving, new and blended raw materials, new designs, new production techniques, improved management practices, etc., are frequently used in Assam. They also noted that there is technological backwardness in the handloom industry across the country. The study focused on factors and problems related to the adoption of technology in rural, nonfarm, and informal micro-entrepreneurs in Assam.

The authors examined the role of key issues such as financial inclusion, family labour contribution and social network in technology adoption. The interaction and sharing of information through a social network are likely to promote technology adoption among the potential adopters. Financial inclusion of handloom micro-entrepreneurs through banks, non-banking credit societies, self-help groups (SHGs) may be regarded as a promoter for increasing the rate of technology adoption. Comparing to small firms, big firms have different problems like lack of resources, labour shortage, and complexity in structure. The study suggested a comprehensive policy framework for the availability of credit or capital, market linkages, and extension services to promote technology adoption among the rural micro-entrepreneurs.

Due to the abolition of multi-fibre Agreement (MFA) quota in January 2005, the textile industry was opened to free competition across countries such as China, India, Bangladesh, Sir Lanka, Vietnam and others [19]. This made the handloom industry to face severe challenges from the organized textile sectors with superior technology. In a competitive market scenario, technological up-gradation and adaption are essential for an enterprise for manufacturing products with competitive price and enhanced quality [18]. In the post-MFA system, technology and skill up-gradation in the handloom industry took on added significance as the segment have been providing revenue and employment to a large population at the lower end of income distribution in many developing countries, including India [20]. It is evident from various reports that there is a positive response from the Indian handloom industry in adopting modern weaving technologies.

5. GOVERNMENT INITIATIVES ON THE TECHNOLOGICAL UP-GRADATION OF HANDLOOM INDUSTRY

The state and central governments have taken various measures to enhance production, productivity, and efficiency of the handloom sector and enhance the income and socio-economic status of the weavers. Major schemes implemented by the state and central government are given below.

5.1 National Handloom Development Programme (NHDP), and Comprehensive Handloom Cluster Development Scheme (CHCDS)

Over the last few years, inadequate attention has been contributed to the up-gradation of technology and supply of low-quality yarns, lead to the gradual decline of this sector. Emphasis was laid on using better technology and improving the skill level of the vast workforce of the industry. The Government provides the necessary capital for technology replacement through various self-employment schemes, which is being implemented in the state.

The Ministry of Textiles, Government of India has implemented a Block Level Handloom Cluster (BLHC) strategy for the growth of the handloom industry. The cluster development approach focuses on the formation of weavers' groups as a visible entity so that the groups become self-sustainable. This offers integrated and holistic cluster development by applying need-based measures where weavers can easily access the facility. The handloom cluster is described as a place where there is a large concentration of handlooms, which produces handloom cloth that conforms to market demands.

Based on the guidelines of the Government of India, Tamil Nadu Government implemented the Cluster Development programme under the National Handloom Development Programme (NHDP), and Comprehensive Handloom Cluster Development Scheme (CHCDS). Under these schemes, the handloom clusters are set up at Block Level where the concentration of the looms ranges from 200 to 500. As per the need, more than one cluster could be included in the identified block. The components for the block level handloom clusters are,

- Technological up-gradation
- Common Facility Centre including Common Service Center
- Skill Upgradation
- Engagement of Designer
- Project Management Cost
- Yarn Corpus Fund
- Design Development / CATD

During 2015-16 to 2017-18, under National Handloom Development Programme (NHDP)/ Comprehensive Handloom Cluster Development Scheme (CHCDS) there are 10 Block Level Handloom Clusters (BLHC), 4 new Block Level Handloom Clusters, 22 BLHCs under Trichy Mega Handloom Cluster, and 16 BLHCs under Virudhunagar Mega Handloom Cluster was established in Tamil Nadu. Name of the Block Level Handloom Clusters is listed in Table 5.

Table - 5: Name of the Block Level Handloom Clusters

| S. No | Name of the Block Level Handloom Cluster | No. of Beneficia ries | |
|----------|---|--------------------------------|--|
| | I. 10 Block Level Handloom Cluster | | |
| | LHC) West Arni | 678 | |
| 1 | | A COLUMN TO THE REAL PROPERTY. | |
| 2 | Palladam | 844 | |
| 3 | Kancheepuram | 810 | |
| 4 | Karamadai - I | 910 | |
| 5 | Ayothiyappattinam | 954 | |
| 6 | Chennimalai | 877 | |
| 7 | Tiruppur Block | 874 | |
| 8 | Paramakudi | 1189 | |
| 9 | Kuruthancode | 343 | |
| 10 | Pollachi North | 912 | |
| | New Block Level Handloom BLHC) | Cluster | |
| 11 | Arni - I | 703 | |
| 12 | Arni - II | 410 | |
| 13 | Nangavalli | 432 | |
| 14 | Kancheepuram - II | 412 | |
| | Trichy Mega Handloom Clus TMHC) | ter | |
| 15 | Thiruvidaimarudhur - I | 407 | |
| 16 | Thiruvidaimarudhur- II | 811 | |
| 17 | Thiruvidaimarudhur-III | 1020 | |
| 18 | Thirupanandal | 363 | |
| 19 | Ammapettai | 292 | |
| 20 | Jayankondam | 841 | |
| 21 | Andimadam | 445 | |
| 22 | T.Palur | 239 | |
| 23 | Sendurai | 279 | |
| 24 | Thathaiyangarpettai | 239 | |
| | 1 | | |

| S. No | Name of the Block Level Handloom Cluster | No. of Beneficia ries |
|----------|---|-----------------------------|
| 25 | Musiri | 71 |
| 26 | Thottiyam | 423 |
| 27 | Karur – I | 243 |
| 28 | Karur - II | 300 |
| 29 | Thanthoni | 272 |
| 30 | Aravakurichi | 246 |
| 31 | Palani | 661 |
| 32 | Dindigul - I | 2273 |
| 33 | Dindigul - II | 2129 |
| 34 | Athoor | 1673 |
| 35 | Thoppampatti | 357 |
| 36 | Mannargudi | 669 |
| | irudhunagar Mega Handloo VMHC) | m Cluster |
| 37 | Aruppukottai Block - I | 220 |
| 38 | Aruppukottai Block - II | 220 |
| 39 | Aruppukottai Block-III | 220 |
| 40 | Aruppukottai Block- IV | 220 |
| 41 | Srivilliputhur Block | 220 |
| 42 | Rajapalayam Block - I | 220 |
| 43 | Rajapalayam Block - II | 220 |
| 44 | Watrap Block | 220 |
| 45 | Sankarankoil Block | 220 |
| 46 | Paramakudi Block | 220 |
| 47 | Karaikudi Block | 220 |
| 48 | Watrap - III Block | 40 |
| 49 | Aruppukottai-V Block | 40 |
| 50 | Watrap-II, Block | 40 |
| 51 | Paramakudi Block-III | 40 |

| S. No | Name of the Block Level Handloom Cluster | No. of Beneficia ries |
|----------|---|-----------------------------|
| 52 | Paramakudi Block - II | 40 |

| S. No | Name of the Block Level Handloom Cluster | No. of Beneficia ries |
|----------|---|-----------------------------|
| | Total | 27221 |

Source: Policy Note, Handlooms and Textiles, Govt. of Tamil Nadu – 2018-19

A total of 27,221 handloom beneficiaries are covered under this scheme. The primary focus of the scheme is to enhance productivity through technological up-gradation of the existing looms, skill up-gradation of the weavers through training, product development and diversification through design interventions, to create required infrastructure, etc. which lead to enhanced earning of the weavers. Under the technological up-gradation component of BLHC scheme, the handlooms and preparatory machineries are upgraded with the latest technology. The details of technological up-gradation components and beneficiaries under the BLHC scheme are given in table 6. There are 23274 beneficiaries covered under this scheme during 2018-19 [21].

Table - 6: Technological up-gradation components and beneficiaries under BLHC scheme

| S. No | Component | No. of Beneficiaries |
|----------|--|-------------------------|
| 1 | Motorized Jacquard | 2070 |
| 2 | Jacquard on Existing Loom | 1864 |
| 3 | Dobby on Existing Loom | 449 |
| 4 | Headls & Reeds | 9091 |
| 5 | Purchase of Frame Loom | |
| | a) Up to 60" | 1001 |
| | b) Above 60" | 574 |
| 6 | Construction of Workshed | 632 |
| 7 | Lighting Units | 4598 |
| 8 | Take-Up & Let-Off | 260 |
| 9 | Warp & Fabric Beam | 1475 |
| 10 | Multi Butti Weaving Sley | 186 |
| 11 | Any Other Intervention | 615 |
| 12 | Motorized Pirn Winding Machine | 270 |
| 13 | Motorized Pirn Cum Bobbin/Duba Winding Machine | 79 |
| 14 | Motorized Warping Machine | 110 |
| • | TOTAL | 23274 |

Source: Policy Note, Handlooms and Textiles, Govt. of Tamil Nadu – 2018-19

5.2 Hathkargha Samvardhan Sahayata Sheme (HSS)

Another significant component under National Handloom Development Programme (NHDP)/ Comprehensive Handloom Cluster Development Scheme (CHCDS) is "Hathkargha Samvardhan Sahayata (HSS)". On August 7, 2016, the plan was announced for improving quality and productivity of the handloom industry through financial assistance for the technological up-gradation. The main objectives of the Hathkargha Samvardhan Sahayata scheme are:

- To facilitate the technological up-gradation in loom units.
- To encourage development capacities, to create employment opportunities in emerging technology areas.

Under the HSS Scheme, the financial implication for the technological up-gradation between the beneficiary and the government is in the ratio of 10:90. The state government of Tamil Nadu also implemented this Scheme. The admissible technological up-gradation items under this scheme are:

- Pneumatic jacquard system for a set of 4 handlooms.
- Motorized jacquard on the existing handloom.
- Take-up & let off motions on the existing handloom.
- Multiple box motion.
- Multiple buti weaving sley.
- Twin cloth weaving mechanism.
- Jacquard with complete set including installation.
- Dobby mechanism.
- Healds reeds, bobbins, shuttles etc. (set)
- Frame Loom up to 60" and above 60".
- Asu Machine (Manual and motorized).
- Warp beam & fabric beam.
- Normal and motorized warping machine.
- Motorized Pirn Winding machine.
- Motorized Prin- cum bobbin/ dubba Winding machine.
- Street warp sizing Kit (brush, sticks, spray gun etc.).

National Handloom Development Programme (NHDP)/ Comprehensive Handloom Cluster Development Scheme (CHCDS) cover the broad spectrum of handloom sector to meet the needs of the industry. Through technical upgradation, skill up-gradation, infrastructure development, this scheme empowers weavers to prepare a sustainable way for development and diversification in line with the trend of evolving markets [1].

5.3 Tamil Nadu Innovation Initiatives (TANII) Scheme

The State Government also have introduced "Tamil Nadu Innovation Initiatives (TANII) Scheme" during the year 2015-2016. The scheme was introduced under "State Innovation Fund" for upgrading handloom technology. Over a period of three years from 2015-2016 to 2017-2018, total 6000 motorized Jacquard lifting machines have been supplied at a cost of Rs. 675 lakh to handloom weavers. The following table 7 shows the details of district wise distribution of motorized Jacquard lifting machine [21].

Table - 7: Details of the district-wise distribution of motorized Jacquard lifting machine under TANII scheme

| Sl. No. | Circle | Year | | |
|------------|----------------|-----------|-----------|-----------|
| | | 2015-2016 | 2016-2017 | 2017-2018 |
| 1 | Coimbatore | 200 | 715 | 160 |
| 2 | Dindugul | 100 | _ | 80 |
| 3 | Erode | 400 | - | 350 |
| 4 | Kanchipuram | 400 | 445 | - |
| 5 | Kumbakonam | 300 | 365 | 80 |
| 6 | Paramakudi | 100 | - | 80 |
| 7 | Salem | 100 | 380 | 200 |
| 8 | Tiruppur | 200 | 220 | 230 |
| 9 | Tiruvannamalai | 100 | 350 | 100 |
| 10 | Virudhunagar | 100 | - | 80 |
| 11 | Madurai | - | 5 | 40 |

| 12 Tiruchengode | | 20 | 100 |
|-----------------|------|------|------|
| TOTAL | 2000 | 2500 | 1500 |

Source: Policy Note, Handlooms and Textiles, Govt. of Tamil Nadu – 2018-19

6. CONCLUSIONS

Indian handloom industry is constantly facing major hurdles for a long time. The weavers of this industry are struggling hard to keep the traditional craft alive. Even though there is a huge demand for the Indian handloom products, the industry is unable to meet the requirements due to various factors such as low production, decentralized in nature, obsolete technology, innovation in products, skill up-gradation, inadequate supply of raw materials, poor marketing, and quality. Technological up-gradation in the handloom industry has assumed added importance as such enterprises generate employment and income for people in the lower segment of income distribution in the developing countries. The state and central government devised a series of plans through various schemes for the upliftment of this industry. There is constant progress of these efforts through which the handloom industry is showing a positive development. It is important to elucidate the fact that, how far the handloom industry adapted to the new business environment after a decade down since phasing out of MFA. A particular point of interest in this context is the extent to which the handloom enterprises, which are typically small-scale and disadvantaged in accessing market and finance, have succeeded in standing up to the challenges of adopting and deploying modern technologies and impact the effort made. There is a need for the study in understanding the effects of the technological up-gradation and factors that affect these efforts.

7. REFERENCES

- [1]. Ministry of Textiles, 2018-19. Annual Report. New Delhi: Ministry of Textiles, Government of India
- [2]. MoT, 2019-20. Fourth All India Handloom Census. Census. New Delhi: Ministry of Textiles, Govt. of India Office of the Development Commissioners for Handlooms.
- [3]. Nandi S.N., 1995. Technology infrastructure and industry: the Indian situation. Productivity, 36(2), pp.246–57.
- [4]. Choi H.S., 1989. Transition from imitation to creation. Technological Forecasting and Social, 36(1/2), pp.209–
- [5]. Dimnik T.P. and Johnston D.A., 1993. Manufacturing managers and the adoption of advanced. Omega International Journal of Management Science, 21(2), pp.151–62.
- [6]. Inderpreet, S.A., 2014. An evaluation of impact of technology upgradations on manufacturing performance. International Journal of Indian Culture and Business Management, 9(2), pp.229-47.
- [7]. Sahai Biswambhar, 1956. Handloom Weaving Industry, in North India. PhD Thesis pp 208. Agra: Agra University.
- [8]. Nanekar K.R., 1968. Handloom Industry in Madhya Pradesh. PhD Thesis. Nagpur: Nagpur University.
- [9]. G. Srikantaiah, N.Seshadri and N.Jayaraman, August 1978. A Study of Handloom Sector to Increase Productivity. Coimbator: SITRA Report, GOI.
- [10]. Kulkarni R.G., July 1978. Improved Handlooms. Khadi Gramodyog, XVII(10), pp.507-11.
- [11]. Gujjulah Rajaiah, 1985. Handloom Industry in Andhra Pradesh-A study of selected Districts. M.Phil Thesis. New Delhi: Delhi University.
- [12]. Clark Nardinelli, 1986. Technology and Unemployment: The Case of the Handloom Weavers. Southern Economic Journal, 53(1), pp.87-94.
- [13]. Manuel P.M., 1987. Capacity Utilisation in the Handloom Industry in Kerala- With Special Reference to Weavers Industrial Societies. M Phil Thesis. University of Kerala.
- [14]. Shailaja D. Naik and Padhye R.N., 1996. Targeting the Handloom Weavers. Kurukshethra, XLIV(12), p.51.
- [15]. Soundarapandian, M., 2002. Growth and Prospects of Handloom Sector in India. Occasional Paper 22. Mumbai: National Bank for Agriculture and Rural Development.
- [16]. Bhavani T.A., 2002. Small-scale units in the era of globalization: problems and. Economical Political Weekly, 29(37), pp.3041–52.
- [17]. Ohja. R.N., August, 2003. Technological Development in Handloom Sector. Yojana, 47, pp.55 57.
- [18]. Hazarika, B., et al., 2016. Adoption of modern weaving technology in the handloom micro-enterprises in Assam: A Double Hurdle approach. Technological Forecasting & Social Change, January. pp.344-56.
- [19]. Tewari, M., 2006. Adjustment in India's Textile and Apparel Industry: Reworking Historical Legacies in a Post-MFA World. Environment and Planning A, 38(12), pp.2325-44.

[20]. Alin Borah Bortamuly, K., 2015. Determinants of the adoption of modern technology in the handloom industry in Assam. Technological Forecasting and Social Change, 90, Part B, pp.400-09.

[21]. Dept. of Handlooms and Textiles, 2018-19. Policy Note. Annual Report. Chennai: Govt. of Tamil Nadu.

