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Powering Livelihoods
A CEEW-VILLGRO INITIATIVE

Solarvastra: Is Renewable Energy-powered Sustainable Fashion a Real Market Opportunity?

Powering Livelihoods

Powering Livelihoods, a USD 3 million (INR 21 crores) initiative by CEEW and Villgro, is mainstreaming clean energy-based solutions in the rural economy. It provides capital, technical, and sectoral growth support to help social enterprises deploy a large number of clean energy-based livelihood solutions in a gender-inclusive manner.

The textile industry is India's second-largest employer. At Powering Livelihoods, we focus on enterprises developing or deploying innovative appliances capable of improving productivity, reducing drudgery, and raising incomes. These include solar-based charkhas, sewing machines, paddle looms, jute machinery, and silk reelers.

About this report

Who should read this report and why?

Powering Livelihoods market research reports aim to boost sectoral growth by helping entrepreneurs, investors, and policy-makers with value chain analysis, as well as market segmentation, policy, and competitor assessments.

This report attempts to answer the following questions:

1. What is the current state of distributed and integrated cotton value chains?
2. Which geographies are best suited to distributed value chain expansion?
3. What is the total addressable market size for garments, fabrics and government procurement?
4. What major market segments can entrepreneurs target in garments, fabric and government procurement?
5. Which policies are relevant for entrepreneurs at different stages of the value chain? Which policies are gender-inclusive?
6. Who are the competitors? How can entrepreneurs navigate the sector in the next 3-5 years?

Highlights

1 The total addressable market (TAM) for woven cotton Solarvastra garments is USD 12.9 billion (INR 90,800 crore) and the serviceable available market (SAM) for the same is **USD 2.4 billion (INR 17,300 crore)**. The top 5 categories are Tops / Shirts, Salwaar Kameez, Trousers, Sarees, and Dresses / Skirts. The serviceable market has the potential to deploy 53,000 sewing machines and create as many as 106,000 jobs.

2 The total addressable market (TAM) for woven cotton Solarvastra fabric is USD 6.5 billion (INR 45,500 crore) and the serviceable available market (SAM) is **USD 1.5 billion (INR 10,600 crore)**. The serviceable market could potentially use 169,500 looms and 386,500 charkhas, and create 606,850 jobs.

3 **Forward market linkage is a major bottleneck in the expansion of solar charkhas and solar looms.** To resolve this, Solarvastra should either be included in the 'Khadi' brand or given equal importance with Khadi in marketing, government procurement and policy support.

4 **Entrepreneurs can establish forward market linkages in several ways.** They could explore collaborations with the Khadi and Village Industries Commission (KVIC) and the Association of Corporations and Apex Societies of Handlooms (ACASH) to fulfil orders. They could partner with sourcing agencies to gain access to global markets. They could also partner with brands focusing on traditional crafts, fair-trade and sustainability to provide a niche/ unique value proposition (100% renewable energy based products).

5 Organic cotton can add value to Solarvastra's sustainability pitch. Odisha is currently the leading state for organic cotton production. **For geographical expansion, entrepreneurs can consider factors** like proximity to central sliver plants, depots or mills; the availability of skilled labour and the density of value chain operations.

6 **To participate in India's booming exports**, Solarvastra entrepreneurs can target garment segments like t-shirts, women's formal suits, women's shirts, babies' garments and accessories. **To mitigate India's increasing imports**, they can target segments like men's suits, men's shirts, women's suits. However, access to these garment segments depends on Solarvastra's technical viability.

Cotton value chain analysis

The word cotton is derived from the Arabic word ‘qutn’, which means a white fibrous substance containing the cotton plant’s seeds. Although it was first spun by machinery in England in the early 18th century, evidence of its use dating back 7000 years has been found in caves in Mexico.[1]

- India contributes **1/4th** of the global cotton acreage, with a cotton area of **12.6 million hectares**[3]
- India produced **6.12 billion kg** of cotton in 2019-20, which accounts for 22% of global cotton production[3]

Questions answered in this section

1. **What is the current state of distributed and integrated cotton value chains?**
2. **Which geographies are best suited to distributed value chain expansion?**

Image: iStock

[1] https://www.cotton.org/pubs/cottoncounts/story/index.cfm; [2] https://www.investindia.gov.in/team-india-blogs/cotton-textile-industry-india; [3] https://cotcorp.org.in/statistics.aspx

Cotton-based Solarvastra production

Across the cotton value chain, production happens through two major routes. The first of these is integrated production, where machines performing different functions are installed under one roof. The second is distributed production, using smaller machines that are generally optimised for single operators and usually installed in households. **This report focuses on the potential in the distributed cotton value chain, in which production happens through distributed renewable energy-powered solar charkhas, and solar looms.** For the purposes of this report, we consider fabric produced using solar charkhas and solar looms as Solarvastra.

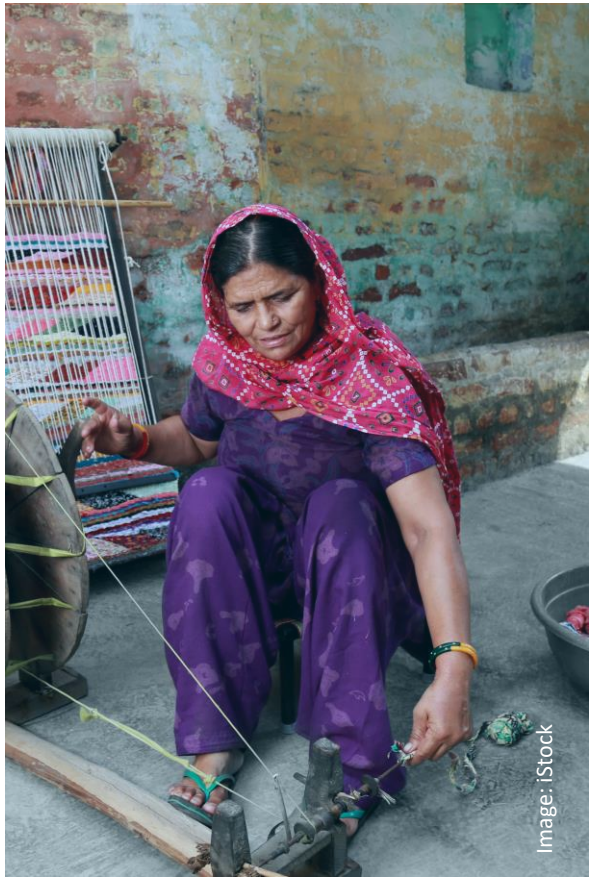
Fibre production/ Farming	Yarn production/ Spinning	Fabric production/ Weaving	Garment production
			

Image: iStock

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What are the different types of value chains and supporting organisations (SO)?

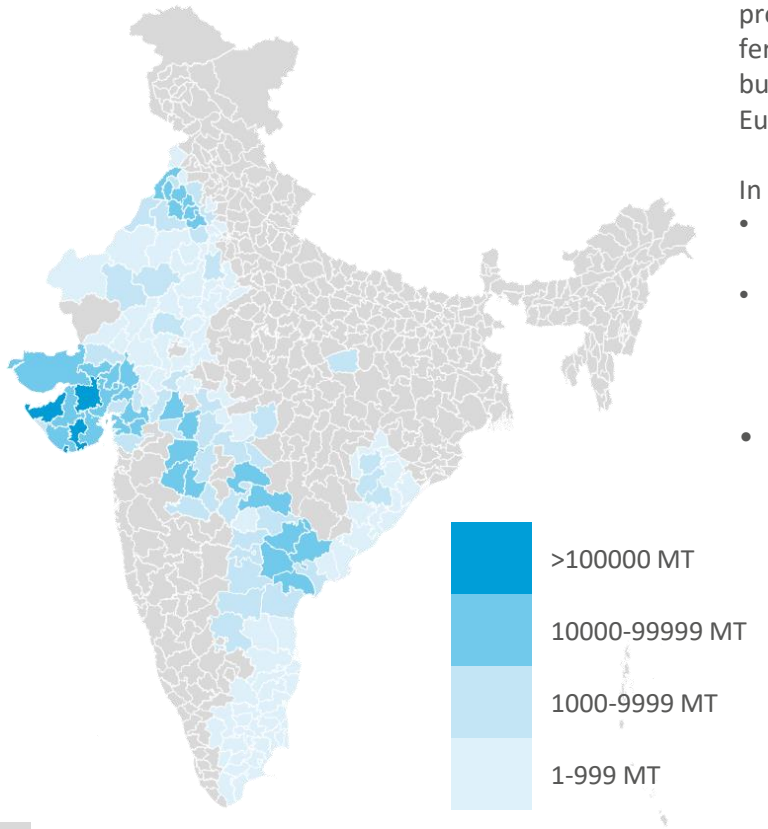
		Fibre		Yarn	Fabric		Garment
Value chain[4]	Cotton value chain	Farming : Cotton balls are harvested in plantations	Ginning : **B**alls are processed to separate seeds, yielding clean cotton fibres	Spinning : Fibres are cleaned, sorted, drawn and twisted together to produce yarns	Weaving : Yarns are crossed over each other to produce grey fabric	Processing : The grey fabric is cleaned, dyed (or printed), and finished to produce the final fabric	Garmenting : Different pieces of fabric are stitched together to produce garments
	Khadi value chain			Yarn is hand spun on charkhas and fabric is woven on handlooms			
	Solarvastra value chain			Yarn is spun on solar charkhas and fabric is woven on solar looms			
	Integrated value chain / industrial mills	Integrated value chain covers production with industrial machines (power loom, industrial sewing, etc.) in centralized units.					
Supporting organisation[5]	Promotion councils				Handloom Export Promotion Council | Powerloom Development & Export Promotion Council | Apparel Export Promotion Council | The Cotton Textiles Export Promotion Council		
					National Handloom Development Corporation		
	Public sector undertakings & statutory bodies	National Textile Corporation Limited | National Handloom Development Corporation Limited | Cotton Corporation of India (CCI) | The British India Corporation Limited | Khadi and Village Industries Commission					
	Advisory boards & industry associations		Indian Spinners' Association (Private)		All India Powerloom Board | All India Handloom Board		
		Cotton Advisory Board | Confederation of Indian Textile Industry (CITI) (Private)					
	Research associations	Ahmedabad Textile Industry's Research Association | Bombay Textile Research Association | South India Textile Research Association | Northern India Textile Research Association					

[4] Authors' Analysis; [5] http://texmin.nic.in; SOs for handlooms; SOs for integrated production units; SOs for both

Where can you procure cotton and organic cotton?

Gujarat and Maharashtra are India's leading cotton growing states. In 2018-19, organic cotton production made up around 2% of the total cotton production and Odisha was the leading producer of organic cotton, followed by Gujarat, Maharashtra and Madhya Pradesh. Solarvastra entrepreneurs can establish backward market linkages in these geographies for the procurement of organic cotton.

District wise cotton production in India[6]



Organic cotton

Organic cotton is grown using organic production systems that replenish soil fertility, avoid the use of chemicals, and build biodiversity.[10] The United States and Europe are the major sources of demand.

In 2018-19,

- India was the world's largest producer of organic cotton, with a 51% market share.
- Approximately 1,67,000 organic cotton farmers cultivated 3,03,000 hectares of land to produce 1,22,600 MT of organic cotton.[11]
- Odisha remained the leader, with Gujarat and Maharashtra showing large improvements over the last year.[12]

Making organic cotton part of the Solarvastra's value chain will improve its sustainability pitch of products. Generally, organic cotton prices are 5-20% higher than those of normal cotton.[11]

State-wise cotton and organic cotton production in India.

State	Cotton production in MT (2018-19)[9]	Organic cotton production in MT (2018-19)[11]
Gujarat	16,15,000	28,500
Maharashtra	13,94,000	28,000
Telangana	9,01,000	600
Rajasthan	4,25,000	6,200
Haryana	3,74,000	300
Madhya Pradesh	3,40,000	23,600
Andhra Pradesh	3,40,000	
Karnataka	3,06,000	
Punjab	2,21,000	
Tamil Nadu	1,02,000	400
Odisha	68,000	35,000
Total	60,86,000	122,600

Livelihoods

Among 58 lakh farmers[7];

- 70% of the total planting workforce are women
- 80% of the field engagement workforce are women
- 95% of the picking workforce are women[8]

[6] Authors' Analysis (Note: Production of cotton in different states is from different years); [7] Cotton Sector - Ministry of Textiles; [8] International Trade Centre (2011) Women in Cotton; [9] https://cotcorp.org.in/procurement.aspx; [10] https://organiccottonplus.com/pages/learning-center; [11] Textile Exchange (2020) Organic Cotton Market Report; [12] Authors' Analysis

Where should entrepreneurs set up their spinning operations?

Tamil Nadu is India's leading yarn producer and West Bengal has the highest number of spinning enterprises*. But neither is a leading cotton producer, indicating that yarn production is not constrained by raw cotton supply.

For spinning on solar charkhas, entrepreneurs need to procure quality roving (bundles of fibre) at competitive prices. States with central sliver plants (CSPs) and spinning mills can help out by ensuring regular roving supplies.

Yarn production can be broadly classified into distributed and integrated spinning.

Distributed spinning

Distributed spinning starts with Central Sliver Plants (CSPs) and spinning mills across India. These units do spinning either up to the draw frame stage to produce sliver or up to the speed frame stage to produce roving. Both sliver and roving are supplied to artisans across the country, who then convert them into yarn using amber charkhas and solar charkhas installed at home or in small centres. In 2016-17, around 32,000 enterprises* spread across 14 Indian states produced around 2 lakh tonnes of cotton yarn.[13]

Roving sourced from textile mills is more competitively priced and is of higher quality than roving obtained from CSPs.

Integrated spinning/ mill production

In 2016-17, India produced 4.05 million tonnes of 100% cotton spun yarn.[15] Mill yarn production contributed ~ 95% of cotton yarn, with Tamil Nadu (39%) having the leading share.

Livelihoods

Ginning enterprises* in rural India support 3,700 livelihoods, employing ~ 32% women[13]
Spinning enterprises* in rural India create 38,600 livelihoods, employing ~ 89% women[13]

State wise distribution of roving, mill yarn production and spinning enterprises.

States/ Union Territories	Roving from CSP (in million kg)[14]	Mill yarn production (in million Kg)[16]	No. of spinning enterprises*[13]
West Bengal			18,495
Odisha			4,358
Telangana		64	4,087
Gujarat		183	1,422
Rajasthan		154	1,263
Andhra Pradesh		355	1,015
Tamil Nadu		1,580	778
Kerala	0.38		413
Uttar Pradesh	1.04	34.5	120
Chhattisgarh			42
Haryana		258	32
Punjab		585	30
Himachal Pradesh			10
Puducherry			5
Madhya Pradesh	0.96	326	
Maharashtra		293	
Karnataka	0.73	17.2	
Bihar	0.23		
Total	**3.35**	**3,851**	**32,070**

[13] Authors' Analysis; NSSO Round 73, Unincorporated non-agricultural enterprises, 2015-16; [14] KVIC (2018-19) Annual Report; [15] Production of Major Textile Items, Ministry of Textiles; [16] http://www.simamills.in/textile-data; * NSSO Round 73, Unincorporated non-agricultural enterprises

What is the current state of Solarvastra?

Khadi has a share of 7.5% in total mill fabric production and is produced through distributed weaving on handlooms.

Distributed weaving

Weavers source yarn from spinners and mills to produce fabric on handlooms, paddle looms and solar looms. Based on the yarn used and type of loom used, the final product is classified as Khadi, Solarvastra, or Polyvastra. In 2018-19, Solarvastra sales grew to INR 55 million (5.5 crore) with a YoY growth rate of 220%. This still accounts for only 0.17% of total sales, including Khadi and Polyvastra.[17]

Weavers either work for companies or arrange themselves in weaver groups and collectively manage raw material sourcing and fabric sales.

Major cotton products include lungis (produced by 19.5 per cent of all weavers) and gamchas (16.5 per cent)[20]. Their production is primarily concentrated in Assam, West Bengal and other north-eastern states.[20]

Gujarat is the leading state in woven fabric production (490 million sq. meters), followed by Maharashtra, Madhya Pradesh, and Tamil Nadu.[18] Knitwear constitutes 27% of India's total fabric production. It is a decentralised sector, and major clusters are Ludhiana (Punjab), Tirupur (Tamil Nadu), Kolkata (West Bengal), and Kanpur (Uttar Pradesh).[22]

Each year, Bihar produces 0.55 million sq metres of Solarvastra fabric, which entrepreneurs can use to create garments.

Weavers and spinners depend on government centres, NGOs, implementing agencies, entrepreneurs, etc., for information on public schemes.

State wise woven cotton fabric production by type in million square meters.

States	Khadi[17]	Solarvastra[17]	Integrated Fabric / Mills[18]
Uttar Pradesh	58.4	0.027	3.2
Haryana	8.8		
Kerala	7.5		
Gujarat	7.1	0.018	490
Tamil Nadu	6.2	0.001	123
Karnataka	4.95		6.9
Rajasthan	3.8		106
Andhra Pradesh	3.1	0.019	
West Bengal	3	0.006	
Uttarakhand	2.9		
Punjab	2.4		97.6
Bihar	1.2	0.553	
Madhya Pradesh	1		168
Telangana	0.8		
Maharashtra	0.3		271
Others	2.0		235
Total	**113**	**0.624**	**1,500**

[17] KVIC (2018-19) Annual Report; [18] http://www.simamills.in/textile-data; [19] Authors' Analysis; NSSO Round 73, Unincorporated non-agricultural enterprises, 2015-16; [20] Ministry of Textiles (2019-20) Fourth All India Handloom Census; [21] Production of Major Textile Items, Ministry of Textiles; [22] Press Information Bureau Delhi, 28 February 2019; * NSSO Round 73, Unincorporated non-agricultural enterprises

Which are the favourable locations for the Solarvastra fabric manufacturing?

Distributed weaving of cotton-based fabrics using handlooms is concentrated in north-eastern, eastern and southern states. Although these are not cotton growing states but government schemes are offering weavers access to quality yarn. A lower count (1 to 20) of cotton has higher demand than other counts and is majorly sourced through the open market. Weavers sell most of their fabric (65 per cent) in local markets.[25]
As much as 2.8 per cent of total loom capacity is idle in rural areas, with 53 per cent of households pointing to lack of market demand as the reason. Further, up to 60 per cent of weaver households require raw material support for their operations.[25] This presents small-scale enterprises or aggregators with an opportunity to provide backward and forward linkages.

North-eastern, eastern and southern states have a high number of cotton-based weaving enterprises and independent weavers. These locations could provide Solarvastra entrepreneurs with skilled labour, and offer solar charkha and loom manufacturers a good market to provide clean energy based solutions.

Livelihoods

Weaving enterprises* in rural India create 4,78,000 livelihoods, employing ~ 51 per cent women[19]
Finishing enterprises* in rural India create 53,000 livelihoods, employing ~ 84 per cent women[19]

India has 1.85 million independent rural weavers and allied workers involved in cotton fabric production. Around 62 per cent of them are women.[20]

State wise distribution of looms, employment, and the number of rural weaving enterprises.

States	No. of commercial looms[23]	Total weavers and allied workers[23]	%age women[23]	Solarvastra artisans[24]	Rural weaving enterprises*
Assam	8,70,186	8,92,489	92%		11,516
West Bengal	1,76,160	3,85,265	58%	25	1,07,219
Tamil Nadu	82,055	1,08,854	51%	10	36,308
Manipur	49,396	50,676	93%		14,650
Odisha	42,940	1,05,355	49%		15,484
Uttar Pradesh	40,643	81,427	51%	860	25,437
Andhra Pradesh	30,353	55,488	49%	10	17,906
Tripura	29,762	24,685	68%		251
Meghalaya	27,040	26,791	71%		
Arunachal Pradesh	25,962	24,369	78%		2
Chhattisgarh	7,884	14,077	45%		1,455
Mizoram	6,177	7,603	77%		527
Kerala	5,927	12,634	70%		496
Karnataka	5,740	14,751	52%		13,324
Nagaland	5,522	2,905	88%		1,044
Gujarat	5,309	5,499	43%	87	82
Telangana	3,446	14,153	49%		2,138
Rajasthan	2,786	5,163	60%		44
Jammu And Kashmir	2,755	4,316	73%		41
Uttarakhand	2,587	4,424	71%		505
Jharkhand	2,552	6,881	50%		276
Madhya Pradesh	2,275	4,997	53%		
Bihar	2,237	3,529	50%	5,104	
Others	707	1,546	60%		2,212
Total	**14,30,401**	**18,57,877**	**62%**	**6,096**	**2,50,917**

[23] Authors' Analysis; Ministry of Textiles (2019-20) Fourth All India Handloom Census; [24] KVIC (2018-19) Annual Report; [25] Ministry of Textiles (2019-20) Fourth All India Handloom Census; * NSSO Round 73, Unincorporated non-agricultural enterprises

Which product categories entrepreneurs should target and how?

Which garment categories are important for entrepreneurs from an export-import perspective?

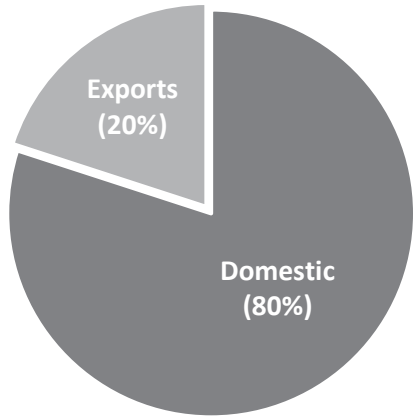
About 20 per cent of India's garments get exported.

Cotton garment exports (2018-19) stood at USD 8,221 million with a 2.74 per cent YoY growth.[26] The USA, UK, UAE, and Germany are major markets.[27] T-shirts, women's suits, and women's shirts are the top three categories in exports by value (not limited to cotton). Baby clothing and accessories are the highest growing category with CAGR of 5.8% (2015-19) (not limited to cotton garments).[27]

Cotton garment imports (2018-19) stood at USD 476 million with a 53.54 per cent YoY growth.[26] Bangladesh is a major exporter to India with a 56% share in the top three categories, followed by China with a 13% share.[27] Men's suits (16%), women's suits (18%), and men's shirts are the top three categories in imports (not limited to cotton garments).[27] India has the potential to increase domestic manufacturing of these categories to meet local demand.

Both export and import categories should only be targeted based on the technical feasibility of Solarvastra.

Garment Industry – domestic usage vs exports[26]



Lessons that can be learnt from the marketing of Khadi

The Khadi Village Industries Commission (KVIC) has taken several initiatives to market its brands. It has built a nationwide network with 23 departmental outlets and 8,058 Khadi outlets, participated in national and international trade fairs and exhibition, organised fests and exhibitions for artisans/ weavers, and explored convergence with corporates like Raymond, Arvind Mills and ABFRL for developing and selling Khadi and Khadi-based garments. Consistent efforts made by KVIC and the government has strengthened the Khadi brand. In 2018-19, KVIC registered sales of INR 28.54 billion (2,854.19 crore) in Khadi, INR 3.55 billion (355.47 crore) in Polyvastra and INR 54.7 million (5.47 crore) in Solarvastra.[28]

Entrepreneurs operating in the Solarvastra value chain can take lessons from such initiatives to design their marketing activities. They can design their retail locations on the lines of Khadi outlets, participate in national and international trade fairs and exhibitions, and explore partnerships with brands who are willing to buy Solarvastra fabric from them.

Livelihoods

Garment manufacturing enterprises* in rural India create 2,51,000 livelihoods, employing ~ 34 per cent women[29]
Custom Tailoring enterprises* in rural India create 32,47,000 livelihoods, employing ~ 57 per cent women[29]

[26] Wazir Advisors Publication (2020, 2019, 2017, 2015) Inside View: Annual Report on Indian Textile and Apparel Industry; [27] Confederation of Indian textile Industry (2018-19) Annual Report, pp 19-27; [28] KVIC (2018-19) Annual Report; [29] Authors' Analysis; NSSO Round 73, Unincorporated non-agricultural enterprises; [30] KPMG (2020) Covid-19: Mitigation strategy for Indian Textile and Apparel Sector; [31] AEPC (2020) Impact of COVID-19 on Indian Apparel Exports; * NSSO Round 73, Unincorporated non-agricultural enterprises

Fibre | **Yarn** | **Fabric** | **Garment**

Which districts are suitable for value chain expansion?

Forward and backward market linkages are important for carrying out any value chain activity. Here, we highlight districts with concentrated value chain activities ranging from yarn production to garment production.

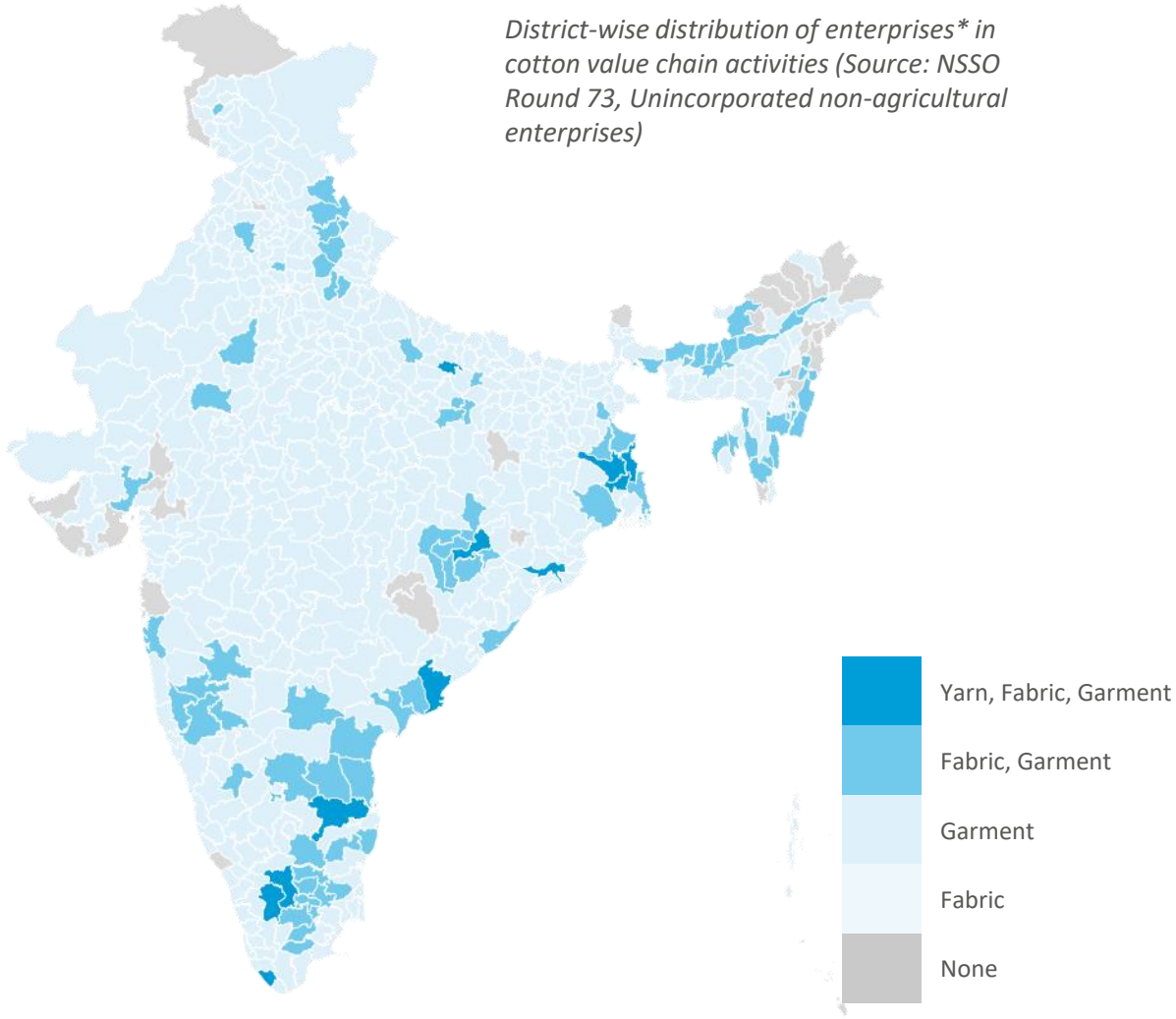
In locations with yarn, fabric and garment enterprises are present, Solarvastra entrepreneurs can act as market linkage providers, ensuring quality output and supporting the existing cluster's transition to solar charkhas, solar looms and solar-powered sewing machines.

In addition to providing technical support for adopting clean energy powered machines in these locations, entrepreneurs can fill the gap by setting up their own manufacturing units for yarn or fabric.

Districts with all three activities (i.e., Yarn, Fabric, and Garment manufacturing)[32]

States	District
Andhra Pradesh	Chittoor
Andhra Pradesh	East Godavari
Kerala	Thiruvananthapuram
Odisha	Bargarh
Odisha	Cuttack
Tamil Nadu	Tirupur
Tamil Nadu	Erode
Tamil Nadu	Coimbatore
Uttar Pradesh	Ambedkar Nagar

District-wise distribution of enterprises in cotton value chain activities (Source: NSSO Round 73, Unincorporated non-agricultural enterprises)*



A complete list of all districts with activities is available here.

[32] Authors' Analysis; *NSSO Round 73, Unincorporated non-agricultural enterprises

Market segmentation

In the cotton value chain, woven fabric is either sold directly to consumers or is first converted into garments such as shirts and dresses, which are then purchased by retail consumers or businesses. Procurement by government bodies too plays an important role in the market for cotton fabric created through distributed production. Broadly speaking, the market is studied under the three following segments:

1. Garment market
2. Fabric market
3. Government procurement market

Questions answered in this section

1. **What is the total addressable market size for garments, fabrics and government procurement?**
2. **What major market segments can be targeted in garments, fabrics and government procurement?**

Image: Greenwear

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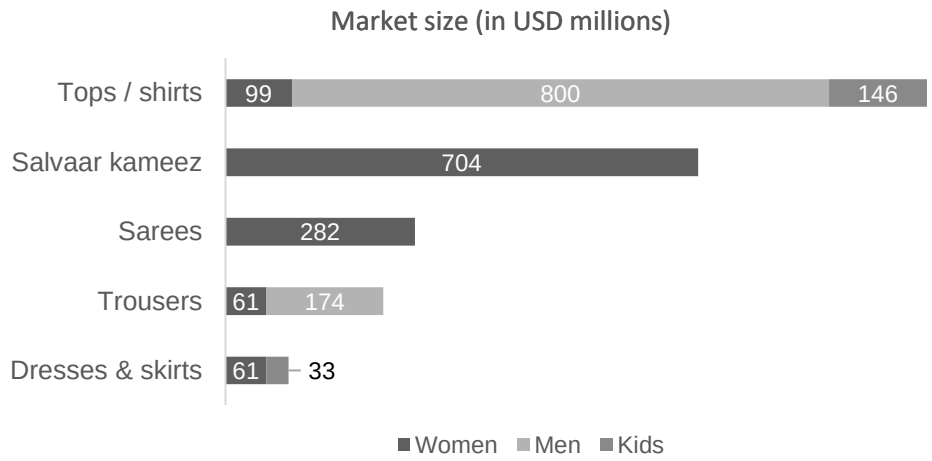
What is the market size of Solarvastra garments?

The total addressable market (TAM) for woven cotton Solarvastra garments is USD 12.9 billion (INR 90,800 crore), and the serviceable available market (SAM) for the same is USD 2.4 billion (INR 17,300 crore) with tops / shirts, salwaar kameez, trousers, sarees, and dresses / skirts as the top 5 categories. The serviceable market has the potential to deploy 53,000 sewing machines and create 106,000 jobs.

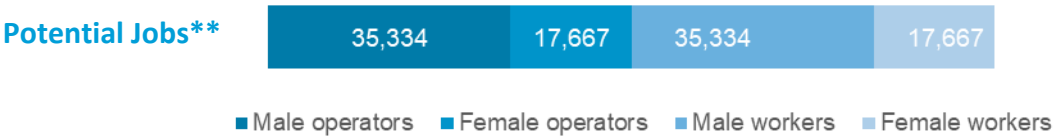
TAM for woven cotton garments: USD 12.9 billion (INR 90,800 crore)[33]

279,000 Sewing machines × 2* Opportunities per machine = 558,000 Operators & workers

SAM for woven cotton garments: USD 2.4 billion (INR 17,300 crore)



53,000 Sewing machines × 2* Opportunities per machine = 106,000 Operators & workers



Knitted Solarvastra could be a promising market once its technical feasibility is established. There is a total market opportunity worth USD 11.4 billion (INR 80,100 crore), around 68 per cent of which is represented by the top two categories (t-shirts and baby clothes).

Methodology: The total addressable garment market is classified based on product type. For each product type, cotton-based woven garment market is calculated and added to get total market. Serviceable market share is calculated based on share of handloom in garment category and production through distributed value chain. Employment opportunities are calculated based on the number of machines, which are estimated based on market size.

[33] Authors' Analysis; Statista; * This assumption is based on a study on "Garment sector to understand their requirement for capacity building" by Technopak in January 2018

**Operators here are people who run the machine; Workers here are people who help operators in allied activities; Male female ratio for potential jobs is taken as 2:1 for garments based on NSSO Round 73, Unincorporated non-agricultural enterprises

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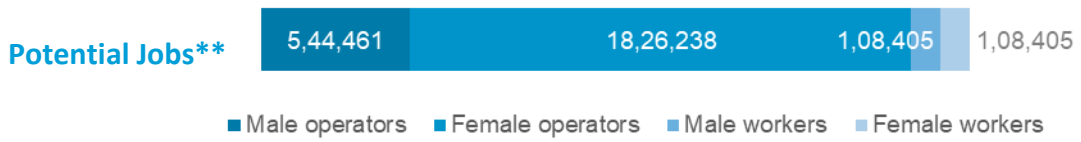
What is the market size of Solarvastra fabric?

The total addressable market (TAM) for woven cotton Solarvastra fabric is USD 6.5 billion (INR 45,500 crore) and the serviceable available market (SAM) is USD 1.5 billion (INR 10,600 crore). The serviceable market could potentially deploy 169,500 looms, 386,500 charkhas and create as many as 606,850 jobs.

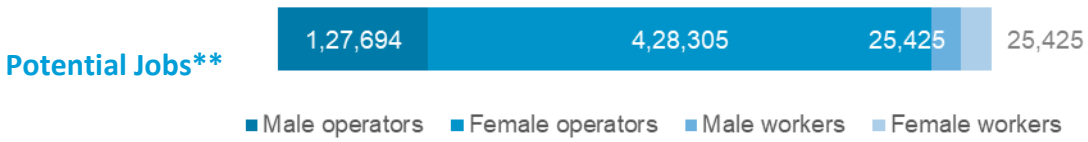
TAM for woven cotton fabric: USD 6.5 billion (INR 45,500 crore)[34]

722,700 Looms	✖	1.3* Opportunities per machine	=	939,510 Operators & workers
1,648,000 Charkhas	✖	1 Opportunities per machine	=	1,648,000 Operators



SAM for woven cotton fabric: USD 1.5 billion (INR 10,600 crore)[34]

169,500 Looms	✖	1.3* Opportunities per machine	=	220,350 Operators & workers
386,500 Charkhas	✖	1 Opportunities per machine	=	386,500 Operators



Knitted Solarvastra could be a promising market once its technical feasibility is established. There is a total addressable market (TAM) opportunity worth USD 6.0 billion (INR 42,300 crore).

Methodology: The total addressable fabric market is calculated by estimating fabric requirements for the garment and ready-to-stitch markets. In both cases, only cotton-based woven market is considered. Serviceable market share is calculated based on share of handloom based fabric and production through distributed value chain. Employment opportunities are calculated based on the number of machines (looms and charkhas), which are estimated based on market size.

[34] Authors' Analysis; Statista; [35] Authors' Analysis; Business Standard, 16 July 2018; * Calculated from loom and employment numbers in Fourth All India Handloom census

**Operators here are people who run the machine; Workers here are people who help operators in allied activities; Male-female ratio for potential jobs is taken as 1:1 for weaving, and 1:8 for spinning based on NSSO Round 73, Unincorporated non-agricultural enterprises

What is the government procurement market for Solarvastra fabrics and garments?

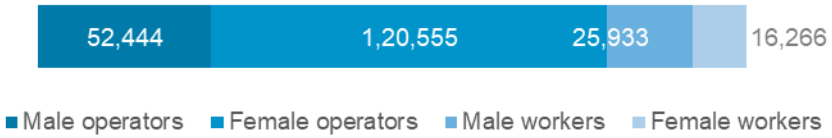
Government bodies have played an important role in promoting 'Khadi' in Indian and international markets. Apart from doing promotions, government bodies have from time to time purchased Khadi to fulfil their own requirements, and could do the same with Solarvastra. They have the potential to play a similar role for 'Solarvastra'. Solarvastra has a total market size of USD 1.27 billion (INR 8,925 crore), with public school dresses contributing a 96% share in the government procurement market.

GOVERNMENT MARKET [36]

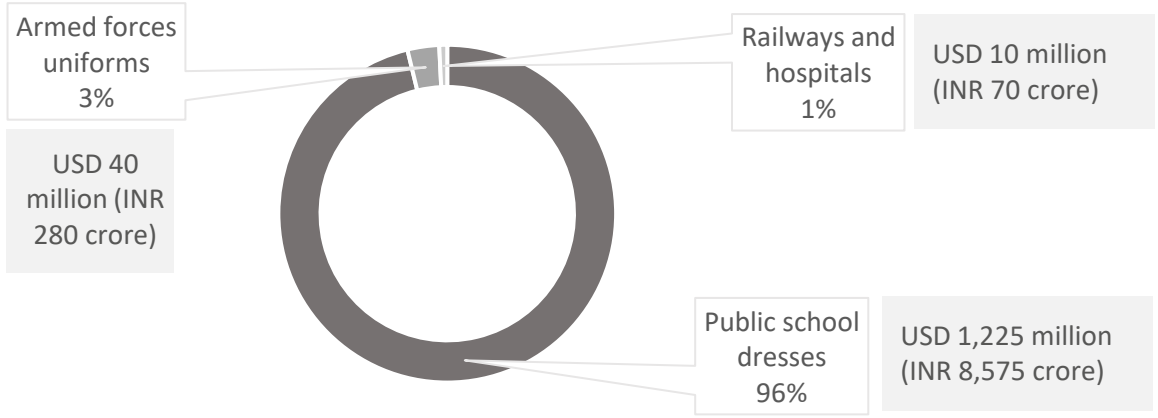
USD 1.27 billion (INR 8,925 crore)

29,000 Sewing machines	×	2 Opportunities per machine	=	58,000 Operators & workers
44,000 Looms	×	1.3 Opportunities per machine	=	57,200 Operators & workers
100,000 Charkhas	×	1 Opportunities per machine	=	100,000 Operators

Potential Jobs**



Government procurement market segments



Corporate gifting – Public Sector Undertakings[36]

Public sector undertakings (PSUs) generally offer gifts to their employees at least once a year. Recently, a few PSUs offered gift cards which their employees could use to purchase Khadi products. If followed across all PSUs with Solarvastra gifts or gift cards, similar initiatives could create huge market potential. The estimated market for this opportunity is:

USD 65 million (INR 455 crore)

Methodology: The total addressable market for government procurement is calculated by adding up opportunities such as school uniforms, and requirements for the armed forces, railways and public hospitals. Estimates of employment opportunities are based on the average number of machine users, which is calculated based on market size.

[36] Authors' Analysis

**Operators here are people who run the machine; Workers here are people who help operators in allied activities; Male-female ratio for potential jobs is taken as 2:1 for garments, 1:1 for weaving, and 1:8 for spinning based on NSSO Round 73, Unincorporated non-agricultural enterprises

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Policy landscape

Questions answered in this section

1. **Which policies are relevant for entrepreneurs at different stages of the value chain?**
2. **Which are the women-focused policies?**

Image: CEEW

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What are the relevant policies for entrepreneurs?

Fabric Stage Yarn Stage

Scheme[37]	Beneficiaries	Objective	How to avail	Scheme value
Holistic development				
National Handloom Development Programme by the Ministry of Textiles	Weavers, self-help groups, non-governmental organisations (NGOs) (gender targeted)	To ensure the integrated and holistic development of handlooms and the welfare of handloom weavers	The state government submits proposals along with the recommendations of the State Level Project Committee (SLPC), and funds are released directly to implementing agencies.	
North Eastern Region (NER) Textile Promotion Scheme (New Cluster Development, Technology Upgradation, and Market Promotion) by the Ministry of Textiles	Implementing agencies, weavers, NER handloom co-operative societies, corporations/federations, self-help groups (SHG) /joint liability groups (JLGs), consortia/ producer companies and SPVs of handloom clusters, agencies registered under handloom mark, members registered with the Handloom Export Promotion Council (HEPC) (gender agnostic)	To provide government support for the development of the handloom sector in the NER (increased employment, higher value of handloom products, and improved market promotion of north-eastern textiles & handloom products)	The implementing agency develops each cluster through the concerned state government as a Centrally Sponsored Scheme in a project mode. State governments invite proposals/projects from Implementing Agencies.	INR 2 to 15 million (0.2 to 1.5 crores) for new cluster development; financial assistance up to INR 3.7 million (0.37 crore)
Khadi Reform and Development Program (KRDP) by the Khadi and Village Industries Commission (KVIC), Ministry of Micro, Small & Medium Enterprises (MSME)	Khadi institutions (gender agnostic)	To reposition Khadi and align it to market demands and trends, enhance artisan welfare and empowerment, build capacity, and implement a of management information system		INR 6.66 billion (666 crore)
Scheme of Fund for Regeneration of Traditional Industries by KVIC, MSME	Nodal and implementing agencies (gender agnostic)	To provide employment opportunities to more traditional artisans, leveraging financial assistance from multilateral agencies	Proposals for setting up clusters are submitted online to any of the nodal agencies listed under the scheme.	INR 3.5 billion (350 crore) for 100 clusters from 2017-18 to 2019-20
Comprehensive handloom cluster development scheme by the Ministry of Textiles	Cluster level implementing agencies, Special Purpose Vehicles (SPV), national and state level handloom organisations, state apex handloom weavers' co-operative societies, central government organisations, other legal entities approved by state governments. (gender targeted)	To develop mega handloom clusters that are in clearly identifiable geographical locations specialising in specific products	State governments submit proposals along with the recommendations of the State Level Committee (SLC), and funds are released directly to the implementing agencies	Need-based funding but limited to INR 40 crore per mega cluster

[37] Authors' Analysis; Ministry of Textiles (2018-19) Annual Report; Khadi and Village Industries Commission (2018-19), Annual Report

Gender Targeted: Policies which have either some women-focused clause or where major beneficiaries are women; Gender Agnostic: No special focus on women.

What are the relevant policies for entrepreneurs?

 Fabric Stage  Yarn Stage

Scheme[38]	Beneficiaries	Objective	How to avail	Scheme value
Financial support				
Weavers MUDRA scheme by the Ministry of Textiles 	Handloom weavers, entrepreneurs; self-help groups, joint liability groups, cooperative societies; apex handloom weavers' cooperative societies; producers' companies; other approved organisations. (gender agnostic)	To reduce the financial distress faced by handloom weavers and cooperatives due to their inability to repay debts	The handloom weavers submit their loan applications as per their requirement to participating banks and the Weavers' Service Centres/State Governments sponsor their loan applications to the participating banks to sanction loans.	
Interest Subsidy Eligibility Certificate by KVIC, MSME  	Khadi institutions (gender agnostic)	To mobilise funds from financial institutions and banks	Interest Subsidy Eligibility Certificates to be issued by the state commission	INR 13.7 billion (1,370 crore)
Prime Minister's Employment Generation Programme by KVIC MSME  	Individuals; self-help groups; production-based co-operatives; charitable trusts; entrepreneurs; existing units (gender agnostic)	To generate employment opportunities in rural as well as urban areas by setting up self-employment ventures, projects, and micro enterprises	Beneficiaries will be identified by a task force consisting of representatives from KVIC/State KVIB and State DICs and Banks. Applicants who have taken any training can apply to banks.	
Infrastructure support				
Workshed scheme by KVIC, MSME  	Below poverty line (BPL) artisans (BPL card holders or those identified through due process) who work at least 100 days a year (gender targeted)	To provide artisans with ideal work environment, leading to enhanced productivity and increased earnings		INR 150 million (15 crore) disbursed by KVIC
Marketing support				
Market Promotion and Development Assistance (MDA) Scheme by KVIC, MSME  	Institutions, artisans, sellers (gender agnostic)	Allowing institutions to add value to Khadi so that the products can be sold at market-oriented price. This is done by de-linking the sales price from the cost chart in the MDA scheme		

[38] Authors' Analysis; Ministry of Textiles (2018-19) Annual Report; Khadi and Village Industries Commission (2018-19), Annual Report

Gender Targeted: Policies which have either some women-focused clause or where major beneficiaries are women; Gender Agnostic: No special focus on women.

What are the relevant policies for entrepreneurs?

Fabric Stage Yarn Stage

Scheme[39]	Beneficiaries	Objective	How to avail	Scheme value
Insurance support				
Handloom Weavers Comprehensive Welfare Scheme by Ministry of Textiles	Weavers (gender targeted)	To enable handloom weavers/ workers to avail social security benefits		
Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)/ Pradhan Mantri Suraksha Bima Yojana (PMSBY) and modified (Aam Aadmi Bima Yojana) AABY by KVIC, MSME	PMJJBY/PMSBY for artisans (18 - 50 years) and modified AABY for artisans (51 - 59 years) (gender agnostic)	To provide insurance cover to artisans		
Artisan Welfare Fund Trust	Artisans associated with Khadi institutions (gender agnostic)	To extend and implement social security benefits to artisans associated with Khadi institutions		The total deposit was INR 1.14 billion (114.54 crore) as of March 2019
Raw material support				
Yarn supply scheme by the Ministry of Textiles	Handloom weavers; self-help groups; joint liability groups; cooperative societies (gender targeted)	To make available all types of yarn at mill gate prices to beneficiaries and to facilitate their regular and timely supply	The National Handloom Development Commission is responsible for issuing of yarn passbooks to all weavers	
Technology upgradation				
Mission Solar Charkha by KVIC, MSME	Existing KVIs; other institutions like SPVs, societies, trusts, section-8 companies; individuals (gender targeted)	To ensure inclusive growth by generating employment, especially for women and youth, and promoting sustainable development through solar charkha clusters in rural areas	Apply online on the KVIC website	INR 5.5 billion (550 crore) for 50 solar charkha clusters

- *Forward market linkage is a major bottleneck in the expansion of solar charkhas and looms. To resolve this, Solarvastra should either be included in the Khadi brand or given equal importance with Khadi in marketing, government procurement, and policy support.*
- *A holistic technology up-gradation scheme can support the adoption of solar kits for handlooms and amber charkhas and speed up their transition to solar power.*

[39] Authors' Analysis; Ministry of Textiles (2018-19) Annual Report; Khadi and Village Industries Commission (2018-19), Annual Report

Gender Targeted: Policies which have either some women-focused clause or where major beneficiaries are women; Gender Agnostic: No special focus on women.

Competitor analysis and the way forward

Question answered in this section

1. **Who are the competitors? How can entrepreneurs navigate the sector in the next 3 to 5 years?**

Image: CEEW

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Who are the major competitors and what is the way forward for entrepreneurs?

The competitor landscape[40] for private Solarvastra companies can be divided into three categories, i.e. Business to Government (B2G), Business to Business (B2B) and Business to Customer (B2C).

	B2G	B2B	B2C
MAJOR COMPETITORS	KVIC, Ministry of MSME, Association of Corporations and Apex Societies of Handlooms (ACASH), Ministry of Textiles	KVIC; Sourcing companies like The Creative Artisans, Gocoop, etc.	Traditional craft-focused brands (Dressfolk, Kessa, FabIndia, Sampadaindia, Sahom, etc.); fair-trade and sustainable brands (Nonasties, Karnam, Upasana, Auruhfy, Soulspace, etc.)
STRENGTHS & WEAKNESSES	Strengths: strong government linkage Weaknesses: limited options in products, less agile value chain	Strengths: massive distributed production capacity, in-depth understanding of design trends, huge variety of fabrics and designs, and a large network of artisans Weaknesses: inability to trade in low minimum order quantities; lack of customisation in fabrics; and lack of solar branding	Strengths: Unique designs, strong geographical Indication like *Banarasi* sarees, etc., focus on attributes like sustainability, organic cotton fair trade, etc., targeted digital marketing
WAY FORWARD FOR ENTREPRENEURS	Explore collaborations with KVIC & ACASH for order fulfilment through the solar value chain route Focus on innovative products like breathable fabrics, extra soft fabrics, organic fabrics, etc., which are difficult for government agencies to supply	Explore collaborations with sourcing agencies that can provide access to global markets Focus on fabric quality and consistency, continuous innovations, solar branding, impact communication	Explore collaborations with brands focused on traditional crafts, fair-trade and sustainability to provide a niche/ unique value proposition (100% renewable energy-based products) Clean energy and the positive impact on artisan's life and environment could be possible branding focus areas for entrepreneurs

Forward market linkages are crucial for establishing or expanding businesses in distributed cotton value chains. So entrepreneurs should either tie up with businesses who can offer them predictable demand or set up their own retail channels.

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