The Technical Efficiency of Handloom Clusters in India

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Introduction

The handloom sector is known for its heritage and the tradition of excellent craftsmanship. It provides livelihood to millions of weavers and craftsperson. The industry has not only survived but also grown over the decades due to its inherent strengths like flexibility of production in small quantities, openness to innovation, low level of capital investment and immense possibility of designing fabrics. Government of India has continued to accord priority to this sector. An imperative step has been taken by the office of Development Commissioner - Handlooms, Ministry of Textiles, Government of India, to promote and develop its exclusiveness for the global market. It's a comprehensive and innovative attempt among others to promote merchandising and marketing both at the domestic and international levels which is central to the success of the handloom sector. Brand equity of handlooms is the need of the hour.

Some of the exclusive product ranges include: Silk Saree from Varanasi, scarf from Barabanki, home furnishing from Bijnore, shawls from Kullu, ikat sari from Sonepur and Bargarh, cotton saree from Chanderi and many other products can be source from the website.

Literature Survey

Entrepreneurship Development Institute of India as a National Resource Agency [NRA] for co-ordination, monitoring and hand holding support of cluster development interventions at 20 locations. Synergised & consistent support to the Handloom Weavers of 20 selected Handloom clusters across the country through focused yet flexible & holistic Approach.

Role of NRA :

- Facilitate, strengthen and provide support services (Training of Cluster Development Executives) for augmenting cluster development initiatives identified by the Office of Development Commissioner (Handlooms).
- Provide effective monitoring and mentoring services for the development of 20 pilot Handloom clusters at different locations.
- Initiate an interactive forum for Cluster Development Executives (CDEs), Associations, Business Development Service (BDS) providers, others stakeholders, implementing agencies and support organizations by means of a newsletter, brochure etc;
- Carry out documentation of 'best practices' in clusters that can foster demonstration effect in others.

- Review quarterly the progress, identify the support to be provided, prepare time frame of actions and seek necessary approval from the O/o DC (HL) wherever necessary.
- Convene period meetings in close co-ordination with the Apex committee at National level to appraise progress, seek approval and inputs if need be for technical, design development and other such issues deemed fit.
- Sensitize policy makers about the requirements of Handloom clusters in close co-ordination with the Apex Committee at the National Level.
- On behalf of DC (HL) disburse the project grant with necessary approval of the Apex Committee & evolve suitable guideline towards the same in close co-ordination with Office of Development Commissioner (Handloom)
- Ensure submission of reports, audited statement, action plan from the Implementing Agencies from time to time and submit the same back to Apex Committee for necessary perusal.
- Carry out any other roles as part of Integrated Handloom Cluster Development Scheme (IHCDS) as assigned by Development Commissioner (Handloom) - DC (HL) from time to time.

Objectives:

- Co-ordinate cluster development activities all across the 20 clusters identified by the ministry at National Level.
- Provide monitoring and support services to ensure holistic development of Handloom clusters.
- Facilitate cluster activity network by dissemination of information on various aspects of cluster development.
- Establish a documentation centre in order to facilitate mutual learning. The documentation of 'best practices' in one cluster can foster demonstration effect in others.
- Provide an interactive forum for CDEs, Govt. organisations, implementing agencies by organizing meetings/ workshops whenever required.
- Enable clusters to take advantage of globalization by providing customized intervention in critical business areas.
- Sensitize policy makers about the requirements of Handloom clusters.

Approach:

The Agency with a Secretariat is being managed by an interdisciplinary team of 8-9 professionals having expertise in diverse disciplines related to cluster development. Senior experts/ consultants (from the field) in the areas of marketing, technology, export, design and other specialised discipline, to take care of the specific requirements of

Handloom clusters. The centre has been involved in developing data bank of BDS providers to enable the Implementing Agencies source quality business development services. The Centre has adopted a hub and spoke strategy where in its regional centres serve the needs of clusters at the local level whereas high end expertise are being provided by the head office. Major research and documentation activities of the activities being supported by the Agency are being carried out at its head quarter in Ahmedabad.

As mentioned earlier, interventions for cluster development call for well-trained change and development agents. Therefore, the Agency initially focussed on capacity building of CDEs from each target cluster. To accomplish this, the Centre organised CDE programme. This training programme was organised in three phases. The first phase enabled the participants in understanding a cluster and its internal dynamics. Inputs were given on how to do diagnostic study, cluster mapping, structure analysis, value chain analysis, SWOT analysis etc. In the second phase the CDE went back to their respective clusters to carry out diagnostic study (of the clusters) by meeting entrepreneurs, members of the local associations, support institutions, BDS providers and opinion leaders. They have prepared a diagnostic study report. In the third phase of the programme, CDE made presentation on the findings of the cluster diagnostic study. Accordingly the cluster vision and action plan have been developed with active participation of the major cluster stakeholders. The CDEs have also been trained on how to do resource mobilisation, trust building, networking, capacity building etc. This also helps them to understand the techniques of carrying out evaluation and monitoring function.

The faculty members of the Agency have been making on site visits to the clusters to understand the prevalent situation, monitor progress of the cluster development scheme and provide hand holding support to ensure holistic development of the clusters. Outside technical experts/ consultants have also been involved in the activities of the centre. Efforts are to screen all technological interventions with visit once in a quarter to the clusters.

Periodic meeting/ workshops have been been organised where CDEs and cluster stakeholders have been invited to share their experiences and expectations. This has enabled understanding the problem areas and devising a mechanism to sort out the same. This has also served as a platform for mutual learning and understanding of the best practices of others. Ministry of MSME proposed enhanced budget allocation during 12th five Year Plan for the promotion of the scheme in a bigger way, with certain modification. Due to global recession there is need for the study on the Technical Efficiency of KVIs Clusters in India.

Objectives of the Study

The objectives are

1. To study the list of Handloom Clusters exists in India.
2. To Study the Technical Efficiency (θ) and Peer Weights (λi) of Handloom Clusters in India.
3. To Study the Input Slacks (S-) and Output Slacks (S+) of Handloom Clusters in India.
4. To Study the Variable Returns to Scale of Handloom Clusters in India.

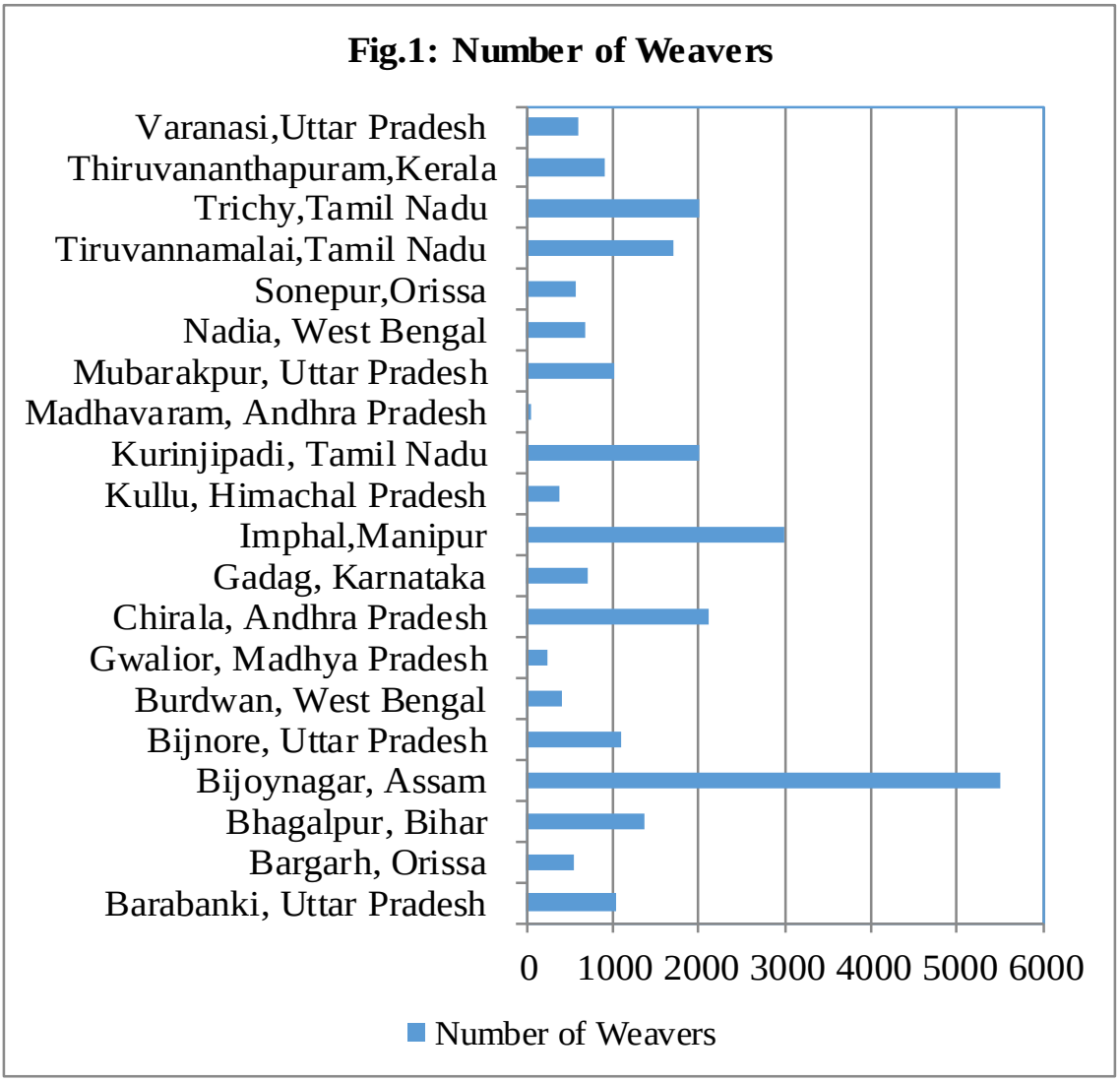
Methodology

The methodology adopted is collection of data from, Office of Development Commissioner (Handlooms)., Government of India and analyzing with Data Envelopment Analysis of Input Oriented Banker Charnes Cooper (BCC) Model by taking Number of Weavers, Yarn Worth (In Rs Lakhs) and Amount Utilized (Rs. In lakhs) as inputs and Sales, as output. A DMU is efficient if θ = 1, S- = 0 and S+ = 0.

Statistical Analysis

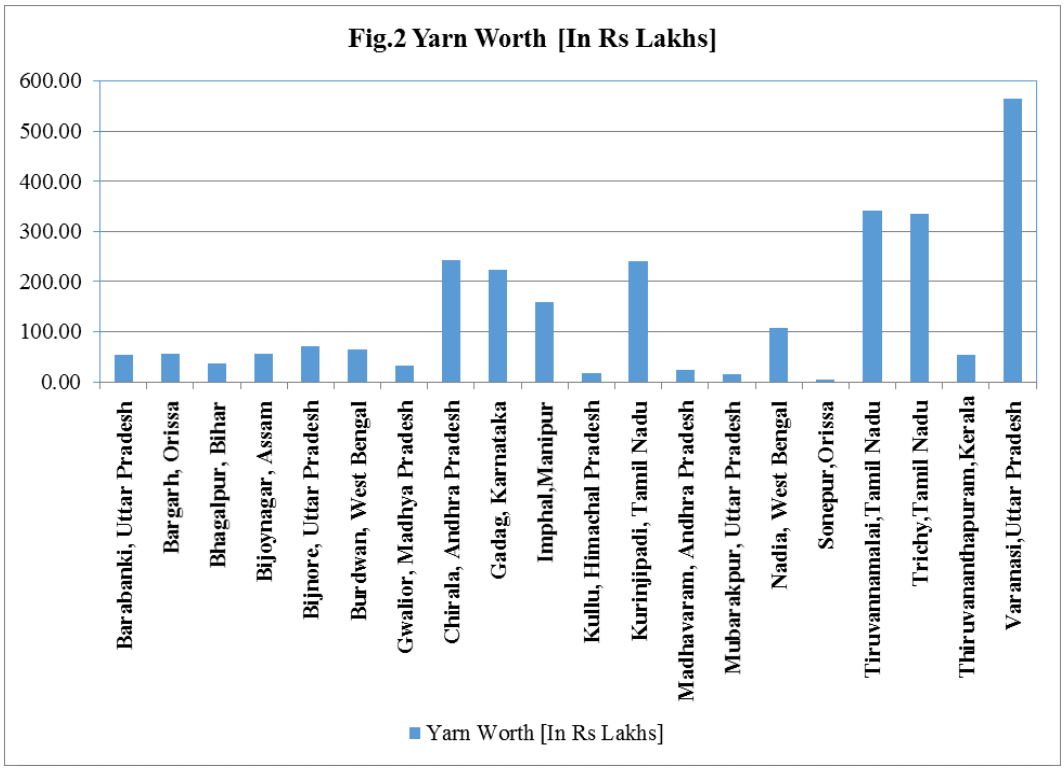
1 Handloom Clusters

The list of Handloom Clusters exists in India and the no. of weavers in each cluster is given in Fig.1 and Fig.5.



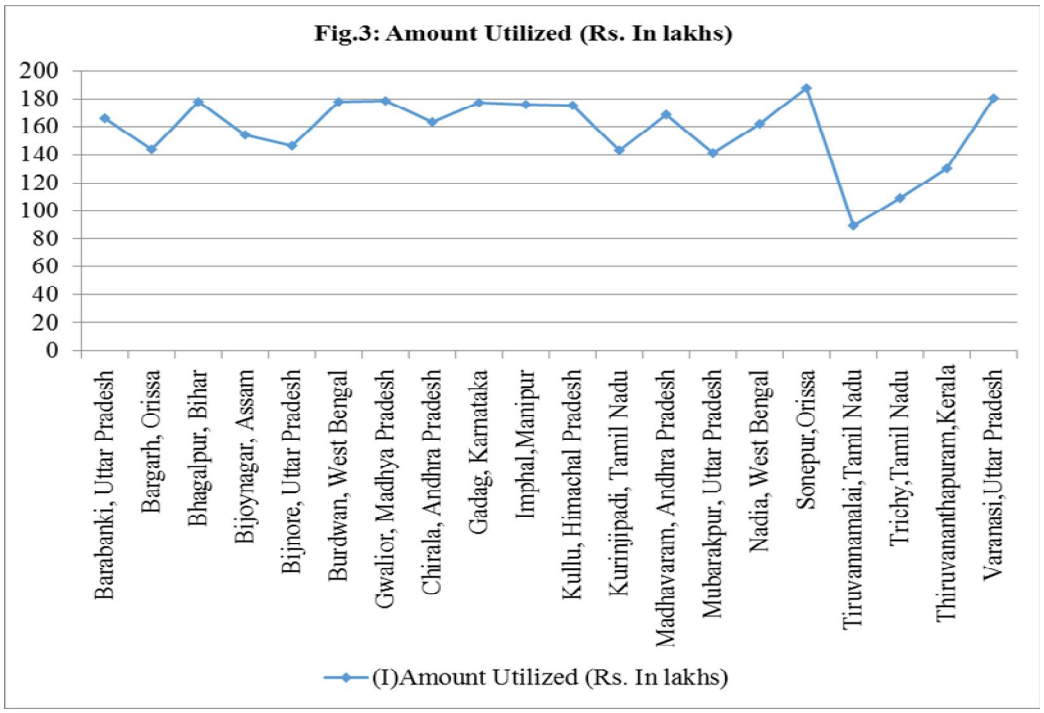
Source: DC, Handlooms, Government of India.

The Worth of Yarn given to each clusters is given in the fig.2.



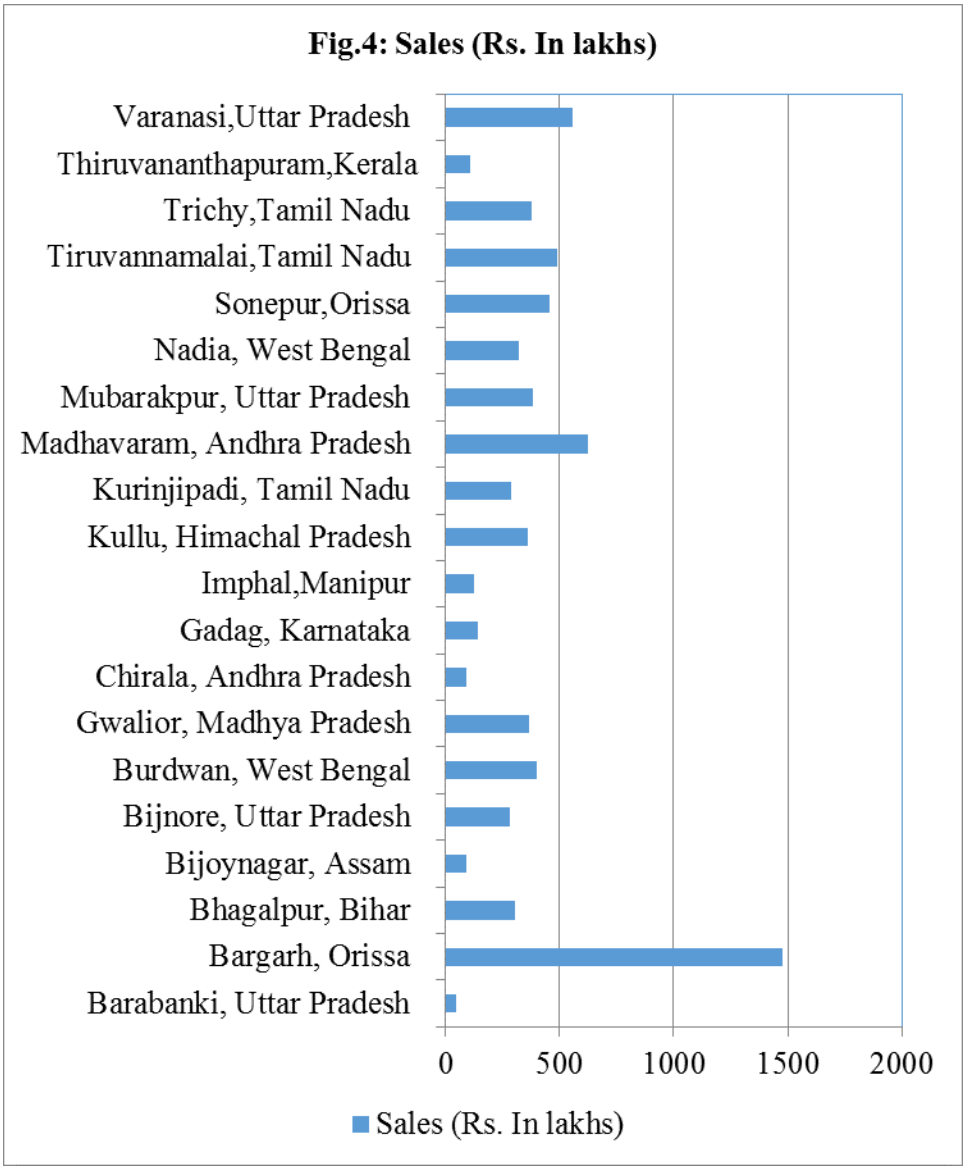
Source: DC, Handlooms, Government of India.

The amount utilized by each clusters is given in the fig.3.



Source: DC, Handlooms, Government of India.

The sales done by each cluster is given in the figure 4.



Source: DC, Handlooms, Government of India.

The location and selection of project sites of the clusters is given in the Indian Map Fig.5. The list of implementing agencies of the 20 clusters is given in table 1.

Fig.5 Pilot Project Sites of 20 Handloom Clusters

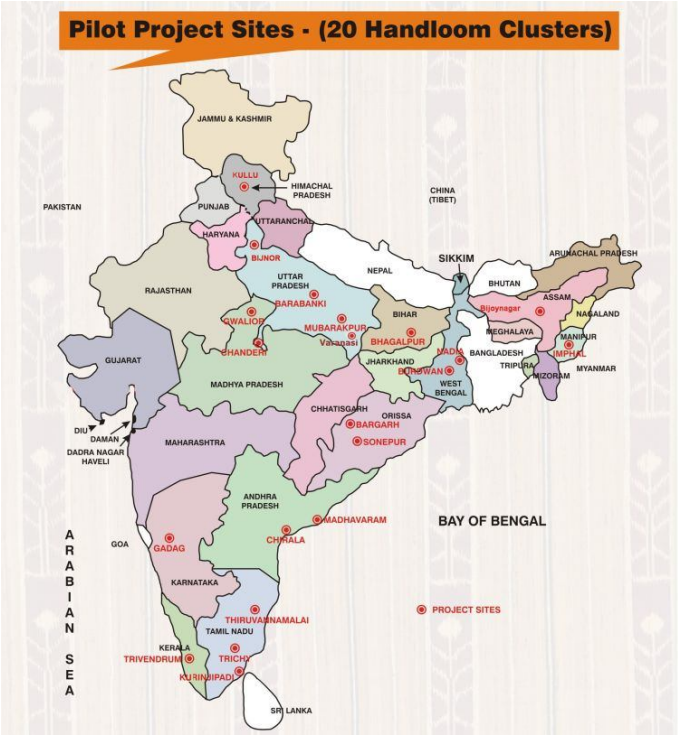


Table 1: List of Implementing Agencies	
Cluster	**Implementing Agency name & Address**
Barabanki, Uttar Pradesh	National Institute of Micro Small And Medium Enterprises. Yousufguda, Hyderabad-500045 (Andhra Pradesh)
Bargarh, Orissa	Orissa State Handloom Weavers Coop. Society Ltd. Pandit Jawaharlal Nehru Marg, Bhubaneshwar - 751 001 (Orissa)
Bhagalpur, Bihar	Asian Society for Entrepreneurship Education & Development. Aseed House, C-8/8007, Vasant Kunj, New Delhi - 110 070
Bijoynagar, Assam	State Institute of Rural Development G. S. Road, Khanapara, Guwahati - 781 022, (Assam)
Bijnore, Uttar Pradesh	Textile Committee P. Balu Road, Prabhadevi Chowk, Mumbai 400 025, (Maharashtra)
Burdwan, West Bengal	National Handloom Development Corporation Ltd. 10 & 11 Floors, Vikas Deep, 22 Station Road, Lucknow - 226 001, (Uttar Pradesh)
Chirala, Andhra Pradesh	Andhra Pradesh State Handloom Weavers Co-Operative Society Ltd. D. No. 305-770, Weavers Bhawan, Vittal Wadi, Chowrasta, Nayanaguda - 500 001, Hyderabad.(Andhra Pradesh)
Gadag, Karnataka	Karnataka Handloom Development Corporation Ltd. 1, Tank Road, Priyadarshini commercial Complex, Halasoor, Bangalore - 560 042 (Karnataka)
Gwalior/Chanderi, Madhya Pradesh	Entrepreneurship Development Institute of India Near Village Bhat, Via Ahmedabad Airport & Indira Bridge, P.O. Bhat - 382 428, Dist. Gandhinagar (Gujarat)

Imphal,Manipur	Indian Institute of Entrepreneurship Bashistha Chariali, Lalmati, Guwahati - 781 029, (Assam)
Kullu, Himachal Pradesh	H. P. State Handicraft & Handloom Corporation Ltd. D-2, SDA Commercial Complex, Kasumpti, Simla - 171 009, (Himachal Pradesh)
Kurinjipadi, Tamil Nadu	Tamilnadu Handloom Weavers Coop. Society Ltd. Balasundaram Buildings, 350, Pantheon Road, Egmore, Chennai - 600 008, (Tamil Nadu)
Madhavaram, Andhra Pradesh	Andhra Pradesh State Handloom Weavers Co-Operative Society Ltd. D. No. 305-770, Weavers Bhawan, Vittal Wadi, Chowrasta, Nayanaguda, Hyderabad - 500 001 (Andhra Pradesh)
Mubarakpur, Uttar Pradesh	National Institute of Micro Small And Medium Enterprises Yousufguda, Hyderabad - 500 045 (Andhra Pradesh)
Nadia, West Bengal	Textile Committee , P. Balu Road, Prabhadevi Chowk, Mumbai - 400 025, (Maharashtra)
Sonepur, Orissa	Entrepreneurship Development Institute of India Near Village Bhat, Via Ahmedabad Airport & Indira Bridge, P.O. Bhat - 382 428, Dist. Gandhinagar (Gujarat)
Tiruvannamalai Tamil Nadu	Tamilnadu Handloom Weavers Coop. Society Ltd. Balasundaram Buildings, 350, Pantheon Road, Egmore, Chennai - 600 008, (Tamil Nadu)
Trichy, Tamil Nadu	Textile Committee, P. Balu Road, Prabhadevi Chowk Mumbai - 400 025, (Maharashtra)
Thiruvananthapuram, Kerala	Kerala State Handloom Development Corporation Ltd. PM-32/249, Thilleri Road, Cannanore - 670 001, (Kerala)
Varanasi, Uttar Pradesh	Entrepreneurship Development Institute of India Near Village Bhat, Via Ahmedabad Airport & Indira Bridge, P.O. Bhat - 382 428, Dist. Gandhinagar (Gujarat)

4. Technical Efficiency of Handloom Clusters

4.1 Data Structure

The Number of Weavers, Yarn Worth (In Rs Lakhs) and Amount Utilized (Rs. In lakhs) as inputs and Sales, is taken as output corresponding to 20 DMUs (Clusters).

4.2 Data Envelopment Analysis - Banker, Charnes and Cooper Model (BCC Model)

Input Oriented BCC Model (BCC-I)

$$\text{Min} \quad Z0 = \theta - \varepsilon \vec{1} S^+ - \varepsilon \vec{1} S^-$$

$$\theta, \lambda, S^+, S^-$$

$$\text{Subject to} \quad Y\lambda - S^+ = Y0$$

$$\theta X0 - X\lambda - S^- = 0$$

$$\vec{1}\lambda \geq 1$$

$$\lambda, S^+, S^- \geq 0$$

4.3 Model Description

The Scalar variable θ appears in the primal problem, is the reduction applied to all inputs of DMUs to improve efficiency. This reduction is applied simultaneously to all inputs and results in a radial movement toward the envelopment surface. The presence of non-Archimedean (Infinitesimal constant) ε in the primal objective function effectively allows the minimization over θ to preempt the optimization involving the slacks. Thus, the optimization can be computed in a two-stage process with

i) maximal reduction of inputs being achieved first via θ

ii) then in the second stage movement on to the efficient frontier is achieved via the positive input and output slack variables (S-, S+)

Here, the constraint

→

1 λ ≥ 1 is known as convexity constraints, which will admit variable return to scale (VRS).

The above discussion leads to form the following statement.

A DMU is efficient if and only if

a) θ = 1,

b) All slacks are zero. S- = 0 and S+ = 0.

4.4 Computing Methodology

Initially we consider Barabanki Cluster, as the studied DMU and the LP Model is formulated as given below
Min θ0

Subject to

45.39 λ1 + 1476.3 λ2 +…….. 555.21 λ_{20} ≥ 98.12 Output Constraints

1050 θ_0 - 1050 λ1 - 550 λ2 -…….. 600 λ_{20} ≥0 Input Constraints

55θ_0 - 55 λ1 - 56.2 λ2 -…….. 563.5 λ_{20} ≥0 Input Constraints

166.06 θ_0 -166.06 λ1- 143.64 λ2- …… 180.24 λ_{20} ≥0 Input Constraints

λ1+λ2+… λ_{20} =1.

λ1,λ2,… λ_{20} ≥0, θ0 is unrestricted.

By solving the above and continuously changing the studied DMUs we get the values of λi's and θi's for each DMU.

4.5 Efficiency Scores

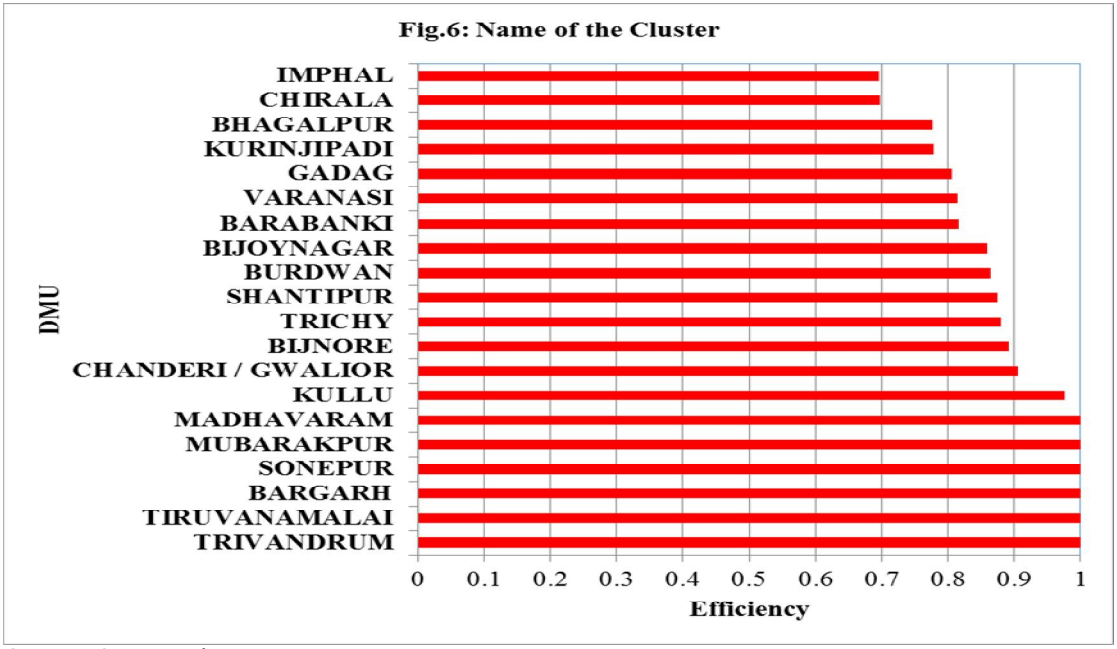
The value of θi's being the efficiency scores of the 20 Handloom Clusters are given in the Table 2 and in the Figure 5.

Table 2: Efficiency Scores of the Handloom Clusters in India									
No.	**DMU**	**Score**	**Rank**	**Reference set (lambda)**					
1	Barabanki	0.82	14	Madh	0.07	Muba	0.20	Tri	0.72
2	Bargarh (Barg)	1.00	1	Barg	1.00				
3	Bhagalpur	0.78	18	Barg	0.01	Muba	0.69	Tri	0.30
4	Bijoynagar	0.86	13	Muba	0.17	Tri	0.83		
5	Bijnore	0.89	9	Barg	0.12	Tvm	0.03	Tri	0.85
6	Burdwan	0.87	12	Barg	0.58	Madh	0.42		
7	Chanderi / gwalior	0.91	8	Madh	0.80	Muba	0.04	Tri	0.15
8	Chirala	0.70	19	Tvm	0.40	Tri	0.60		
9	Gadag	0.81	16	Barg	0.99	Tvm	0.01		
10	Imphal	0.70	20	Tvm	0.20	Tri	0.80		
11	Kullu	0.98	7	Madh	0.51	Muba	0.15	Sone	0.34
12	Kurinjipadi	0.78	17	Tvm	0.46	Tri	0.54		
13	Madhavaram (Madh)	1.00	1	Madh	1.00				
14	Mubarakpur (Muba)	1.00	1	Muba	1.00				
15	Shantipur	0.87	11	Barg	0.97	Tvm	0.03		
16	Sonepur (Sone)	1.00	1	Sone	1.00				
17	Tiruvanamalai (Tvm)	1.00	1	Tvm	1.00				
18	Trichy	0.88	10	Tvm	0.84	Tri	0.16		
19	Trivandrum (Tri)	1.00	1	Tri	1.00				
20	Varanasi	0.81	15	Barg	0.88	Madh	0.12		

Source: Computed Data

As per table 2 and figure 6, nearly 6 clusters have θi = 1 and rank=1 and they are highly efficient. The efficiencies and ranks of other clusters θ < 1 are also given. They have to perform well to attain 100% efficiency and rank 1.

The overall efficiency of the Handloom Clusters in India is 0.88 which is much satisfactory. It needs only 12% to attain 100% efficiency.



Source: Computed Data

Frequency of highly efficient cluster is given in the Table 3.

Table 3: Frequency in Reference Set	
Peer set	Frequency to other DMUs
Bargarh	5
Madhavaram	4
Mubarakpur	4
Sonepur	0
Tiruvanamalai	6
Trivandrum	8

Source: Computed Data

Among the 6 efficient clusters Trivandrum comes first as it is referred 8 times, followed by Tiruvannamalai, Bargarh, Madhavaram, Mubarakpur and Sonepur.

The projections of the variables is given in the table 4.

Table 4: Projections of the Variables					
No.	**DMU**	**Score**			
	I/O	**Data**	**Projection**	**Difference**	**%**
1	BARABANKI	0.82			
	Number of Weavers	1050	857.3763	-192.624	-18.35%
	Yarn Worth [In Rs Lakhs]	55	44.91019	-10.0898	-18.35%
	Amount Utilized (Rs. In lakhs)	166.06	135.5961	-30.4639	-18.35%
	Sales (Rs. In lakhs)	45.39	201.5972	156.2072	344.14%
2	BARGARH	1			
	Number of Weavers	550	550	0	0.00%
	Yarn Worth [In Rs Lakhs]	56.2	56.2	0	0.00%
	Amount Utilized (Rs. In lakhs)	143.64	143.64	0	0.00%
	Sales (Rs. In lakhs)	1476.29	1476.29	0	0.00%
3	BHAGALPUR	0.78			
	Number of Weavers	1380	966.6226	-413.377	-29.95%
	Yarn Worth [In Rs Lakhs]	36.5	28.33061	-8.16939	-22.38%
	Amount Utilized (Rs. In lakhs)	178.12	138.2534	-39.8666	-22.38%
	Sales (Rs. In lakhs)	306.68	306.68	0	0.00%
4	BIJOYNAGAR	0.86			
	Number of Weavers	5500	917.001	-4583	-83.33%
	Yarn Worth [In Rs Lakhs]	56.4	48.4427	-7.9573	-14.11%
	Amount Utilized (Rs. In lakhs)	154.11	132.3671	-21.7429	-14.11%
	Sales (Rs. In lakhs)	91.6	153.859	62.25901	67.97%
5	BIJNORE	0.89			
	Number of Weavers	1100	884.2363	-215.764	-19.61%
	Yarn Worth [In Rs Lakhs]	72	64.22729	-7.77271	-10.80%
	Amount Utilized (Rs. In lakhs)	146.55	130.7293	-15.8207	-10.80%
	Sales (Rs. In lakhs)	280.6	280.6	0	0.00%
6	BURDWAN	0.87			
	Number of Weavers	398	344.2734	-53.7266	-13.50%
	Yarn Worth [In Rs Lakhs]	63.93	43.18039	-20.7496	-32.46%
	Amount Utilized (Rs. In lakhs)	178.16	154.1099	-24.0501	-13.50%
	Sales (Rs. In lakhs)	396.99	1120.467	723.4765	182.24%
7	CHANDERI / GWALIOR	0.91			
	Number of Weavers	250	226.5461	-23.4539	-9.38%
	Yarn Worth [In Rs Lakhs]	32.25	29.22445	-3.02555	-9.38%
	Amount Utilized (Rs. In lakhs)	178.45	161.7086	-16.7414	-9.38%

	Sales (Rs. In lakhs)	364.9	534.1517	169.2517	46.38%
8	CHIRALA	0.698			
	Number of Weavers	2100	1221.34	-878.66	-41.84%
	Yarn Worth [In Rs Lakhs]	243.36	169.8791	-73.4809	-30.19%
	Amount Utilized (Rs. In lakhs)	163.39	114.0555	-49.3345	-30.19%
	Sales (Rs. In lakhs)	91.84	261.9409	170.1009	185.21%
9	GADAG	0.81			
	Number of Weavers	703	566.7645	-136.235	-19.38%
	Yarn Worth [In Rs Lakhs]	224	60.35177	-163.648	-73.06%
	Amount Utilized (Rs. In lakhs)	177.19	142.8521	-34.3379	-19.38%
	Sales (Rs. In lakhs)	142.3	1461.945	1319.645	927.37%
10	IMPHAL	0.696			
	Number of Weavers	2980	1057.484	-1922.52	-64.51%
	Yarn Worth [In Rs Lakhs]	160	111.3005	-48.6995	-30.44%
	Amount Utilized (Rs. In lakhs)	176	122.4306	-53.5694	-30.44%
	Sales (Rs. In lakhs)	124.09	183.0872	58.99722	47.54%
11	KULLU	0.98			
	Number of Weavers	380	371.2378	-8.7622	-2.31%
	Yarn Worth [In Rs Lakhs]	17.35	16.94994	-0.40006	-2.31%
	Amount Utilized (Rs. In lakhs)	175.11	171.0722	-4.03776	-2.31%
	Sales (Rs. In lakhs)	360	530.1539	170.1539	47.26%
12	KURINJIPADI	0.78			
	Number of Weavers	2000	1270.899	-729.101	-36.46%
	Yarn Worth [In Rs Lakhs]	241	187.5962	-53.4038	-22.16%
	Amount Utilized (Rs. In lakhs)	143.27	111.5224	-31.7476	-22.16%
	Sales (Rs. In lakhs)	284.75	285.7903	1.040275	0.37%
13	MADHAVARAM	1			
	Number of Weavers	57	57	0	0.00%
	Yarn Worth [In Rs Lakhs]	25	25	0	0.00%
	Amount Utilized (Rs. In lakhs)	168.73	168.73	0	0.00%
	Sales (Rs. In lakhs)	623.6	623.6	0	0.00%
14	MUBARAKPUR	1			
	Number of Weavers	1000	1000	0	0.00%
	Yarn Worth [In Rs Lakhs]	16.43	16.43	0	0.00%
	Amount Utilized (Rs. In lakhs)	141.58	141.58	0	0.00%
	Sales (Rs. In lakhs)	381.16	381.16	0	0.00%
15	SHANTIPUR	0.87			
	Number of Weavers	675	590.2224	-84.7776	-12.56%
	Yarn Worth [In Rs Lakhs]	106.87	66.16115	-40.7088	-38.09%
	Amount Utilized (Rs. In lakhs)	162.11	141.7495	-20.3605	-12.56%
	Sales (Rs. In lakhs)	321.68	1441.874	1120.194	348.23%
16	SONEPUR	1			
	Number of Weavers	561	561	0	0.00%
	Yarn Worth [In Rs Lakhs]	5	5	0	0.00%
	Amount Utilized (Rs. In lakhs)	188.03	188.03	0	0.00%
	Sales (Rs. In lakhs)	456.45	456.45	0	0.00%
17	TIRUVANAMALAI	1			
	Number of Weavers	1700	1700	0	0.00%
	Yarn Worth [In Rs Lakhs]	341	341	0	0.00%
	Amount Utilized (Rs. In lakhs)	89.59	89.59	0	0.00%
	Sales (Rs. In lakhs)	492.29	492.29	0	0.00%
18	TRICHY	0.88			
	Number of Weavers	2000	1570.342	-429.658	-21.48%
	Yarn Worth [In Rs Lakhs]	335.14	294.6474	-40.4926	-12.08%
	Amount Utilized (Rs. In lakhs)	109.44	96.21713	-13.2229	-12.08%

	Sales (Rs. In lakhs)	374.88	429.8939	55.01385	14.68%
19	TRIVANDRUM	1			
	Number of Weavers	900	900	0	0.00%
	Yarn Worth [In Rs Lakhs]	55	55	0	0.00%
	Amount Utilized (Rs. In lakhs)	130.48	130.48	0	0.00%
	Sales (Rs. In lakhs)	107.3	107.3	0	0.00%
20	VARANASI	0.81			
	Number of Weavers	600	488.57	-111.43	-18.57%
	Yarn Worth [In Rs Lakhs]	563.5	52.31	-511.19	-90.72%
	Amount Utilized (Rs. In lakhs)	180.24	146.77	-33.47	-18.57%
	Sales (Rs. In lakhs)	555.21	1370.04	814.83	146.76%

Source: Computed Data

The weight of the variable is given in table 5.

Table 5: Weight of the variables

No.	DMU	Score	V(1)	V(2)	V(3)	U(0)	U(1)
1	Barabanki	0.82	0.00	0.00	0.00	0.82	-
2	Bargarh	1.00	0.00	0.01	0.00	-	0.00
3	Bhagalpur	0.78	-	0.00	0.01	0.76	0.00
4	Bijoynagar	0.86	-	0.00	0.01	0.86	-
5	Bijnore	0.89	-	0.00	0.01	0.87	0.00
6	Burdwan	0.87	0.00	-	0.01	0.87	-
7	Chanderi / Gwalior	0.91	0.00	0.00	0.01	0.91	-
8	Chirala	0.70	-	0.00	0.01	0.70	-
9	Gadag	0.81	0.00	-	0.00	0.81	-
10	Imphal	0.70	-	0.00	0.01	0.70	-
11	Kullu	0.98	0.00	0.01	0.00	0.98	-
12	Kurinjipadi	0.78	-	0.00	0.01	0.78	-
13	Madhavaram	1.00	0.02	-	-	-	0.00
14	Mubarakpur	1.00	-	0.02	0.01	0.76	0.00
15	Shantipur	0.87	0.00	-	0.01	0.87	-
16	Sonepur	1.00	0.00	0.05	-	-	0.00
17	Tiruvanamalai	1.00	-	-	0.01	0.70	0.00
18	Trichy	0.88	-	0.00	0.01	0.88	-
19	Trivandrum	1.00	-	0.00	0.01	0.99	0.00
20	Varanasi	0.81	0.00	-	0.00	0.81	-

Source: Computed Data

The weighted data of the variable is given in table 6.

Table 6: Weighted data

No.	DMU	Score	VX(1)	VX(2)	VX(3)	UY(0)	UY(1)
1	Barabanki	0.82	0.15	0.09	0.75	0.82	-
2	Bargarh	1.00	0.17	0.78	0.05	-	1.00
3	Bhagalpur	0.78	-	0.04	0.96	0.76	0.02
4	Bijoynagar	0.86	-	0.10	0.90	0.86	-
5	Bijnore	0.89	-	0.07	0.93	0.87	0.02
6	Burdwan	0.87	0.10	-	0.90	0.87	-
7	Chanderi / Gwalior	0.91	0.04	0.06	0.90	0.91	-
8	Chirala	0.70	-	0.18	0.82	0.70	-
9	Gadag	0.81	0.16	-	0.84	0.81	-
10	Imphal	0.70	-	0.12	0.88	0.70	-
11	Kullu	0.98	0.08	0.16	0.76	0.98	-
12	Kurinjipadi	0.78	-	0.19	0.81	0.78	-
13	Madhavaram	1.00	1.00	-	-	-	1.00
14	Mubarakpur	1.00	-	0.28	0.72	0.76	0.24

15	Shantipur	0.87	0.16	-	0.84	0.87	-
16	Sonepur	1.00	0.74	0.26	-	-	1.00
17	Tiruvanamalai	1.00	-	-	1.00	0.70	0.30
18	Trichy	0.88	-	0.30	0.70	0.88	-
19	Trivandrum	1.00	-	0.06	0.94	0.99	0.01
20	Varanasi	0.81	0.14	-	0.86	0.81	-

Source: Computed Data

The Input and Output Slacks of Handloom Clusters is given in the table 7.

Table 7: : Input and Output Slacks of Handloom Clusters in India

No.	DMU	Score	Excess Number of Weavers	Excess Yarn Worth [In Rs Lakhs]	Excess Amount Utilized (Rs. In lakhs)	Shortage Sales (Rs. In lakhs)
			S-(1)	S-(2)	S-(3)	S+(1)
1	Barabanki	0.82	-	-	0	156.21
2	Bargarh	1.00	-	-	0	-
3	Bhagalpur	0.78	104.51	-	0	-
4	Bijoynagar	0.86	3,807.02	-	0	62.26
5	Bijnore	0.89	97.01	-	0	-
6	Burdwan	0.87	-	12.12	0	723.48
7	Chanderi / Gwalior	0.91	-	-	0	169.25
8	Chirala	0.70	244.58	-	0	170.10
9	Gadag	0.81	-	120.24	0	1,319.65
10	Imphal	0.70	1,015.49	-	0	59.00
11	Kullu	0.98	-	-	0	170.15
12	Kurinjipadi	0.78	285.92	-	0	1.04
13	Madhavaram	1.00	-	-	0	-
14	Mubarakpur	1.00	-	-	0	-
15	Shantipur	0.87	-	27.29	0	1,120.19
16	Sonepur	1.00	-	-	0	-
17	Tiruvanamalai	1.00	-	-	0	-
18	Trichy	0.88	188.01	-	0	55.01
19	Trivandrum	1.00	-	-	0	-
20	Varanasi	0.81	-	406.54	0	814.83

Source: Computed Data

6 Clusters, are efficient by having $\theta = 1$, $S^- = 0$ and $S^+ = 0$. The remaining 14 clusters need improvement by increase in annual Sales. The $S > 0$ obtained for other 16 clusters reveals the excess Production in Rs.lakhs (S-) in the Clusters or shortage in annual sales (S+).

Variable Return to Scale of Handloom Clusters

For a long time DEA models were based on Constant Returns to Scale (CRS) and it has been criticized as a limiting factor for the application of DEA. Many economists viewed CRS assumption as over restrictive and preferred alternative methodologies. Banker et al (1984) for the first time introduced the VRS in DEA models through convexity constraints and thereafter remarkable change has led to make changes in CCR DEA models. Variable Return to Scale of Clusters is given in table 8.

Table 8: Variable Return to Scale of Handloom Clusters in India				
No.	**DMU**	**Score**	**RTS**	**RTS of Projected DMU**
1	Barabanki	0.82		Increasing
2	Bargarh	1.00	Constant	
3	Bhagalpur	0.78		Increasing
4	Bijoynagar	0.86		Increasing
5	Bijnore	0.89		Increasing
6	Burdwan	0.87		Constant
7	Chanderi / Gwalior	0.91		Increasing
8	Chirala	0.70		Increasing
9	Gadag	0.81		Increasing
10	Imphal	0.70		Increasing
11	Kullu	0.98		Increasing
12	Kurinjipadi	0.78		Increasing
13	Madhavaram	1.00	Constant	
14	Mubarakpur	1.00	Increasing	
15	Shantipur	0.87		Increasing
16	Sonepur	1.00	Constant	
17	Tiruvanamalai	1.00	Increasing	
18	Trichy	0.88		Increasing
19	Trivandrum	1.00	Increasing	
20	Varanasi	0.81		Constant

Source: Computed Data

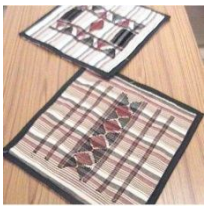
Table 9: Overall RTS of Handloom Clusters			
RTS	**Efficient**	**Projected**	**Total**
No. of IRS	3	12	15
No. of CRS	3	2	5
No. of DRS	0	0	0
Total	6	14	20

Source: Computed Data

From table 9 it is proud to say that the RTS of 15 Clusters are increasing RTS. For other 5 Clusters it is constant RTS and 6 Clusters are decreasing RTS needs improvement.

Fig. 7 Handloom Cluster Products in India

Barabanki	Bargarh	Bhagalpur
		
Stole	Dress Material	Dupatta
Bijoy Nagar	Bijnore	Burdwan

		
Cotton Mat	Cushion Cover	Saree
Gwalior	Chirala	Gadag
		
Mat	Dress Material	Towel
Imphal	Kullu	Kurinjipadi
		
Cushion Cover	Jacket	Lungi
Madhavaram	Mubarakpur	Nadia
		
Saree	Saree	Stole
Sonepur	Thiruvannamalai	Trichy
		
Saree	Saree	Curtain

Thiruvananthapuram	Mubarakpur	Varanasi
		
Shirt	Saree	Wall Hanging

Source: DC, Handloom Clusters

Findings and Conclusions

The Consolidated Major Achievements of the 20 Handloom Clusters from April 2007 - May 2012 is given below:

- Total **2285 Self Help Groups** (SHGs) has been formed covering 28682 weavers in 20 clusters under this scheme. 2246 SHGs have opened their bank accounts. Successful credit linkages are established with various banks by getting credit of Rs. 1074.13 Lakhs by SHGs. This credit is serving their immediate needs of small working capital and also to meet urgent needs of the family.

- There are total **57 consortiums formed** in all 20 clusters covering total membership of 20091 stakeholders from the cluster areas. The members of the consortiums are 18905 Weavers, 391 Master weavers, 63 Traders, 438 Cooperative Societies/ SHGs. 29 consortiums are registered under Societies Act. Chanderi, Varanasi, Sonepur, Bijnore, Bhagalpur & Burdwan clusters have formed Producer Company Ltd and have been registered Producer Company Act. Trivandrum, Kullu and Gadag clusters have not formed any consortium as their IA is acting as an Apex Body for marketing of the cluster products.

- **400 awareness camps** organized, involving 29580 weavers from the cluster pockets. Weavers were made aware about the scheme and its benefits.

- **203 dyers workshops organized** with participation of 2952 dyers, leading to improvement in dyeing technology.

- 418 exhibitions and 88 Buyer Seller Meets organized with **Total sales & orders realization of Rs.7278.00 Lakhs**. Sales generated through CCIC: Rs. 39.81 & Rs. 102.90 through Handloom House, other buyers Rs.3856.04 Lakhs and through the **exhibitions and BSMs - Rs.3269.25 Lakhs**.

- **3664 new designs developed** by professional designers hired by the cluster to provide marketable designs inputs. **Rs. 363.46 Lakhs sales generated by designers** which are included in sales through other buyers.

- 70 managerial training programmes organized for office bearers of consortium and local institutions for strengthening the institution building for taking further responsibility of the consortium and CFC management.

- **Yarn Depot**: NHDC has supplied total **yarn worth Rs.2705.96 Lakhs completed 541 Cycles (@ Rs.5 Lakhs each**) under the yarn corpus provided to NHDC for the yarn depot established in the cluster area befitting about 25884 weavers.

- New Product Catalogue developed by 20 clusters. 16 clusters have prepared a documentary film on cluster interventions.

- 20 Clusters sanctioned **CFC & Dye house**. Out of which CFC is operational in 11 places & 18 - Dye house are functional.

Fund Utilization:

Total Amount Released to the clusters: Rs. 3144.97 Lakhs.

Total Amount Utilized by the Clusters: Rs. 3150.22 Lakhs

%age of Utilization : 100.17

To conclude, for inclusive growth and sustainable development, the Handloom clusters should increase their Production or Sales. Moreover the Handloom Clusters should strengthen infrastructure interrelationships, technology interrelationships, procurement interrelationships, production interrelationships and marketing interrelationships and should make use of the benefits announced by Government of India under Micro, Small Enterprises Cluster Development Programme (MSE-CDP) and Modified Industrial Infrastructure Upgradation Scheme (MIIUS). The soft and hard intervention on Cluster Development Programme of Government of India will help Handloom Clusters in India to increase their productivity and efficiency.

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