**Swashakt Evidence Programme**

Gramyashakti: developing rural women’s spice processing enterprises in three Indian states

Implementing partner: ACCESS Development Services

Pre-analysis Plan

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# Introduction

## Abstract

We study the impact of value chain development in women’s farmer producer organisations on household and women’s economic outcomes and their agency in the enterprise and the household. The project “Gramya-shakti” aims to collectivise rural women into producer groups for processing of local spices for sale in high-end urban markets. We propose a village level randomised evaluation design by which the project will be rolled out on randomly selected spice-producing villages. The control villages were be intervened under the project. We use three rounds of household and enterprise panel data and process level qualitative data to estimate program impacts and understand the mechanisms of change.

## Background

This pre-analysis plan articulates the proposed evaluation design of the project “Gramyashakti: developing rural women’s spice processing enterprises in three Indian states” supported by the ***Swashakt evidence programme***. The programme was launched in 2020 and provides support to nine projects that aim to form and strengthen women’s collective enterprises over the course of the three-year project period. Gramyashakti is one of the projects supported under Swashakt.

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 that, in turn, are expected to improve women’s economic status and their agency in economic and non-economic decision-making.

## Theory of Change

We start by proposing a simple theory of change (ToC) that hypothesises the possible causal relationship between women’s economic collectives (WECs) and women’s economic empowerment (WEE). This is based on our 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.

We start by laying out the definition of WEE that we use in our project. WEE has been defined in many ways (Wu, 2013) and 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 enterprises and group membership

In rural India, women have limited access to livelihood assets such as finance, productive assets, education and weak social capital (Basu, 2006). The 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 programmes 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 such interventions 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 ensure 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 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.

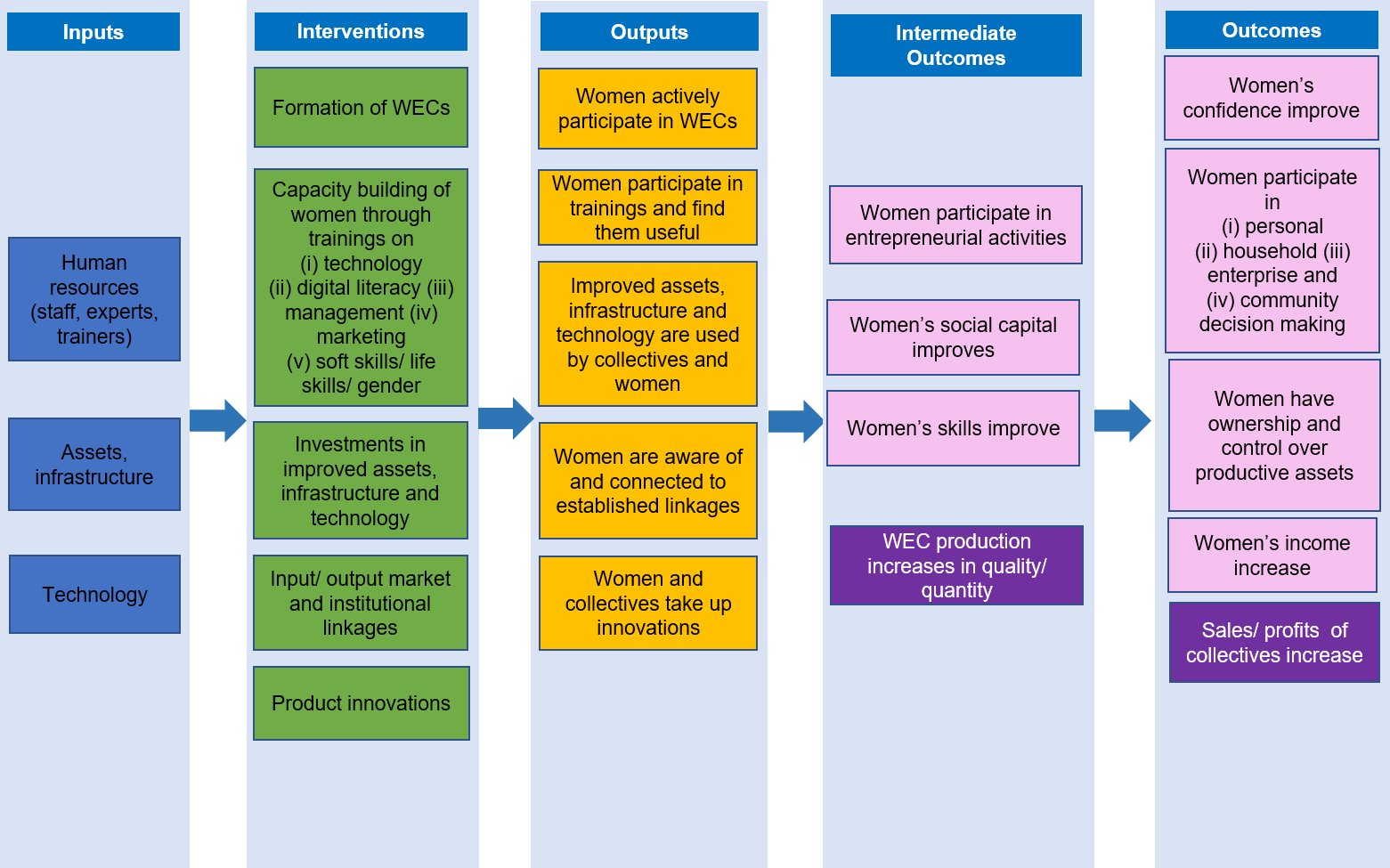
Another set of outcomes that merit discussion is related to WEC enterprises. Better skilled women, better technology, increased access to capital and markets and production of value-added commodities are likely to improve the quality and quantity of production by WECs. This may lead to increased sales 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. We assume that women and households perceive the value of women’s remunerative work and that gender norms that discourage women from working outside the home will respond 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**: Swashakt Evidence Program WEE Theory of Change Model



# Introduction to Gramyashakti

## Background and motivation for the project

The government of India has set an ambitious target of establishing over 10,000 new farmer producer organizations (or FPOs) between 2020 and 2024, with special focus on poor districts (PIB Delhi, 2021). FPOs in India are membership-based groups that may undertake numerous services such as inputs provision, production enhancement, processing and value addition, opportunities for training or skill development, market linkages, credit linkages, access to technology, and/or procurement and sales support. The FPO model posits that bringing individual farmers together enhances their bargaining power, reduces costs, enables risk sharing and generates value addition that optimizes profits and utilizes economics of scale.

ACCESS Development Services is a national livelihoods support organization with 14 years of experience in promoting sustainable livelihoods in rural India.[[1]](#footnote-2) In 2019, ACCESS launched the *Gramyashakti* project to mobilize female farmers in western and southern Rajasthan. ACCESS organized women into groups of 15 to 20 to form FPOs that pursued common economic activities, and confederated FPOs to form the women owned and operated Ranthambhore Mahila Aajeevika Producer Company Ltd (RMAPCL). With training in technical capacity and business development, ACCESS has incubated the Producer Company (PC) and established market linkages that have cut costs and increased revenues for female farmers. With support from *Swashakt****,*** in the next phase of Gramyashakti, ACCESS will replicate the FPO-Producer Company confederation model that has shown success in Rajasthan in four new locations.

## Collectivizing women’s spice processing

### Description of intervention

Under Gramyashakti, ACCESS will establish and scale four new spice processing farmer producer companies in the states of Rajasthan, Odisha and West Bengal, mobilizing at least 800 female participants (Table 1). The main interventions proposed in the first year of implementation are (i) technical training on spice processing and storing, (ii) training on business management and strategy, (iii) training on gender and leadership and (iv) establishing four new common processing facilities. Towards the end of the second year, and once market linkages have been established through business-to-business (B2B) and business-to-customer (B2C) channels, spices procured by the company will be marketed under a high-value brand called StirNSpike.[[2]](#footnote-3)

Broadly, the goals of the Gramyashakti programme are to:

* 1. Add value to spice products and to reach higher value markets
  2. Build company capacity through training of participants in entrepreneurship, financial management, enterprise growth, and gender equity
  3. Empower women to access loans for enterprise development as well as their rights and entitlements
  4. Build *Tamara*, a competitive commercial brand through packaging, market linkages both online and offline

**Table 1:**Project Locations and Expected Participation

|  |  |  |  |
| --- | --- | --- | --- |
| **Location** | **Number of villages** | **Status** | **Expected Number of Active women** |
| Kota, Rajasthan | 11 | 1 New FPC | 200 |
| Kandhamal, Odisha | 16 | 1000 women have been registered into an FPC, but no production activity has started | 200 |
| Uttar Dinajpur, West Bengal | 39 | 1 FPC of 3000 women has been registered. No production activity has started. | 200 |
| Alipurduar, West Bengal | 52 | 1 FPC of 1500 women has been registered. No production activity has started. | 200 |

### Geographic and population characteristics of project area

The ACCESS team will target women from 91 villages in Rajasthan, West Bengal and Odisha to participate in the programme. These regions are characterised by high levels of social and economic deprivation. In Table 2, we present some socio-economic characteristics of the project districts from the 2011 Census of India.

**Table 2**: Characteristics of ACCESS project Villages in RJ, WB, OD (2011)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **State** | **Women in cultivation (%)** | **Literate adult women (%)** | **SC Population (%)** | **ST Population (%)** |
| Rajasthan | 12.5% | 64.0% | 18.6% | 29.3% |
| West Bengal | 13.8% | 39.2% | 12.7% | 18.5% |
| Odisha | 21.7% | 58.5% | 7.7% | 72.0% |

Inclusion into Gramyashakti will depend on the following member characteristics:

1. The members should be in low-income groups with a monthly household income not exceeding Rs.10,000.
2. The membership will be voluntary. Women members willing to be part of the enterprise will be enrolled for the project.
3. Only one adult woman (18-55 years of age) from a household will be offered membership. This will ensure there is no concentration of power in the enterprise.
4. Member should be preferably from small and marginal farmer/producer community.
5. There will not be any restriction on membership based on religion, caste or social status of a member.
6. As far as possible, politically strong households will be excluded to ensure minimal power gaps within the enterprise.
7. Members should be a farmer either cultivating the spice on own land or leased (legal owned).
8. Members should be willing to contribute towards the mutually agreed share price of the FPC to ensure sufficient share capital.

### Timeline

The project timeline and activities are summarized in Figure 2 below. In Year 1, the project will mobilize participants, deliver key trainings and refresher courses, set up centralised spice production units and initiate production. In Year 2, the project leads advanced trainings, develop market linkages, and establish a strong umbrella brand. In Year 3, the project will create modern packaging and labelling and focus on sustainability.

**Figure 2:** Project activities and 3-year implementation timeline

## Research Questions

The Gramyashakti evaluation will generate high-quality, relevant and transferrable evidence on the potential of ACCESS’s farmer collectivisation model to facilitate women’s economic empowerment.

Our main research questions are summarized below:

1. What is the impact of the intervention on stated project outcomes of interest identified in the theory of change (Figure 1)?
2. How do WECs increase women’s economic empowerment? What mechanisms explain the linkages between outputs and outcomes?
3. Why, or why not, did the observed impacts occur?
4. Were the observed impacts similar across caste and economic status at baseline?
5. Does gender and leadership training for female participants and their male family members lead to better economic outcomes for women?

# Research Strategy

## Evaluation approach & design

3ie will undertake the evaluation of the Gramyashakti project using a theory-based, mixed methods experimental 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 research team will develop survey instruments to collect data on project participants and non-participants at the individual, household and collective level before project activities begin in both treatment and control villages in August 2021. The same sample will be interviewed at the midline in 2022 and endline in 2023 to examine the changes in key processes and outcomes.

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 farmers, 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 farmers in overcoming the same. Table 2 summarises the evaluation method and data collection tool for each research question. We will use a mix of quantitative and qualitative methods to answer the main research questions of this project.

**Table 2:** Overview of the Evaluation approach

|  |  |  |
| --- | --- | --- |
| **Research questions** | **Research method** | **Data** |
| 1. What is the impact of the intervention on stated project outcomes of interest identified in the theory of change (Figure 1)? | Impact evaluation using experimental and qualitative methods with counterfactual to examine if outcomes changed due to the intervention | Quantitative data collected at baseline, midline and end line, MIS data |
| 1. How do WECs increase women’s empowerment? | Development of the Theory of change. Examining the association between project outputs and outcomes. Examining the validity of the assumptions of the causal links | Qualitative data collected at baseline, midline and end line, project documents |
| 1. Why, or why not, did the observed impacts occur? | Process evaluation to examine if the project implementation was per plan and if identified project outputs were produced | Qualitative data collected at baseline, midline and end line, MIS data, KIIs and FGDs |
| 1. Were the observed impacts similar across caste and economic status at baseline? | Heterogeneity of impacts by caste and economic status of women | Quantitative and qualitative data collected at baseline, midline and endline |
| 1. Does gender and leadership training for female participants and their male family members lead to better economic outcomes for women? | Qualitative evaluation to understand impact and utility of training | Qualitative data collected at baseline and end line, KIIs and FGDs |

The evaluation approach is aligned with the Gramyashakti implementation plan. ACCESS will invite women from the treatment villages for the training programme in Year 1. Baseline data will be collected in 2021 before the training is implemented in both treatment and control villages. After the programme launches, midline data will be collected at the end of Year 2. By Year 2 it is expected that spices from the treatment villages will be branded and sold to high-value markets. The end line data will be collected in 2023. Comparing the change in outcomes of interest between baseline and midline across treatment and control villages will enable us to attribute these changes to training and access to CFC. Comparing outcomes between baseline and end line will enable us to identify the effect of these when combined with the branding exercise.

## Randomisation

To measure project impact, we propose a cluster randomized control trial (CRCT) with the village as the unit of randomisation. The village is the appropriate unit for randomisation because these are the geographical areas from which women are mobilized into FPOs. An FPO typically includes 20-25 women from the same village who form the grassroot level group enterprise, which are federated into the producer company. ACCESS’s partner villages in Rajasthan, Odisha and West Bengal form our sampling frame.

An important criterion that determined the feasibility of including villages in the project was the distance of villages from the central processing units (CPUs) that would be set up by ACCESS under the project. The location of the CPUs were identified by the ACCESS team in collaboration with the livelihoods departments of the respective states and are therefore endogenous to village characteristics. We excluded these CPU villages and requested ACCESS to identify villages close to the CPU villages from where women could be mobilised. ACCESS identified 118 such villages as eligible to participate in the Gramyashakti project. While villages in Rajasthan were all close to the CPU i.e within 10 kilometers, some villages in West Bengal and Odisha (107 of the 118 villages) were located as far as 40 kilometers from CPU. We excluded all villages that were greater than 30 kilometers from the CPU. This reduced are sample to 91 villages- 11 from Rajasthan, 51 from West Bengal and 29 from Odisha. We used the Census 2011 data to match village characteristics of our sample village. We block randomised villages using census village administrative clusters (also called blocks) while ensuring balance on female literacy rate, percentage of women in agricultural cultivation, percentage of men in agricultural cultivation and whether the village was accessible by all weather roads.[[3]](#footnote-4)

Appendix 1 compares common demographic characteristics, such as the average household income, proportion SC/ST households, education, gender composition, among treatment and control villages. There are no significant observable differences in these characteristics between the groups.

Our identification strategy relies on the assumption that villages operate as localized economies, and there is no exchange of skills, information and technology among participants in treatment and control villages. We will test this assumption by collecting information on possible program spillover effects to control village.

## Household listing and selection

Prior to the main survey, a household listing operation will be conducted in all sampled villages. Households will be screened on three main eligibility criteria (i) there must be a woman aged 18 to 55 residing in the household (ii) the household must be involved in cultivation of the spice identified for processing (iii) the annual household income in the last 12 months must be less than INR 10,000. This listing operation generate a sample frame of eligible households from which 3ie will randomly select the households to be interviewed in the evaluation sample, preventing bias in selection of households by field teams. The same households will be tracked in the midline and endline.

## Minimum detectable effect

Increase in women’s income is the primary outcome of interest of the project. The project aims to increase women’s income by 15% in three years. We use rural agricultural incomes for Odisha from NSSO, 2013 to calculate the minimum detectable effect size (MDE) for our proposed sample. The mean annual income per household in Odisha is INR 4,976. However, this data set does not provide any information on intra-cluster correlation. We use data on agricultural household incomes collected by 3ie for a different study to obtain this number. Standard deviations are assumed to be high- more than half of the mean income. Using the *clustersampsi* command in STATA-16, we conclude that our sample of 91 villages with 30 households per village is adequate to attribute 13% increase in income to the project (alpha=0.05, power= 80%).

**Table 3:** Range of Minimum Detectable Effects to assume programme impact

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Actuals** | | | **Assumptions** | | **Minimum Effect** | |
| **Mean** | **Std Dev** | **ICC** | **Clusters per arm** | **HH per cluster** | **DD** | **% change** |
| 4976 | 3500 | 0.07 | 46 | 20 | 705.58 | 14.2% |
| 4976 | 4000 | 0.07 | 46 | 20 | 806.37 | 16.2% |
| 4976 | 3500 | 0.07 | 46 | 30 | 656.96 | 13.2% |
| 4976 | 4000 | 0.07 | 46 | 30 | 750.82 | 15.1% |
| 4976 | 3500 | 0.07 | 46 | 40 | 631.26 | 12.7% |
| 4976 | 4000 | 0.07 | 46 | 40 | 721.43 | 14.5% |

## Attrition from the sample

Attrition from the project poses bias to our evaluation design. 3ie will attempt to minimise 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.

In the previous section, we showed that 30 households per village is adequate to measure a 13% increase in incomes. To account for attrition, we have oversampled households per village. Instead of 30 household, we will include 40 households per village. Assuming that 10 households attrite from our sample, we will still be powered to study project impacts. Including the additional 10 households in our sample has another benefit as it enables us to account for imperfect take-up. 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

## Data sources

Data will be collected at the project baseline (August 2021), midline (2022) and end line (2023) to measure changes in key process and outcomes of interest. We will field four tools: 1) a household questionnaire for response by the household head; 2) a women’s questionnaire for response by one adult woman in the household; 3) a village questionnaire for response by a village leader to gather information on village demography; and 4) a qualitative questionnaire, which will include interviews with ACCESS staff, participants, family members, and other value chain actors.

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 end line 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 Gramyashakti 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 Gramyashakti 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 one (1) woman based on Gramyashakti’s selection criteria (Appendix 2).
* If the household does not have an enterprise, the WQ will be fielded to one (1) woman based on Gramyashakti’s selection criteria (Appendix 2).

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 access to productive assets with additional questions on social capital and ownership of assets associated with spice processing. We have also added a module on mental health that is based on the Self-Reporting Questionnaire 20-Item (SRQ-20) to identify participants with major depression, anxiety disorders or suicidality.

### Qualitative evaluation for impact assessment

In addition to the quantitative instruments mentioned above, we will field qualitative evaluation instruments. Qualitative research will help to unpack the answers given in surveys and better understand the process and rationale justifying changes in the project outcomes of interest. As Patton (2002) describes, “qualitative findings in an evaluation illuminate the people behind the numbers and put faces on the statistics.”

The qualitative evaluation component aims to understand if WEC’s lead to women empowerment and identify the enablers and barriers to impact. Importantly, the study will also capture information on the implication of various social and cultural intersections - like caste, class, gender, geographical location etc. - on our empowerment outcomes. These ‘intersections’ are critical in understanding the challenges faced by women in achieving meaningful steps towards ‘entrepreneurship’ as well (Torrvi and Maritnez 2011). Intersectional analysis is critical to feminist research since it analyses acts of concealed power relations, discrimination, agency in constructing identities (Crenshaw 1989).

We will field three tools for the qualitative evaluation:

1. Focused Group Discussions (FGD): FGDs will be conducted with women farmers who join FPOs and/or are in leadership positions. FGDs will also be conducted with women in treatment and control areas who did not join an FPO. Each FGD will comprise of 8-10 women.
2. Key informant interviews (KII): Key informant interviews will be conducted with village leaders, Gramyashakti participants, trainers, value chain actors, and ACCESS staff, trainers, and/or anyone influential within the local community who may have helped ACCESS in forming the women collectives.
3. Life history interviews: Life history interviews will be conducted with programme participants to inform us on the history of Agri-processing and entrepreneurship in project locations.

Additionally, the qualitative evaluation will investigate how project interventions led to increased empowerment of the participants by studying contextual factors and identifying enablers and barriers in the process. To do so, we will gather qualitative data on the existing norms and contextual factors. Table 4 shows the data we will use and sources of the data.

**Table 4**: Collecting Data on the enablers and barriers to gender empowerment

|  |  |
| --- | --- |
| **Factors** | **KII respondents** |
| (1) Gender norms at household, enterprise and community level that restrict or promote women’s participation in collective enterprises | Women (two generations), Husbands, Sarpanch, FPO board members, FPO members |
| (2) Attitude of women towards entrepreneurship | Women entrepreneurs, ACCESS staff, |
| (3) Attitude of value chain actors towards women’s enterprise | Input providers and buyers , ACCESS staff |
| (4) Current and potential role of institutions such as local banks, SHGs and MSME departments | FPO board members, women, ACCESS staff, officials of banks, SHGs and MSME departments |

## Data collection & processing

## 3ie has partnered with Neerman for baseline data collection in Rajasthan, West Bengal and Odisha. Enumerators will be trained to administer quantitative and qualitative survey instruments and will be required to inform respondents of 3ie’s confidentiality policies (i.de that all information shared will be anonymized and kept confidential) and that respondents are free to refuse or terminate interviews at any time. An additional consent form will be read to respondents before participating in the mental health modules, which could be triggering for some. Quality assurance

We place great emphasis on the quality of data collection for this study including preparations for subsequent survey rounds. 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

## Output and outcome variables

Based on the TOC, we identified the following set of indicators that we will use to assess program impacts (Table 5). Column 2 shows the outputs and outcomes defined in the TOC. Column 3 presents the indicators. This table also reports the indicators we will report at baseline to check for variable balance. In addition to the outputs and outcomes of the TOC framework, we have included some questions study the impact of the project on women’s mental health.

**Table 5:** 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 ACCESS through brand name |  |  |  |  |  | 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 ACCESS |  |  |  |  |  | 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 |  |  |  |  |  | WE13: Mental health | 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  WE Making | Baseline, Midline, Endline |

## Covariate balance

Villages participating in the Gramyashakti project were 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. We will present baseline balance on the following covariates that may influence impacts:

Village covariates:

(i) distance of the village from basic health, education and enterprise facilities

(ii) prevailing prices of the spices produced

(iii) an index of village infrastructure such as roads, electricity and public transport

(iv) prevalence of economic groups in the village such as SHGs, other FPOs

Household covariates:

(i) Years of education of adult men and women in the household

(ii) Proportion of SC/ST households

(iii) Proportion of BPL households

(iv) Proportion of households that have FPO members

Women level covariates:

(i) Age and education of interviewed woman

(ii) Average age of children

(iii) FPO or SHG membership of women

(iv) If the woman has a bank account of her own

1. Treatment Effects

### Intent to treat (ITT)

The sample of households selected at baseline will be re-visited in 2022 for the mid line and 2023 for the end line questionnaires, which will administered to the same respondents. Three rounds of data will therefore be available for the panel households (0=baseline, 1= mid line and 3=end of treatment). We plan to provide two estimates of programme impacts - the Intention-to-Treat estimator (ITT) and the Treatment on the Treated estimator (TTT). The ITT is appropriate in this our project as non-project members may benefit from wage employment in the enterprises as well as changes in commodity prices. The ITT estimate will be given by:

Where Yivst is the outcome variable for household i in village v in state s for time t =(1,2). *Treatment* takes on the value 1 if a village v is assigned to the treatment; *Treatment* will be 0 if a village is assigned to control. Yivs0 is the value at baseline. We also include state fixed effects (𝐷s) and strata fixed effects (𝜏d). The value of 𝛽1 will give us the casual effect of the treatment 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 Gramyashakti training interventions which are planned in the first year of the project. Comparing outcomes between baseline and end line will enable us to attribute impacts the year 1 interventions when combined with the branding and marketing interventions that will be introduced in the second year. Standard errors will be clustered at the village level.

### Treatment on the treated (TTT)

In addition to this intent-to-treat estimator, we will also implement the following specification to estimate the average treatment effect on the treated:

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

## Heterogeneous Effects

We will examine heterogeneous impacts by women’s age, age of children, education level, prior experience in spice processing and membership in SHGs. We will examine heterogeneous impacts 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 use rely primarily on the project MIS and KIIs interviews with main stakeholders including ACCESS staff and project participants in the process evaluation. Specifically, we will answer the following questions:

1. Did the project reach the target population 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?
   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 shelf life of the spices increase due to better processing?
   5. Were urban markets responsive to ACCESS branding? Did they receive feedback?
   6. 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

The 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. We have 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 anonymized, de-identified data and code used for data analysis will be shared on 3ie’s GitHub page 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. ACCESS will file Gramyashakti’ quarterly spending reports using the 3ie cost collection template. To estimate the benefit of ACCESS program, the analysis will estimate the net present value of participation for the female participations. 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.

# Appendix

**Appendix 1**: Comparison of baseline characteristics in Treatment and Control Villages

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Treatment  (n=46) | | Control (N=45) | |  |  |
|  | Mean | SD | Mean | SD | Difference | P-value |
| Number of HH (#) | 548.27 | (896.2) | 505.91 | (622.97) | 42.35 | .79 |
| Fraction SC (%) | 0.09 | (0.09) | 0.11 | (0.1) | -0.02 | .44 |
| Fraction ST (%) | 0.44 | (0.37) | .4 | (0.34) | 0.03 | .64 |
| Literate females (#) | 577.91 | (1045.88) | 456.67 | (656.67) | 121.24 | .51 |
| Total # of Main Workers | 972.73 | (1589.32) | 879.3 | (1148.89) | 93.43 | .75 |
| Main Workers, Male (#) | 507.04 | (883.08) | 460.89 | (572.1) | 46.15 | .77 |
| Main Workers, Male (%) | 0.79 | (0.16) | 0.79 | (0.15) | 0.00 | .96 |
| Main Workers, Female (#) | 170.18 | (378.11) | 153.96 | (335.89) | 16.22 | .83 |
| Main Workers, Female (%) | 0.21 | (0.16) | 0.21 | (0.15) | 0.00 | .96 |
| Marginal Workers, Male (#) | 164.04 | (273.12) | 152.35 | (229.43) | 11.70 | .83 |
| Marginal Workers, Male (%) | 0.53 | (0.21) | 0.53 | (0.24) | 0.01 | .91 |
| Marginal Workers, Female (#) | 131.47 | (192.89) | 112.11 | (141.86) | 19.36 | .59 |
| Marginal Workers, Female (%) | 0.47 | (0.21) | 0.47 | (0.24) | -0.01 | .91 |

**Appendix 2**: Gramyashakti Criteria for Selection of Members for Women-based FPOs

For selection of women members of the FPCs, ADS will apply the following criteria:

1. The membership will only be from the villages identified by 3ie as treatment villages (list of region-wise villages identified randomly by 3ie provided as annexure 1).
2. The members should be in low-income groups with a monthly household income not exceeding Rs.10,000.
3. The membership will be voluntary. Women members willing to be part of the enterprise will be enrolled for the project.
4. All members under an enterprise will belong to the same geography. Women staying within a radius of 5-10 kms of the primary operations will be offered membership.
5. Only one adult woman (18-55 years of age) from a household will be offered membership. This will ensure there is no concentration of power in the enterprise.
6. Member should be preferably from small and marginal farmer/producer community.
7. There will not be any restriction on membership based on religion, caste or social status of a member.
8. As far as possible, politically strong households will be excluded to ensure minimal power gaps within the enterprise.
9. Members should be a farmer either cultivating own land or leased (legal owned).
10. Members should be growing one of the dominant spices grown in the region around which production and marketing activities will be targeted. This criterion can be relaxed for Kota and Sawai Madhopur locations in Rajasthan.
11. Members should be willing to contribute towards the mutually agreed share price of the FPC to ensure sufficient share capital

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1. Please see ACCESS’s website here: https://www.accessdev.org/ground-operations/ [↑](#footnote-ref-2)
2. Project documents note that branded spices can command at least 140% higher price than a non-branded product. Thus, this is an important means to maximise earnings for women by marketing to customers willing to pay a higher price for their products. [↑](#footnote-ref-3)
3. We set minimum runs to 500 and seed as 8114. [↑](#footnote-ref-4)