



Faculty of Design

2020

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

Jayant Singh, Poonam

Suggested citation:

Jayant Singh, Poonam (2020) Systemic design thinking for creating sustainable products through women self help groups. In: Proceedings of Relating Systems Thinking and Design (RSD9) 2020 Symposium., 9-17 Oct 2020, Ahmedabad, India. Available at <http://openresearch.ocadu.ca/id/eprint/3690/>

Open Research is a publicly accessible, curated repository for the preservation and dissemination of scholarly and creative output of the OCAD University community. Material in Open Research is open access and made available via the consent of the author and/or rights holder on a non-exclusive basis.

The OCAD University Library is committed to accessibility as outlined in the [Ontario Human Rights Code](#) and the [Accessibility for Ontarians with Disabilities Act \(AODA\)](#) and is working to improve accessibility of the Open Research Repository collection. If you require an accessible version of a repository item contact us at repository@ocadu.ca.

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

An Experimental case study from the outskirts of Lucknow

Poonam Jayant Singh

ICAR-National Bureau of Fish Genetic Resources

Abstract

Systemic Design thinking approach has been used to empower marginalised women community through co-creating products with locally available raw material existing in the surrounding area to help in livelihood generation. Two experimental case studies were used to empower women and learn from ground realities by being a spectator participant. Locally and freely available clay and “chikan”, a Geographical Indication of Lucknow, a traditional artisanal form of designing motifs by thread on cloth, using locally available material showed how design intervention can provide solution for change. Rural Women Self Help Groups (RW-SHG), designed to empower women at community level also act as microfinance institutes where women lend and collect finances for their needs. The women need handholding support for understanding market needs, bringing new products to the market, designing with functionality and market behaviour. Urban market reach with sustainable, eco-friendly products by creations of rural women was one of the targeted goals. A quadrupole intervention with society, academia, Government organisations, Non-Governmental organisations and business groups together can co-create community empowerment. The two case studies give a glimpse on the problems faced by women and how as a spectator participant, lessons can be used to create a working model with coordinated effort to empower women.

Keywords : *Rural Women Self Help Groups, Co-creation, sustainability, Chikan, Systemic design thinking, urban, rural connect, design intervention*

Introduction

The study uses a participatory approach of design, with informal interview method. The author is also a subject of the design process where the study does not look from outside, but becomes a part of the process by hand holding and mentoring. The main issue among SHG members from marginalised community was lack of work. The women were told by volunteers to collect money as a part of creating SHG, to avail matching grant from government agencies which has a interest component to be given back. The financial capability of SHG did rise, but it did not create entrepreneurial activities. The women were literate, could stitch but work around their houses. A structured community space was needed with basic infrastructure like sewing machines for stitching, a place to keep stitched products. Systemic design thinking was used to think about the resources available at hand and what could be done without training, with those resources that was available in the village.

Two experiments were conducted with one with baked clay and the other was by co-creating unique products with Jute and Chikan work, a registered Geographical Indication with ecofriendly and sustainable approach. The project started in 2017, with interaction with women, participation in monthly meetings

as spectator. Women were motivated to think about possibility of what they would like to do. The systemic thinking was done together with what was possible, what could be done with limited resources. The two case studies show how creativity and design can be used as a tool to strategise empowerment. Later on women got work orders. The women who had no work earlier now have work.

Here a quadrupole innovation approach was used incorporating members of private citizens, government agency, researcher and the SHG. Bringing together all four pillars, creating a network helped in out of box thinking for venturing into new areas by taking a risk, as mentoring and handholding support was provided.

But there are challenges for women changemakers that needs government intervention. A direct procurement strategy by government bodies through SHG will help women to create a networked cluster in an area for a particular product. Government intervention can help for bridging the gap by compulsory procurement by event managers for a government event to procure handmade goods from SHG to help in creating a flow of demand through event managers hired by Government and help in rural urban connect.

Co-creating community led design intervention

The major problem of women SHG was getting work for generating finance and utilising finance accumulated in SHG fund. The women took loans from the voluntary organisation recognised by National Rural Livelihood Mission, and contributed back the monthly amount with interest for basic household needs. The main objective of the mission was to provide financial empowerment through livelihood creation. Systemic design approach was used to find what can be done. Brainstorming for ideation was done with women informally, orally.

The women were first motivated to work for earning, trying out skills they had. Once they understood they were motivated to work. Since capital was an issue, scouting was done for available raw material. The purpose of the strategy was to create a working model that can be replicated. The problem was identified by communication and semi-informal participatory interviews

Case study 1: Baked Clay motifs and fish scales

Since free clay was available in the village that women used to make cooking stove (*chullas*) for cooking food. The women were inspired to use it as water retaining porous material for planters and as motifs for terrarium decor. The women created their own unique clay balls and motifs that could be used for decorating mud pots and terrariums that also helped to cover mud of the pot. This could last for a few months. ICAR-NBFGR also procured clay balls for testing it as an aquarium filter and as a substrate for fishes. This small initiative gave insights into the challenges these women face. A structured handholding and mentoring was needed for helping the women get into the mainstream of entrepreneurship.



Figure 1 The journey from Scouting to training and exhibition, Row A: Primary scouting and interaction with SHG, handholding and mentoring, Row B: Preparation of terrariums by SHG and exhibition of terrarium at Sibtainabad Imambara visited and appreciated by the Mayor of Lucknow in 2017, Row C: Terrariums were made by locally available materials. Fish scale were also used as a recyclable reuse material, Row D Designs created by locally available material for final product by mentoring and financial inclusion

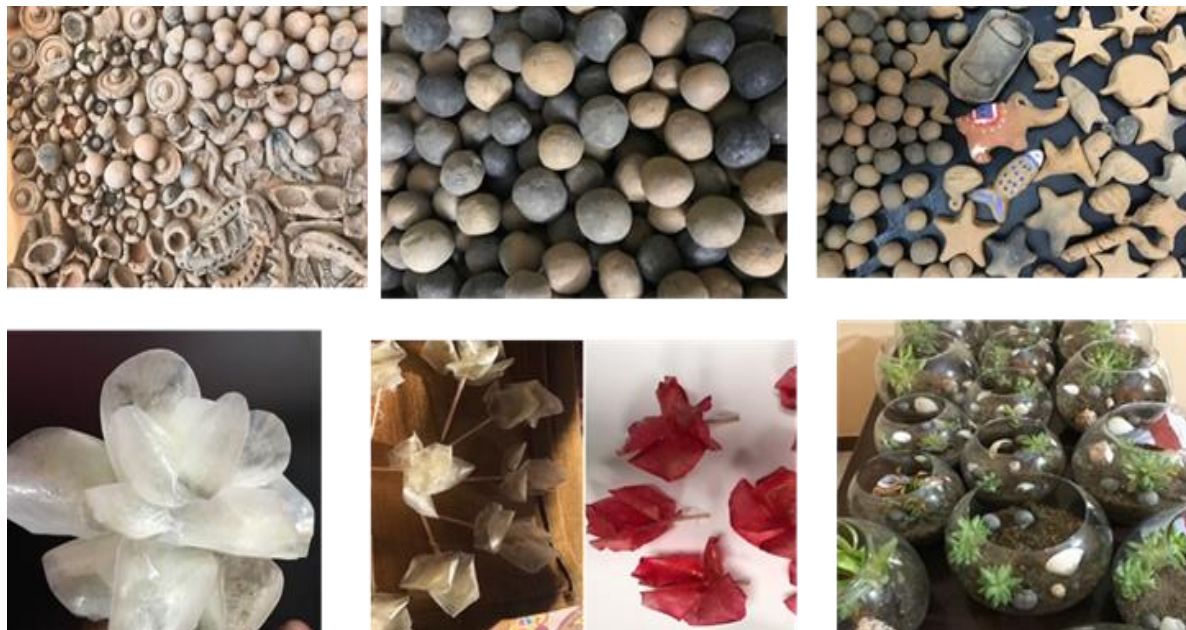


Figure 2 : Systemic design using local products like Clay Motifs (baked in *chullah*) (First row) and fish scale reuse for terrariums (second row)

Creative Rethinking for designing



Figure 3. Baked clay products with ingenious design in terrarium by women Self Help Group members. Last row shows being different in design approach matters to create a niche



Figure 4. The water planter with baked clay balls: an alternative use

Case study 2: Traditional Chikan work with Jute

Another systemic design experiment was initiated. Jute as a raw material was available in the local urban market. Women were already skilled in the living traditional art form of “*Chikankari*”, that is also a registered Geographical indication of Lucknow and surrounding area. The practitioners of this art are skilled and learn the art of needlework passed from generations to generations and also through learning a new skill through practice. The Uttar Pradesh state government of India started a programme to empower every district with its own core set of skills that had entrepreneurial potential and create local clusters of industries for rural youth. It also helped in protecting traditional skilled artisans. One District One Product (ODOP) initiative was announced by government to bolster entrepreneurship. Since the market had goods that were chikan surplus, an initiative was taken to combine both jute and chikan and create uniqueness not available in the market. An initiative was taken to connect women SHG with Urban offices where workshops, conferences and trainings took place, thereby creating demand of products. Custom design products were co designed by community by a student kid designer, Aoishi, who provided creative uniqueness giving a new perspective to traditional products and the SHG got into the less explored market niche that needed plastic replacement with sustainable products in office sector. An example is custom planted cum bouquet that could be reused as a planter. Similarly files, folders and small bags were created with uniqueness of ODOP of Chikankari. This helped to give a unique placement to the product and these products were procured for workshops of Food and Agricultural Organisation delegates, farmer trainings, researcher trainings for ICAR institute. The SHG now provides product to a Women entrepreneur member registered under Udyog Aadhar, now Udyam Aadhar a scheme of Government of India for MSME .

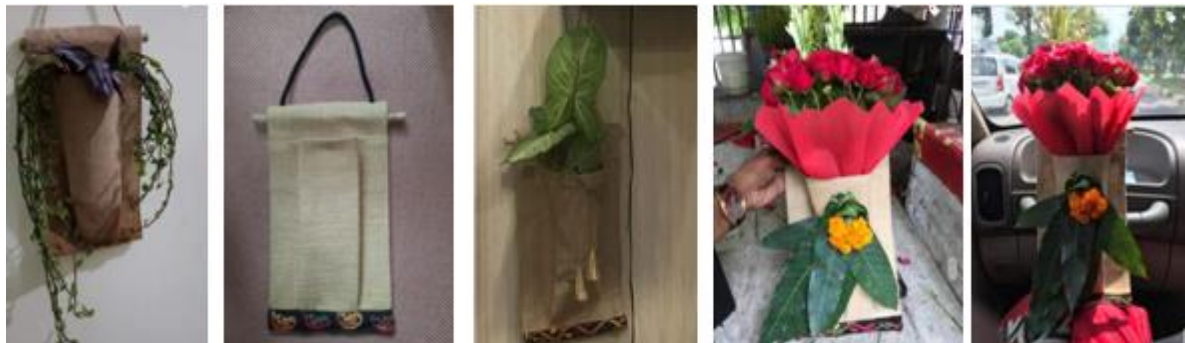


Figure 5 :The jute planter cum bouquet with different prototypes with chikan work , a Geographical Indication: Systemic thinking for creating products for sustainability, Reusability and recyclability



Figure 6 One product multiple uses. The mobile cum charger holder was created by women SHG for their own needs, and further modified it to be used as an insulator for water bottle and for holding paper. A Creative design thinking and systemic approach to look at a solution to create new products

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

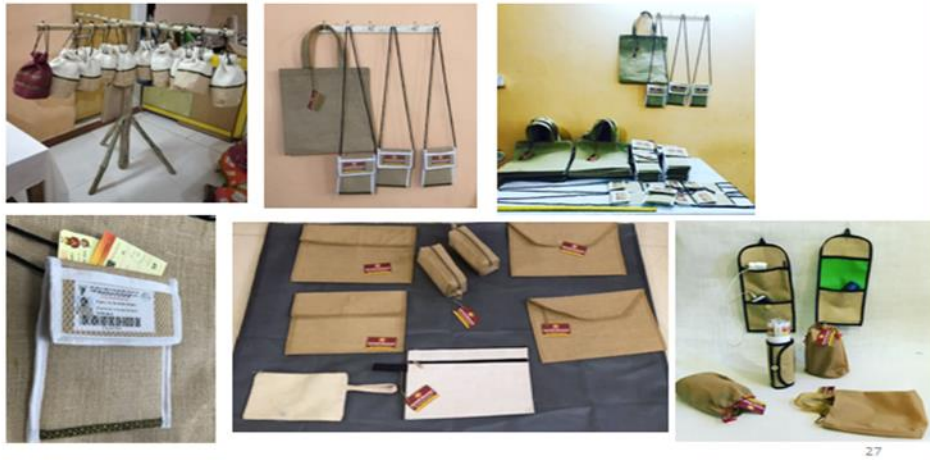


Figure 7. Jute Products created for urban consumer by SHG at incubation centre



Figure 8. The Incubation centre with creative products



Figure 9: A small bag for keeping edible food, the samosa bag



Figure 10. Community co-creation. A skilled bamboo artisan designs a bamboo stand to display Jute products



Figure 11. Chikan design motifs for use in stamping on cloth for chikan work

Community empowerment and Self-Help Groups and creativity

The origin of SHGs was from the Grameen Bank of Bangladesh, which was started by Mohammad Yunus in 1983 to bridge the gap between formal and informal system. Self-help group is a group of 10-20 people from a homogeneous class typically having common problems (Kumar, 2010). Self help groups have been created under National Rural Livelihood Mission (NRLM, 2020). The aim of this paper is to find strategy and reach out to academia and government policy makers to provide handholding and mentoring support to women Self Help Groups. NRLM should strategise to digitally and non digitally connected women. Mahila-e-haat is an initiative that can connect with networked market for product point of sale. Mahila E-Haat (Mahila-e-haat, 2020) is an online marketing platform has been set up by the Ministry of Women and Child Development, Government of India under Rashtriya Mahila Kosh (RMK) for women, to display their products and act as a catalyst by providing a web based marketing platform to the women entrepreneurs to directly sell to the buyers. Under National Rural Livelihood Mission (NRLM, 2020) there are around 6554315 SHG with 71624405 members. The present paper does not describe about the working modalities of SHG rather a systemic design approach to empower women with existing structure through design intervention. Rashtriya Mahila Kosh has disbursed 31177.39 lakh to 74035 SHGs (RMK, 2020) with an average of 0.42 lakh to each SHG having about 10 members each, if distributed evenly every member gets 4200 annually, that amounts to Rs 350 monthly and around Rs 11 per day. The amount is miniscule for expenses for creating entrepreneurs. The macro level figures may be impressive to be projected by the government authorities, but the micro level amount reaching SHG is not sufficient to create a mark in the family or provide edge in the market. Thus just dissemination of money does not show success parameters, rather how SHGs are supported by government interventions will help them in creating long term journey of entrepreneurship. The government through NRLM officials can help women to register for Mahila-e-haat, Ughyog Aadhar now Udhyam Aadhar and provide training support to understand how the system works. Though registrations are digital and free, women need support to file, submit, scan papers to upload. These tasks are simple for a digitally literate person, but for SHG it becomes a frightening task. As an example form our community experience, I helped in registering Udhyog Aadhar for a women entrepreneur, but the process was not easily user friendly. The name and identity was verified with Aadhar One time password. Mostly women don't possess individual phones. They have to borrow phone or give family members phone number and call back for one time password. Similarly for registering choice for the entrepreneurship activity to be performed, codes have to be searched, that is not user friendly searchable. Getting a print out needs money to be given to a kiosk. These are hinderances the women face and shun from registering. Non registration makes it difficult to supply to offices, as some registration number on bill is needed.

Genesis of Kalyani Grameen Mahila Udhyog (KGMU) and Kalyani Creations

When SHG as a group works, they have to cater to order, processing, procuring raw material, creating product, packaging and delivery. After delivery bill is submitted to the consumer. Tracking finances, receiving payments etc becomes a task that demotivates women, according to them, the want orders to be given to them and immediate payment be made. To tackle this problem a new initiative was taken up. A new structure, a new brand name "Kalyani Creations" under Udhyog Aadhar registered enterprise 'Kalyani Grameen Mahila Udhyog' (KGMU) by a women entrepreneur who had a social cause driven motivation to help women SHG. KGMU looked after all needs of billing and timely payment irrespective of whether payment is received from the consumer. This helped women to think, ideate and create, with the motivation that nothing is impossible and there is always a new route to create.

Genesis of first Women lead Rural Village Level Incubator Centre

The Incubator, Kalyani Women Incubation Centre, (KWIC) first of its kind in a rural set up was mentored and hand held without financial implications by Intellectual Property Rights Cell of ICAR-NBFGR under National Innovation Fund Component, a plan scheme of Indian Council of Agricultural Research(ICAR) through Systemic design intervention for co-creating sustainable design solutions, for economic empowerment, rapid prototyping paves further way for resilience in a socially designed environment, ideation, growth, creating inclusive, resilient and antifragile environment for women .

An Incubation cum co-community centre was the first step to bring SHG together at a platform and give them tools to work with like a sewing machine, cloth as raw material to prototype, newspapers to use for prototyping, a black board for creating designs, working desk space, basic amenities of printing, photocopying. The structure served as a foundation and a vantage point for women to get to gather, discuss and coordinate activities. Such incubation centres can be created in every village to help women create opportunities to enhance livelihood options for themselves and next generation

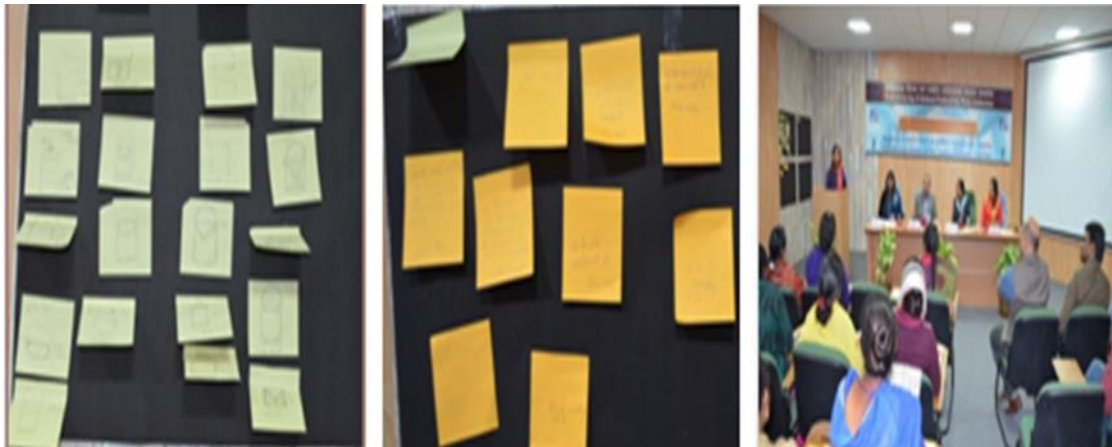


Figure 12. Ideation and brainstorming by Women SHG

The urban customer needs solutions for replacing plastic. The opportunities from agricultural bio-waste provide immense opportunities to create new niche products, unheard, unseen of, eco friendly and sustainable that adapts to the core structure of 3R recycle, reduce and reuse. Creating user friendly, non-technology intensive products from Agri-biowaste like corn, fish scale, jute, moonj (a locally available grass fibre used to create baskets) and bamboo helps to create new products using creativity, prototyping, ideation and brainstorming among women community members and outsiders to create a need based product taking into account a balance of raw material and skill needed to create and its user friendliness.



Figure 13. Off shoots from Agri-biowaste usage: Corn waste used for creating product: Connecting systems: Mr Harish at Telibagh using solar panel with fan to roast corn, the left over corn waste can be used to create products

This model can pave way and curb the menace of plastic by using natural fibre option as a sustainable and biodegradable option. Products were created, orders were received and a brand was set. Intellectual property protection of trademark and design registration can help to have exclusive right on the design by SHG. They shall be able to license the design and benefit financially. However, funds are needed for registration that can be provided by NRLM. Khadi and Village Industries Commission (KVIC) can also help by providing them an outlet to sell. These issues can be dealt with coordinated efforts at government and policy level where SHG identity should be legalized to be recognized by Khadi and Village Industries Commission. The integrated approach can help in empowering women.

Design Strategy

The paper is a summary of field interaction, mentoring and handholding, written as a social experimental research by design paper with systemic practise. Initial ideas were scouted and brainstormed from existing unused designs, for example basic jute bags and moonj baskets that were too big to be used as rural usage needs larger storage areas to keep basic agri-products and food eatables, which is not needed by a nuclear family urban consumer. If the scale is reduced, it can be reused. This will help in creating an urban demand with rural creation. There may be issues with the scalability and competitiveness in the market, but this was a social experiment and a starting point to see how women respond to

entrepreneurial changes in their own systems and find solutions by understanding the problems faced by them to communicate to higher authorities.

The Incubation centre: visible outcomes from invisible village rooted problems

The incubation centre was created to connect dots, scaling a social experiment to co create a community design system involving stakeholders, the SHG women for redesigning for connecting rural system with urban market by reusing things, for livelihood and economic empowerment for decision making. The rural system is composed of a complex design with government offices located in cities with red tapism, that made women hesitant towards entrepreneurship. Government initiative on zero plastic use came handy as offices started looking for plastic alternatives and gave new market for designed demand-based product. This helped in outreach of rural products in urban office spaces. The design and product-oriented trainings were given at the incubation centre for visible outcomes from invisible village rooted problems.

Such experimental setup of a village level incubation centre can help as a model for replication for translating problems into solutions with minimalistic design intervention. Ideation was also used to where to sell the products, schools and offices came handy with orders. Designs were made for workshop office folders, planters, and diary covers with chikan work with community co creation. The products were made taking into account perception and empathy for redesigning based on usage by redesigning creatively new products with the help of kids who needed low-cost bags and pencil pouches for their needs for school. The pricing, production, delivery bills was taken care of by Udyog Aadhar registration. However, products could not be sent out of the state as Goods and Service tax would then be applicable. The goods were hence sold locally. The learning was two way, from researcher to SHG and from SHG community to researcher for understanding entrepreneurial journey that connected research and creativity with rural and urban systems. A journal diary helped women to track and note fleeting ideas and improve to get a workable solution



Figure 14. The Village Incubation Centre

Micro finance management of SHG

The lack of entrepreneurial opportunity led women SHG to rotate the money among them with interest, to replenishing the amount to the bank but not getting any benefit or income generation. The input by voluntary contribution from incubation centre towards raw material, helped women to create 24 terrariums for sale. This made them understand about the price, design and inputs and packaging with transport needed to create a small livelihood business. In the subsequent case study. Provisions were designed from learnings to reduce movement by using locally sourced items Their traditional knowledge and skills were used for building local toys can be used eg chulla, bullock etc were used. Fish scales were reused, corn covering was used to create products. Flex sheets used in office spaces were reused to create bags

Events and activities for handholding, and mentoring support

Various events, formal, semiformal and informal events were organized to interact with Women SHG for encouraging entrepreneurship and creativity among rural women. Outreach workshop with 30 women SHG members on “Women Empowerment through Innovation and Creativity” was celebrated on World Intellectual Property 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 constraints was lack of community working space that could help for creating Women SHG Agri-Business Incubation Centre. The problem was solved by creating an incubation centre where women could dare to fail and not be hesitant of a wrong prototype. The events were covered by newspapers, that aided in visibility.



Figure 15 Informal interaction with women groups



Figure 16 Women SHG used during mentoring workshop



Figure 14. Outreach activity celebrating women empowerment through innovation and creativity



Figure 15. Outreach workshop with zero plastic waste and jute with chikan work being displayed at exhibition counter



Figure 19. The newspaper clippings showing activities of SHG

Co-creating sustainable design solutions in a common community space

Bottom up approach was used for interaction during an outreach activity 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 was displayed at various exhibitions giving new opportunities for women to understand fast selling product and less selling product. The women also exhibited in state lev exhibitions including Hunar haat, and Sanatkada exhibition held yearly at Lucknow. The One District-One Product concept with systemic design intervention helped in creating new livelihood opportunities through enhancing sustainable productivity and fulfilling rural manufacture with and urban demand. The exhibitions showcased the efforts of women of the Self Help Groups and should be strengthened economically by buying their products like jute bags, boarding pass bag, file covers and samosa bags

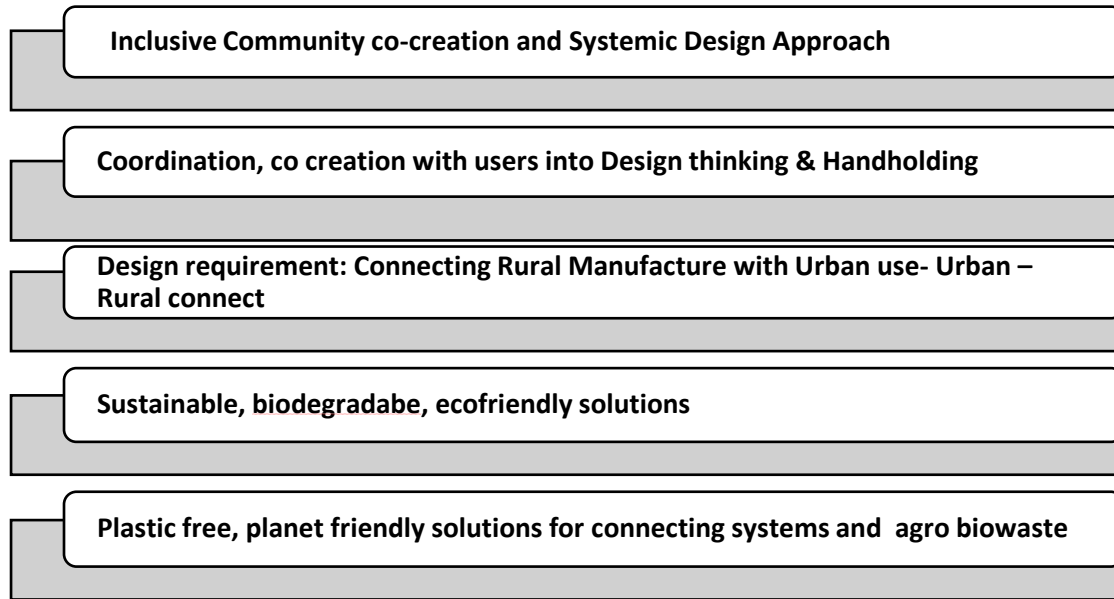


Figure 20. Strategy for Empowering Women Entrepreneurship for Intrapreneurship

Quadrupole helix innovation system

To empower SHG and create a system, a quadrupole innovation approach was used incorporating members of private citizens, government agency, researcher and the Self help group. Bringing together all four pillars, creating a network helped in out of box thinking for venturing into new areas by taking a risk, as mentoring and handholding support was available. But there are challenges for women changemakers that needs government intervention. A direct procurement strategy by government bodies by SHG will help women to create a networked cluster in an area for a particular product. Government intervention can help for bridging the gap by compulsory procurement by event managers for a government event to procure handmade goods from SHG. This will help in creating a flow of demand through event managers. This also helps in rural urban connect of consumers and creators. The quadrupole helix approach can be used for creating sustainable design products using systemic approach from agricultural biowaste like fish scale and maize corn by women SHG can help in lowering carbon foot print and provides entrepreneurial opportunities for urban consumers. Handholding is required for filtering down products from the many prototypes that is needed by the market. The three major parties in innovation are industry (wealth generation), universities (novelty production) and public control (government) creating a triple helix for new knowledge, technology, product and services (Arnkil, 2010) The Quadruple Helix type of innovation activity enables larger variety of innovations than the Triple Helix model does.

Quadrupole innovation by bottom-up approach

The quadrupole innovation system can be used as a functional strategy by turning the direction towards empowerment of women Self Help Groups. The quadrupole pillar consists of the SHG, academia, policy maker and the Government with interdependent goals, should get out of core cocoon silos. Compulsory procurement through SHG by Government agencies should be made to tame market forces and provide protection to emerging SHGs. Government should help registering SHGs at marketing platforms specially GEM (Government e marketplace) and also help in creating an Intellectual property portfolio for new designs created by the community. Procurement clauses of tenders should help SHGs for marketing through Udhhyog Bandhu, a Department of Uttar Pradesh State Government, hired event managers through compulsory procurement by incorporating in RFP/ RFQ (Request for proposal / quotation) for 10-15% procurement in floated e tender document. The government, business entity through corporate social responsibility funds and local NGOs should help in establishing common facility centre and incubation centres in villages by villagers for central procurement and order. These initiatives will help in affirmative action for marginalised communities

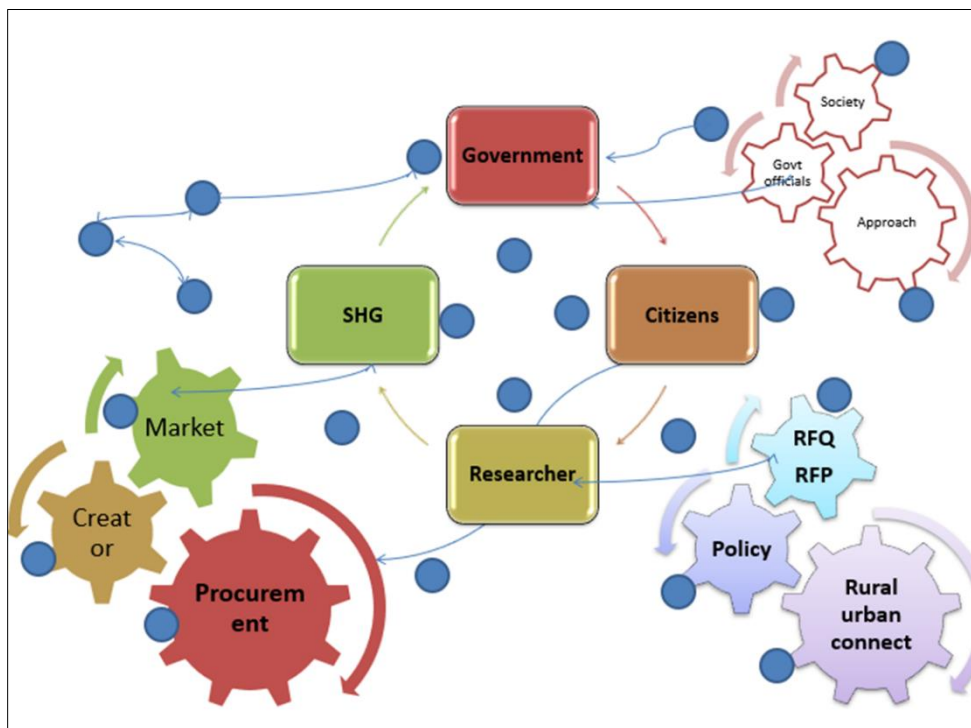


Figure 21. Quadrupole innovation, connecting dots, network and systems by bottom-up approach, with SHG taking a lead with mentorship of Government, stakeholders and policy makers.

Most of the planned activities are pushed from top with planners and policy makers without SHG having a say on what is needed at ground level by working community. How can problems be solved and needs be met. From an SHG perspective, when change starts from bottom up, it is sustainable and not

dependent on government aid. But conducive environment is need to propagate seeds of SHGs into trees that would remain sustainable and keep fruiting with inclusive community co-creation, and coordination

Design Implication, social cohesiveness, Synthesis and lessons learnt

Using locally available materials an initiative was taken to connect SHG with urban customer. The initiative opened a plethora of problems. Initially SHG were interested but the complexity of the design and proportion made them take a back seat. The women agreed to create local products that can be used for toys etc. A number of offshoots came out of the project, but only the ones that women agreed to were taken up. One of the offshoots was to cater to biocompost needed in Terrariums. The brick kiln nearby becomes a source for raw ingredient for terrarium designing for base material. Terracotta toys miniature ones that had market only during festivals were made that was traditional known to them. The product that came up had rural design that was rustic, the rusticness gave it a new dimension and an added opportunity for sales. Though the opportunities were provided to women, it could not be sustainable because of transport of fragile boxes of terrariums. A few customised rustic terrariums were provided to a vendor, but due to lack of demand the creations dimmed slowly. The rigorous market advertisement and selling was a problem. But due to the clay toys a new area of using baked clay balls arose to cover plant pots and for usage in jute planters. Systemic thinking, restructuring, reusing and re alignment of existing product for new use was a continuous venture to be pursued

Self Help Groups can be transformed when approached as a mini business model. Cooperation of public and private sector is needed for achieving this goal. Only four SHG groups were surveyed and communicated with. Those who volunteered to work were taken further and skilled for providing them opportunities to understand market. Government schemes are important landmark that have helped women SHG. But getting contracts and order from government firms becomes a problem. Though open market gives them space but bargaining and uncertainty becomes a trouble. The systemic design study could identify the problems. Though skill development was provided to SHG. It was not enough due to limitations of the approach of women SHG of getting orders, networking coordinating with market and with local authorities were the drawbacks. Registering for a trademark and design for their products could have provided them a niche. The study incorporates developing a model to be replicated in villages at Block level using systemic design approach. With coordination and networking between public private and government organization, a system can be developed using intrinsic resources available specially associated with agriculture and its offshoots. Systemic design approach along with Village level women incubation centre has not been used for empowering women SHG. The study helped in bringing social cohesiveness with women from all religion, caste, age working in a group for empowerment as a social unit.



Figure 22. Cohesiveness of women as SHG

References

- Arnkil, R., Järvensivu, A., Koski, P., & Piirainen, T. (2010). Exploring the quadruple helix. *Report of quadruple helix research for the CLIQ project. Tampere: Work Research Centre, University of Tampere.*
- Assembly, G. (2015). *United Nations: Transforming our world: The 2030 agenda for sustainable development. UN: New York, NY, USA.*
- Costanza, R., Alperovitz, G., Daly, H., Farley, J., Franco, C., Jackson, T., Kubiszewski, I., Schor, J., & Victor, P. (2012). *Building a Sustainable and Desirable Economy-in-Society-in-Nature*; United Nations, Division for Sustainable Development
- Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., Öhman, M. C., Shyamsundar, P., ... & Noble, I. (2013). *Sustainable development goals for people and planet. Nature, 495(7441), 305-307.*
- Kumar, S. (2010). *Performance and Impact of Self-Help Groups in Punjab—Past Experience and the Roadmap Ahead. The Microfinance Review, 2(1), 19-35.*
- Mahila-e-haat <http://mahilaehaat-rmk.gov.in/en/> accessed 17/05/2020 available at <https://vikaspedia.in/e-governance/women-and-e-governance/mahila-e-haat> accessed 16/05/2020
- NRLM, Data from <https://nrlm.gov.in/shgOuterReports.do?methodName=showShgreport> accessed 16/05/2020
- RMK, Data available from <https://rmk.nic.in/cumulative-and-state-wise-achievement-upto-31032019-rs-lakh> accessed 16/05/2020
- Robert, C., Kubiszewski, I., Giovannini, E., Lovins, H., McGlade, J., Pickett, K., ... & Wilkinson, R. (2014). *Time to leave GDP behind.*