



Faculty of Design

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Systemic design thinking for creating sustainable products through women self help groups

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Relating Systems Thinking & Design
13-15 October 2020



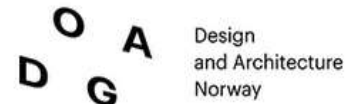
Systemic Design Thinking for Creating Sustainable Products Through Women Self Help Groups

An Experimental case study from the outskirts of Lucknow

Track 9 | Systems for equity ,collectivism, Co-
design and citizen movements
Friday, October 16

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Outline

- Connecting dots
- Social experiment
- Co-creating community design
- Involving stakeholders
- Redesigning
- Urban rural connect
- Reusing things, knowledge, raw material available locally, systemic design thinking

**LEARNINGS FROM BEFORE EXPERIMENT
PERIOD**

ONLY SOCIAL AWARENESS AT MEETINGS

Traditional Knowledge and Biodiversity: Awareness for ABS

Khandwa, Harda and Betul : Interacting with Tribal women for Traditional Knowledge associated with Biodiversity for Entrepreneurship



← Khandwa

Interacting with Tribal women for TK and Entrepreneurship in Betul



Harda: Inculcating Entrepreneurship

Khandwa: Interacting with Tribal women for potential GI from Traditional Knowledge



Taking stock of ground realities, SHG registration is just the beginning

LEARNINGS AFTER EXPERIMENT PERIOD

**UNDERTOOK A NEARBY VILLAGE FOR
EXPERIMENTATION BY DOING**

Research based systemic design intervention

- **Scouting for free raw material**
- **Procurement of raw material- cost intensive**
- **Started with what readily available eg agro waste, by-product, mud etc**
- **Zeroed on few materials**
 - mud
 - Fish scales
 - Jute with Chikankari (as women knew chikankari, but market for basic chikankari was competitive, Strategized on creating unique products)
- **Government initiative on zero plastic use came handy as offices started looking for plastic alternatives**
- **Gave new market**
- **Designed demand based product**
- **Urban rural connect**
- **Village product reaches office spaces**

Sustainable Development Goals [SDG] and Women Self Help Groups [WSHGs]

- **SDG1 Ending POVERTY**
- **SDG2 Eradicating HUNGER**
- **SDG3 Bringing GENDER EQUALITY**

- **Central theme :**
 - **Livelihood and economic empowerment**
 - **Decision making**

- **Experimental Designing**
 - **Scouting for active Women Self Help Groups (WSHGs)**
 - **Interaction for finances, loan and its interest with repayment issues**
 - **Understanding problems of failure and hesitation of WSHGs towards entrepreneurship**
 - **Scouting for known resources available using systemic design approach**
 - **Designing product oriented training for urban and rural market connect**
 - **Extracting visible outcomes out of invisible village rooted problems**

Experimental set up in a rural village: A model for replication

- **Minimalistic design intervention**
 - Terrarium clay balls
 - Jute products with hand woven design motif embroidery using traditional knowledge having a Geographical Indication (GI) registration for Lucknow and nearby areas known as *Chikankari*
 - *Chikankari* is recognised by Government of Uttar Pradesh as a One District One Product initiative taken for all districts for creating industrial clusters for fostering entrepreneurship



Systemic Design Thinking and creativity

- **Idea generation**
- **Problem solvers with co community creation**
- **Stakeholders: office spaces and school**
- **Designing solutions, strategic thinking for workshops and conferences**
- **Perception and Empathy, redesigning solutions based on usage**
- **Product process policy: redesigning**
- **Creativity, creating new products with the help of users eg kid designers**
- **Pricing, production, delivery, bills, Udhog aadhar registration**
- **Developing private incubation centre for ideation and workable product designing**
- **Learning through understanding from SHG to researcher and researcher to SHG**
- **Scouting for Potential Applications**
- **Connecting Research and Creativity, Connecting Rural and Urban**
- **Designing and Redesigning solutions, working with students**
- **Rethinking , ideating, being Creative, Idea journal ... Trap random fleeting ideas, ... Write**
- **Think Crazy.... Get workable solution**



Experimental Case Study **Terrariums**

Problem:

The Mudra Yojna gave a rotational financial incentive to the Women SHGs

- **The lack of skills led women to rotate the money among them with interest, hence replenishing the amount to the bank but not getting any benefit or income generation**
- **The input of Rs 7000 towards raw material, helped women to create 24 terrariums**
- **Designing provisions to reduce the moment regional/ locally sources items are used. Their traditional knowledge for building local toys can be used eg chulla , bullock etc were used. Fish scales were reused**

Initiative

- **Using locally available materials an initiative was taken to connect shelf help groups with urban customer. The initiative opened a plethora of problems. Initially SHG were interested but the complexity of the design made them take a back seat.**
- **The women agreed to create local products that can be used for toys etc. A number of offshoots could come out of the project. Catering to biocompost needed in Terrariums**
- **The brick klin nearby becomes a source for raw ingredient for terrarium designing Terracotta toys miniature ones that had market only during festivals, Creating rural designs, The rusticness gives added opportunity for sales**



Rustic clay design

Designing with clay and fish scales



Redesigning



Clay and aquarium



Creative Rethinking for designing



Being different

The process of joining , scouting, training and working

A



B



C



D



E



Row A: Primary interaction with Self Help Groups handholding and mentoring:

Row B: Preparation of terrariums by SHGs and exhibiting terrariums at Sibtainabad Imambara for displaying Terrariums made of locally available materials. Fish scales were also used as a recyclable reuse material:

Row C : Designs created by locally available material:

The corn, an Agro biowaste more uses key rings, book mark



The samosa bag, paper use, parrafin roll reuse



Courtesy: The samosa bag, by Aoishi paper reuse by Satya & Amritha, bamboo planter

Using degradable Jute for livelihood

Replacing jute files in offices with degradable Jute

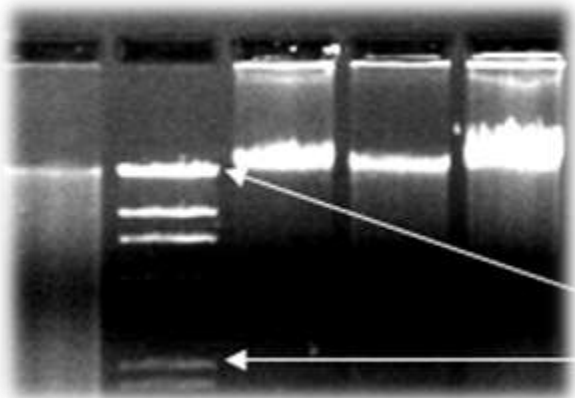


A QUADRAPOLE PILLAR

**THE SCIENTIST ACADEMIA AND POLICY
MAKER SHOULD GET OUT OF CORE
COCOON**

Connecting dots of the QUADROPOLE HELIX

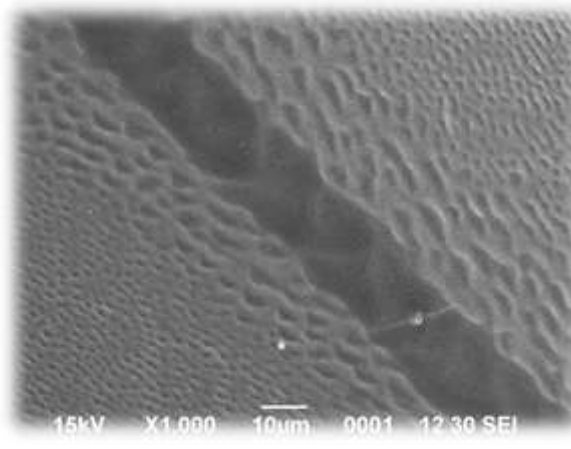
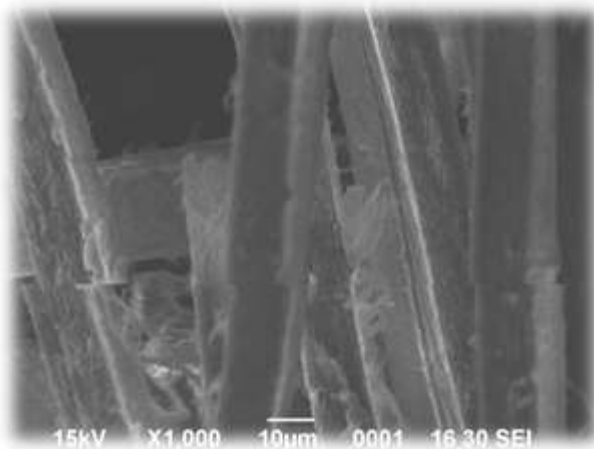
Fish Bio-waste: Connecting Science with Art



DNA from fish scale



In vitro collagen
recrystallisation



Connecting researchers with end users

A CORE SCIENTIST:

Non Invasive DNA Extraction from fish scales

- A rapid, non-invasive (2 hr) DNA extraction method from fish scales, with modified lysis buffer was developed for *Catla catla*, *Labeo rohita*, *Labeo calbasu*, *Labeo bata*, *Cirhinnus mrigala*, *Channa punctatus* and *Cyprinus carpio*
- Inexpensive and reproducible ,High efficiency of DNA recovery
- Suitable for RE digestion and PCR amplification

S.N.	Fish species	Average concentration	Range of concentrations in 5 specimens
1.	<i>Catla catla</i>	50	40-76
2.	<i>Labeo rohita</i>	100	80-136
3.	<i>Labeo calbasu</i>	33.5	30-52
4.	<i>Labeo bata</i>	25	22-35
5.	<i>Cirhinnus mrigala</i>	53	32-68
6.	<i>Channa punctatus</i>	36	30-47

Indian Journal of Experimental Biology
Vol 45, November 2007, pp. 992-997

A non-invasive technique for rapid extraction of DNA from fish scales

Ravindra Kumar, Poonam Jayant Singh, N S Nagpure, Basdeo Kushwaha, S K Srivastava & W S Lakra
National Bureau of Fish Genetic Resources, Canal Ring Road, P.O. Dilkusha, Lucknow 226 002, India

Received 14 August 2006; revised 15 July 2007

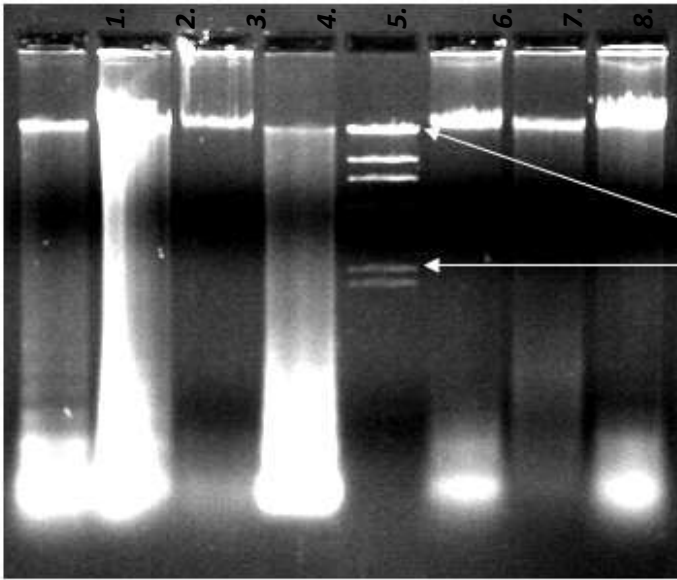
DNA markers are being increasingly used in studies related to population genetics and conservation biology of endangered species. DNA isolation for such studies requires a source of biological material that is easy to collect, non-bulky and reliable. Further, the sampling strategies based on non-invasive procedures are desirable, especially for the endangered fish species. In view of above, a rapid DNA extraction method from fish scales has been developed with the use of a modified lysis buffer that require about 2 hr duration. This methodology is non-invasive, less expensive and reproducible with high efficiency of DNA recovery. The DNA extracted by this technique, have been found suitable for performing restriction enzyme digestion and PCR amplification. Therefore, the present DNA extraction procedure can be used as an alternative technique in population genetic studies pertaining to endangered fish species. The technique was also found equally effective for DNA isolation from fresh, dried and ethanol preserved scales.

Keywords: DNA extraction, Fishes, Non-invasive, Scales

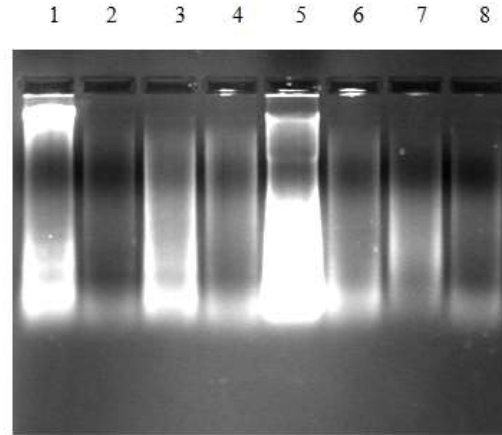
Concentration of DNA (ng/μl)

Agarose gel of DNA samples obtained from fish scales. (1) *Catla catla*, (2) *Labeo rohita*, (3) *Labeo calbasu*, (4) *Labeo bata*, (5) *Lambda Hind III* DNA marker, (6) *Cirrhinus mrigala* (7) *Channa punctatus* (8) *Cyprinus carpio*.

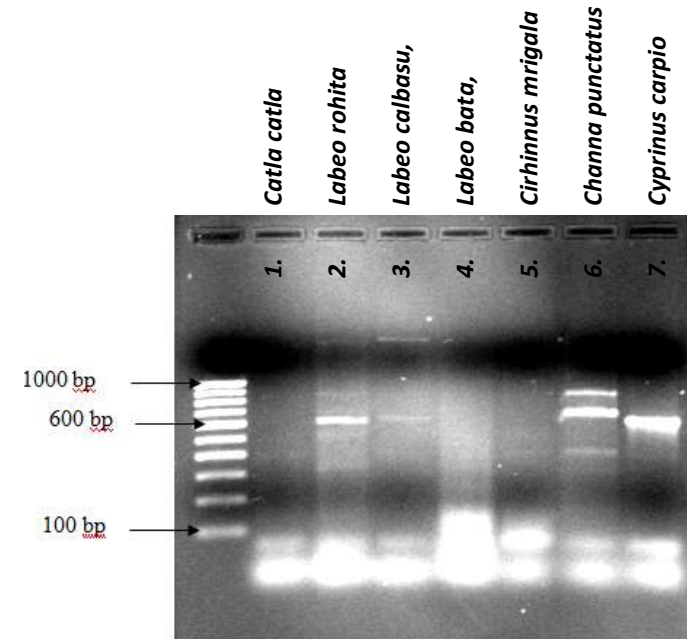
Catla catla
Labeo rohita
Labeo calbasu,
Labeo bata,
Lambda Hind III
DNA marker
Cirrhinus mrigala
Channa punctatus
Cyprinus carpio



PCR product
from DNA



Digested
DNA



Visuals for systemic design

**COORDINATING AND MENTORING
WSHG THROUGH TRAININGS ,
INTERACTIONS , HANDHOLDING**

World IP Day 2018 “Powering change: Women in Innovation and Creativity”

- For encouraging entrepreneurship and creativity among rural women an outreach workshop with 30 women SHG members on “Women Empowerment through Innovation and Creativity” was celebrated on World IP Day on 26th April 2018 at Kalli Paschim, Lucknow.
- SHG women participated in the discussion programme and spoke about their problems in their entrepreneurial journey regarding working space , funds and market constraints. The need for systemic design intervention was explained to create opportunities from basic material
- One of the constraint was lack of community working space that could help for creating Women SHG Agri-Business Incubation Centre



“Powering change: Women in Innovation and Creativity” : Constraints

- **30 women belonging to 2 self help groups participated in the discussion programme and spoke about their problems in their entrepreneurial journey.**
- **The discussion was around working space, price and market constraints.**
- **The need for systemic design intervention was explained to create opportunities from basic material**
- **One of the constraint was lack of community working space that could help for creating Women SHG Agri-Business Incubation Centre**

Village Level Women lead Incubator for co-creating sustainable design solutions

- **Mentoring and handholding of Rural Village Level Women lead Incubator for co-creating sustainable design solutions**
- **Using bottom up approach for interaction on “Co-creating Community Empowerment through design based intervention for Women Empowerment” with Women Self Help Groups namely Radhe SHG, Shakti SHG, Saraswati SHG and Sai SHG at ICAR-NBFGR**
- **Exhibition of co created products through its brand Kalyani Creations , an offshoot of the KWIC incubator with hand crafted products prepared by women of Self Help Groups using natural fibre jute, that is ecofriendly biodegradable and reusable with chikan embedded products**
- **Creating new livelihood opportunities through enhancing sustainable productivity and fulfilling One District-One Product concept with systemic design intervention**
- **Connecting rural manufacture with and urban office demand**

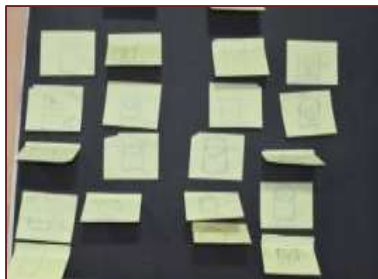
“Co-creating Community Empowerment through design based intervention for Women Empowerment”

Exhibition by SHGs: The exhibition on sustainable agro jute based products was inaugurated by the Director ICAR-NBFGR, Dr Kuldeep K Lal who admired the efforts of women of the Self Help Groups and stressed the need to strengthen them economically by buying their products.

The jute bags, boarding pass bag, file covers, files, and samosa bags were exhibited, that sold like a hot cake

The program was attended by ex Block Pramukh Mrs Kiran Yadav who has initiated **Kalyani Women Village Level Incubator (KWIC)** to promote Self Help Groups from marginal urban communities for co-creating reusable and sustainable products and bridging urban demand with rural created products.

**Ideation
and
rapid
prototyping**



Sustainable workshop with zero plastic waste



Kalyani Womens Rural Village Level Incubator (KWIC)

- **The Incubator , first of its kind in a rural set up was mentored and hand held by NBFGR**
 - **through Systemic design intervention**
 - **for economic empowerment , growth**
 - **inclusive resilient environment for women**
 - **Ideation, co creation and brainstorming**
 - **rapid prototyping paves further way for antifragility not resilience in a socially designed environment.**
- **A model to pave way to enhance livelihood options and curb the menace of plastic by using natural fibre option as a sustainable and biodegradable option with small interventions**

Brainstorming , co creating for ideation: Need + Expertise



Products refined for office use, co created through Kalyani Womens Village Incubation (KWIC) BY Kalyani Creations



Small Interventions Small Success : Big Motivation



Memento jute Bag given to delegates
Ordered by ICAR-NBFGR



The co created and co designed jute product, with reusable packaging bag and folds into a roll that can be used for keeping papers or bottle:
Rethinking packaging: Rethinking jute uses



Jute co created gifts to winners
on Women Day
Ordered by Women Cell
of ICAR-NBFGR



Figure 1) Rural women of SHGs participating the programme “Women Empowerment Through Innovation and Creativity” on World Intellectual Property Day, 2018 at Kalli Paschim, Lucknow. 2) Interactive session on “Co-creating Community Empowerment through design based intervention for Women Empowerment” on 18 the February 2018 at ICAR-NBFGR 3) Group photograph of SHG women co creating products 4) Director ICAR-NBFGR inaugurating the exhibition of products by SHG under the theme Co-creating Community Empowerment through design based intervention for Women Empowerment



L-R Clockwise; Inauguration of workshop with Jute bouquet cum planter; Jute bouquet cum planter co created by Kalyani Creations of Kalyani Village Women Incubation Centre by SHGs; Exhibition at Ganga Aquarium for IP awareness for kids; Interactive Studio Session on creative brainstorming for fostering creativity: Awareness outreach workshop on creativity and IP and sports for Self Help Group rural Women

Awareness outreach workshop on creativity and IP for Self Help Group rural Women



World Intellectual Property Day 2019

ICAR-NBFGR's events on WIPO IP Day events map

ICAR-NBFGR celebrated 'World Intellectual Property Day' on 26th April 2019, to create awareness towards IP for fostering innovation and creativity among researchers. The theme of the celebration at ICAR-NBFGR was on IP, creativity, innovation and sports.



<http://bit.ly/2GQldcj>

<https://www.wipo.int/ip-outreach/en/ipday/2019/map.html>

ICAR-NBFGR's events on WIPO IP Day events map

National Bureau of Fish Genetic Resources (ICAR) organise a series of events to create awareness towards IP for fostering innovation and creativity among researchers:

Event 1: Workshop on IP awareness with a presentation on IPR and inculcating creativity for researchers, technical officers and students

Event 2: Interactive studio session on creative brainstorming for fostering creativity

Event 3: Enactment of a scripted play on plagiarism by students

Event 4: Exhibition display for IP awareness for kids at Ganga Aquarium

Event 5: An awareness outreach workshop on creativity and IP for self help group rural women is organised at the Kalyani Village Women Incubation Center

Date: April 26, 2019

Link: <http://bit.ly/2GQldcj>

एनबीएफजीआर में मनाया गया विश्व बौद्धिक सम्पदा दिवस

पायनियर समाचार सेवा। लखनऊ

भारतीय कृषि अनुसंधान परिषद-राष्ट्रीय मत्स्य आनुवंशिक संसाधन ब्यूरो (एनबीएफजीआर) लखनऊ में विश्व बौद्धिक सम्पदा दिवस मनाया गया। कार्यक्रम का शुभारंभ निदेशक डॉ. कुलदीप कुमार लाल द्वारा तथा समन्वयन डॉ. पुनम जयंत सिंह द्वारा किया गया।



इस अवसर पर शोधार्थियों व स्वयं सहायता समूह की महिलाओं तथा बच्चों में सृजनात्मकता के अभिवर्धन के लिए कार्यक्रम आयोजित किया गया। छात्रों को बौद्धिक सम्पदा अधिकार, साहित्यिक जोरी तथा नवाचार जैसे विषयों पर जानकारी दी गई। संस्थान परिसर स्थित गंगा एक्झेरियम में बच्चों के लिए बौद्धिक सम्पदा से संबंधित शैक्षिक प्रदर्शनी लगायी गयी। जिससे

बच्चों को बहुत कुछ नया देखने और सीखने को मिला। कल्ली पश्चिम स्थित कलापानी क्रेअशन्स नामक इनक्यूबेटर सेंटर की स्वयं सहायता समूह की महिलाओं के समक्ष परंपरागत मूल खेलों को पुनर्जीवित करने तथा सृजनात्मकता के माध्यम से नए उत्पादों को विकसित करने के संबंध में एक परस्पर संवादात्मक कार्यक्रम आयोजित किया गया।

अमर उजाला 7
शनिवार • 11.05.2019

इन्क्यूबेशन सेंटर का शुभारंभ

लखनऊ।
राष्ट्रीय जैव विविधता प्राधिकरण की पूर्व चेयरपर्सन डॉ. बी



मीनाकुमारी ने शुक्रवार को कल्ली पश्चिम में कल्याणी महिला इन्क्यूबेशन सेंटर का शुभारंभ किया। यह केंद्र एनबीएफजीआर के सहयोग से विकसित किया गया है। इसमें महिलाएं अपने उत्पाद बनाकर उनकी मार्केटिंग भी कर सकेंगी। केंद्र की कोऑर्डिनेटर किरण यादव हैं। एनबीएफजीआर के निदेशक डॉ. केके लाल मौजूद रहे। ब्यूरो



SELF-HELP GROUPS



Former chairperson of National Biodiversity Authority B Meenakumari was in the city in connection with a review meeting at ICAR-NBFGR. She motivated and encouraged self-help group members for their economic empowerment. She appreciated creatively made eco-friendly jute products at Kalyani village Women Incubation Centre (KWIC) in Kalli Paschim mentored by NBFGR. She emphasised that such products by women self-help groups created a niche space in the market leading to smart economic empowerment of women. She appreciated Kiran Yadav, coordinator of the incubation centre, NBFGR director KK Lal, and nodal officer (IPR) Poonam Jayant Singh for encouraging women SHGs for ideation and developing co-created products for community empowerment, livelihood assurance and social upliftment.

WORLD INTELLECTUAL PROPERTY DAY

exhibited at the Ganga Aquarium.

National Bureau of Fish Genetic Resources (NBFGR) celebrated 'World Intellectual Property (IP) Day' on Friday to create awareness for fostering innovation and creativity among researchers. The theme was IP, creativity, innovation and sports. Three programmes were organised at NBFGR for researchers, women from self-help groups, and kids. For researchers, an interactive brainstorming studio session on creativity was organised. A presentation on IPR, plagiarism, creativity and innovation was made. A short play for understanding issues in plagiarism was staged by the students. For kids, a display of IPR educational material was

The products



1. Terrarium with baked clay balls



2. Jute Bouquet cum planter with ODOP Chikankari work (with and without)



3. Jute Table pen cum diary holder with bouquet ODOP Chikankari work



4. Jute multifunctional paper / bottle cooler cum wall hanging - all in one

Empowering Women Entrepreneurship for Intrapreneurship

Inclusive Community co-creation and Systemic Design Approach

Coordination, co creation with users into Design thinking & Handholding

Design requirement: Connecting Rural Manufacture with Urban use- Urban –Rural connect

Sustainable, biodegradable, ecofriendly solutions

Plastic free, planet friendly solutions

Problems and learnings

- **Quadrupole innovation by bottom up approach, with WSHG taking a lead with mentorship of Government, stakeholders and policy makers.**
- **Compulsory procurement by SHG by Government agencies to tame market forces**
- **Helping for registering at marketing platforms specially GEM (Government e marketplace) and Intellectual property portfolio**
- **Procurement clauses should help SHGs for marketing**
- **Establish common facility centre and incubation centres in villages for central procurement and order**
- **Will help in Affirmative action for depressed communities**

Thanks



THANKS