**Swashakt Evidence Programme**

**Chitrika: Creating agency of women in weaving value-chain in India**

Pre-analysis Plan

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# Introduction

## Background and motivation

This pre-analysis plan articulates the proposed evaluation design of the project “Creating agency of women in weaving value-chain in India” supported by 3ie’s evidence programme, “Swashakt: Empowering women through collective-based approaches”. The Swashakt programme was launched in 2020 and provides support to nine projects that aim to form and strengthen rural women’s collective enterprises over the course of project period, 2020 to 2023.

We define women’s economic collectives (WECs) as collectives where groups of women come together in a common economic activity, such as those registered as a company or cooperative, or informal clusters that access markets together, that draw on business principles and leverage social capital. Swashakt aims to generate evidence on interventions that enhance the viability, scalability and returns for WECs, thereby promoting women’s economic empowerment and their agency in economic and non-economic decision-making. The programme’s goal is to inform the Indian Government’s NRLM on identifying scalable and transferable models that can increase economic gains for women.

## Theory of Change

We start by proposing a simple theory of change (ToC) that explains the causal relationship between women’s economic collectives (WECs) and women’s economic empowerment (WEE). This is based on a literature review of existing evidence and theoretical models on WECs. The review identified the inputs, interventions, outputs and outcomes of a typical WEC in our portfolio, as well as the various assumptions and linkages between the inputs and outcomes.

Women’s economic empowerment has been defined in many ways (Wu, 2013). Uniform across these definitions of economic empowerment is the emphasis on women having the power to control their economic lives. Pereznieto and Taylor (2014) define power as having four dimensions that need to be considered when conceptualizing women’s economic empowerment. These are:

*“Power* ***within****: the knowledge, individual capabilities, sense of entitlement, self-esteem, and self-belief to make changes in their lives, including learning skills to get a job or start an enterprise.*

*Power* ***to****: economic decision-making power within their household, community, and local economy (including markets), not just in areas that are traditionally regarded as women’s realm, but extending to areas that are traditionally regarded as men’s realm.*

*Power* ***over****: access to and control over financial, physical, and knowledge-based assets, including access to employment and income-generation activities.*

*Power* ***with****: the ability to organise with others to enhance economic activity and rights.”*

We use this power framework to define interventions that enhance women’s power in the four dimensions as economic empowerment. Thus, in our ToC, Women’s Economic Empowerment (WEE) consists of the following outcomes:

1. Power to: participate in taking economic decisions that affect themselves, their households, their enterprises and the community
2. Power within: confidence to access institutions that impact their economic lives such as markets, entitlements and public spaces
3. Power over: economic assets by ownership and control, their income
4. Power with: collective production and value-added operations through group-based enterprises

Having defined WEE for our specific project, we now present the links that explain the causal relationship between interventions, outputs, intermediate outcomes and WEE.

Women in rural India have limited access to livelihood assets such as finance, productive assets and education and weak social capital. The set of WEC interventions are designed to alleviate these initial conditions. The first intervention in our projects is usually the formation of WECs by bringing together women, establishing norms of group-functioning and establishing formal recognition as a producer company or collective. This is followed by training of women in income generating activities, enterprise management and business skills. Some projects propose digital education and gender trainings to improve women’s capacity to manage own enterprises.

The next type of intervention is investment in WEC assets, technology and infrastructure. For example, setting up of common facilities where advanced tools and technology are available for members. Establishing market and institutional linkages is another important component of WEC interventions. Almost all projects will facilitate linking WECs to input and output markets and expand their supplier and customer base, removing middlemen and strengthening connections and linkages. Some projects will link WECs to banks and government programs for entrepreneurial support. Finally, innovations in products and value-added services will be taken up to move WECs ahead in the value chain.

If these interventions alleviate the constraints faced by women and there is adequate uptake of these by WECs and their members, then women’s participation in entrepreneurial activities is likely to increase. Reviews by McKenzie and Woodruff (2014) and Chinen et al. (2017) show that business and technical trainings increase women’s skills and consequently their labour force participation. The literature in microfinance has shown that providing women access to finance through groups enables them to share risks and increase their involvement in income generating activities. In the same vein, access to collective productive assets may facilitate women’s control over the production process and may prove to be pivotal in their economic activities. Several studies have shown that women have weaker social and economic networks than men which limits their access to sources of information, inputs, capital and markets or makes it too costly for them to participate in market-based transactions. Diaz-Martin et al. (2020) has shown that one of the most important contributions of economic groups for women empowerment is the development of their social capital. Thus, in the first level of outcomes we may expect to observe changes in women’s participation in entrepreneurial activities, their business skills and their social capital. All of these may lead to changes in women’s economic empowerment, by impacting their ability to access and control economic and human capital resources.

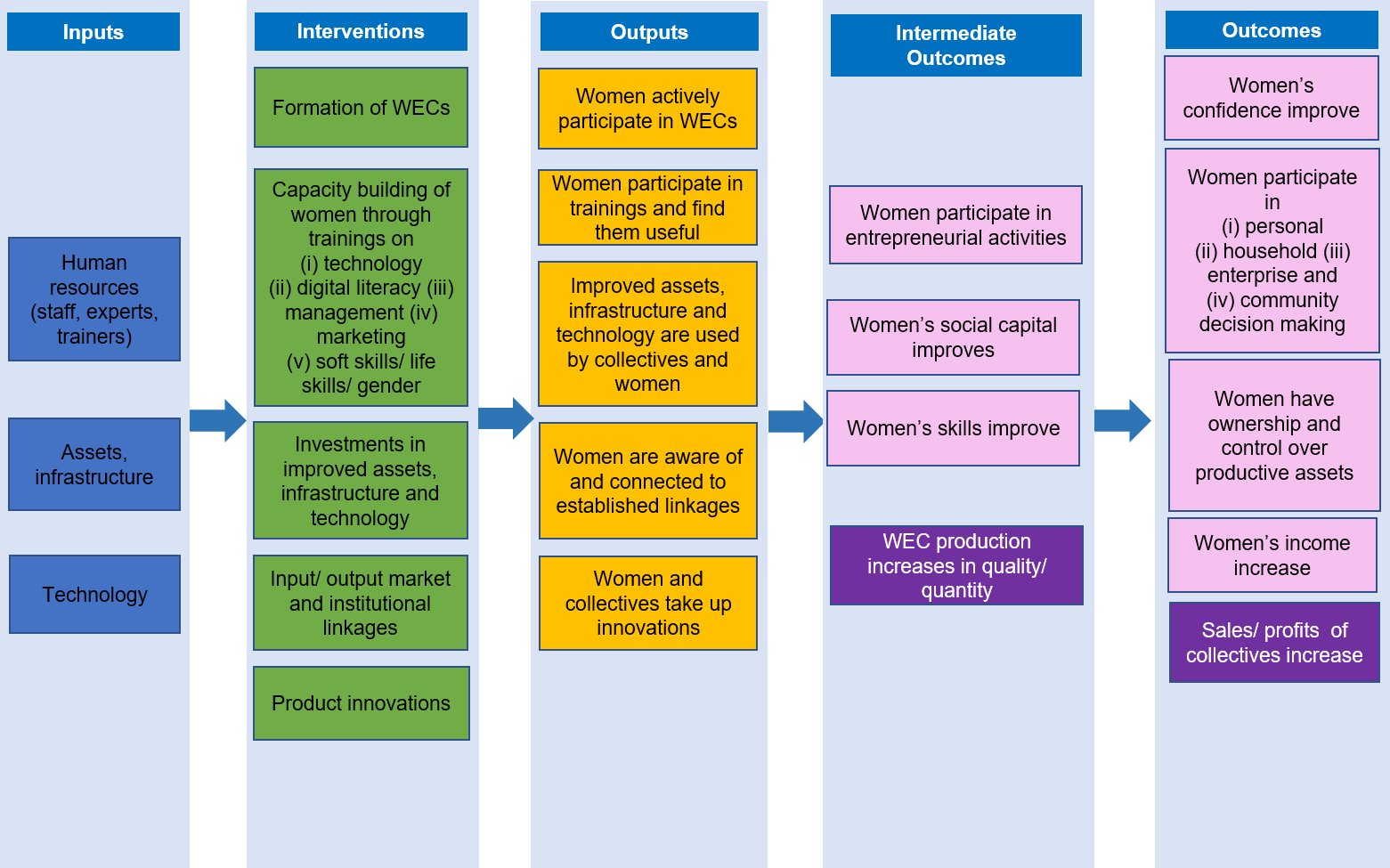
Another set of outcomes that merit discussion is related to WEC enterprises. Better skilled women, better technology, increased access to capital and markets and production of value-added commodities are likely to improve the quality and quantity of production by WECs. This may lead to increased sales or profits, provided market conditions are favourable. Increased production and revenue/profits from WECs may increase women’s incomes. The other dimensions of their economic empowerment may be affected with an improvement in women’s economic status within households and in the community.

Our ToC is based on several assumptions that may or may not hold in reality. We assume that women and households perceive the value of women’s remunerative work and that gender norms are able to adapt to women’s increased economic status. Contextual factors such as the government, civil society and markets’ commitment to empowering women play an important role in the success of WECs.

Our draft theory of change was also presented in a consultative meeting with the implementation partners, researchers and professionals working in this sector including representatives from the donor organization. There were over 41 participants who were divided into four groups, each facilitated by two moderators and a note-taker. Each group was required to discuss critical outcomes and the validity of the proposed pathway to change. Participants in each group could add new outcomes and remove irrelevant ones. This was followed by a discussion on what key assumptions and stakeholder support were pivotal for projects success.

The discussions of each group were transcribed, and outcomes were then compared based on their relative importance in the causal chain and the duration in which they are likely to manifest. Arguments on the feasibility of measuring outcomes and methods that could be used to measure were carefully summarized. Key assumptions linking outputs, outcomes and impact were then modified by comparing the experiences of the implementation partners while keeping their operating context in mind. Based on this discussion, we revised the Theory of Change and finalized a set of core outcomes that would be studied uniformly across studies, as shown in Figure 1.

***Figure 1: Theory of Change for Swashakt***



# Creating agency of women in weaving value-chain in India

## Background and motivation for the project

The handloom sector in India provides employment to over 3 million households (Handloom Census, 2019-20), most of which are located in rural areas. Handloom production is primarily a small-scale household-based activity with household members operating on one loom. Women form the majority of weavers and allied workers with their representation being higher in laborious but low-paid or unpaid allied work (over 70%). Yet, average incomes remain low in this sector, with 66% of weaver households earning less than Rs 5000 a month (Ministry of Textiles, Govt. Of India, 2020). Low demand for handloom products that are not able to keep up in quality and design is one of the main drivers of poor returns from this sector (Chitrika proposal to 3ie).

The project “Creating agency of women in weaving value-chain in India” by Chitrika will aim to address some key challenges facing weavers in the southern states of Andhra Pradesh and Telangana, India. Telangana accounts for over 47,800 weavers who are involved in handloom cloth production and allied activities (Ministry of Textiles, Govt. Of India, 2020). Chitrika is an incubator of handloom and artisan enterprises. Since 2006, it has successfully incubated three collective enterprises in Andhra Pradesh and Telangana. These are registered as producer companies (PCs). Services currently provided by Chitrika include skilling of weavers, providing them access to modern weaving and value-addition technology in the form of a ‘craft hub’ and marketing. The existing collectives comprise of 600 weavers from 300 households. Under Swashakt, the project will collectivise around 1100 additional weavers either by bringing them into the fold of existing collectives or forming new collectives.

## The intervention

Chitrika has collectivized and incubated three producer companies with 600 members, since 2006. In the project period i.e., from 2021 to 2023, the goal is to scale up to include 1100 additional members. This is planned to be achieved by reaching out to new geographical regions and forming new PCs. In areas where Chitrika is already operating, new women members will be collectivised into the existing PCs. The key activities undertaken by the collectives at present are 1) Procurement and processing of raw material, 2) Doorstep delivery and collection of yarn and finished products, 3) On-loom and off-loom quality assurance, 4) Consumption loans, 5) Mobilization of finance for operations and investments, 6) Design Development, 7) Management skilling, 8) Marketing and 9) Technology support.

A key innovation of the project is the push towards enhancing women’s role in management of their own businesses as well as in the collective. This will be done by training women with a “Micro Hand-made MBA” along with training on technology. Not all women will be trained for the Micro MBA. Women will be screened on the basis of basic literacy skills and entrepreneurial aptitude for the MBA. The unique feature of the Micro MBA is its emphasis on practical or experiential learning – of 144 days of training, 75% will be provided in the form of interactions with local entrepreneurs, group tasks and digital learning. The remaining 25% will be in the form of classroom training. By limiting classroom training and incorporating on-the-job training, this innovation addresses one of the main factors that determine women’s low participation in paid work - the lack of sufficient and consistent time to allocate to trainings and work.

The second innovation under this project is the setting up of five integrated handloom hubs to provide value chain development services to weavers. Traditional weaving methods employ environmentally damaging dyes posing health risks to pre-loom workers. Weavers in the project area often work for Master weavers, mostly men, who control access to advanced weaving technology. Under the project, the integrate handloom hubs will provide a one-stop facility that will include advanced dyeing units, pre-loom units, garmenting units and retail support. The project further aims to set up an advanced Enterprise Resources Planning (ERP) at the collective level to track enterprise outputs systematically. The creation of such a one-stop facility for weavers is likely to reduce dependencies on middlemen for inputs and provide opportunities for learning across weavers. The locations of the handloom hubs have been decided by the team.

### Geographic region

The population group in this project will mainly comprise weaver/allied services households as well as non-artisan households from sampled villages in four districts across Andhra Pradesh – Srikakulam, East Godavari, Krishna, Guntur – and one district in Telangana – Narayanpet.

### Timeline

The project period is for three years starting in 2021 and ending in 2023. The project implementation timeline, as proposed by Chitrika to 3ie, is below:

**Table 2: Chitrika Implementation timeline**



## Research Questions

The goal of the Swashakt evidence programme and specifically Chitrika’s programme, is to generate high-quality, relevant and transferrable evidence on the potential of women’s economic collectives to improve women’s empowerment. Our main research questions are summarized below:

1. Did the Chitrika intervention increase women’s empowerment?
2. What is the impact of the intervention on project outcomes defined in Table 4?
3. How do WECs increase women’s empowerment? What mechanisms explain the linkages between outputs, outcomes and impact?
4. Why, or why not, did the observed impacts occur?
5. Were the observed impacts similar across caste and economic status at baseline?

A secondary question we will attempt to answer is: Does experiential management training lead to better economic outcomes for women?

# Research Strategy

3ie will undertake the evaluation of the Chitrika project using a theory-based, mixed methods approach. To examine the impacts of the project and establish the causal link between project interventions and outcomes, we will use experimental methods to identify the counterfactual against which project areas will be compared. To understand the contextual factors that may influence project impact and project implementation, we will use qualitative methods such as key informant interviews and focus group discussion with project participants and non-participants.

We adopt a cluster randomized method to establish causality in which villages will be randomly assigned to the project (treatment) or not (control). The village is the appropriate unit for randomization because these typically form artisan sub-clusters. The project period is for three years starting in 2021 and ending in 2023. Data will be collected at individual, household, and enterprise level, before the project is started in all villages i.e., treatment and control areas, forming the baseline. The same sample of households and individuals will be interviewed in 2022 and 2023 to examine the changes in key outputs and outcomes of interest.

The evaluation will include a qualitative process evaluation in which we will analyse the implementation of the project, highlighting areas of strong and weak implementation. This will help us answer why the project was or was not able to achieve its stated outcomes. It will include an examination of participation in the project by women weavers, the quality of trainings, as well as the reach of project services. This should also help us in getting a clearer understanding of the overall context of the region and community, structural barriers to women’s empowerment in the region and the journey of women weavers in overcoming the same. Table 2 represents our evaluation approach. We will use a mix of quantitative and qualitative methods to answer the main research questions of this project.

**Table 2. Evaluation approach**

|  |  |  |
| --- | --- | --- |
| **Primary Question** | **Research method** | **Data** |
| Did Chitrika’s WEC intervention work? | Impact evaluation using experimental method with counterfactual to examine if outcomes changed due to the intervention | Quantitative data collected at baseline and end line, qualitative data such as KIIs and FGDs, MIS data |
| How do WECs lead to women’s empowerment? | Development of the theory of change, examining the association between project outputs and outcomes, and examining the validity of assumptions of the causal links | Quantitative data collected at baseline, midline and end line, MIS data, project documents |
| Why, or why not, were impacts observed? | Process evaluation to examine if the project implementation was per plan and if identified project outputs were produced | Quantitative data collected at baseline, midline and end line, MIS data, KIIs and FGDs |
| Were observed impacts similar across caste and economic status at baseline? | Heterogeneity of impacts by caste and economic status of women | Quantitative data collected at baseline and endline, qualitative data such as KIIs and FGDs |

## Sampling

Chitrika proposes to work in five districts across Andhra Pradesh and Telangana. Although the number of villages in a district is well over 100, weaving is undertaken by households of only some villages. Chitrika provided us with a list of 124 villages spread across 5 districts. This list included the number of weavers in each village. These are villages located close to their central facility. In 30 villages, Chitrika already had a presence. We excluded the villages where Chitrika was already working. We ranked villages based on their distance from town in each cluster and retained the 16 closest villages. This reduced our list of villages to 77 for randomization.

Prior to the main survey, a household listing operation will be conducted. The household listing exercise will cover weaver hamlets across both treatment and control villages, generating a list of sampling units covering the target population, i.e., the sampling frame. This listing operation will enable 3ie to perform pre-selection of households to be interviewed, preventing bias in selection of households by field teams. Moreover, this exercise will capture updated information on basic household characteristics such as heads of the households, caste, religion, primary activity of households and also generate updated maps of the hamlets and villages covered in the study. At the end of this exercise, we should have a sample frame of weaver and allied households for our study.

### Randomisation

As our randomization is at the village level, our first step was to the 77 villages in our sample to the Census 2011 data. This was a complicated exercise for two reasons. First, the state of Andhra Pradesh was bifurcated into two states- Andhra Pradesh and Telangana in 2014. Chitrika proposes to work in both states. As a consequence of this split, new districts and mandals (administrative blocks) were created. We had to search the old mandals of a village and identify the new mandal to locate some villages. Second, many new villages were created or renamed between 2011 and the present. Fortunately, these new villages could be found in the local government directories (LGD) which includes their original Census 2011 codes. We used the codes in the LGD to merge villages to the Census data. We could not locate 6 villages in either LGDs or Census 2011 Data but were able to verify that these were indeed villages by locating them on Google Maps. For these villages, we used the Census data of the nearest village, under the assumption that contiguous villages are likely to similar in characteristics.

We use the following village-level census data in randomization: Female labour force participation, Female labour force participation in agriculture, Female labour force participation in non-agriculture, Female literacy rate and Male labour force participation. Using the STATA-15 “randomize” command, we block randomised at the district level (also a craft cluster) to assign villages into two groups while ensuring balance on female labour force participation rate, percentage of women employed in agriculture, percentage of women employed in non-agriculture, female literacy rate, male labour force participation.[[1]](#footnote-2)

Table A1(a and b) in Appendix presents the balance of covariates from the Census data. We test for balance at baseline using the following specification:

,

where represents a village, is a set of variables representing demographic characteristics, geographic characteristics, and economic characteristics of the village. takes the value 1 if the village was randomly assigned to the treatment group, and is a set of dummy variables representing the cluster (or center) that the village belongs to. No significant observable differences for our set of village characteristics are seen between the control and treatment groups.

### Statistical Power

Increase in women’s income is the primary outcome of interest of the project. The project’s stated goal is to raise women’s annual income by 20% over the project period. We use women’s income to calculate the detectable difference for our proposed sample. Using data obtained from the implementing organisation on the incomes of women associated with existing collectives in their first year of joining the collective, we were able to calculate the mean, standard deviations and village level intra-cluster correlations (ICC). Using the*clustersampsi* command in STATA-16, we conclude that our sample of 77 villages and 3080 households is adequate to attribute 20% increase in income to the project (alpha=0.05, power= 80%).

**Table 3: Chitrika Minimum Detectable Effect size**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Actuals** | | | **Assumptions** | | **MDE** | |
| **Mean** | **Std Dev** | **ICC** | **Clusters** | **HH per cluster** | **DD** | **% Change** |
| 123680 | 93645.34 | 0.12 | 70 | 40 | 23977.8 | 19.4% |
| 123680 | 93645.34 | 0.12 | 70 | 45 | 23770.5 | 19.2% |
| 123680 | 93645.34 | 0.12 | 70 | 50 | 23603.4 | 19.1% |
| 123680 | 93645.34 | 0.12 | 75 | 40 | 22985.2 | 18.6% |
| 123680 | 93645.34 | 0.12 | 75 | 45 | 22786.5 | 18.4% |
| 123680 | 93645.34 | 0.12 | 75 | 50 | 22626.3 | 18.3% |
| 123680 | 93645.34 | 0.12 | 77 | 40 | 22680.75 | 18.3% |
| 123680 | 93645.34 | 0.12 | 77 | 45 | 22484.68 | 18.2% |
| 123680 | 93645.34 | 0.12 | 77 | 50 | 22326.59 | 18.1% |

### Assignment to Treatment

Chitrika will mobilise households and roll out the programme in the villages assigned to the treatment group. The programme will not be started in the control villages during the project period. The control villages will therefore serve as a comparison group for the evaluation. Baseline data will be collected in 2021-22 before the project is implemented. The midline data will be collected in 2022 and end line data will be collected in 2023. Comparing the change in outcomes of interest between baseline and end line across treatment and control villages will enable us to attribute the differences to the programme.

### Attrition from the sample

Attrition, or losing respondents interviewed at baseline during follow-up surveys poses a threat of bias in our evaluation design. Attrition in our sample will result in reduced power, thus it is important to have a plan to minimize attrition. 3ie will attempt to limit and address attrition at baseline by taking the following key precautionary measures:

* At baseline, we will collect information such as addresses and mobile numbers of respondents and relatives to be able to track households over time.
* The informed consent process at the beginning of the baseline survey will highlight the importance of study and potential benefits to participants of completing the programme.
* If we find in a follow-up survey that a respondent has moved to a new location, we will conduct phone interviews where possible.
* 3ie will also oversample at the village level – we will interview 45 households a village at baseline. Assuming an expected attrition rate of 10% between subsequent rounds of survey, at endline we would still have more than 40 households per village so that we are powered to measure estimated effect sizes as in Table 3.

In the case that attrition is found to be correlated with treatment status, we will use Lee bounds on our treatment estimates to obtain robust impact estimates.

## Fieldwork

### Instruments

Data will be collected at the individual, household, village and collective levels, before the project is started in both treatment and control villages, forming the baseline, in May 2021. The same sample will be interviewed in 2022 and 2023 to examine the changes in key processes and outcomes of interest. At baseline, 3ie will field three types of quantitative tools – a household questionnaire for response by the household head, a village questionnaire for response by the village head, and a women’s questionnaire for response by one adult woman in the household, and a qualitative tool comprising of focus group discussions (FGDs), key informant interviews (KIIs) and life history interviews.

Additionally, the implementation partner will periodically share data on key performance indicators of the collectives with 3ie, which we will be able to use for monitoring as well as evaluation.

#### Household (HQ) and Village (VQ) Questionnaires

The Household and Village questionnaires draw on the National Rural Livelihoods Project (NRLP) 2018-2019 endline surveys (Kochar et al., 2020). In addition to standard demographic, educational and occupational information about each household member, the household questionnaire will collect in-depth information on the household’s income sources (i.e., from agriculture, livestock, casual/MGNREGA labour, self-employment, etc), and individual members’ participation in income-generating activities (disaggregated by gender). The questionnaire will also assess the household’s institutional linkages, ownership of assets, expenses and COVID-19 disruption.

The Village questionnaire collects information on infrastructure, prices of key products related to the Chitrika programme and institutional linkages. The panel will equip us to measure village, household and individual-level changes in income, participation in entrepreneurial activities and expenses attributable to the Chitrika programme.

#### Women’s Questionnaire (WQ)

The women’s questionnaire will be administered to one adult female in each household. To capture the effect of the programme on the relevant population, the selection of the woman will be based on the following criteria:

* If the household has an enterprise and women are involved in it, the WQ will be fielded to one woman who is involved in the enterprise.
* If the household has an enterprise and no women are involved in it, the WQ will be fielded to a woman based on Chitrika’s eligibility criteria for the programme.
* If the household does not have an enterprise, the programme’s eligibility criteria will be used to select one woman for the WQ.

The modules are drawn from the Women’s Empowerment in Agriculture Index for Value Chains (WEAI4VC) to capture changes in participation in entrepreneurial activities, time use, physical mobility, and empowerment. We have supplemented the modules on women’s self-efficacy and access to productive assets with additional questions on social capital and ownership of assets associated with weaving and allied activities.

#### Qualitative instrument

In addition to the quantitative instruments mentioned above, 3ie will also be conducting a qualitative evaluation. Qualitative research would help us understand the process and the causal chains behind the project outcomes and impacts. As Patton (2002) describes, “Qualitative findings in an evaluation illuminate the people behind the numbers and put faces on the statistics”.

The qualitative evaluation would aim to understand if the interventions led to increased empowerment among the participants, what factors contributed to it, and what the enablers and barriers in the process were. The study would also explore the implications of various social and cultural intersections like caste, class, gender, and geographical location on the project outcomes. Women’s agency at the household and community level, aspirations, social capital, knowledge and skills, and economic empowerment are some of the thematic areas that will be covered by the qualitative survey.

We propose three types of tools for the qualitative evaluation:

1. Focused Group Discussions (FGD) – FGDs will be conducted with women weavers who are part of Chitrika’s collectives. Additionally, FGDs will also be conducted with women who aren’t collectivised by Chitrika and are not a part of their programme. Each FGD will comprise of 8-10 women.
2. Key informant interviews (KII) – Key informant interviews will be conducted with village leaders, master weavers, trainers, value chain actors, Chitrika staff, and women weavers.
3. Life history interviews – Life history interviews will be conducted with refugee migrants (first, second and third generations) who migrated to India, are associated with Chitrika and started working in the weaving sector.

### Data Collection & Processing

3ie has partnered with Catalyst Management Services for baseline data collection.

### Quality assurance

We place great emphasis on the quality of data collection for this study including preparations for subsequent survey rounds. To reduce attrition to a minimum and facilitate tracking of the households interviewed at baseline in midline and endline, we collect detailed information about neighbours and networks who will have information about household members’ whereabouts if a household relocates between the baseline and midline/endline.

We are using the SurveyCTO mobile data collection platform, which contains several features and design options to facilitate collection of high-quality data with less effort. This section contains our proposals for quality-assurance (QA), and the SurveyCTO features that we will use to ensure high-quality data collection.

#### Data Validation

An important requirement is that accurate survey data is recorded during the interview and that mistakes can be corrected efficiently during the interview itself. The response fields on the survey form will be designed to prevent enumerators from entering data that is obviously incorrect, invalid, or inconsistent. The form will disallow answers that are clearly impossible, or those that contradict earlier responses, while still allowing unusual (but sometimes correct) values. In these fields, where we do not want to fully disallow some kinds of responses, we will implement a warning or confirmation (otherwise known as a "soft" constraint) which prompts the enumerator to add a note or confirmation if an entry looks potentially incorrect, invalid, or inconsistent. The enumerator is able to either confirm the entry and continue or make a correction.

#### Monitoring and auditing of surveys

To help assure quality in our data-collection, survey supervisors will randomly accompany our enumerators and revisit a sample of surveyed individuals to perform back-checks. As an alternative or complement to these manual QA methods, SurveyCTO offers two random auditing options to allow us to monitor the quality of survey administration. The first is a random "text audit." For any random proportion of administered surveys (from 1% to 100%), SurveyCTO can save meta-data about the survey administration, including how much time the enumerator spent on each question in the survey form and the sequence with which he or she proceeded through the survey. The second auditing option is a random "audio audit." For any random proportion of surveys, SurveyCTO can audio-record some or all of the survey administration, starting at a specified time or point in the survey, or set randomly. Duration can also be specified. Enumerators are unaware of when they are being recorded, so they cannot behave systematically differently when being audited. Once the survey data is exported, the text and audio data (recorded in separate files) can be opened and reviewed for QA checking.

#### Speed Limits

Another quality-control tool available in SurveyCTO is "speed limits": We can specify a minimum number of seconds that enumerators should spend on a particular field. The first time the specified field appears in a given survey, SurveyCTO will (invisibly) keep track of how much time the enumerator spends before moving on to another question. If the enumerator spends less than the specified minimum time, there are a number of options for responding – track the number of violations, track the fields, trigger audio audits to hear what is going on, or alternatively, enforce the speed limit and prevent the enumerator from moving to the new question until the time has elapsed.

#### Monitoring Incoming Data

As well as the checks on data collection in the field, we will configure automated quality checks to monitor the overall quality of our incoming data. For example:

1. Individual field values that are too low or too high.
2. Individual field values that are outliers. SurveyCTO uses statistics to warn when field values are unusually high or low.
3. Individual field values that are too frequent or too infrequent, allowing monitoring of the frequency of certain response values.
4. Field means that are too low or too high, giving a warning when overall mean or average of a field is above or below a certain threshold.
5. Mean values that differ from one sub-group to another, for example checking that average values for a particular field do not differ significantly depending on the interviewer.
6. Response distributions that differ from one sub-group to another, checking to see if the distribution of responses differs across sub-groups which might indicate enumerator effects in the reported response.

SurveyCTO gives warnings whenever submission values, frequencies, means, or distributions in our data cause configured quality checks to fail. This will allow a rapid response to any potential issues that arise.

# Empirical Analysis

## Variables

### Primary outcome variables

Table 4 presents an overview of the full set of outcomes identified in the programme Theory of Change (Figure 1) and examples of the indicators that will be used to assess them at baseline, midline and end line.

**Table 4:** Assessment Indicators to measure Program Impact

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Indicators** | **Modules/Survey** | | | | | | **Analysis reported** |
| **HQ** | **WE** | **VQ** | **MIS** | **QS** | **Example Modules** |
| Outputs | Women's participation in WECs | (i) Percentage of women in the sample who are part of the collective/programme |  |  |  |  |  | WE4: Time Allocation | Midline, Endline |
| WE6: Women's role in Decision Making |
| HQ3: HH Income from business enterprise |
| Women participate in trainings and find them useful | (i) Number of technical trainings held (ii) Number of women who participate in technical, business management and/or leadership trainings (iii) Feedback on training sessions |  |  |  |  |  | MIS | Midline, Endline |
| Improved assets, infrastructure and technology are used by collectives and women | Proportion of women who report using CFCs and advanced machinery |  |  |  |  |  | WE5: Groups and collectives | Midline, Endline |
| WE7: Self efficacy and networks |
| Women are aware and connected to established linkages | Proportion of women who access (i) formal loans (ii) government enterprise schemes (iii) livelihoods trainings by other organisations |  |  |  |  |  | WE2: Savings & Loans  HH10: HH Institutional linkages | Midline, Endline |
| Women and collectives take up innovations | (i) Percentage of women who sell to Chitrika under governance of CFCs |  |  |  |  |  | MIS  HH4: Enterprise Activities & income generation | Midline, Endline |
| Outcomes | Women participate in entrepreneurial activities | (i) Time spent by women in entrepreneurial activities (ii) reduction in domestic chores (ii) Percentage of women who start new businesses |  |  |  |  |  | WE4: Time use  HQ2: Activities roster | Baseline, Midline, Endline |
| Woman’s social capital improves | Women are connected to a network of entrepreneurs, input providers and buyers |  |  |  |  |  | WE7: Self efficacy and networks | Baseline, Midline, Endline |
| Respondent participates in at least one community group. |  |  |  |  |  | WE7: Self efficacy and networks | Baseline, Midline, Endline |
| # Women that receive newspaper, watch television, use mobile phone |  |  |  |  |  | WE9: Personal Info | Baseline, Midline, Endline |
| Women's skill improves | Percentage of women/producers who meet production target on time |  |  |  |  |  | MIS | Midline, Endline |
| Percentage of women who meet the quality standards for procurement by Chitrika |  |  |  |  |  | MIS | Midline, Endline |
| Total sales, revenue and profit from enterprise |  |  |  |  |  | HH4.4: Enterprise Income | Baseline, Midline, Endline |
| Self-efficacy of women workplace |  |  |  |  |  | WE7: Self-efficacy and networks | Baseline, Midline, Endline |
| WEC production increase and quantity and quality | (i) Total production (ii) Production per worker |  |  |  |  |  | MIS: Performance of the collectives | Midline, Endline |
| Change in prices of products |  |  |  |  |  | V3: Prices | Baseline, Midline, Endline |
| Additional funding received, number of new buyers, number of new markets |  |  |  |  |  | WE5: Groups and collectives | Midline, Endline |
| Process evaluation |
| Maintenance of records, bookkeeping, # of updates, number of board meetings, process of selection of board members |  |  |  |  |  | MIS: Performance of the collectives, process evaluation | Midline, Endline |
| Women income increases | Women's income |  |  |  |  |  | WE1: Women’s Income and Role in enterprise activities | Baseline, Midline, Endline |
| M1.5: Improved household income of women |
| Proportion of women who are employed; proportion of women employed in cultivation, wage employment and enterprises |  |  |  |  |  | HQ2: Details on Household Members | Baseline, Midline, Endline |
| HQ3, 5, 6, 7: Household Income |
| Total member wages paid; revenue, profit, generated per participant |  |  |  |  |  | MIS | Midline, Endline |
| Women's confidence improves | SES index |  |  |  |  |  | WE7: Self efficacy and networks | Baseline, Midline, Endline |
| Respondent can visit at least two locations once per week |  |  |  |  |  | WE9: Physical Mobility | Baseline, Midline, Endline |
| Respondent is comfortable engaging with market actors |  |  |  |  |  | WE5: Groups and collectives | Baseline, Midline, Endline |
| WE7: Self efficacy and networks |
| SRQ-20 index |  |  |  |  |  | WE8: Intrahousehold relationships | Baseline, Midline, Endline |
| Women’s ownership and control over productive and financial assets increase | Amount saved in formal and informal sources |  |  |  |  |  | WE2: Savings and loans | Baseline, Midline, Endline |
| HQ11: Household Savings |
| Ownership of assets/Number of assets owned |  |  |  |  |  | WE3: Access to productive capital | Baseline, Midline, Endline |
| Respondent solely or jointly owns at least one large or two small assets; Respondent solely or jointly has at least one right to at least one XYZ asset that their household owns. | HQ9: HH Assets |
| Respondent has at least some input in decisions about income or feels they can make decisions about income, not including minor household purchases |  |  |  |  |  | WE6: Women's Role in HH Decision Making | Baseline, Midline, Endline |
| Amount spent on health/education/home improvement |  |  |  |  |  | HQ8: Household Expenses and debt | Baseline, Midline, Endline |
| Sales/Profits of collectives increase | (i) Total sales (ii) Revenue (iii) Profit |  |  |  |  |  | MIS | Midline, Endline |
| Women’s agency improves in (i) personal (ii) household (iii) enterprise and (iv) community decision making | Level of involvement in personal, household, enterprise, group and community decision making |  |  |  |  |  | WE1: Women's Income and Role in enterprise activities  WE5: Groups and collectives  WE6: Women's Role in HH Decision Making | Baseline, Midline, Endline |

### Covariates

Villages participating in the Chitrika project will be randomly assigned to treatment and control groups. The process of randomization ensures that, on average, demographic characteristics that could influence our outcomes of interest are likely to be similar in both groups, so we will not need to account for demographic differences by including covariates in our model. However, because there could be systematic differences that disproportionately impact villages at the state level, we include cluster-fixed effects in our regression specification. Standard errors will be clustered at the village level.

## Randomisation and Balancing Checks

We will present baseline balance on the following covariates that may influence impacts:

1. Village covariates
2. Distance of the village from basic healthcare, education and enterprise facilities
3. Prevailing prices of weaver outputs
4. An index of village infrastructure such as roads, electricity, and public transport
5. Prevalence of economic groups in the village such as SHGs and other FPOs
6. Household covariates
7. Years of education of adult men and women in the household
8. Proportion of SC/ST households
9. Proportion of BPL households
10. Proportion of households that have FPO members
11. Women level covariates
12. Age and education level of women
13. Marital status and whether they have children
14. FPO or SHG membership status
15. Proportion of women who have bank accounts

## Treatment Effects

### Intent to Treat

The sample of households selected at baseline will be re-visited in 2022 and 2023 for the midline and endline surveys, which will be administered to the same respondents. Three rounds of data will therefore be available for the panel households (0 = baseline, 1 = midline and 3 = endline). We plan to provide two estimates of programme impacts - the Intention-to-Treat estimator (ITT) and the Treatment on the Treated estimator (ToT). The ITT estimate will be given by:

where is the outcome variable for household *i* in village *v* in state *s* for time *t* = (1,2). takes on the value 1 if a village *v* is assigned to the treatment; will be 0 if a village is assigned to control. We include an additional term to account for the variation in the impact of treatment at time *t* during the baseline, midline and endline. We also include cluster fixed effects () and controls for baseline values of at time *t* = 0. The value of will give us the casual effect of the intervention on project outcomes for villages assigned to the treatment group, relative to the villages assigned to the control group. Comparing the change in outcomes of interest between baseline and midline across treatment and control villages will enable us to attribute these changes to the Chitrika interventions.

### Treatment on the Treated

In addition to this intent-to-treat estimator, if variation in take-up rates allow, we will also estimate the following specification for the average treatment effect on the treated (ToT):

Where takes that value 1 if the household participated in the Chitrika project.

## Heterogeneous Effects

We will examine heterogeneous impacts by women’s age, age of children, education level, prior experience in weaving and membership in SHGs, and by husband’s occupation.

## Standard Error Adjustments

### Clustering

Since treatment is assigned at the village level, standard errors for all specifications will be clustered by village.

### Multiple hypothesis testing

Our study aims to look at the impacts of collectivizing women into WECs on women’s incomes and empowerment outcomes. Some of our primary and secondary outcome variables will be constructed from multiple sub-indicators. Where index variables will be used, the number of tests will already be reduced. Furthermore, we will employ multiple hypothesis testing corrections on the primary index variables to correct for the false detection rate (Benjamani and Hochberg, 1995).

# Process Evaluation

The process evaluation will answer why (or why not) did the expected project outcomes manifest. To do so, we will examine if the project was implemented as per plan and project targets and outputs were met. We will rely primarily on the project MIS and KIIs interviews with main stakeholders including Chitrika staff and project participants and non-participants in the process evaluation. Specifically, we will answer the following questions:

1. Did the project reach the target population it was expected to? If this was not reached, what prevented the project from doing so?
2. Did the project reach the scale it was expected to?
   1. What factors inhibited project uptake by women?
   2. We will examine if the project was designed to be gender sensitive on parameters such as (i) accessibility of CFCs (ii) work conditions and (iii) safety at work.
3. What was the quality of the interventions?
   1. Were these interventions relevant and needed?
   2. Were CFCs equipped with machinery that women could operate?
   3. How did the women respond to the technical and gender training?
   4. Did the brand click with urban markets?
   5. Were effective market linkages established?
4. Were there any changes in the project design and implementation strategy? If so, why and what were the implication on project outcomes?

# Ethical Considerations

This study poses limited risks to participants. Personal identifiable information (PII) will not be shared, and data will be safely collected and stored using encryption technology; any information collected by hand will be stored and archived. We will also protect the privacy of participants throughout the interview to avoid sharing their personal information unintentionally. All results will be anonymized and screened to prevent identifying responses from being published.

All participants will be given the option to read or be read our consent form. Consent will be asked during the baseline, midline and endline quantitative and qualitative surveys. The Swashakt evidence programme, including the Chitrika evaluation, has received ethical approval from the Catalyst Institutional Ethics Committee. In addition to ethics, we will adhere to high standards of quality assurance and research transparency.

3ie is committed to protecting the rights of our participants and ensuring our evaluation does no harm. Survey enumerators will be trained to provide additional mental health, sexual violence prevention, and/or other health resources to high-risk participants. All partners will follow state COVID-19 protocols where relevant to ensure participants and enumerators are protected.

# Replication

All anonymised, de-identified data and code used in the analysis will be shared on 3ie’s GitHub for transparency and replication.

# Cost Effectiveness Analysis

Swashakt will also support cost effectiveness analyses (CEA) to collect and compare costs of projects within the program portfolio. Chitrika will file the project’s quarterly spending reports using the 3ie cost collection template. To estimate the benefit of the Chitrika program, the analysis will estimate the net present value of participation for the female participants. Costs and benefits of participation will be estimated (using the opportunity cost of participation) and monetized for comparability across projects. The assumptions used for the estimation of costs and benefits will be published in the final analysis. The team will also conduct sensitivity analysis to ensure results are robust in different scenarios.

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# Appendix

**Table A1(a): Balance on village characteristics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Village characteristic | Number of households | Total population | Female literacy rate | Female labour force participation | Male labour force participation |
|  |  |  |  |  |  |
| *Treatment* | 786.5 | 1,697 | 0.00548 | -0.000757 | -0.000321 |
|  | (1,117) | (3,940) | (0.0206) | (0.0298) | (0.00867) |
| *Cluster - Guntur* | 282.3 | 6,290 | -0.0588\* | 0.188\*\*\* | -0.000891 |
|  | (1,792) | (6,324) | (0.0331) | (0.0478) | (0.0139) |
| *Cluster - Krishna* | -2,815 | -6,378 | 0.0262 | 0.236\*\*\* | 0.0166 |
|  | (1,761) | (6,212) | (0.0325) | (0.0470) | (0.0137) |
| *Cluster - Narayanpet* | -3,572\*\* | -6,800 | -0.281\*\*\* | 0.334\*\*\* | -0.0155 |
|  | (1,732) | (6,110) | (0.0319) | (0.0462) | (0.0134) |
| *Cluster - Srikakulam* | -1,016 | -486.8 | -0.170\*\*\* | 0.190\*\*\* | -0.0226\* |
|  | (1,732) | (6,110) | (0.0319) | (0.0462) | (0.0134) |
| *Constant* | 4,572\*\*\* | 12,765\*\*\* | 0.661\*\*\* | 0.273\*\*\* | 0.680\*\*\* |
|  | (1,346) | (4,748) | (0.0248) | (0.0359) | (0.0105) |
| Observations | 77 | 77 | 77 | 77 | 77 |
| R-squared | 0.101 | 0.077 | 0.639 | 0.437 | 0.123 |
| Standard errors in parentheses | | | | | |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 | | | | | |
| Note: The default cluster is East Godavari | | | | | |

**Table A2(b): Balance on village characteristics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Village characteristic | Secondary school in village | Arts/Science college in village | Paved roads in village | Electricity main source of lighting | Mobile health clinic in village |
|  |  |  |  |  |  |
| *Treatment* | 0.0867 | 0.0260 | -0.0260 | -3.367 | 0.107 |
|  | (0.104) | (0.0260) | (0.0259) | (6.807) | (0.0982) |
| *Cluster - Guntur* | 0.0268 | -0 | 0.0714\* | -10.61 | -0.0982 |
|  | (0.167) | (0.0418) | (0.0416) | (10.93) | (0.158) |
| *Cluster - Krishna* | 0.149 | 0.000867 | -0.000867 | 4.100 | -0.176 |
|  | (0.164) | (0.0410) | (0.0408) | (10.73) | (0.155) |
| *Cluster - Narayanpet* | 0.125 | -0.0625 | 0 | 4.133 | -0.125 |
|  | (0.162) | (0.0403) | (0.0401) | (10.55) | (0.152) |
| *Cluster - Srikakulam* | 0.125 | -0 | 0 | -7.735 | 0 |
|  | (0.162) | (0.0403) | (0.0401) | (10.55) | (0.152) |
| *Constant* | 1.144\*\*\* | 1.987\*\*\* | 1.013\*\*\* | 84.06\*\*\* | 0.259\*\* |
|  | (0.126) | (0.0314) | (0.0312) | (8.203) | (0.118) |
| Observations | 77 | 77 | 77 | 77 | 77 |
| R-squared | 0.027 | 0.063 | 0.072 | 0.046 | 0.044 |

1. We set a random seed drawn from random.org. Minimum runs for randomization was set to 700. [↑](#footnote-ref-2)