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Statistical Analysis of Value Addition Organic Textile in India

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Abstract

This study places a strong emphasis on the production of organic cotton and fabric, which promotes environmentally friendly, sustainable farming practises and raises both producer and consumer quality of life. Because organic cotton is produced responsibly, to the highest standards, and on the basis of trust, the entire supply chain, from product development to plantation, cares for the people. Demand for organic fabric is rising, particularly in the global market. Being a commodity with added value, organic cotton is quite lucrative. India has excellent opportunities to gain foreign currency and advance its economy. However, the market for organic cotton product is still niche and not developed. There are people who are not aware of organic fabric or are not alert about the importance of sustainable cultivation.

The goal of the article is to make readers aware of the importance of living a clean, healthy lifestyle and to encourage them to support sustainable agriculture. A cotton crop must go through numerous processing steps, utilising a variety of expertise and technologies, before becoming a finished textile and finally a garment. We look at the actions taken and the prices obtained at each link in this chain, from the cultivation of the cotton crop through its eventual sale in clothing stores.

Keywords: organic cotton; value chain analysis; India.

1.Introduction

In order to understand where and how value is added at each level of the production process, this article explores the many activities that make up the value chain of organic cotton in India. By investigating the costs associated with various activities and the degree to which these activities are coordinated, a value chain analysis is a technique for researching and analysing how value is added at distinct activities, typically within an organisational setting.

An annual field crop, cotton is farmed in many different ways in many different parts of the world. India, China, the United States, West Africa, Australia, and Brazil are the nations with the largest producing areas. As a plant, cotton typically needs a lot of sunlight. Cotton is grown and harvested either manually or mechanically. Hand picking is still prevalent in several nations, including those in West Africa, China, and India. The majority of harvesting is done by machines in nations like Australia and the United States.

The process of turning a cotton crop into a textile, then into a finished article of apparel, requires numerous steps, frequently taking place in numerous nations and requiring the use of numerous technologies and talents. From the cultivation of the cotton crop through its eventual sale in clothing stores, we look at this process.

It is very much important from policy point of view to study the agro-supply chain of cotton which can contribute to the literature in a larger extent and can open the ways to do further research on various aspect of it.

FIG.1 AGRO SUPPLY CHAIN OF COTTON

The intricacies of the cotton agro supply chain are shown in Fig. 1, which demonstrates that the process of cotton supply chain begins with field-level harvesting and finishes in terms of the final product, i.e., fabric/fashion/garments available in the market for the customer. Every step of the supply chain involves adding value to the cotton itself.

We briefly touch on some historical background information and conceptual clarification of the management of cotton value addition and supply chain in Odisha at the beginning of this presentation. A brief literature review of the study is presented in the following section. The aims of the study are presented in part three, while the methodology and data source are presented in section four. The results of the supply chain for cotton in Odisha are presented in section five, along with a variety of issues that small and medium-sized farmers in the state are dealing with. The study's conclusions and closing remarks, which have consequences for policy, are presented in the final part.

To determine where value is added in each category, we looked at the manufacturing chains of t-shirts made from fully certified organic cotton, organic cotton, and non-organic cotton in this study. In order to compare the value added at each stage to that of a conventional cotton garment, this paper breaks down the numerous steps in the creation of organic cotton clothing. We take into account the numerous factors that affect the demand for organic cotton as part of the process.

2.Literature Review:

Cotton, also referred to as "White Gold," is a crucial fibre crop in the agro-supply chain. It makes a considerable contribution to the supply chain, creating jobs and bringing in foreign cash for the country. Currently, 90 nations in the world produce about 23 million tonnes of cotton, which is cultivated by an estimated 30 million farmers. The majority of the world's cotton is exchanged through commodity exchanges and passes through numerous phases of exchange, processing, and manufacture between the cotton field and final customer, unlike organic and fair-trade cotton, which is distinguished at source and certified as such.

The origin of cotton is well-known and significant to trade and spinning, the earliest textile technique. The importance of origin starts to lose significance once you start spinning. The origin of the cotton fibre is typically seen as inconsequential if the product at the yarn, fabric, and completed product stages fits the consumers' needs (exceptions being where provenance is synonymous with quality, such as with Egyptian cotton). According to the length of the staple and its fineness, the cotton grown in this state is among the best in the country (The Orissa State Co-operative Spinning Mills Federation Ltd. (SPINFED), 2014).

After TMC (Textile Mission for Cotton), Odisha saw a significant increase in cotton cultivation. Up to fifteen districts in Odisha engage in the cultivation. Cotton is presently grown in 40 different cultivars, with Bunny & Tulasi being the most popular types. Cotton was grown in 335 thousand bales in the 2011–2012 growing season.

There was a resurgence of interest in sustainable practises in the late 1990s and early 2000s, which coincided with a massive development in the selection, style, and calibre of organic clothing as well as the organic infrastructure in general (Tonne, 2002). This was accompanied by a rise in media and public awareness of sustainability issues, as well as a turnaround in the downward trend in sales of organic cotton.

3.Objectives of the Study:

Value chain studies are performed to determine where value is contributed as a product is produced inside an organisation, or in this example, an industry. Cotton value chain research is crucial in determining how prices will behave for fabrics in the textile market. It is crucial to understand the full cotton value chain, from field-level harvesting to the selling of clothing, in order to make any necessary policy changes regarding price, availability, and market competitiveness. Therefore, in this backdrop, the following are the study's goals:
i) to study the value chain analysis of organic cotton in
Odisha, and
ii) to study the problems faced by small and medium farmers
in the entire value chain process.

4.Methodology and Data Source:

A value chain analysis often breaks down the steps a product takes from the start of manufacture to the last sale and even beyond. The goal is to identify areas of inefficiency or ineffectiveness through a systematic categorization of activities and their associated costs (both real and opportunity costs), in order to determine where value could be increased by improving the chain's individual processes or by strengthening the connections between organisational activities.

Typically, the examination of a manufacturing value chain concentrates on five or six "primary" operations that are unique to a particular product. These include the creation and design of products, as well as supply, manufacture, distribution, marketing, and after-sale services. There are also a variety of "supporting" activities, such R&D, human resources, and finance, that are not connected to specific goods but may nonetheless improve their value.

Activity	**Examples of associated costs**	**Potential areas of value loss or gain**
Product design and development	Drawing, tooling, prototyping, market research and testing	Under-investment in early-stage development resulting in prototype or market wastage
Supply (also known as inbound logistics)	Delivery charges / logistics services, fuel, IT (EDI)	Delays to just in time deliveries, or too early deliveries of supplies resulting in stock holding costs and damage to ephemeral goods; materials damaged in transit; transaction costs; risks of hold up by monopolistic suppliers.
Production	Tooling, plant and machinery (buying and operating), power (electricity / gas etc.), experiential service design and delivery	Quality levels; retooling; wastage; stock management, fuel costs, economies of scale
Distribution (also known as outbound logistics)	Delivery charges / logistics services, fuel, IT systems (EDI)	Penalties for late deliveries; breakages, theft/pilfering
Marketing and sales	Advertising, PR, packaging design, CI, / brand design	Market research, changes to segments targeted,
Post sales service	Product recalls, IT (on-line support, expert systems), call centres	Call centre locations, IT systems, multi-channel facilities
Supporting activities		
Finance and planning	Exchange rate movements, financial instruments (swaps, futures), share management (dividends, IPOs)	Dividend policy, treasury function
R&D	Experimental activities, market probes, investments in start-ups	NPD failure rates, new market failure rates

Purchasing	Raw materials, pricing policies	Economies of scale and scope; buying power
Personnel	Employees (numbers, salaries); staff training	Skills, manpower levels
IT	Hardware, software development, networks, staff training	Hardware / software, linkages with external stakeholders, staff training

For both supporting and primary activities a calculation must be made of firstly the costs associated with that activity and secondly any increased value achieved by the activity.

However, the value chain is a flexible model that may be used at the level of the sector, industry, or system, as in this article, just as well as at the level of the individual company or product. Costs at each stage of the production chain can be computed and totaled across all the companies involved in that stage in an industry-level study. In addition to pure monetary costs like raw materials and other inputs, structural or government-related costs (delays, red tape, and regulatory hurdles) may also be taken into account. Sensitivity analysis can be performed on these expenses to determine how changes in exchange rates, stock-holding costs, and productivity gains, among other factors, affect the value achieved (FIAS).

Cotton cultivation is a growing industry in Odisha. Many farmers in the western belt, particularly those in the districts of Rayagada, Bolangir, Kalahandi, Nabarangpur, and Nuapara, have been cultivating this cash crop. The state grows about 3.5 lakh bales of cotton annually, of which about 2 lakh bales are ginned and pressed there. The leftover cotton is purchased by dealers and spinners from other states. As a result, we decided to focus our current research on Odisha in this context. The study is based on secondary data gathered from the Department of Agriculture, Government of Odisha, Textile Committee, Ministry of Textile, Government of India, and other published sources. In addition to gathering data, various government agencies' research reports were also studied.

5.Result and Discussion

5.1 Value Chain analysis of Cotton in Odisha

The field-level harvesting of cotton, production, ginning and pressing, classification, warehousing, logistics, spinning, and selling of the fabrics make up the full value chain. The information about each stage as it relates to our study area is provided below.

5.1.1 Harvesting and Production

Cotton is grown in Odisha's western region, which is next to Andhra Pradesh, therefore we can assume that the majority of farmers in this region are affected by southern agricultural practises. There are two different kinds of cotton farming: contract farming and ordinary farming.

In contract farming, large-scale farmers from other states operate as agents and take land from local farmers in exchange for a rent payment. No matter if a crop fails or succeeds, once the rent per year is established, that decision is irrevocable. The contract farmer, however, transports all of the cotton made in Odisha to his home state. It has been noted that contract farming accounts for 60% of cotton cultivation, with state common farmers handling the remaining 40%. This is the only explanation for why the majority of the cotton is sent to nearby states like Gujrat, Andhra Pradesh, and Karnataka.

Cotton predominates in the Indian textile industry. There are significant variances when it comes to the area where cotton is grown. Total cotton farming covered 63254 hectares of land in the years 2001–2002, 29490 hectares the following year, and 36730 hectares in the years 2003–2004. Because young people are drawn to this particular occupation these days, the area under cultivation has been growing significantly. In the state, cotton is typically grown in quantities of 3.5 lakh bales, of which about 2 lakh bales are ginned and pressed there. The last of the cotton is being purchased by traders and spinners from other states.

In Odisha, cotton is typically farmed from June to October, and in many of the districts, it is grown solely as a cash crop with no other crops mixed in. In the district of Kalahandi, approximately 42,000 hectors of land are currently used for cotton farming, with an annual yield of 4.5 to 5.00 lakh quintals. The western section of the state currently has a total coverage area of around 1 lakh hectors. The current cotton crop can support ten spinning mills with 25,000 spindles each. Each spinning mill needs about 15,000 bales, while the current annual production of bales, which each contain 170 kg of clean cotton, is 3 lakh.

Cotton cultivation gained momentum in Odisha during the post TMC (Textile Mission for Cotton) period. The cultivation is practiced in as many as fifteen districts of Odisha. Forty different varieties of cotton are now cultivated, of them *Bunny &Tulasi* are the most preferred varieties. Odisha cotton is popular for its long staple length. The fiber has good demand among the southern spinners as it is used in production of high-end qualitative products.

5.1.2. Ginning and Pressing

After production and harvesting, the first phase in the textile value chain is ginning, when the lint is taken out of the kapas. Later, the lint is formed into bundles, compacted, and delivered to spinning machines. In the districts of Rayagada, Kalahandi, and Bolangir, there are 17 registered Ginning and Pressing (G&P) facilities. To create a work plan for the growth of the ginning pressing sector and a road map for the textile industry, a focus group discussion (FGD) was held in the study area in front of all the ginners and spinners. According to the FGD, the regional ginning and pressing businesses process only 75% of the state's yearly cotton production. The fact that the leftover cotton fibre is traded to southern and western regions for value addition shows how this industry has room to grow. Contract farming, as noted in the section on harvesting, is the primary cause of cotton drainage. For the production of high-quality textiles, clean, uncontaminated raw cotton is a crucial requirement.

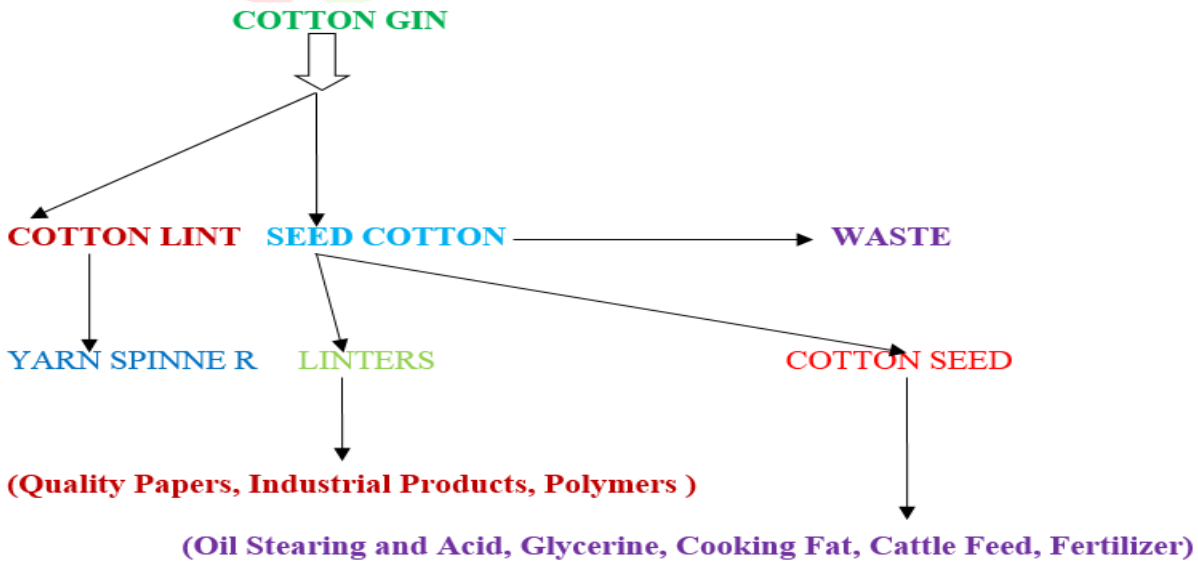

FIG 2 VARIOUS BYPRODUCT AND USAGE OF COTTON AFTER GINNING

Despite having excellent fibre characteristics, the cotton grown in Odisha has a significant level of pollution and litter content. On the one hand, the high prevalence of trash and pollution in cotton reduces yarn realisation, and on the other, it results in a high level of yarn flaws. By modernising existing ginning and pressing plants, market yards, and work practises, it is possible to drastically lower the amount of garbage and pollution (see Fig. 2).

5.2.3. Classification

The process of characterizing cotton quality in terms of grade, staple length, and micronaire is known as classification, or classing. An airflow measurement is used to determine the micronaire, which represents the fineness of the fibre. The quality of cotton, which is categorised according to staple length and contamination percentage, determines the quality of the yarn or fabric. If the staple length is long, the fabric will be of the highest quality in the finished product. The ongoing process of globalization and liberalization has unleashed competitive forces both in domestic and international market. The quality, price delivery schedule and eco-friendliness rules the market. Therefore, the quality aspects of cotton have assumed greater significance.

Similar to how cotton is classified in the state according to contamination levels, if cotton is cleaned or has very little contamination and has been brought to market using a pre-cleaning method, the price will be high. If the contamination percentage is very high, cotton is classified as having a very high level of contamination and will have a low price. As a result, the categorization determines the cotton's quality and cost.

5.2.4. Warehousing

Cotton is frequently transported to a warehouse or gin yard after classification, where samples are taken to ascertain the fibre characteristics. Generally speaking, cotton may be maintained in stores for extended periods of time without deteriorating. It's important to handle cotton properly. Since cotton is a natural fabric, it requires careful handling and logistical techniques to avoid contamination or fibre damage. However, in areas like Odisha, the warehousing facilities are generally of poor quality. Sometimes, when production is at its peak, it is seen that some farmers cover their kapas with polythene to keep them in the agricultural area, and that some farmers leave their kapas open all day and all night. Even while Odisha produces some of the best cotton in the nation due to climatic and soil conditions that are ideal for cotton production, it is also one of the main causes of the production of more polluted cotton. Therefore, the state should have the necessary and sufficient area for warehousing facilities that may be used both during and before the ginning stage.

5.1.5 Logistic

Spinning mills take bales of cotton, combine different cotton grades, and then spin the cotton fibre into cotton yarn. The materials made from the yarn are then cut and stitched to create final objects. One integrated fabric mill can handle the entire process from yarn to completed items, or there can be a number of mills, each of which handles a distinct step in the fabrication process.

After ginning, cotton is generally shipped to a warehouse/gin yard and sampled to establish its fibre characteristics and quality, and can remain in storage for extended periods. Spinners use cotton from a range of origins, and of varying qualities to produce the yarn; fabric mills also source from a range of origins and garment manufacturers may have subcontractors to dye, launder or embellish their product. Retailers may source the same product from a variety of garment manufacturers

5.1.6 Spinning and Yarn Production

With a total installed spindleage of 380772 spindles and 800 rotors, there are fourteen spinning mills located throughout the state, including one in the Small-Scale Industries (SSI) sector, one in the non-SSI sector, and one composite unit. Of them, 45.2% are operable but closed as of the current day due to administrative or managerial issues, whereas 23.4% of the spindles are in operation.

Seven mills in all, accounting for 26.48% of the state's installed spindleage, are operated by private management. Five mills, or 29.19% of the state's spindleage, are under the administrative authority of the cooperative sector, whilst the state and central governments each oversee two and one mills, or 34.24% of the state's installed spindles. The majority of spinning mills operate independently, with no backward or forward connections to the G&P sector or to the weaving segment (power looms and handlooms).

The state's spinning industry began to collapse in the middle of the 1990s, reaching its nadir in 2006. Cotton serves as the primary raw material for the spinning industry. Ironically, the state spinning industry thrived when cotton fibre was in short supply locally, but has since contracted and scaled back production now that cotton is widely available. The fundamental causes of the spinning industry's demise include (i) a lack of timely technological advancement, (ii) the inability to work in three shifts as a result of strict labour laws, (iii) a lack of potential value-adding segments, (iv) the use of subpar raw materials, such as inferior cotton, and (v) managerial and administrative factors.

The state produced 16.65 lakh kgs of yarn in total between 2010 and 2011, of which one EOU (Export Oriented Unit) at Kerie in the Sundargarh district alone produced 14.55 lakh kgs of yarn. This level of operation equates to 9.35% (3 shifts working) of the production capacity of 92000 working spindles (14.02% & 28.05% for 2 & 1 Shifts respectively), which shows that three of the four operating mills are frequently closed due to labour issues, a lack of raw materials, or inability to complete one shift of work. With 92000 spindles in use, the four operating mills, in accordance with the SITRA (South India Textile Research Association) standards for spinning, are capable of producing 178.02 lakh kgs of yarn, assuming that the units work all three shifts (118.68 lakh kgs for two shifts and 59.34 lakh kg for one shift), over the course of a year with 300 working days.

It should be highlighted that the current level of output cannot even match the state's 19.63 lakh kilogramme annual requirement for handloom yarn. The Power Loom sector was forced to obtain yarn from other states in the provided circumstance. Furthermore, only 2.10 lakh kgs of the 14.55 lakh kg of yarn produced by the EOU are available for the local market, or 10.69% of the demand in the handloom sector.

5.1.7 Fabric Production and Marketing

Handwoven textiles are arguably the oldest and most well-known of all the Indian arts and crafts. The handloom sector, which supports more than 30 lakh weavers directly and indirectly, is India's second-largest economic activity after agriculture. Nearly 23% of the nation's fabric is produced on handlooms. On the other hand, given its considerable contribution to GDP and foreign exchange revenues, it has a significant impact on the Indian economy. However, the handloom industry has suffered greatly from the onslaught of fashion changes, being relatively isolated and under pressure due to its inability to embrace necessary technology, boost production, and get access to the market effectively. The distinctive feature of the Orissa handloom industry is the *ikat* design, which finds ancient linkages in the cross-cultural influences with the maritime activities of South East Asia. The tradition of producing hand woven textiles is one of the major activities next to agriculture in the coastal region & especially western Orissa. In this dynamic era, fast changes in fashion trend have also led to the increasing demand of handloom products from even the foreign countries but also thrown up to ever increasing future challenges on the other hand. Even though the situation would prevail,

handlooms will survive, as it has the immense design potentiality, diversities with less cost effective according to the customer's requirement and fashion trends. The industry will have to look for competing & surviving purely on its intrinsic strength & competitive edge in a holistic & integrated manner.

44.53 million square metres of cloth are produced annually in the state on handlooms and power looms combined (GoO, 2013). According to estimates, the handloom industry produced 31.83 million square metres overall in 2003, with the remaining 12.7 million square metres coming from powerlooms. Sarees (2624632 pieces) and Gamcha (3468424 pieces) are both produced on handlooms. More than 69% of the overall production is made up of the 22.10 million square metres of cloth used to make sarees. The well-known Saree-producing regions include Cuttack, Sambalpur, Bargarh, etc. The products now being produced include the gamcha, dasa saree, dhoti, lungi, blouse, and long cloth. Gamcha has the highest output rate of these commodities, at 11.5 million square metres (90.55%). 433 of the 469 operating units in districts like Balasore, Bhadrak, Dhenkanal, Ganjam, Khurda, Nayagargh, and Puri are involved in the production of gamcha and saree.

6.Conclusions

Our research has demonstrated that using organic cotton may benefit farmers as well as middlemen at every stage of the production chain. The implementation of sustainable practises also results in larger social and environmental benefits for organic approaches. The design and extent of the value chain are anticipated to change in the future due to a number of changes to the cotton production sector. In the upcoming years, a significant increase in demand for organic cotton is anticipated. Producers in poor nations are projected to increasingly fill this need as they get access to improved support services, expertise, and the financial and regulatory infrastructure required to switch to organic production.

However, even though organic farming is forecast to grow, organic dyeing may be a different matter. Organic dyes add to the cost of full certification as well as contributing to other environmental problems such as deforestation and acid waste. This suggests that demand for fully organic cotton products may be lessened by lobbying on the part of the most knowledgeable environmentally-aware consumers. The implication is that organically farmed cotton, not fully certified throughout the whole value chain, is likely to be the biggest seller in the future.

There are several policy implications of our study. If, as our research suggests, there are both economic and social net benefits to the adoption of organic methods in the Indian cotton farming industry, one would imagine that the Indian national and regional governments should be doing their utmost to support farmers' moves to organic production methods.

A further value chain analysis in a year or two would be useful for understanding any changes in the value-added profile of the organic cotton production chain. In this industry, with its chain of independent producers each of whom strikes a price at each stage, assessing a stages' contribution to the end price is relatively straightforward. But the process of analysis directs producers, governments, and agencies alike to the areas like Odisha where most value is added, or alternatively lost, and where additional scope for value addition may be found. It also signals where power is particularly strong or weak, providing the evidence necessary to remedy any inefficiencies or, indeed, to redress any social wrongs. Although never intended originally as a method for assessing social or political structures in the wider economy, a value chain analysis undertaken on a whole industry, especially as in this case one that straddles two very different economic groups, provides a potentially powerful tool by which to assess areas where political intervention or social activism may best be directed.