

The Productivity Analysis of Village Industries Clusters in India

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Introduction

The Khadi and Village Industries (KVI) sector occupies a significant role in the total manufacturing sector of India. For the development of KVI sector, the Government is implementing various programmes / schemes through Khadi and Village Industries Commission (KVIC) for assisting eligible applicants in setting up village industries, Rebate scheme for Khadi Institutions, Interest Subsidy Eligibility Certificate (ISEC) scheme for providing bank loans, Rural Industries Service Centre (RISC) for providing common facility centres (CFCs) to provide infrastructure and service support, Scheme of Fund for Regeneration of traditional Industries (SFURTI) for development of clusters in Khadi, Village industries and Coir Sectors, Products development, Design Intervention and Packaging (PRODIP), marketing export promotion, exhibition at district, state, zonal and national level, design facility, brand building etc.

As a result of these efforts, KVI sector has registered a growth of around 9.6 % in 2010-11 over the performance of previous year. The total KVI production during 2011-12 (up to 15 February 2012) is estimated at Rs. 23,551.64 crore (Khadi Rs. 637.95 crore and V.I. Rs. 22,913.69 crore) as against Rs. 19871.86 crore (Khadi Rs. 673.01 crore and V.I. Rs. 19198.85 crore) in 2010-11. Similarly, estimated sales of KVI products up to 15 February 2012 is Rs. 25155.30 crore (Khadi Rs. 821.10 crore and V.I. Rs.24334.20 crore) in 2011-12 as against Rs. 25792.99 crore (Khadi Rs. 917.26 crore and V.I. Rs. 24875.73 crore) of the previous year. The total cumulative employment in the KVI sector is estimated to have also increased to 130.12 lakh persons (10.35 lakh in Khadi and 119.77 lakh in V.I.) by 15 February, 2012 as against 113.80 lakh persons (10.15 lakh in Khadi and 103.65 lakh in V.I.) of corresponding period of previous year.

Literature Survey

India has a rich tradition in traditional industries. The eco-friendly products of traditional industries not only have great potential for growth in production and export but can also lead to widespread generation of employment opportunities in the rural areas of the country. With a view to making the traditional industries more productive and competitive and facilitating their sustainable development, the Central Government announced the setting up of a fund for regeneration of traditional industries, with an initial allocation of Rs. 100 crore. Pursuant to this announcement, a Central Sector Scheme titled the "Scheme of Fund for Regeneration of Traditional Industries (SFURTI)" has been drawn up and approved at a total cost of Rs. 97.25 crore. The Scheme will be implemented by the Union Ministry of Agro and Rural Industries (ARI) and its organisations and institutions, in collaboration with State Governments, their organisations concerned, non-Governmental organisations, etc.

- SFURTI is Scheme of Fund for Regeneration of Traditional Industries.
- Ministry of MSME has launched this scheme in the year 2005 with the view to promote Cluster development. KVIC is the nodal Agency for promotion of Cluster development for Khadi as well as for V.I. products.
- As on date, a no. of 76 Clusters have come up as per the scheme and many of these clusters have completed.
- Outcome of the programme was very much encouraging which speaks of the enhancement of wages of Artisans and the increase in production and sales of the I.A. (Implementing Agency).
- Evaluation studies conducted for SFURTI Clusters has rated the programme, as quite successful.
- 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 Physical and Financial Performance of Village Industries Clusters exists in India.
2. To Study the Correlation Analysis, Technical Efficiency (θ) and Peer Weights (λ_i) of Village Industries Clusters in India.
3. To Study the Input Slacks (S^-) and Output Slacks (S^+) of Village Industries Clusters in India.
4. To Study the Variable Returns to Scale of Village Industries Clusters in India.
5. To give suggestions for successful implementation of Village Industries Clusters in India.

Methodology

The methodology adopted is collection of data from, KVIC, Government of India and analyzing with Data Envelopment Analysis of Input Oriented Banker Charnes Cooper (BCC) Model by taking No. of Artisans Benefited and Production as inputs and Annual Sales and Exports as outputs. A DMU is efficient if $\theta = 1$, $S^- = 0$ and $S^+ = 0$.

Statistical Analysis

Village Industries Clusters

The Physical and Financial Performance of the Village Industries Clusters is shown in fig.1 and fig.2 respectively.

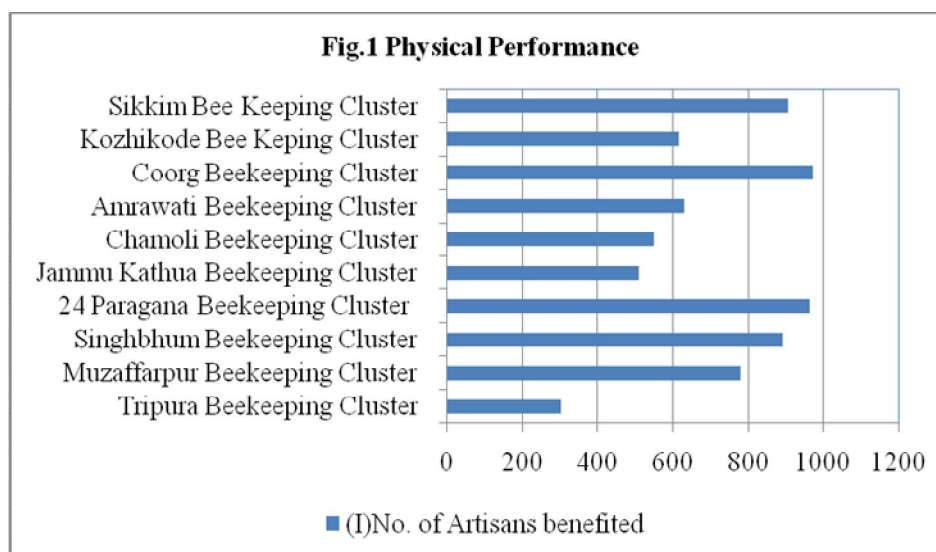
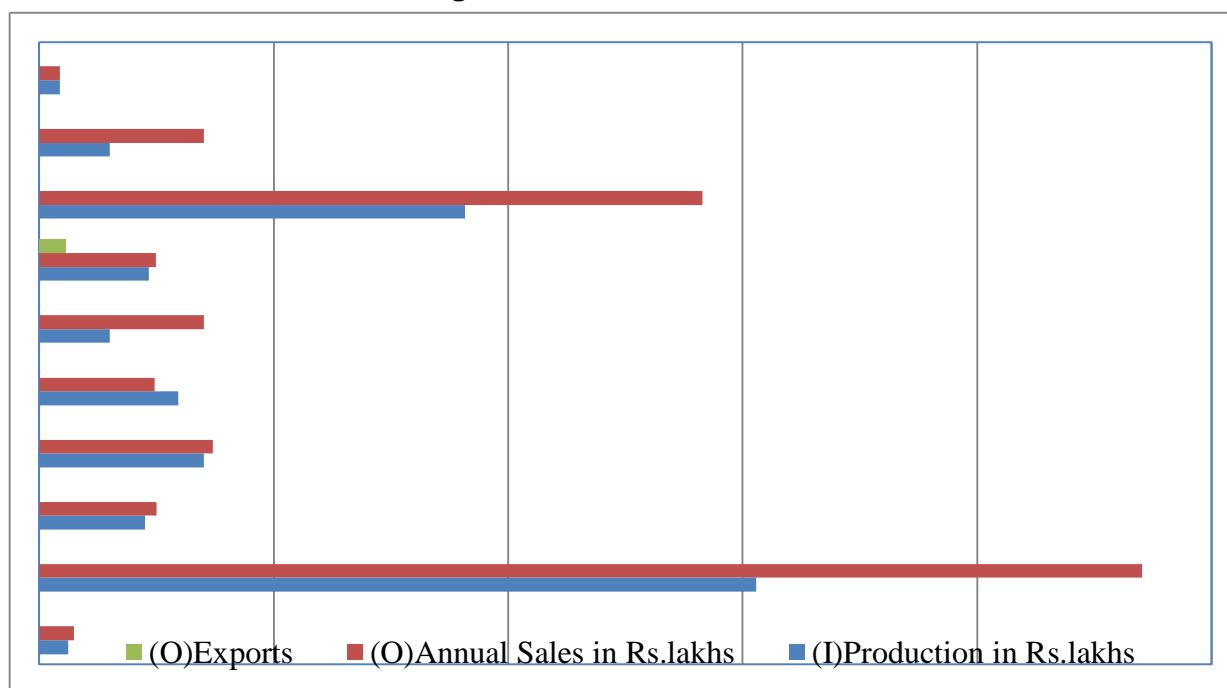


Fig.2: Financial Performance



The list of Village Industries Cluster exists in India is given in Table 1.

Sr No.	Cluster Name	Industry	State
1	Dress Making Cluster	Other	Arunachal Pradesh
2	Meghalaya Cane and Bamboo	Cane & Bamboo	Meghalaya
3	Tripura Beekeeping Cluster	Bee-Keeping	Tripura
4	Cane & Bamboo Cluster Pardo	Cane & Bamboo	Manipur
5	Barpeta Cane and Bamboo Cluster	Cane & Bamboo	Assam
6	Gauripur Cane and Bamboo Cluster	Cane & Bamboo	Assam
7	Carpentry Cluster	Carpentry Wooden Works	Manipur
8	Mon Beads Cluster	Carpentry Wooden Works	Nagaland
9	Gandhi gram Craft Pros Cluster	Cane & Bamboo	Tripura
10	Mizoram Cane and Bamboo Cluster	Cane & Bamboo	Mizoram
11	Muzaffarpur Beekeeping Cluster	Bee-Keeping	Bihar

12	Murshidabad Cane & Bamboo Cluster	Cane & Bamboo	West Bengal
13	Luburising Palm Jaggery Cluster	Cane & Bamboo, Food Processing and Health Drink	West Bengal
14	Singhbhum Beekeeping Cluster	Bee-Keeping	Jharkhand
15	24 Paragana Beekeeping Cluster	Bee-Keeping	West Bengal
16	Arikama Bamboo Cluster	Cane & Bamboo	Orissa
17	Dausa Pottery Cluster	Other	Rajasthan
18	BaramulaEmb. Cluster	Embroidery	Jammu Kashmir
19	LadakhSeabuck Throne Cluster	Food Processing and Health Drink	Jammu Kashmir
20	Bhiwani Wooden Beads Cluster	Carpentry Wooden Works	Haryana
21	Handmade Paper Cluster	Hand Made Paper and Fibre	Haryana
22	Jammu Kathua Beekeeping Cluster	Bee-Keeping	Jammu Kashmir
23	Phulkari Cluster	Embroidery	Punjab
24	Una Plant Fibre Cluster	Hand Made Paper and Fibre	Himanchal Pradesh
25	Wooden Handicraft Cluster	Carpentry Wooden Works	Punjab
26	Punjabi Juti Cluster	PCBI	Punjab
27	Chamoli Beekeeping Cluster	Bee-Keeping	Uttaranchal
28	PratapgarhAmla Cluster	Food Processing and Health Drink	Uttar Pradesh
29	KanaujiAgarbathi Cluster	Agarabatti	Uttar Pradesh
30	Horns and Bone Cluster	Horn & Bone	Uttar Pradesh
31	Bamboo Craft Cluster	Cane & Bamboo	Madhya Pradesh
32	Lac Cluster	Other	Madhya Pradesh
33	Ektal Bell Metal Cluster	Metal and Pottery	Chhattisgarh
34	Sindhudurg Food Processing Cluster	Food Processing and Health Drink	Maharashtra
35	Gadchiroli Pottery Cluster	Metal and Pottery	Maharashtra
36	GujaratNeera Cluster	Food Processing and Health Drink	Gujarat
37	Chittoor Wood Carving Cluster	Carpentry Wooden Works	Andhra Pradesh
38	Amrawati Beekeeping Cluster	Bee-Keeping	Maharashtra
39	HindupurAgarbatti Cluster	Agarabatti	Andhra Pradesh
40	Devarakonda Jewellery Cluster	Traditional Jewellery	Andhra Pradesh
41	Coorg Beekeeping Cluster	Bee-Keeping	Karnataka
42	NachiyarkovilBrass metal Cluster	Metal and Pottery	Tamil Nadu
43	Siddha and Ayurveda Cluster	Ayurveda	Tamil Nadu
44	Kalpetta Bamboo Craft Cluster	Cane & Bamboo	Kerala
45	Kozhikode Bee Keeping Cluster	Bee-Keeping	Kerala
46	Mehsi River Shell Button Cluster	River Shell Button and Lac	Bihar
47	Gandhi gram Craft Processing Cluster	Cane & Bamboo	Tripura
48	Sikkim Bee Keeping Cluster	Bee-Keeping	Sikkim

Source: KVIC, Government of India.

Table 1 a: List of Bee keeping Village Industries Clusters in India

Sr No.	Cluster Name	Industry	State/ Office	Cluster products	Registration with ISOs	Branding of products
1	Tripura Beekeeping Cluster	Bee-Keeping	Tripura, TRIPURA - SO	Honey & Wax		Tripura Khadi Honey
2	Muzaffarpur Beekeeping Cluster	Bee-Keeping	Bihar, BIHAR-PATNA -SO	Honey and Honey products		Sudha Honey
3	Singhbhum Beekeeping Cluster	Bee-Keeping	Jharkhand, JHARKHAND (RANCHI) - SO	Honey, Jingar Jelly, Honey Tulsi, Jingar Aweleh, Honey Jingar Sarbat		
4	24 Paragana Beekeeping Cluster	Bee-Keeping	West Bengal, WEST BANGAL (KOLKATA)- SO	Honey, Pollen, Royal Jelly, Bee-wax, Wax sheet,	yes	Bengal Honey
5	Jammu Kathua Beekeeping Cluster	Bee-Keeping	Jammu Kashmir, JAMMU-SO	Bee-Box		Applied for agmark.
6	Chamoli Beekeeping Cluster	Bee-Keeping	Uttaranchal, UTTARANCHAL (DEHRADUN) -SO	Honey		

7	Amrawati Beekeeping Cluster	Bee-Keeping	Maharashtra, MAHARASHTRA-MUMBAI-SO	Forest Honey - Organic honey		Melghat honey
8	Coorg Beekeeping Cluster	Bee-Keeping	Karnataka, KARNATAKA-SO	Honey	Under Process	CBK AgmarkCoorg Honey
9	Kozhikode Bee Keeping Cluster	Bee-Keeping	Kerala, KERALA-SO	Agmark Honey, Honey Cola, Honey pouches, Honey Squash, Honey Jam	Yes	
10	Sikkim Bee Keeping Cluster	Bee-Keeping	Sikkim, SIKKIM - SO	Honey		Sikkim Honey

The details on input and output data of Bee Keeping Clusters is given below.

DEA model = BCC-I

Problem = Cluster Name

No. of DMUs = 10

No. of Input items = 2

Input(1) = No. of Artisans benefited

Input(2) = Production in Rs.lakhs

No. of Output items = 2

Output(1) = Annual Sales in Rs.lakhs

Output(2) = Exports

Returns to Scale = Variable (Sum of Lambda = 1)

Source: Computed Data

Names of the machinery used in Common Facility Centre

1. Honey Processing Plants with moisture reducing unit, ROPP Capping Machine.
2. Twin Head Volumetric Honey Filling Machine, Bottle Label, Gumming & Pasting Machine.
3. Voltage Stabilizer for HPP, Comb Foundation Mill (A. Melifera).
4. FSS Liquid Filling & Sealing Machine, Specto-photometer.
5. Honey Pouch packing Machine.
6. Honey Bristol packing, & cutting machine.
7. Honey Storage tank (5000x2).
8. Bottling unit.
9. Sealing & Feeding Gum.
10. Honey carry canes, Honey tank 5 M.T.

Fig.3 Manufacturing Process of Honey Making



The Statistics on Input / Output Data is given in table 2.

	No. of Artisans benefited	Production in Rs. lakhs	Annual Sales in Rs. lakhs	Exports
Max	972	305.66	470.25	11.40
Min	302	8.75	8.75	0
Average	712.30	78.96	113.93	1.14
SD	213.94	88.73	139.36	3.42

Source: Computed Data

DMUs with inappropriate Data with respect to the chosen Model is given in Table 3.

No.	DMU
	None
No. of DMUs	10
Average	0.868789
SD	0.197666
Maximum	1
Minimum	0.525452

Source: Computed Data

The Frequency in Reference Set is given in table 4.

Peer set	Frequency to other DMUs
Tripura Beekeeping Cluster	2
Muzaffarpur Beekeeping Cluster	2
Chamoli Beekeeping Cluster	3
Sikkim Bee Keeping Cluster	0

Source: Computed Data

The table 4 reveals that Chamoli Beekeeping Cluster is referred 3 times by other cluster and it is most efficient when compared to Tirupura and Muzaffarpur Beekeeping Cluster. The overall Efficiency of the Cluster is given in table 5.

No. of DMUs in Data =	10
No. of DMUs with inappropriate Data =	0
No. of evaluated DMUs =	10
Average of scores =	0.87
No. of efficient DMUs =	6
No. of inefficient DMUs =	4
No. of over iteration DMUs =	0
Elapsed time = 0 seconds	
Total number of simplex iterations = 73	

Source: Computed Data

Table 5 reveals that the overall efficiency of the cluster is 87% and it needs 13% more to achieve 100%. 6 clusters are efficient and 4 clusters are inefficient which needs improvement.

Correlation Coefficiency Analysis

The correlation coefficient Analysis is given in the table 6.

Variables	No. of Artisans benefited	Production in Rs. lakhs	Annual Sales in Rs. lakhs	Exports
No. of Artisans benefited	1.00	0.35	0.32	-0.13
Production in Rs. lakhs	0.35	1.00	0.99	-0.12
Annual Sales in Rs. lakhs	0.32	0.99	1.00	-0.15
Exports	-0.13	-0.12	-0.15	1.00

Source: Computed Data

There is high degree of relationship exists between Production and Annual Sales. The clusters should concentrate on Exports.

Technical Efficiency of Village Clusters

1 Data Structure

The No. of Artisans Benefited and Production is taken as inputs and Annual Sales and Exports is taken as outputs corresponding to 10 DMUs (Beekeeping Clusters).

2 Data Envelopment Analysis - Banker, Charnes and Cooper Model (BCC Model) Input Oriented BCC Model (BCC-I)

$$\begin{aligned} &\rightarrow \rightarrow \\ \text{Min} & \quad Z_0 = \theta - \varepsilon 1 S^+ - \varepsilon 1 S^- \\ & \theta, \lambda, S^+, S^- \\ \text{Subject to} & \quad Y \lambda - S^+ = Y_0 \\ & \quad \theta X_0 - X \lambda - S^- = 0 \\ & \rightarrow \end{aligned}$$

$$\begin{aligned} &1 \lambda \geq 1 \\ &\lambda, S^+, S^- \geq 0 \end{aligned}$$

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

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$1 \lambda \geq 1$ 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) $\theta = 1$,
- b) All slacks are zero. $S^- = 0$ and $S^+ = 0$.

4 Computing Methodology

Initially we consider Tripura Beekeeping Cluster, as the studied DMU and the LP Model is formulated as given below

Min θ_0

Subject to

$14.72\lambda_1 + 470.25\lambda_2 + \dots \dots \dots 8.75\lambda_{10} \geq 14.72$	Output Constraints
$0\lambda_1 + 0\lambda_2 + \dots \dots \dots 0\lambda_{10} \geq 0$	Output Constraints
$302\theta_0 - 302\lambda_1 - 781\lambda_2 - \dots \dots \dots 907\lambda_{10} \geq 0$	Input Constraints
$12.5\theta_0 - 12.5\lambda_1 - 305.66\lambda_2 - \dots \dots \dots 8.75\lambda_{10} \geq 0$	Input Constraints
$\lambda_1 + \lambda_2 + \dots \lambda_{10} = 1$.	
$\lambda_1, \lambda_2, \dots \lambda_{10} \geq 0, \theta_0$ is unrestricted.	

By solving the above and continuously changing the studied DMUs we get the values we get the value of λ_i 's and θ_i 's for each DMU.

5 Efficiency Scores

The value of θ 's being the efficiency scores of the Clusters are given in the Table 7 and in the Figure 4.

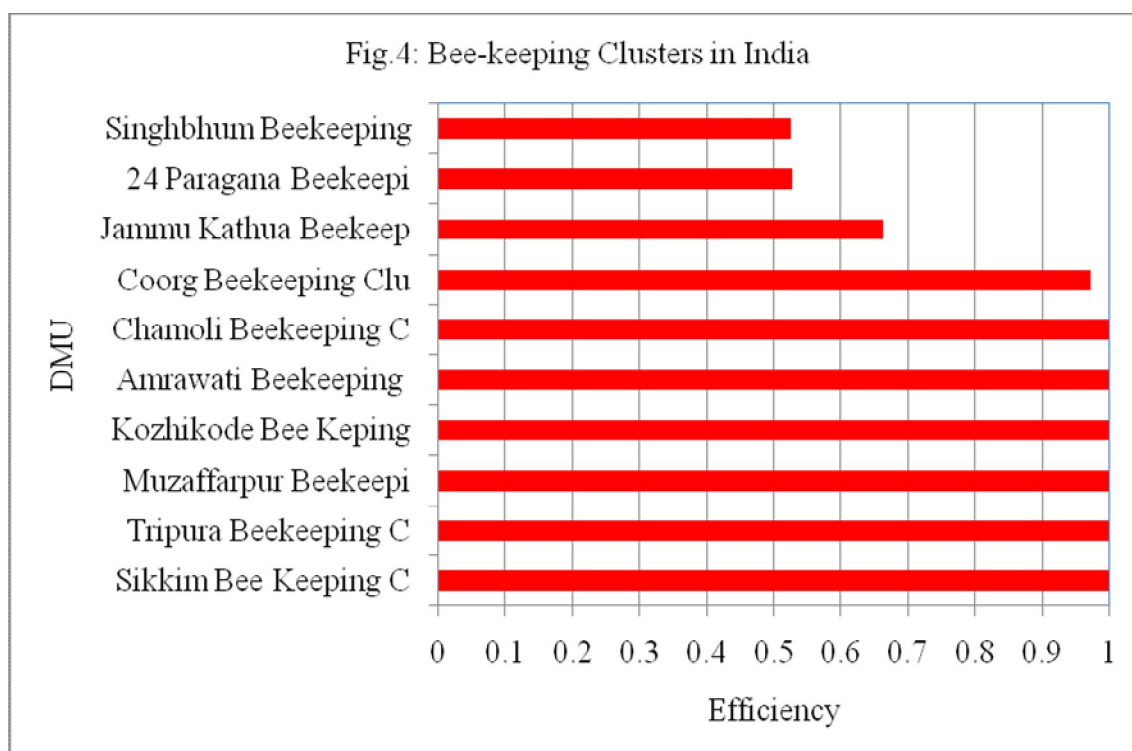


Table 7: Efficiency scores of the Beekeeping Clusters

No.	DMU	Score	Rank	Reference set (lambda)					
				Reference DMU	Score	Reference DMU	Score	Reference DMU	Score
1	Tripura Beekeeping Cluster	1.00	1	Tripura Beekeeping Cluster	1.00				
2	Muzaffarpur Beekeeping Cluster	1.00	1	Muzaffarpur Beekeeping Cluster	1.00				
3	Singhbhum Beekeeping Cluster	0.53	10	Tripura Beekeeping Cluster	0.35	Chamoli Beekeeping Cluster	0.64	Sikkim Bee Keeping Cluster	0.01
4	24 Paragana Beekeeping Cluster	0.53	9	Tripura Beekeeping Cluster	0.20	Muzaffarpur Beekeeping Cluster	0.04	Chamoli Beekeeping Cluster	0.76
5	Jammu Kathua Beekeeping Cluster	0.66	8	Tripura Beekeeping Cluster	0.92	Muzaffarpur Beekeeping Cluster	0.08		
6	Chamoli Beekeeping Cluster	1.00	1	Chamoli Beekeeping Cluster	1.00				
7	Amrawati Beekeeping Cluster	1.00	1	Amrawati Beekeeping Cluster	1.00				
8	Coorg Beekeeping Cluster	0.97	7	Muzaffarpur Beekeeping Cluster	0.53	Chamoli Beekeeping Cluster	0.47		
9	Kozhikode Bee Keeping Cluster	1.00	1	Chamoli Beekeeping Cluster	1.00				
10	Sikkim Bee	1.00	1	Sikkim Bee	1.00				

	Keeping Cluster			Keeping Cluster				
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Source: Computed Data

As per table 7 and figure 3, nearly 6 clusters have $\theta_i = 1$ and rank=1 and they are highly efficient. The efficiencies and ranks of other clusters $\theta < 1$ are also given. They have to perform well to attain 100% efficiency and to get rank 1. The overall efficiency of the village Clusters in India is 0.87 which is much satisfactory. It needs only 13% to attain 100% efficiency. The less efficient clusters like Coorg Beekeeping Cluster (97%), Jammu Kathua Beekeeping Cluster(66%), 24 Paragana Beekeeping Cluster (53%) and Singhbhum Beekeeping Cluster (53%) should follow the efficient clusters like Tripura Beekeeping Cluster (100%), Muzaffarpur Beekeeping Cluster(100%), Chamoli Beekeeping Cluster(100%), Amrawati Beekeeping Cluster(100%), Kozhikode Bee Keeping Cluster (100%) and Sikkim Bee Keeping Cluster(100%).

The projections of each efficient cluster are shown in table 8.

No.	DMU I/O	Score		Difference	%
		Data	Projection		
1	Tripura Beekeeping Cluster	1			
	No. of Artisans benefited	302	302	0	0.00%
	Production in Rs.lakhs	12.5	12.5	0	0.00%
	Annual Sales in Rs.lakhs	14.72	14.72	0	0.00%
	Export Market if any	0	0	0	0.00%
2	Muzaffarpur Beekeeping Cluster	1			
	No. of Artisans benefited	781	781	0	0.00%
	Production in Rs.lakhs	305.66	305.66	0	0.00%
	Annual Sales in Rs.lakhs	470.25	470.25	0	0.00%
	Export Market if any	0	0	0	0.00%
3	Singhbhum Beekeeping Cluster	0.525452			
	No. of Artisans benefited	891	468.1775	-422.822	-47.45%
	Production in Rs.lakhs	45	23.64533	-21.3547	-47.45%
	Annual Sales in Rs.lakhs	50	50	0	0.00%
	Export Market if any	0	0	0	0.00%
4	24 Paragana Beekeeping Cluster	0.527187			
	No. of Artisans benefited	965	508.7353	-456.265	-47.28%
	Production in Rs.lakhs	70	36.90308	-33.0969	-47.28%
	Annual Sales in Rs.lakhs	74	74	0	0.00%
	Export Market if any	0	0	0	0.00%
5	Jammu Kathua Beekeeping Cluster	0.66333			
	No. of Artisans benefited	510	338.2986	-171.701	-33.67%
	Production in Rs.lakhs	59.39	34.71562	-24.6744	-41.55%
	Annual Sales in Rs.lakhs	49.24	49.24	0	0.00%
	Export Market if any	0	0	0	0.00%
6	Chamoli Beekeeping Cluster	1			
	No. of Artisans benefited	550	550	0	0.00%
	Production in Rs.lakhs	30	30	0	0.00%
	Annual Sales in Rs.lakhs	70	70	0	0.00%
	Export Market if any	0	0	0	0.00%
7	Amrawati Beekeeping Cluster	1			
	No. of Artisans benefited	630	630	0	0.00%
	Production in Rs.lakhs	46.68	46.68	0	0.00%

	Annual Sales in Rs.lakhs	49.63	49.63	0	0.00%
	Export Market if any	11.4	11.4	0	0.00%
8	Coorg Beekeeping Cluster	0.971918			
	No. of Artisans benefited	972	672.7575	-299.242	-30.79%
	Production in Rs.lakhs	181.59	176.4906	-5.09935	-2.81%
	Annual Sales in Rs.lakhs	282.7	282.7	0	0.00%
	Export Market if any	0	0	0	0.00%
9	Kozhikode Bee Keeping Cluster	1			
	No. of Artisans benefited	615	550	-65	-10.57%
	Production in Rs.lakhs	30	30	0	0.00%
	Annual Sales in Rs.lakhs	70	70	0	0.00%
	Export Market if any	0	0	0	0.00%
10	Sikkim Bee Keeping Cluster	1			
	No. of Artisans benefited	907	907	0	0.00%
	Production in Rs.lakhs	8.75	8.75	0	0.00%
	Annual Sales in Rs.lakhs	8.75	8.75	0	0.00%
	Export Market if any	0	0	0	0.00%

Source: Computed Data

The <1 score cluster should follow the projections given so as to achieve 100%.

The weight given to each clusters is shown in table 9.

No.	DMU	Score	V(1)	V(2)	U(0)	U(1)	U(2)
1	Tripura Beekeeping Cluster	1.00	0.00	0.07	0.64	0.02	-
2	Muzaffarpur Beekeeping Cluster	1.00	0.00	-	-	0.00	-
3	Singhbhum Beekeeping Cluster	0.53	0.00	0.02	0.18	0.01	-
4	24 Paragana Beekeeping Cluster	0.53	0.00	0.01	0.19	0.00	-
5	Jammu Kathua Beekeeping Cluster	0.66	0.00	-	0.56	0.00	-
6	Chamoli Beekeeping Cluster	1.00	0.00	0.02	-	0.01	-
7	Amrawati Beekeeping Cluster	1.00	0.00	0.02	-	0.01	0.05
8	Coorg Beekeeping Cluster	0.97	-	0.01	-0.10	0.00	-
9	Kozhikode Bee Keeping Cluster	1.00	-	0.03	-	0.01	-
10	Sikkim Bee Keeping Cluster	1.00	-	0.11	0.65	0.04	-

The weighted data of each Beekeeping Clusters is shown in table 10.

No.	DMU	Score	VX(1)	VX(2)	UY(0)	UY(1)	UY(2)
1	Tripura Beekeeping Cluster	1.00	0.07	0.93	0.64	0.36	0.00
2	Muzaffarpur Beekeeping Cluster	1.00	1.00	0.00	0.00	1.00	0.00
3	Singhbhum Beekeeping Cluster	0.53	0.06	0.94	0.18	0.35	0.00
4	24 Paragana Beekeeping Cluster	0.53	0.57	0.43	0.19	0.34	0.00
5	Jammu Kathua Beekeeping Cluster	0.66	1.00	0.00	0.56	0.10	0.00
6	Chamoli Beekeeping Cluster	1.00	0.40	0.60	0.00	1.00	0.00
7	Amrawati Beekeeping Cluster	1.00	0.00	1.00	0.00	0.46	0.54
8	Coorg Beekeeping Cluster	0.97	0.00	1.00	-0.10	1.07	0.00
9	Kozhikode Bee Keeping Cluster	1.00	0.00	1.00	0.00	1.00	0.00
10	Sikkim Bee Keeping Cluster	1.00	0.00	1.00	0.65	0.35	0.00

Source: Computed Data.

The Slack Variables of each cluster is given in table 11.

No.	DMU	Score	Excess		Shortage	
			No. of Artisans benefited	Production in Rs. lakhs	Annual Sales in Rs. lakhs	Export Market if any
			S-(1)	S-(2)	S+(1)	S+(2)
1	Tripura Beekeeping Cluster	1.00	0.00	0.00	0.00	0.00
2	Muzaffarpur Beekeeping Cluster	1.00	0.00	0.00	0.00	0.00
3	Singhbhum Beekeeping Cluster	0.53	0.00	0.00	0.00	0.00
4	24 Paragana Beekeeping Cluster	0.53	0.00	0.00	0.00	0.00
5	Jammu Kathua Beekeeping Cluster	0.66	0.00	4.68	0.00	0.00
6	Chamoli Beekeeping Cluster	1.00	0.00	0.00	0.00	0.00
7	Amrawati Beekeeping Cluster	1.00	0.00	0.00	0.00	0.00
8	Coorg Beekeeping Cluster	0.97	271.95	0.00	0.00	0.00
9	Kozhikode Bee Keeping Cluster	1.00	65.00	0.00	0.00	0.00
10	Sikkim Bee Keeping Cluster	1.00	0.00	0.00	0.00	0.00

Source: Computed Data

The less efficient clusters should either increase the annual sales and exports. 6 Clusters, are efficient by having $\theta = 1$, $S^- = 0$ and $S^+ = 0$. The remaining 4 clusters need improvement by increase in annual Sales. The $S > 0$ obtained for other 4 clusters reveals the excess Production in Rs.lakhs (S^-) in the Clusters or shortage in annual sales (S^+).

6 Variable Return to Scale of Khadi Clusters

The Variables Return to Scale is shown in table 12. 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 13.

No.	DMU	Score	RTS	RTS of Projected DMU
1	Tripura Beekeeping Cluster	1.00	Increasing	
2	Muzaffarpur Beekeeping Cluster	1.00	Constant	
3	Singhbhum Beekeeping Cluster	0.53		Increasing
4	24 Paragana Beekeeping Cluster	0.53		Increasing
5	Jammu Kathua Beekeeping Cluster	0.66		Increasing
6	Chamoli Beekeeping Cluster	1.00	Constant	

7	Amrawati Beekeeping Cluster	1.00	Constant	
8	Coorg Beekeeping Cluster	0.97		Constant
9	Kozhikode Bee Keeping Cluster	1.00		Constant
10	Sikkim Bee Keeping Cluster	1.00	Increasing	

Source: Computed Data

RTS	Efficient	Projected	Total
No. of IRS	2	3	5
No. of CRS	3	2	5
No. of DRS	0	0	0
Total	5	5	10

Source: Computed Data

From table 12 and 13 it is proud to say that the RTS of 5 Clusters are increasing RTS. For other 5 Clusters it is constant RTS needs improvement and nil Clusters are decreasing RTS.

Findings and Conclusions

The Funds given under the Scheme of Fund for Regeneration of traditional Industries (SFURTI) for development of clusters in Village industries is successful one and many Common Facility Centres (CFCs) were created with the help of highly reputed technical agency. Interventions are carried out in Design product Development of Village Industries. Market Promotional Assistance was taken place. Capacity Building Measures like exposure visit to other successful cluster and need based training within the clusters (skill development, Self Help Credit & others) were also conducted. Many Self Help Group were formed, registered and tied up with Bank to get credit.

There is also achievement in 24 Paragana Beekeeping Cluster and Kozhikode Bee Keeping Cluster which has got ISO: 9001-2008. The Amrawati Beekeeping Cluster has exported some of the products. There is enhanced wages for Spinner, Weaver and Artisans after Cluster Development Approach. The Social Security Coverage of Artisans is increased by way of artisan Insurance scheme, Health Insurance Card, educational assistance, and many of them are covered under Jan Shree Bima Yojana (JSBY) & they are issued passbook. The achievement is also by Improved Packaging and Branding of products. Tripura Beekeeping Cluster has got brand name, namely Tripura Khadi Honey, Muzaffarpur Beekeeping Cluster has got brand name, namely Sudha Honey, 24 Paragana Beekeeping Cluster has got brand name, namely Bengal Honey, Jammu Kathua Beekeeping Cluster has applied for agmark, Amrawati Beekeeping Cluster has got brand name, namely Melghat honey, Coorg Beekeeping Cluster has got brand name, namely CBK Agmark Coorg Honey and Sikkim Bee Keeping Cluster has got brand name, namely Sikkim Honey.

To conclude for inclusive growth and sustainable development, the inefficient Village Industries clusters should increase their Production or Sales. Moreover the Village Industries 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 SFRUTI. The soft and hard intervention on Cluster Development Programme of Government of India will help Village Industries Clusters in India to increase their productivity and efficiency.

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