Significant Technologies Developed- Clothing and Textiles (Dr. Manisha Gahlot, Professor)

1) Protective clothing (Apron and gloves)

Brief description of technology

Developed protective clothing (apron and gloves) for mitigating occupational health hazard of workers engaged in agriculture and allied sector.

Specification of Apron for workers engaged in printing unit

- Made from non woven material which is used for packaging of rice, polyester fabric used as inner lining
- Belt at neck and sides
- One pocket on the front side to keep valuables
- Easy to wear and remove
- Protect clothes from colour and dust

Specification of denim gloves for sugarcane harvester

- Made from discarded denim jeans to emphasize concept of recycling
- Added strip between front and back part of glove for better fit/grip
- Easy to wear and remove
- Comfortable while working
- Protects hands from burning and itchy rashes due to sugarcane leaf blades

2)Extraction and processing of hemp and nettle fibers and its value addition for income generation

A. Brief description of technology

Hemp fiber (*Cannabis sativa*)

- Production of hand spun hemp yarn on *Bageshwari Charka*(yarn count-438.32 tex)
- Development of union fabric using hand spun hemp yarn as weft along with cotton yarn as warp (Fabric thickness –1.23mm and fabric count 24 x 15).

Hemp-cotton union fabric

B. Nettle fiber

Potential of Himalayan nettle fibre has been explored in terms of diversified end uses through production of woven, nonwoven and blended fabrics for technical and apparel purpose.

1. **Nettle fiber Union fabric**

Specifications

Fabric-1 Twill weave fabric woven on hand loom

Fabric-2 Plain weave fabric woven on power loom

- Fabric 1: Twill weave fabric woven on hand loom (Fabric thickness - 0.87 mm and fabric count 30x32)
- Fabric 2: Plain weave fabric woven on power loom (Fabric thickness - 0.85 mm and fabric count 34x36)

2. Himalayan-nettle and cotton union fabric (Woven and non woven fabrics)

Specifications

- Optimized extraction and processing methods of Himalayan nettle fibre
- Spinning of nettle yarn (yarn count-1.83) on *Bageshwari Charka*
- Development of four types of fabric structures
  - Fabric 1: Pure nettle (Fabric weight-392.5 GSM)
  - Fabric 2: Nettle-merino union fabric (Fabric weight-178.33 GSM)
  - Fabric 3: Nettle-hersil cross wool blended fabric (Fabric weight-149.33GSM).
  - Fabric 4:Development of non woven (Fabric weight-534.00 GSM)




Plate 1: Pure nettle fabric fabric1 **Plate 2: Union nettle fabric2** **Plate 3: Union nettle fabric3** **Plate 4: Nonwoven fabric 4**

3) Development of UV Protective scarf masks for farm women using *Jamun* (*Syzygiumcumini*) leaf extract

Brief description of technology

Jamun (*Syzygiumcumini*) leaf extract was prepared and finishing process was optimized for UV protective finish on cotton fabric based on the results of UPF (Ultra Violet Protection Factor). The UPF of this finished fabric was found to be very good (UPF: 36.7) which meant that fabric can provide protection against UV rays. Finished fabric was used for the development of UV Protective scarf masks for farm women.

Specification of UV Protective scarf mask

- Use of cotton fabric treated with *jamun* leaf extract
- Design features of scarf mask meant to give full Coverage to the head, face and neck of the wearer

- Easy to tie fastening system

4) Diversification of *Aipan*floor art of Kumaon (Uttarakhand) using different textile surface enrichment techniques

Brief description of technology

The *Aipan* folk art uses geometric and stylized designs which are made on *geru* painted floor (red background) with rice paste (white). There are specific *Aipan* for different religious occasions and ceremonies The main symbols used in this are the lines, dots, triangles, circles, squares, swastika, lotus and their various combinations. These designs of Kumaoni *Aipan* were chosen for adaptation on textile products through different surface enrichment techniques.

Specification

- Use of commercial dyes and printing techniques such as block printing, screen printing, heat transfer printing and hand embroidery.
- Development of designs and design arrangement for different products like cushion covers, stoles, bags and pouches.

5) Herbal *gulals*

Brief description of technology

Herbal *gulals*of various shades were prepared using beetroot extract, *tesu* flower extract and marigold flower extract.Colours were extracted from natural sources and filtered.The filtrates were concentrated to some extent and mixed with the arrowroot starch powder in different proportions as per the required shade.

Specification

- Use of colors from natural sources
- The process of *gulal* making did not include the use of any chemical
- Developed *gulal* were soft in touch with good sticking ability on skin

6) Delignification of Himalayan nettle

Brief description of technology

Extraction and processing of Himalayan nettle fibre was done with the minimal use of chemicals.

Specification

- Delignification of nettle fiber was done using sodium chlorite, sodium hydroxide and acetic acid
- Reuse of bath with minimal use of chemicals
- Development of handspun yarn
- Value addition of Himalayan nettle fibre