

Appendix A: Pre-analysis plan

PRE-ANALYSIS PLAN FOR THE IMPACT EVALUATION OF JEEVIKA

1. *Introduction to JEEVIKA:*

Historically, Bihar has been one of India's most impoverished states, languishing at the bottom of the heap along various socio-economic dimensions. Social segregation along caste lines, gender discrimination, poor infrastructure and a near breakdown in provision of public amenities had accentuated the abysmal income levels, especially in rural Bihar. However, in recent times, Bihar has witnessed a steady turnaround under a slew of administrative reforms. In late 2006, the Govt. of Bihar inaugurated the Bihar Rural Livelihoods Project or JEEVIKA, executed by the autonomous Bihar Rural Livelihoods Promotion Society and funded by the World Bank. JEEVIKA has become the flagship rural poverty reduction program of the government, operating in 9 out of 34 districts of Bihar. Recently, JEEVIKA received the mandate of scaling up its model across Bihar under the National Rural Livelihoods Mission. Over a period of the next 10 years, the mandate is to mobilize 12.5 million rural HHs into 1 million SHGs (Self Help Group), 65000 VOs (Village Organization) and 1600 CLFs (Cluster Level Federation).

The project's key features include:

- a) Focusing on the poor and vulnerable members of the community, particularly women.
- b) Building and empowering pro-poor institutions and organizations.
- c) Emphasis on stimulating productivity growth in key livelihood sectors and employment generation in the project area.
- d) Positioning project investments to be catalytic in nature to spur public and private investment in the livelihood areas/sector of poor households.
- e) Identification of existing innovations in various areas and help in developing processes, systems and institutions for scaling up of these innovations.

The primary goal of the project is to promote socio-economic inclusion of rural impoverished households by mobilizing women members from such families into SHGs (Self Help Groups). SHG members meet regularly to participate in savings, borrowing and repayments; additionally, the group provides an opportunity for 10-15 women of similar backgrounds to come together and discuss their day-to-day lives. Each member is required to deposit 10-20 cents weekly; once some equity is established, the members may begin drawing credit from this pool. After some weeks or months of demonstrated group savings, the project provides the SHG with access to lending capital of 875 USD, which the SHG may disburse as loans to its members. Going forward, the goal is to link SHGs to banks and leverage funds from formal credit institutions. The annual cost of credit to SHG members is 24%, a relatively low rate compared to those charged by existing informal creditors.

Once a minimum number (10-15) of SHGs form in a village, they are federated into a Village Organization (VO). The VO acts as a platform through which JEEVIKA initiatives, such as linkages with NGO-led income generating projects or government programs, are communicated to SHG members. The VO also has a mandate to identify issues at the village level and liaise with the project's staff to provide practical solutions.

2. The Evaluation Design:

In 2010, JEEVIKA was expanding into its 'Phase 2' areas, 37 new blocks of 9 districts, providing an opportunity to rigorously evaluate this flagship project. Funding was provided by the International Initiative for Impact Evaluation (3ie) and by JEEVIKA for a randomized evaluation of the project. 180 panchayats were randomly selected for inclusion in the study from within 16 blocks in 7 districts in which JEEVIKA was planning to scale up. In each of the study panchayats, one to two villages were then randomly selected for inclusion in the study. In each study village, one or more hamlets in which the majority of the population belonged to a scheduled caste or scheduled tribe was identified, and households were randomly selected within these. Overall, nearly 9000 households were interviewed at baseline in the 180 study panchayats using a structured data collection instrument. In addition, focus group discussions were held in each study village, one to which all community residents were invited, including men and women, and one which was restricted to women in targeted areas of the community (the intended beneficiaries of the intervention). The purpose of these discussions was to understand baseline community characteristics and capabilities. At the time of the baseline survey, which was fielded from July to early October 2011, JEEVIKA was not operating in any of the study panchayats.

Prior to treatment assignment, study panchayats were stratified by block and by the average outstanding value of high-cost loans (defined as loans which have a monthly interest rate equal to 4% and above) reported by households surveyed at baseline. Panchayats were then assigned to either treatment or control status using a random number generator.

JEEVIKA began operating in the treatment panchayats of 3 districts in January 2012. Rollout was delayed for the other 4 districts, where baseline work for a parallel qualitative study was being conducted. JEEVIKA moved into the remaining treatment panchayats in April 2012. After over two years of project activities in the treatment areas, the first follow-up survey began in July 2014 and is projected to be complete by early October, 2014. A second follow-up survey is planned to begin in July 2015.

3. Approach to the analysis

All hypotheses will be tested using a linear regression framework. The specification used to analyze a given outcome variable will depend on the degree of serial autocorrelation observed in that variable across survey rounds. Using the formulae presented in McKenzie (2012), the choice of a difference-in-differences versus ANCOVA specification for each variable will be made to maximize statistical power to detect a treatment effect on that variable.

For variables that are relatively uncorrelated over time, the outcome variable in the follow-up round will be regressed on a treatment status indicator, baseline value of the independent variable, and stratification variables (ANCOVA specification). For those in which the outcome is highly auto-correlated over time, the outcome variable (both pre- and post- intervention) is regressed on treatment status at that round, time dummies, and stratification variables (difference-in-differences specification). Additional baseline

controls will be included in secondary specifications for both the ANCOVA and diff-in-diff models.

Stratification variables are the following:

- The panchayat mean of households' outstanding high cost debt (loans with an annual interest greater than or equal to 48%) at baseline
- Block dummies

Controls to be included in the second specification are the following:

- Baseline values of all of the primary outcome variables (indicated with an asterisk below).
- Any other variables for which the difference in means between treatment and control groups differs from 0 at the 5% level of significance (after accounting for clustering at the panchayat level and controlling for stratification variables)

For analysis of village-level outcomes, village means of control variables will be used. Standard errors will be clustered at the panchayat level, which is the unit of randomization.

Heterogeneous Treatment Effects:

For all household outcomes, we will analyze the data for heterogeneous treatment effects by caste, landholdings at baseline, and residence in Kosi Division vs. other study areas.

4. Household- Level Analysis:

Participation: None of the higher order impacts of the JEEVIKA program would be realized if participation in self-help groups among households in treatment panchayats is not greater than among those in control panchayats (note that there are other SHG projects in Bihar).

We define participation in two ways: first, basic participation is defined as whether at least one member of the household was a member of an SHG at the time of the survey; second, active participation is defined as whether any household member either saved or obtained credit through an SHG in the past year.

H1 (Basic participation): The probability that at least one member of the household belongs to a SHG is significantly higher in treatment areas. (11.1 in the follow-up women's questionnaire)*

H2 (Meaningful participation): The probability that least one member of the household actively saves through an SHG is significantly higher in treatment areas. (8.C.2 in the follow-up HH questionnaire; 11B.4 in the follow-up women's questionnaire)

Since one of the objectives of JEEVIKA is to inculcate a habit of savings, and since households may be linked to formal financial institutions through JEEVIKA, we will also test the impact of access to the program on whether the household saves, regardless of where savings are deposited.

H3 (Savings): The probability that a member of the household saved at all during the past year is higher in treatment areas. (8C.1 in the follow-up HH questionnaire, 11B.4 in the follow-up women's questionnaire)*

SHG participants are taught to sign their names so that they can handle financial transactions better. We should thus expect that signature literacy is higher in treatment areas; signature literacy may also lead to more awareness among women about basic signs like bus numbers, road signs, etc.

H4 (Signature literacy): Percentage of signature literate women is higher in treatment sample. (9A.11 in the follow-up women's questionnaire)

H5 (Basic literacy): Percentage of women able to read basic signs such as phone/bus numbers, road signs is higher in treatment areas. (9A.12 in the follow-up women's questionnaire)

Microcredit: Assuming that households in treatment areas do participate to a greater extent in SHGs, access to financial services (savings vehicles as well as credit) is expected to be the primary mechanism through which the program results in poverty reduction, given the lack of access formal credit or savings mechanisms, and cost of informal credit in the study area. Better access to financial services is expected to allow beneficiary households to smooth consumption during emergencies, reduce high cost existing debts and enable them to borrow for productive purposes. Additionally, given the lumpiness of pre-intervention informal borrowing, we may expect to see a higher number of loans in treatment areas, with a lower amount borrowed per loan compared to control areas. It is not clear a-priori whether the total debt burden should be higher in treatment areas (the cost of debt is lower so the price effect on debt is expected to be positive; on the other hand the positive wealth effect of access to lower cost credit is expected to have a negative effect on households' outstanding debt burden). We do, however, anticipate that the program will affect the purpose for which loans are taken, with the share of loans used for investment (as opposed to consumption smoothing) increasing due to a positive wealth effect.

H6 (High cost debt): Percentage of households with any outstanding high cost loans (defined as loans with an annual interest rate of greater than or equal to 48%) is lower in treatment sample. (8B.13 B in the follow-up HH questionnaire)

H7 (High cost debt): Average total value of outstanding high-cost household debt is lower in treatment areas. (8B.13 B, 8B.14, 8B.15 in the follow-up HH questionnaire)*

H8 (Average interest rate): Average annual rate of interest on cost household debt is lower in treatment areas. (8B.13 B, 8B.14, 8B.15 in the follow-up HH questionnaire)*

H9 (Number of loans): Number of loans taken out over the past year is higher in treatment areas. (8B.4, 8B.5 in the follow-up HH questionnaire)

H10 (Indebtedness): Average total value of outstanding debt is lower in treatment areas. (8B.15 in the follow-up HH questionnaire)

H11 (Consumption borrowing): Amount borrowed for consumption purposes over the past year, as a percentage of the total borrowing during this period, is lower in treatment areas. (8B.1, 8B.2, 8B.4, 8B.5 in the follow-up HH questionnaire)

H12 (Debt reduction borrowing): Amount borrowed for debt reduction over the past year, as a percentage of the total borrowing during this period, is higher in treatment areas. (8B.1, 8B.2, 8B.4, 8B.5 in the follow-up HH questionnaire)

H13 (Productive borrowing): Amount borrowed for productive purposes over the past year, as a percentage of the total borrowing during this period, is higher in treatment areas. (8B.1, 8B.2, 8B.4, 8B.5 in the follow-up HH questionnaire)

Additionally, we may expect some general equilibrium effects. If participation in the program is high, and competition in the informal credit sector is imperfect, then access to cheap credit from SHGs should reduce the cost of borrowing from informal sources due to competitive effects, irrespective of whether a household contains an SHG member or not. On the other hand, the high cost of informal credit may reflect the risk premium that exists when a creditor does not know the risk profile of the borrower. Participation in an SHG (regular savings, regular borrowing and regular repayment) could serve as a signal to informal creditors about a lower risk profile. If this is the case, we may expect that SHG members are charged a lower interest rate when they borrow from informal sources than non-SHG members; indeed, non-SHG members may see their cost of borrowing increase as lack of participation serves as a negative signal to creditors in areas where SHG membership is widespread.

H14 (Cost of borrowing – competition): Interest rates paid to informal lenders on loans taken out during the past year are lower, on average, in treatment areas, irrespective of whether any household members belong to an SHG. (8B.3, 8B.4, 8B.13, 8B.14 in the follow-up HH questionnaire)

H15 (Cost of borrowing – signaling): In treatment areas, interest rates paid to informal lenders on loans taken out during the past year are lower, on average, among households in which at least one member belongs to an SHG; the difference in interest rates among these groups is larger in treatment areas than in control areas. (8B.3, 8B.4, 8B.13, 8B.14 in the follow-up HH questionnaire; 11.1 in the follow-up women's questionnaire)

Livelihood Opportunities: JEEVIKA aims to provide a basket of livelihood opportunities to beneficiary households through the VOs. However, this takes place only after the VOs are well enough established to take up livelihood interventions on a demand driven basis. VOs usually form one year after initial entry into a village, which leaves JEEVIKA about 1-1.5 years to design interventions according to demand. Better access to credit may also enable households to diversify their income-generating activities, or to concentrate their activities in those activities which are most profitable. Because JEEVIKA specifically targets women, who are less likely to be engaged in income-generating activities at baseline, the proportion of adult women household members engaged in income-generating activities may increase as a result of the program. Availability of income-generating opportunities may vary seasonally, thus in addition to comparing activities over the entire year, we will also compare activities in each season.

H16 (Livelihood diversification): Households engaged in a larger number of income generating activities over the past year in treatment areas.

H17 (Women's labor force participation): Proportion of adult women involved in income generating activities over the past year is higher in treatment areas.*

H18 (Women's seasonal labor force participation): Proportion of adult women involved in income generating activities by season over the past year is higher in treatment areas.

Asset Position: Both the microfinance and livelihoods interventions are expected to result in beneficiary households accumulating assets at a faster rate. Additionally, given Bihar's agricultural landscape, and high landlessness, one could expect that these interventions promote leasing in of agricultural lands.

H19 (Productive assets): An index of productive asset ownership is higher in the treatment sample. (Section 6A in the follow-up HH questionnaire)*

H20 (Consumption assets): An index of consumption asset ownership is higher in the treatment sample. (Section 6B in the follow-up HH questionnaire)*

H21 (Housing quality): Quality of housing is higher in treatment sample. (Section 4 in the follow-up HH questionnaire)*

H22 (Assets): Amount of land leased in for cultivation is higher in the treatment sample. (511A in the follow-up HH questionnaire)

Access to other government schemes: JEEVIKA creates a platform through which households can voice demands related to various government schemes like pensions, NREGS employment, PDS rations, health and life insurance, which are provided by the relevant government departments usually through the panchayats. Although JEEVIKA cannot ensure the supply of such schemes, one may expect better service delivery due to increased demand.

H23 (Entitlements): Households' likelihood of access to one or more government schemes such as NREGS employment, pensions from panchayat and PDS cards is higher in the treatment sample.*

Empowerment: By providing microfinance services to women, through a curriculum aimed at enhancing women's voice both within and outside of the household, and through the expansion of women's social networks, JEEVIKA is expected to positively affect the empowerment of women.

H24 (Mobility): An index of women's mobility (ability to travel alone or accompanied) to the village grocery store, health center, banks, post office, panchayat and group meetings and friend or relative outside the village is higher in treatment areas. (Section 9B in the follow-up women's questionnaire)*

H25 (HH decision-making): An index of participation in household level decision making (regarding purchase of durable goods and personal items, migration, labor

activities, politics, education and borrowing) is higher in treatment areas. (Section 9C in the follow-up women's questionnaire)*

H26 (Collective action): Women's propensity to participate in collective action (to solve issues related to public services, domestic violence and alcoholism) is higher in treatment sample. (Section 9E in the follow-up women's questionnaire)*

H27 (Aspirations): Aspirations for children in general, and particularly for girls (educational attainment, profession) are higher in treatment areas. (Section 6D in the follow-up women's questionnaire)*

H28 (Political awareness): Women's political awareness (ability to name India's Prime Minister and Bihar's chief minister) is higher in treatment areas (9A.13 and 9A.14 in the follow-up women's questionnaire)

H29 (Political participation): Probability that a woman voted or ran in recent elections, serves on a panchayat committee, or aspires to stand for public office is higher in treatment areas (9A.15 – 9A.25 in the follow-up women's questionnaire)

H30 (Social networks): Women are more likely to confide in or seek help from social contacts outside of the household in treatment areas. (Section 9F in the follow-up women's questionnaire)

Consumption: We expect total per-capita consumption to be greater in treatment areas, leading to higher consumption of nutritious items such as vegetables, pulses and meat products. Consumption of 'sin' goods typically not consumed by women, such as alcohol and tobacco, may decrease due to women's increased bargaining power in the household (or could increase if the income effect outweighs the bargaining effect). We may also expect greater investments in children's education, and higher spending on assignable female goods, as compared to assignable male goods.

H31 (Consumption): Value of total consumption per adult equivalent is higher in treatment areas. (Section 10 in the follow-up women's questionnaire)*

H32 (Diet quality): Per-adult equivalent consumption value of non-staple, nutritious food items (vegetables, pulses, animal-sourced foods) is higher in treatment areas.

H33 (Food expenditure): Per-adult equivalent consumption value of higher unit-cost food items is higher in treatment areas.

H34 (Food quality): Per-adult equivalent consumption of low-unit cost staples is lower in treatment areas. (Section 10 in the follow-up women's questionnaire)

H35 (Sin goods): Consumption of sin goods (alcohol, tobacco) is lower in treatment areas.

H36 (Education): Investment in children's education is higher in treatment areas. (10.4 codes 1, 2, 3 in the follow-up women's questionnaire)

H37 (Private goods): Expenditure on women's assignable goods relative to expenditure on men's assignable goods is higher in treatment areas.

Subjective well-being: Through effects on access to financial services, income-generating opportunities, and empowerment, JEEVIKA is expected to positively affect the subjective well-being of women.

H38 (Subjective well-being): Women's subjective well-being is higher in treatment areas (Sections 9G and 9H in the follow-up women's questionnaire)

5. Village Level Analysis:

Due to the institutional approach of JEEVIKA, changes in the extent of the civic participation and mutual support are expected. Awareness about government schemes, willingness to engage in collective action to ensure service delivery, and a greater sense of collective efficacy should materialize when women are mobilized into village wide institutions. The following hypotheses will be tested using data from community-level surveys (conducted in two sessions, one general and one for women specifically):

H39 (Collective action - completed): Conditional on problems with a particular amenity, the proportion of villages in which women have acted to resolve the problem(s) is higher in treatment areas. (Follow-up women's community survey, Section 2)

H40 (Collective action - planned): Given continuing problems with a particular amenity, the proportion of villages in which women are planning to act is higher in treatment areas. (Follow-up women's community survey, Section 2)

H41 (Mutual support): The proportion of villages in which women report receiving assistance from others in the village is higher in treatment areas. (Follow-up women's community survey, Section 3)