

# Innovation In Minor Fibers Towards Technical Textiles For Women Empowerment

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## Abstract

Our country has a vision of uplifting the status of women and utilization of natural minor fibers. Women have an inbuilt skill of utilizing and management of the resources. The only need is to impart knowledge, motivate them in right direction and having easy working strategy which will provide better standard of living. On the other hand natural fibers are abundantly available in our country and can be used for various applications. These fibers have their own characteristics with which a need of research to increase its commercial use is an urge. Both the ideas when combined will definitely bring change in the status of women's in our society and the economic change will also be seen in our country. Hence the main thrust of the research is to provide a commercial channel wherein the consumption of minor for technical textiles, majorly management by the women's.

**Keywords:** Women's empowerment, employment, Minor fibers, technical textiles, innovation.

## INTRODUCTION

According to the fifth annual employment-unemployment survey at all-India level shows 77 per cent of the households are of non-regular wage/salaried person. While, by the report of Labour Bureau the unemployment rate in India has shot up by 5 per cent in 2015-16, out of which 8.7 per cent are of women and 4.3 per cent for men. Thus government has initiated projects like 'Make in India' to create job opportunities for the growth of the country.

"In rural sector, unemployment rate was 5.1 per cent whereas in urban sector, the rate was 4.9 per cent under the UPS (Usual Principal Status) approach," the report said. Female unemployment rate was estimated to be 8.7 per cent, whereas for males it was 4.3 per cent. Conducted survey across all states and union territories during April to December 2015 also reveals that amongst the 1, 56,563 samples - 88,783 households in the rural sector and 67,780 in the urban sector were unemployed [1].

The use of textiles has increased in both the rural and urban areas for various applications. This has increased the consumption of majorly cotton as natural fibers and synthetic fibers due to cost and easy processing factors. India has various natural minor fibers which are not explored upto the mark because of lack of infrastructure, passion towards increasing its utility and awareness of the same.

These fibers are abundantly grown in various areas, also extracted by the farmers and are biodegradable still major portion of it goes as waste due to are lack of utilization. The major factors associated with most of the minor fibers are its characteristics like stiffness and cohesiveness, which obstructs full utilization for clothing and textile purposes.

The specific and critical character of the minor fiber can and has imposed a dynamic change in the fields of the design, engineering, production and testing. Hence a thought of building up a strategy to involve women's for an innovative idea of manufacturing technical textiles from minor fibers.

## THRUST OF INNOVATION

- 1) To increase the utilization of natural minor fibers in India
- 2) To improve the employment status of the women's
- 3) To channelize the fiber to fabric process of minor fibers and direct its utilization towards technical textiles

## EXPLORATION WITH MINOR FIBER

The concept of eco-friendly and sustainable development has extended the importance of natural minor cellulosic fibers and a need of manufacturing more products for various applications to create an identity in the market. Other reasons of increasing the use of minor fibers are – environmental stability, utilization of natural resources, cost factors, population and leisure as well.

Amongst these fibers each fiber has some or the other inherent features like stiffness, staple length, less cohesive, strength, etc. Hence traditional and modernized methods need to be utilized together based on the product, properties, required behavior and evaluation based on final performance.

## INNOVATION IN MANUFACTURING PROCESS

Innovation refers to the performance, production methods and applications of the minor fibers to increase its consumption by providing unconventional products to the market. A schematic innovative manufacturing process (Fig. 1) was prepared, wherein stepwise at each level the research and development will take place to formulate a strong and long lasting women entrepreneurship.

The process shows that majorly three departments i.e. Market need (market analyzer), function and aesthetic and designing and manufacturing departments will further take care of the five major criteria's:

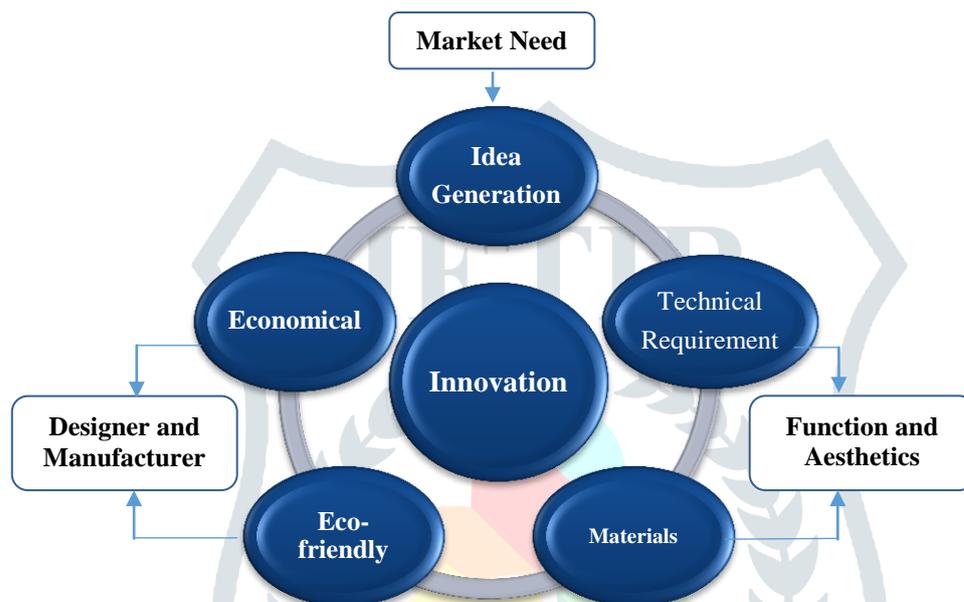


Fig. 1. Schematic Innovative Manufacturing Process

- 1) **Idea Generation** –According to the customer's need available fiber can be used for non-clothing purpose. All the required data's related to the fibers will collected and basic process like extraction, drying of the fibers and preparing bundles of the same will be done.
- 2) **Technical requirements** – These fibers having various inherent properties like cohesiveness, stiffness, etc needs special kinds of instrument and machine to convert them into technical textile.
- 3) **Materials** – Based on the collected data, the properties of the fibers will be taken care of and accordingly it will be utilized for the functional textiles. Like for example the fibers which has a hollow structure or are more aligned will be utilized for the acoustic materials or the fibers which are more absorbent will be utilized for the filtration. Also the cost of the fibers, processing cost, fabrication of the materials will be considered and further the fabrics will be analyzed for its durability, marketability and technical evaluations before proceeding for the bulk quantity (Fig. 2).
- 4) **Eco-friendly** – During the entire fiber to fabric process care will also be taken to identify the utilization of the waste materials. That is shorted length or waste fibers can be used for stuffing of the product or creating sculptures, or else paper making, bio gas, etc. Also the treatment of the fibers will be done by enzymes hence no harm to environment may it be land, water or air.
- 5) **Economical** – Designing and manufacturing of technical textiles will be done based on the market need, availability of the resources and environmental conditions will also be considered. The raw material cost is minimal, per cent unemployed women's are more which will be engaged and their by fast and easy production through assembly line will strengthen production amount. Higher the awareness, requirement will increase, which will elevation the production rate and the sales. Thus, a gap between the demand and the supply of these products should be reduced to create good market opportunity. Then production of these products scales up to mass market requirement, there by growth in economic status of the country through women empowerment will be achieved.

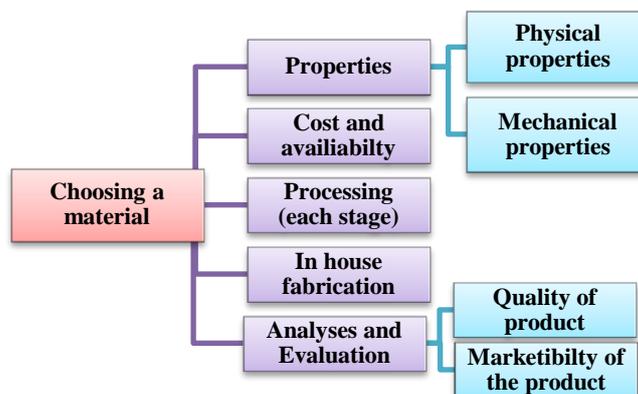


Fig. 2. Criteria For The Selection Of The Materials For The Product

## DIRECTING TOWARDS TECHNICAL TEXTILES

The country's technical textile market has huge growth potential and it is expected to grow at 12 per cent per annum to reach \$23billion (Rs 1,50,000 crore) in 2020 from the present \$18.16 billion (Rs 1,60,000 crore). Demand for technical textiles is expected to stay steady during the period 2017-2020, due to a broadening application in end – use industries, such as automotive, construction, healthcare and sports equipment and so on.

Technical textile offers immense potential and has been termed as a sunrise industry in India as it also employs about 51 million people directly and 68million people indirectly. It has a future in every aspect of our life but needs better productivity, better technology and better durability. A lot of investment opportunities is also likely to attract and government is also offering 15 per cent subsidy for domestic players, who want to set up machinery [4].

While exploring the minor fibers for technical textiles its essential to address technical textile design, innovation concept related to its application, function, performance, manufacturing, and sustainability. Technical textile is a structured process majorly depending upon the performance and functionality. Yet with the recent trend aesthetics are also considered, hence a product has to fulfill all the parameters and requirements to sustain in the market.

To prepare a minor fiber technical textile product with all the parameters and requirements finalized process will be done at all the stages i.e Fiber, yarn and fabric.



Fig. 3. Stages For Technical Textile Product Preparation

At fiber stage- extraction, cleaning, washing, beating, softening and drying process will take place. It will be done near to the place of fiber cultivation. The team will also have to co-ordinate with the cultivation group in to know the details like biological name of the fiber, maturity period and grade of the fiber.

Preparing bundles of fibers for hand or charkha spinning depending upon the count required for the specific product, cone preparation, variety of yarn preparation and finishing of yarn will be taken care of at the second i.e. yarn stage. Again all the parameters will be decided by the designer and manufacturing team depending upon the need of the product.

Fabric stage will include various types of weaves, weaving with fiber or yarn, thickness of the fabrics, etc will be considered based on the product type and its end use.

Final stage is a stage where in the parameters considered at each level will sum up to have a product which will undergo for the finishing work like resin application, edge finishing, softening, etc process to have an required product. Before finalizing the entire process, prototype will be evaluated based of its aesthetics, durability and marketability.

### WOMEN CENTRIC INDUSTRY

Employment is a need or a way of survival in today's growing world, but sadly unemployment is a problem not only in India but in many other developing countries [8]. To understand the reasons behind the employment status of women, an indepth study was done by collecting theoretical studies and by conducting a small trial workshop. The hitches were identified like - low paid job, discrimination towards male colleagues, early family responsibility, lack of job oriented skills and enthusiasm in females, mentality of the society that certain places or jobs are not fit for women, etc.

The entire channel of inception to promoting of the product will be completely done by the group of females. Involvement of women's will be based of the knowledge, skills and interest of an individual towards the work and also the unemployment issues will also be considered. Rural and urban women will be included so that the growth in employment ratio is uplifted, escalation in the knowledge amongst both the group through continues interaction, training sessions will be conducted to bring the satisfactory level in all terms and thus women empowerment will be achieved. Healthy working environment and comforts also be considered and regular evaluation for the growth of women's, industry and finally for the economic growth of the country will be taken care of.

### GOVERNMENT POLICIES FOR THE INNOVATION

The Government of India has undertaken several initiatives and instituted policy measures to foster a culture of innovation and entrepreneurship in the country. With a significant and unique demographic advantage, India, however, has immense potential to innovate, raise entrepreneurs and create employment for the benefit of the nation and the world.

In the recent years, a wide spectrum of new programmes and opportunities to nurture innovation has been created by the Government of India across a number of sectors. From engaging with academia, industry, investors, small and big entrepreneurs, non-governmental organizations to the most underserved sections of society.

Recognizing the importance of women entrepreneurship and economic participation in enabling the country's growth and prosperity, Government of India has ensured that all policy initiatives are geared towards enabling equal opportunity for women. The government seeks to bring women to the forefront of India's entrepreneurial ecosystem by providing access to loans, networks, markets and trainings [2].

*Table 1. Government schemes for promoting innovation and entrepreneurship.*

Sr. No.	Name Of The Scheme	Fiscal Incentive (*T&C applied)
1	Modified Special Incentive Package Scheme (M-SIPS)	Majorly provides capital subsidy of 20% in SEZ (25% in non-SEZ) for units engaged in electronics manufacturing.
2	NewGen Innovation and Entrepreneurship Development Centre (NewGen IEDC)	Provide a limited, one-time, non-recurring financial assistance, up to a maximum of INR 25 Lakhs.
3	Atal Incubation Centres (AIC)	AIM will provide a grant-in-aid of INR 10 Cr to each AIC for a maximum of five years
4	Scale-up Support to Establishing Incubation Centres	Grant-in-aid support of INR 10 Cr will be provided in two annual instalments of INR 5 Cr each.
5	Enhancement of Competitiveness in the Indian Capital Goods Sector	One time grant up to 25% of the cost of the technology acquisition of each technology. Maximum amount given shall not exceed INR 10 Cr
6	Assistance to Professional Bodies & Seminars/Symposia	The incentives include nominal support for pre-operative expenses
7	High Risk-High Reward Research	The research grant covers equipment, consumables, contingency and travel apart from overhead grants. No budget limit is prescribed for these projects.
8	Technology Development Programme (TDP)	Provided support for project staff salaries, equipment, supplies and consumables, contingency expenditure, patent filing charges, outsourcing charges, etc.

9	National Science & Technology Management Information System (NSTMIS)	Grant-in-aid are provided for projects. Also, overheads on projects are provided at the rate of 10% of the total project cost for educational institutions and NGOs and 8% for laboratories & institutions under Central Government departments/agencies.
10	Extra Mural Research Funding	The research grant covers equipment, consumables, contingency and travel apart from overhead grants. No budget limit is prescribed.

## CONCLUSION

A huge scope has been identified in various segments of the study i.e. unexplored areas like minor fibers, processing of technical textiles with various fibers and employment generation. These particular sector of requires minimal skills which can also be polished by organizing training and workshops.

Women empowerment and economic uplift can be achieved by bringing the awareness on benefits of working women, about the unexplored minor fibers, creating the demand for the utilization of these fibers, diverting these fibers for technical textile will raise the demand of fibers hence economic status of the farmers will also grow.

Hence by creating the market and awareness of such eco-friendly technical textiles products will strengthen three major segments – status of the women, farmers and the country. Also with the support of government policies, assistance or collaboration with the established industries will bring the motivation in the startup and also motivate women to work enthusiastically towards the aim of the entrepreneur.

## REFERENCES

1. India's unemployment rate highest in 5 years in 2015-16. *The Indian Express* [Internet] 2016 September 29; Available from: <http://indianexpress.com/article/india/india-news-india/unemployment-india-paints-grim-picture-highest-in-5-years-in-2015-16-3056290/> (Electronic Newspaper Article on the Internet).
2. Government of India Support for Innovation and Entrepreneurship in India. The Eighth Annual Global Entrepreneurship Summit; 2017; Available from: <https://www.ges2017.org/govt-of-india-support-for-entrepreneurs/> (Electronic Report on the Internet).
3. Agarwal M. 50+ Startup Schemes By The Indian Government That Startups Should Know About. *Inc42*. 2017 June 30; Available from: <https://inc42.com/startup-101/startup-scheme-indian-government-startups/> (Electronic Magazine Article).
4. Technical textile market to grow at 12 per cent CAGR. *The Hindu Business Line* [Internet] 2014 September; Available from: <https://www.thehindubusinessline.com/economy/technical-textile-market-to-grow-at-12-per-cent-cagr/article9859829.ece> (Electronic Newspaper Article on the Internet).
5. Khalifa. F. Technical textile; Design & Methodology, *International Design Journal*, Vol.3 No.1, 51-61p.
6. Karolia. A., Sharan. M., Desai. A. *Value addition and product diversification of natural minor fiber UGC Major research project Report*, Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara; 2014 July. Report No: 41-697/2012 (SR) dated 23/07/2012.
7. Patel. F., Karolia. A. *Natural dye value added eri silk and sisal products, craft techniques for contemporary decor International workshop on Natural dyes*, Acharya.N.G.Ranga Agricultural University, Hyderabad, October 2013 [Published in proceedings].
8. Reasons why women in India are unemployed, even after being educated! *Young Skilled India A Professional Networking Platform*. 2016 December 22; Available from: <https://youngskilledindia.wordpress.com/2016/12/22/reasons-why-women-in-india-are-unemployed-even-after-being-educated/> (Electronic Magazine Article).