Skilled but Invisible: The Gendered Impact of Skill Training on Employment and Migration [*]

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Abstract

Men and women face different motivation and challenges towards migration. The failure to successfully migrate in search of better employment opportunities is a crucial, but relatively understudied, constraint to female labour force participation (FLFP). Using a combination of administrative and survey data from India, we conduct the first long-run evaluation of a large-scale public skill training program. Quasi-experimental estimates suggest that skill-training increased the probability of employment among males, but not females. At the same time, skilling increased migration propensities, with higher impact for women in some specifications. In exploring the channels, we find correlational evidence that women who undertook training had higher measures of empowerment, potentially a channel through which skilling affects migration outcomes. At the same time, the insignificant employment effects suggest that trained women were not able to overcome the demand side and institutional constraints.

Keywords: skilling, gender, migration, employment, female empowerment

JEL codes: J6; J61; J68; J160

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1. Introduction

A vast literature in economics has focussed on migration among males (Sharp, 2021). Female migration is relatively understudied due to the emphasis placed in neoclassical migration theory on economic opportunities being the main driving force behind migration (Sjaastad, 1962). In these models, economic concerns are not an important determinant of migration among females, who are more likely to migrate as dependents or after marriages. The literature also identifies several reasons why women, compared to men, are more likely to prefer work opportunities that are physically closer to home. These include restrictive social norms and unequal distribution of work at home (MacDonald, 1999; Afridi et al. 2022), concerns about safety (Chakraborty et al. 2018) and limited information about work opportunities due to weak social networks (Calvo-Armengol et. al. 2004; Fletcher, Pande and Moore, 2018). Given that men and women face different motivation and challenges towards migration, it is important to study the gendered effect of labour market policies that foster human capital and thereby facilitate internal migration. In this paper, we study the effect of a large-scale public skilling program on employment and internal migration in India.

Unlike other developing countries, Female Labour Force Participation (FLFP) in India is very low and has witnessed a dramatic decline over the last three decades (Afridi, Dinkelman and Mahajan, 2018; Klasen and Pieters 2015). According to data from the National Sample Service Office (NSSO) and the Periodic Labour Force Survey (PLFS), while female labour force participation rate was 30 percent in 1990, it declined sharply to 19.7 percent in 2018 (Andres et. al. 2017)[2]. These numbers are puzzling in the backdrop of declining fertility rates and increasing education levels, with primary school enrolment among girls at par with enrolment among boys.

While FLFP in India has garnered a lot of academic and policy interest, the gender dimension of migration in India has not received much attention despite its significance and equally puzzling trends. According to the 2011 Census, internal migrants comprised 37 percent of total Indian population and the majority (67 percent) were female migrants who migrated for marriages (Rajan & Bhagat, 2021). For migrants in the 20-34 age group, while 38.5 percent of men migrated for work/employment, only 2.7 percent for women migrated

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[2] See also, https://www.pib.gov.in/PressReleasePage.aspx?PRID=1908961

for work (2011 Census). These trends are alarming since low rates of internal migration of women for employment is considered one of the key factors which deters the entry of women into higher education, skilling and employment (The Economic Times, Sept 29, 2022).

In this paper, we study the impact of a government skill training program on employment and migration outcomes in India using a combination of administrative and survey data. We further investigate the gender specific barriers associated with migration and study whether skill training can overcome some of these barriers. The program we evaluate is called the Deen Dayal Upadhyay Grameen Kaushalya Yojana (DDU-GKY). Launched in 2014, DDU-GKY is a demand-driven placement-linked skill training initiative of the Ministry of Rural Development (MoRD), Government of India (GoI) meant for rural poor youth between the ages of 15 to 35. A key feature of the program is that states are encouraged to provide migration support centres (MSCs) for successful trainees who are displaced from their native places in search of employment.[3]

Theoretically, the labour supply response of unemployed women to job training should be higher in labour markets with search frictions and low female labour force participation (Killingsworth and Heckman; 1986). In an intertemporal framework, an unemployed woman chooses between the decision to work or to bear children (and/or be a housewife) while the spouse is the primary income earner. In this scenario, a training program that upgrades skills and increases labour market opportunities may increase participation and reduce barriers to migration. Training programs may also reduce the noise in measures of female productivity leading to lower statistical discrimination by employers (Bergemann and van den Berg, 2008)[4]. Finally, training may reduce the job search costs which are predicted to be higher for women due to their lower level of information and weaker social networks.

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[3] The Indian government has taken several steps to address the challenges faced by internal migrants. The National Skill Development Corporation (NSDC) has been established to provide vocational training and employment opportunities to migrants. The National Rural Livelihoods Mission (NRLM) has been launched to provide financial assistance to rural migrants to start their own businesses. Additionally, the government has launched various schemes such as the National Health Mission and the National Urban Livelihoods Mission to address the healthcare and livelihood needs of internal migrants. One nation one ration card was implemented in 2020 to avoid domicile-based access of foodgrains under the Public Distribution System.

[4] Statistical discrimination" arises when an employer does not observe the true productivity of workers but only observes a noisy signal based on stereotypes. In the absence of complete information, the profit maximizing employer, who does not intentionally discriminate, pays according to the signal leading to unequal treatment of members of two groups.

Consistent with this, using data from the Indian National Sample Survey (NSS), Fletcher, Pande and Moore (2018) find that at all levels of education, women with vocational training are more likely to work than those without training. Similarly, Barua, Joshi and Singh (2022) evaluate the short run effect of DDU-GKY and find an increase in wage and self-employment probabilities for women 6 months to 1 year after training. While the authors study the short run effects of skill-training on employment probabilities, no study has looked at the effect of skill training in India on medium/long run employment outcomes and migration. According to McKenzie (2017), the formal/industrial positions that many of these training programs consider *successful* outcomes are not valued by job seekers, and as a result, job dropout rates are high in the first year of employment.[5] Thus, the long run analysis of DDU-GKY might provide greater understanding of the success of such training programs in India. Furthermore, despite the programs emphasis on the need to support migration, no study has evaluated the effect of this program on migration outcomes.

Investigating the causal effect of skill training is challenging due to the selection bias associated with trainees. Investment in human capital (in the form of skill training) and migration are considered risky activities (Jaeger et al. 2010; Bauernschuster et al., 2014; Dustmann et al., 2023).[6] Trainees are not randomly chosen and generally tend to be positively selected from the general population as they are intrinsically motivated to change their employment situation or are less risk averse. We deal with the endogeneity concerning trainee selection using a battery of methods. To difference out unobserved characteristics, we use a canonical Differences-in-Differences (DID) model that exploits variation in time and training status using a combination of administrative and survey data. Our rich data allows us to control for an exhaustive set of explanatory variables, including detailed measures of risk and social network, usually not available in survey data. Further, we check the robustness of our results using nonparametric approaches.

Our results shed light on the barriers to employment and migration among women. While we find long run positive effects (5 years post training) on employment and migration

probabilities among males, there is no effect of training on female employment. However, females are also more likely to migrate for work after training and in some settings also have higher migration probabilities than men. We find suggestive evidence that training increased female bargaining power which could potentially be a mechanism to explain the increased migration.[7] At the same time, the lack of evidence in support of long run employment implies that though training eased supply side constraints, it was not able to completely eliminate demand side constraints.

Our paper makes important contributions to the literature on Active Labour Market Policies (ALMP), internal migration, and employment outcomes. Jia et al. (2023) note, in a comprehensive review of the literature on internal migration, that there needs to be more research on the myriad policies that shape migration. To the best of our knowledge, this is the first paper that studies the causal effect of skill-training on internal migration outcomes differentiated by gender. Second, our results are important for public policy in light of stagnant labour force participation rates among women in India. Lawson (2008) estimates that per capita income in India could be 20 per cent higher by 2030 if India's gender participation gap could be halved. Several studies (Klasen and Pieters 2015; Chatterjee et al., 2018) have shown that women in India are constrained by both supply side factors (such as rising education levels of spouse, patriarchal societal norms, and unsafe work environment) and demand side factors (lack of suitable employment opportunities for moderately educated women). Our results suggest that skill-training empowers women to overcome supply side constraints and is effective in facilitating migration in search of employment opportunities.

The rest of the paper is structured as follows. We discuss the institutional context of DDU-GKY in section 2 followed by a detailed description of data, employment and migration statistics and trends in section 3. Section 4 presents the methods used in the analysis followed by results in section 5. Finally, we conclude the discussion in section 6.

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[7] Providing women with information, vocational skills, and skill development for employability can not only improve development outcomes, but also improves female empowerment and participation in household decision making (Ahamad et. al., 2015; Kandpal et. al. 2013).

2. Institutional Context

DDU-GKY, launched in 2014, is a free of cost wage employment training program of the MoRD, GoI. It offers job training to rural poor youth who are 15 to 35 years of age (the age limit is 45 for minorities), with the aim of subsequently placing them into gainful employment.[8] DDU-GKY is a part of the National Rural Livelihood Mission (NRLM), tasked with the dual objectives of adding diversity to the incomes of rural poor families and catering to the career aspirations of rural youth. DDU-GKY is currently present in 28 States and UTs, impacting youth from 689 districts.

DDU-GKY is implemented through a 3 tier structure with MoRD at the apex as the policy making, facilitation and coordination agency. The State Skill Missions (SSMs) or State Rural Livelihood Missions (SRLM) are the nodal implementation support agencies at the state level and Project Implementation Agencies (PIA) serve as the skill and placement providers. Trainings are 3 to 12 months long (including on-the-job trainings), and are implemented by the PIAs who bring together the trainers, experts, sectoral knowledge and infrastructure required for skill development. These trainings take place in a PIA set training centre covering 82 sectors with 450 job role courses. The training centre can be residential with food and lodging provided or non-residential if the training centre is close to the candidate's location.

A key feature of the training program is that for individuals who are interested in migrating for work, the program provides free counselling and guidance via dedicated centres. MSCs established under DDU-GKY are important agencies to support migrating candidates. These centres are set up across most states where DDU-GKY is operational through SRLMs. For the establishment of MSCs, MoRD has increased the funding from INR 10 lakhs per centre per year to INR 30 lakhs per centre per year.[9] The services provided by MSCs include housing/accommodation support, information access on basic social and government services (housing-related, schools, hospitals, social programs/ schemes etc.), counselling related to finance, health, education and work ethics.[10] This also aids in the tracking and

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[8] Eligibility for DDUGKY scheme is any of the following: Age 15- 35 (extended to age 45 for Minorities and women), and any of the following documents: Below Poverty Line (BPL) card, BPL ration card, Rashtriya Swasthya Bima Yojana (RSBY) cards i.e. poor households who benefit from a government run health insurance program, family member being part of an Self Help Group (SHG), family member participating in the rural employment guarantee program (MGNREGS).
[9] http://ddugky.gov.in/sites/default/files/Notification/Notification_10_2020.pdf
[10] https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/jan/doc2022163601.pdf

facilitation of displaced workers after placement. Thus, the major role of training partners includes training, assessment and certification, placement, post placement support, such as cash and mobilization support that help them to assimilate with newer work environments and cities. Figure 1 below presents the salient features of the DDU-GKY program.

Figure 1: Salient Features of the DDU-GKY
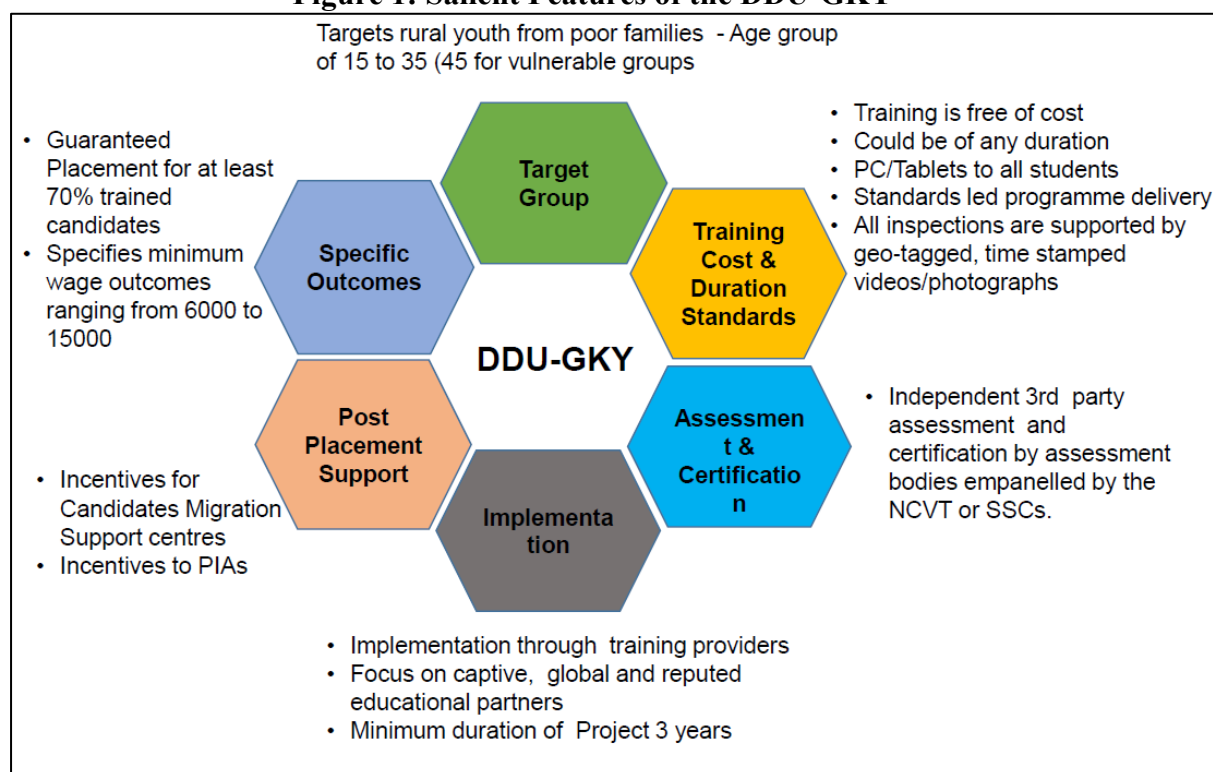
Note: National Council for Vocational Training (NCVT) and State Council for Vocational Training (SCVT) are the governing body for Industrial Training Institute (ITI) colleges across the country and state, respectively.

3. Data and Descriptive Statistics

A first step for any rural youth seeking to upgrade skills or start a business is to register online in the Kaushal Panjee (KP) portal.[11] Since its inception in October 2017, rural poor youth have registered for wage or self-employment training on the KP portal. Training Partners, PIAs, and Banks can use KP to contact registered candidates for training or jobs. Apart from their contact information, registrants are asked to provide detailed information about their educational attainment, family, income, and the sectors and trades of their interest for subsequent matching with PIAs. Further, they are asked if they are willing to move to a

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[11] Their enrolment relies on two key channels. First, direct outreach to eligible youth by SRLM field staff and PIAs who register interested candidates for training. Second, indirect outreach through information dissemination via key stakeholders, word of mouth, advertising in newspapers and radio.

different state or district for work, and if they prefer self-employment or wage employment. This provides us with preferences for migration and occupation before a candidate has undertaken any training, and is assumed to be looking for livelihood opportunities.

Our analysis is obtained from two data sources, one is administrative data provided by the Ministry of Rural Development's Kaushal Panjee (KP) portal and the other is primary phone survey data conducted in year 2019 (to study short run outcomes) and again in 2024 (to study long run outcomes). In the following sub-sections, we show descriptive statistics from each of these datasets and discuss the differences in key variables by gender.

3.1 Administrative Data and Phone Surveys 2019

From the Kaushal Panjee (KP) MIS dataset, we obtained individual level information on 646,679 registered candidates of four states i.e., Gujarat, Madhya Pradesh, Odisha and Tamil Nadu. These candidates registered on the KP Portal from October 1, 2017, the date of its inception, to February 5, 2019. These states were chosen on the basis of two criteria. First, all four states had, as of 5th February 2019, more than 15,000 registrants, a sample size that was sufficient for our follow up phone surveys where we expected low pick-up rates and high attrition. Second, we choose two states that experience high in-migration- Tamil Nadu and Gujarat, and two that experience high out-migration- Odisha and Madhya Pradesh. This data contains contact information, educational attainment, family, income, and employment status. Further, the data includes information on migration and employment preferences, i.e., if they are willing to move to a different state or district for work and if they prefer self-employment or wage employment. The KP dataset is unique as the respondents in our survey are rural unemployed youth with relatively high education who are interested in upgrading their skills through government training programs and who have never migrated.

Around 200,000 registered candidates had valid phone numbers.[12] Using contact information from the KP data, in September 2019, we randomly reached out to 57,000 registrants, out of which 12,144 calls (21 percent) materialized into full-length surveys after accounting for consent and whether the call was answered. The phone survey data cross-

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[12] Valid numbers are those that meet the criteria of being 10- digit in length, starting with numbers 6, 7, 8 and 9 and having 10 or fewer people associated with it.

validates demographic questions given in K.P. data. Further, it provides new information on DDU-GKY training status, employment outcomes, risk and social networks.[13]

3.2. Descriptive Statistics from KP data

Table 1: Descriptive Statistics by State in KP Data

	All States	Gujarat	MP	Odisha	TN
Willing to move to a different state for a job	0.38	0.24	0.33	0.75	0.24
	(0.48)	(0.43)	(0.47)	(0.43)	(0.43)
Willing to move to a different district for a job	0.58	0.43	0.53	0.89	0.51
	(0.49)	(0.50)	(0.50)	(0.31)	(0.50)
Prefers Wage Employment	0.32	0.14	0.14	0.63	0.42
	(0.47)	(0.35)	(0.35)	(0.48)	(0.49)
Prefers Self-Employment	0.24	0.29	0.31	0.16	0.17
	(0.43)	(0.46)	(0.46)	(0.37)	(0.38)
Percentage Currently Employed	0.06	0.02	0.03	0.01	0.15
	(0.23)	(0.13)	(0.18)	(0.11)	(0.36)
Any member of household belongs to SHG[a]	0.36	0.23	0.31	0.37	0.50
	(0.48)	(0.42)	(0.46)	(0.48)	(0.50)
Working in NREGA[b]	0.07	0.03	0.05	0.08	0.11
	(0.25)	(0.18)	(0.21)	(0.27)	(0.32)
Below Poverty Line	0.16	0.24	0.20	0.14	0.05
	(0.36)	(0.43)	(0.40)	(0.35)	(0.21)
Belong to a minority	0.07	0.07	0.03	0.04	0.14
	(0.26)	(0.26)	(0.17)	(0.19)	(0.35)
Having RSBY Card[c]	0.10	0.07	0.03	0.23	0.09
	(0.29)	(0.25)	(0.17)	(0.42)	(0.28)
Observations	**12108**	**2511**	**3844**	**2509**	**3244**

[a]Self Help Group [b]National Rural Employment Guarantee Act, [c]Rashtriya Swasthya Bima Yojana)

Table 1 shows the summary statistics from the KP registration data for the sample of 12,144 registrants from the first round of phone surveys. The majority (94 percent) of the KP sample was unemployed at the point of online registration and almost no one had ever migrated before for work opportunities; 99.94 percent of the KP sample reported that their present district of residence is same as their permanent district as per domicile. Among the registrants, 38 percent reported that they were willing to move to another state for work as

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[13] A concern with the analysis is the external validity of the estimates given that we attempted 57,000 calls out of more than 200,000 valid phone numbers. Table A1 in appendix shows the relation between observable variables (including gender, caste, education, income, social standing, employment/migration preferences, and employment status) from the KP MIS data and attempted calls. Almost all individual and household characteristics are uncorrelated with the probability of a call being attempted.

opposed to 58 percent stating their willingness to move intra state[14]. While 32 percent preferred wage employment, one-fourth of the sample prefer to be self-employed. Furthermore, eligibility for DDU-GKY requires ownership of a Below Poverty Line (BPL) card/ Antyodaya Anna Yojana card, Rashtriya Swasthya Bima Yojana (RSBY) card, any household member working as an MGNREGA[15] worker and belonging to a Self Help Group (SHG). The state-wise descriptive statistics for these variables is shown in Table 1.

3.3. Descriptive Statistics from First Round Phone Survey

Table 2 captures the descriptive statistics obtained from the first round phone surveys conducted in September 2019. The average age is 25 years and 38 percent of the sample are women with gender balance in Tamil Nadu and an unbalanced sample in Madhya Pradesh. Madhya Pradesh has the lowest female male registration ratio on the KP portal of DDU-GKY. Further, the female response rate (females giving the consent for the survey divided by number of females contacted for the survey) for the final survey round is very less for Madya Pradesh (29 percent) as compared to Tamil Nadu (53 percent). It is not clear why both KP registrations and consents among women are lowest in this state. Any cultural differences will be accounted for in the empirical specification with district fixed effects.

The relatively younger population in our sample explains the low marital rate of 40 percent. The education levels of the respondents are high, only 8 percent of the sample has not completed 9th grade while 42 percent of the sample has completed high school. Thus, the sample is representative of rural educated youth who were actively seeking employment and interested in upgrading their skills. The unemployment rate had reduced to 39 percent at the time of the survey (as compared to 94 percent in KP). Among those who are employed, one-fifth are wage earners while 8 percent are in self-employment. The remaining workers are either out of the labour force (21 percent) or working as agricultural and casual labour. While Tamil Nadu has the lowest rate of unemployment in the sample, it has the highest rate of wage employment (34 percent) and lowest rate of self-employment (5 percent). Unemployment rate, at 45 percent, is highest in Gujarat. While one-fifth of the sample said that they prefer to migrate to another state in search of employment, more than half said that

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[14] There were two questions on migration preferences in the KP form which were also replicated in our phone surveys: "Are you willing to migrate to another state for work?" and, "Are you willing to migrate to another district within your state for work?"

[15] Mahatma Gandhi National Rural Employment Guarantee Act provides employment opportunity to the rural poor for up to 100 days in the financial year. The nature of the work under this scheme is unskilled Labour work.

they prefer intra state migration. This is an expected response since districts in India are relatively culturally homogeneous within a state and most migration occurs within states (Dyson and Moore 1983, Foster and Rosenzweig 2001).[16] In our data, the proportion of respondents who are willing to migrate to another state in search of employment is highest in Odisha and lowest in Gujarat.

Table 2: Descriptive Statistics of Demographic Characteristics by State: Survey Data

Variables	All States	Gujarat	MP	Odisha	TN
Age	25.37	26.11	24.88	23.75	26.65
	(5.56)	(6.22)	(5.07)	(4.74)	(5.77)
Female	0.38	0.44	0.20	0.43	0.51
	(0.49)	(0.50)	(0.40)	(0.49)	(0.50)
Married	0.41	0.49	0.42	0.23	0.49
	(0.49)	(0.50)	(0.49)	(0.42)	(0.50)
Number of Children	0.58	0.69	0.60	0.23	0.75
	(0.98)	(1.08)	(1.03)	(0.65)	(1.00)
Household Size	4.02	4.53	4.59	3.63	3.25
	(1.84)	(1.79)	(1.96)	(1.72)	(1.41)
Mother's educ: None	0.47	0.58	0.63	0.35	0.27
	(0.50)	(0.49)	(0.48)	(0.48)	(0.44)
Mother's educ: Up to 10th grade	0.46	0.36	0.34	0.55	0.63
	(0.50)	(0.48)	(0.47)	(0.50)	(0.48)
Either Parent Self Employed	0.27	0.32	0.29	0.12	0.31
	(0.44)	(0.47)	(0.45)	(0.32)	(0.46)
Own Educ: Up to 8th grade	0.08	0.09	0.09	0.03	0.09
	(0.27)	(0.28)	(0.28)	(0.18)	(0.29)
Own Educ: 9th to 12th Grade	0.50	0.56	0.49	0.69	0.33
	(0.50)	(0.50)	(0.50)	(0.46)	(0.47)
Own Educ: More than High School	0.42	0.35	0.43	0.28	0.58
	(0.49)	(0.48)	(0.49)	(0.45)	(0.49)
Land	0.58	0.47	0.59	0.65	0.61
	(0.49)	(0.50)	(0.49)	(0.48)	(0.49)
Smartphone	0.74	0.80	0.80	0.71	0.65
	(0.44)	(0.40)	(0.40)	(0.45)	(0.48)
Speak English	0.33	0.28	0.29	0.42	0.33
	(0.47)	(0.45)	(0.46)	(0.49)	(0.47)
Speak Hindi	0.62	0.68	1.00	0.74	0.02
	(0.49)	(0.47)	(0.04)	(0.44)	(0.14)
Preference to move state	0.20	0.12	0.22	0.32	0.16
	(0.40)	(0.32)	(0.41)	(0.47)	(0.37)
Preference to move district but not state	0.53	0.57	0.62	0.71	0.29
	(0.50)	(0.50)	(0.49)	(0.46)	(0.45)
Wage Employed	0.21	0.13	0.12	0.25	0.34
	(0.41)	(0.34)	(0.32)	(0.44)	(0.47)
Unemployed	0.39	0.45	0.41	0.36	0.35
	(0.49)	(0.50)	(0.49)	(0.48)	(0.48)
Self Employed	0.08	0.07	0.11	0.09	0.05

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[16] Kone et. al. (2018) finds that average migration in India between neighboring districts in the same state is at least 50 percent larger than neighboring districts on different sides of a state border.

	(0.28)	(0.26)	(0.32)	(0.29)	(0.22)
Number of blood relatives in district	33.57	32.15	34.43	28.87	39.22
	(39.35)	(44.37)	(42.44)	(22.78)	(41.95)
Number of friends met in a week	7.64	7.14	8.43	5.78	9.06
	(11.49)	(7.38)	(8.84)	(10.68)	(18.35)
Ever Migrated	0.33	0.41	0.36	0.50	0.09
	(0.47)	(0.49)	(0.48)	(0.50)	(0.29)
Risk Score (Self-Scored)	5.98	4.33	5.38	7.88	6.21
	(2.83)	(2.28)	(2.64)	(1.82)	(3.14)
Risk Score (Lottery)	2.85	2.87	3.30	3.18	2.04
	(1.54)	(1.41)	(1.56)	(1.59)	(1.20)
Prefers Wage Employment	0.49	0.45	0.42	0.65	0.50
	(0.50)	(0.50)	(0.49)	(0.48)	(0.50)
Prefers Self-Employment	0.30	0.29	0.31	0.18	0.38
	(0.46)	(0.45)	(0.46)	(0.38)	(0.48)
Received Training	0.14	0.13	0.10	0.36	0.04
	(0.35)	(0.33)	(0.30)	(0.48)	(0.19)
Observations	**12,144**	**2,513**	**3,846**	**2,541**	**3,244**

*Standard errors are in parentheses

3.4. Risk and Social Network

Apart from socio-economic variables, in 2019, we also collected information on an individual's social network and risk preferences. We measure risk attitude in two different ways. The first measure of risk is a self-reported general risk assessment based on the question: *"How do you see yourself: are you generally a person who is fully prepared to take risks, or do you try to avoid taking risks?"* Responses are given on a 10 point Likert scale where 1 means not at all willing to take risks and 10 means very completely willing to take risks. The second measure of risk is based on a lottery game with hypothetical money. We asked respondents to play a coin toss game with a fixed winning amount (Rs. 500 or approximately USD 7) if the flip of the coin showed heads, but we gradually increased the losing amount if the coin toss yielded tails. The losing amounts were Rs. 25, 75, 150, 250, and 350. If a respondent did not want to play the game at all, we assigned them the lowest risk score (value of 1). If the respondent played the game only for the loss amount of Rs. 25 but refused to play for higher values, we assigned them a risk score of 1. Similarly, if the respondent decided to play even with a loss of Rs. 350, their risk appetite was highest (with a score of 7).

The self-reported and lottery-based risk scores present some interesting findings. Risk attitudes elicited through the two methods differ from each other. The Spearman correlation

coefficient indicates a very low correlation of 0.16 between the two measures[17]. There are also differences in the two risk measures across states. For example, while respondents in Tamil Nadu have the lowest risk-taking abilities according to the lottery-based measure, the self-reported risk measures suggest they have a very high risk score. Table 2 shows that Madhya Pradesh has the highest average risk lottery measure (3.30) and Tamil Nadu has the lowest (2.04). Interestingly, Madhya Pradesh has the largest percentage of youth who are self-employed and the lowest percentage of youth who are wage workers, whereas Tamil Nadu has the lowest percentage of youth who are self-employed and the highest percentage of youth who are wage workers. These figures, albeit correlational, are in line with the risk attitude and the self-employment theory (Hartog et al., 2002; Brown et al., 2011).

The theory of social network and self-employment suggests that one's social network provides support financially and emotionally, reducing the cost of self-employment (Allen, 2000). In most studies, social networks act as a control and support mechanism for migrants' employment, earnings, and other labour market outcomes (Munshi, 2003; Beaman, 2012). To proxy for networks, we use two variables. The first, the number of blood relatives in the district, is an exogenous proxy for kinship networks. Second, we use the number of friends met in the past week as a proxy for the regularity of contact between the individual and network members.

3.5 Second Round Phone Surveys, 2024

The follow up survey data collection exercise spanned over two months of January-February 2024. For the survey, we first reached out to 12,144 respondents who completed the surveys for the short run analysis in 2019. Out of them, 41 percent gave their consent for survey this time as well. After completing this list, we made calls from the master list of 57,000 registrants from the original KP survey. In total we called 14,000 individuals and materialized 5040 calls into full-length surveys. The survey data and sample sizes are explained in appendix table A.2. In addition to questions on training, employment and migration, the second-round survey included several questions on gender roles, including

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[17] Lönnqvist et al. (2015) and Mamerow et al. (2016) also found very low correlation between self-reported risk measure and lottery-based risk measure. This is in contrast to some studies that suggest that self-reported risk measures are a good proxy for lottery-based risk measures (Hardeweg et al., 2013).

intra-household dynamics, to understand the constraints trainees face in employment and migration decisions.

We first compare those who gave consent for the second round of surveys to those who did not, using observable characteristics from the KP portal and the first-round survey data (2019). As shown in Table A.3 in appendix all variables are statistically insignificant suggesting that the decision to give consent for the survey is random and does not create any bias due to high attrition in the second-round survey.

Table 3 summarizes the background characteristics from the phone survey for the four states. The average age is 29 years and only 37 percent of the sample are women with gender balance in Tamil Nadu and an unbalanced sample in Madhya Pradesh, reflective of the first-round survey data. Nearly two-thirds of the sample is married, and the average household size is four. The education levels of the respondents are high, one-fourth of the sample has not completed 9th grade while three-fourth of the sample has completed high school. Compared to the KP data and first round surveys, where 94 percent (38 percent women and 62 percent men) and 39 percent were unemployed (42 percent women and 58 percent men), respectively, the unemployment rate has reduced to 25 percent at the time of the survey (67 percent women and 23 percent men). Among the employed, 31 percent are wage earners while 21 percent are in self-employment. The training status is still low: 26 percent have completed DDU-GKY training (compared to 14 percent in 2019), most of them from Gujarat (44 percent) and Odisha (41 percent).

Table 3: Descriptive Statistics of Demographic Characteristics by State: Survey Data

Variables	All States	Gujarat	Madhya Pradesh	Odisha	Tamil Nadu
Age	29.24	29.49	28.85	27.59	30.02
	(6.35)	(7.24)	(6.22)	(5.03)	(6.04)
Female	0.37	0.36	0.16	0.34	0.56
	(0.48)	(0.48)	(0.37)	(0.48)	(0.50)
Married	0.61	0.62	0.63	0.39	0.67
	(0.49)	(0.49)	(0.48)	(0.49)	(0.47)
Number of Children	0.91	0.93	1.02	0.42	1.00
	(1.09)	(1.13)	(1.20)	(0.76)	(1.01)
Adult members in household	4.08	4.23	5.27	5.16	2.53
	(8.03)	(3.43)	(11.23)	(10.62)	(5.44)
Mother's education: No formal education	0.53	0.47	0.66	0.32	0.56
	(0.50)	(0.50)	(0.47)	(0.47)	(0.50)
Mother's education: 10th grade or below	0.37	0.38	0.26	0.57	0.37

	(0.48)	(0.49)	(0.44)	(0.50)	(0.48)
Mother's education: 11th grade or above	0.10	0.14	0.09	0.12	0.07
	(0.30)	(0.35)	(0.28)	(0.32)	(0.26)
Father's education: none	0.37	0.22	0.49	0.18	0.46
	(0.48)	(0.42)	(0.50)	(0.39)	(0.50)
Father's education: 10th grade or below	0.43	0.50	0.33	0.59	0.39
	(0.49)	(0.50)	(0.47)	(0.49)	(0.49)
Father's education: 11th grade or above	0.20	0.28	0.18	0.23	0.15
	(0.40)	(0.45)	(0.39)	(0.42)	(0.36)
Respondent's education: none	0.01	0.01	0.01	0.00	0.01
	(0.09)	(0.10)	(0.11)	(0.04)	(0.08)
Respondent's education: 10th grade or below	0.13	0.30	0.09	0.25	0.20
	(0.34)	(0.46)	(0.28)	(0.43)	(0.40)
Respondent's education: 11th grade or above	0.20	0.68	0.18	0.74	0.78
	(0.40)	(0.46)	(0.39)	(0.44)	(0.41)
Father Wage Employed	0.07	0.08	0.06	0.07	0.08
	(0.26)	(0.28)	(0.23)	(0.25)	(0.28)
Father Self Employed	0.37	0.50	0.45	0.41	0.19
	(0.48)	(0.50)	(0.50)	(0.49)	(0.39)
Unemployed	0.25	0.16	0.21	0.27	0.34
	(0.43)	(0.37)	(0.41)	(0.44)	(0.48)
Not Currently in the Labour Force	0.10	0.18	0.06	0.14	0.05
	(0.30)	(0.38)	(0.24)	(0.35)	(0.22)
Currently Self Employed (Non-farm)	0.12	0.10	0.15	0.14	0.09
	(0.32)	(0.31)	(0.36)	(0.34)	(0.28)
Currently Self Employed (Farm)	0.09	0.11	0.18	0.05	0.03
	(0.29)	(0.31)	(0.39)	(0.21)	(0.17)
Currently Wage Employed	0.31	0.35	0.25	0.31	0.34
	(0.46)	(0.48)	(0.43)	(0.46)	(0.48)
Prefers wage employment	0.66	0.60	0.67	0.66	0.70
	(0.47)	(0.49)	(0.47)	(0.48)	(0.46)
Prefers self-employment	0.46	0.36	0.60	0.31	0.47
	(0.50)	(0.48)	(0.49)	(0.46)	(0.50)
Ever Migrated	0.29	0.23	0.19	0.46	0.35
	(0.45)	(0.42)	(0.39)	(0.50)	(0.48)
Willing to move to district for work	0.36	0.31	0.25	0.41	0.47
	(0.48)	(0.46)	(0.43)	(0.49)	(0.50)
Willing to move to state for work	0.15	0.10	0.23	0.26	0.07
	(0.36)	(0.31)	(0.42)	(0.44)	(0.25)
Completed DDU-GKY Training	0.26	0.44	0.22	0.41	0.12
	(0.44)	(0.50)	(0.41)	(0.49)	(0.32)
Hindi Speaking	0.62	0.91	0.94	0.87	0.03
	(0.48)	(0.27)	(0.25)	(0.33)	(0.18)
English Speaking	0.35	0.28	0.21	0.52	0.42

	(0.48)	(0.45)	(0.41)	(0.50)	(0.50)
Observations	**5040**	**1274**	**1420**	**664**	**1682**

3.6 Trends in Migration Propensities

We next discuss migration trends between 2019 and 2024. While in 2019, 33 percent of respondents had migrated to another district or state, the migration rate is 29 percent in 2024. The drop in migration can perhaps be explained by unreachable phone numbers in the second round of phone surveys i.e. individuals who moved between 2019 and 2024 may have changed phone numbers. While there is no bias in our estimates due to consent as discussed earlier, there could be a sample selection problem with respect to the migration outcomes. We discuss and address this concern further in the following sections.

Table 4 below gives the gender differences in reasons for migration among men and women between 2019 and 2024. As shown in columns 3 and 4, in 2019, majority of the females who migrated stated marriage as the main reason (23 percent) followed by family/personal reasons (22 percent) and in search of work (20 percent). Only 15 percent migrated due to work compared to 23 percent among males. Among males, the main reason for migration was in search of employment (31 percent). In comparison, only 14.7 percent women migrated for marriages and/or personal reasons in 2024. The main reason for migration among both genders is work, approximately 50 percent and 67 percent of women and men, respectively. The second most important reason for migration is education, 25 percent and 14 percent, respectively, among women and men. Among females and males who migrated, reassuringly 39 percent and 30 percent, respectively have undertaken DDU-GKY training.

Table 4: Reasons for Migration, by Gender: 2019 and 2024

Reason for migration	Female (%)	Male (%)	Female (%)	Male (%)
	2024	2024	2019	2019
DDU-GKY	2.41	0.32	NA	NA
Family/Personal	1.72	1.94	22.22	11.71
For marriage	13.06	0.40	23.33	14.53
To conduct business	1.03	4.37	5.69	6.55
To pursue education	26.12	14.07	13.42	12.38
To search for work	6.19	11.64	20.28	31.48
To work	49.48	67.26	15.06	23.35

Though the percentage of respondents who have migrated has declined in the last round (potentially due to a self-selection in our sample), the reasons for migration are very different. In 2019 females migrated mainly because of marriage and family reasons, however, in the long run we find that majority of females migrated to work (or in search of work) or to pursue education.

3.6 Female Empowerment

Table 5 lists the questions that we use to measure women empowerment/female bargaining power in household. All the questions have binary options for the answers, taking the value 1 if the decision making is done by the respondent and zero otherwise. A total of 1479 women answered these nine questions on empowerment. To get a measurable value for empowerment, we developed an index for female empowerment using Principal Component Analysis (PCA). The table also presents the scoring factors derived from the principal components analysis of the nine variables.

According to the data, 25 to 28 percent of women are actively involved in household decision making. The table shows the proportion of women making decisions on their own related to money utilization (22 percent), daily household purchases (26 percent), family planning (19 percent), employment choices (25 percent), going to the market alone (28 percent) and participating in community activities (26 percent). Within the household, 64 percent of women receive physical help and support from their family members for various household chores. Almost 96 percent of women report that they have not been subjected to violence by other household members, and a similar number say that they are not afraid to express disagreement with their husbands out of fear of their anger.

Table 5: Description of questions used for making Women Empowerment/Bargaining Index (Principal Component Analysis)

Questions	Mean	SD	Scoring Factors	Marginal Effect (Scoring Factors/SD)
Who decides how the money will be used?	0.22	0.42	0.41	0.99
Decision about making purchase for daily household needs like food, cloth etc?	0.26	0.44	0.42	0.96
Decisions about family planning such as when to have children/how many children to have/children's schooling?	0.19	0.39	0.39	0.99
Decision of work/job to support family?	0.25	0.44	0.40	0.91
Decision of going to market/ health canter/ visit your friend's house?	0.28	0.45	0.42	0.93
Decision to participate in community activities?	0.26	0.44	0.41	0.94
Is physical support by your family available in household chores?	0.64	0.48	-0.06	-0.12

		0.96	0.19	-0.05	-0.25
Have you been physically assaulted or man handled by anyone in the house?		0.96	0.19	-0.05	-0.25
Are you afraid to disagree with your husband because he will be angry with you?		0.96	0.19	-0.05	-0.25

Table 6 provides information on the women empowerment index (WEI) by states and by training status. The states with the highest empowerment index are Gujarat (80.4 percent), followed by Tamil Nadu (63.5 percent), Odisha (43.16 percent) and Madhya Pradesh (28.6 percent). Out of the sample of 1,479 women, 28 percent have received DDU-GKY training and they have higher WEI compared to those who didn't receive the training. The t-tests of differences in mean of WEI by training status is significant at the 1 percent level.

Table 6: Mean of Women Empowerment Index by State and by Training Status

	Mean of women empowerment (Std. Dev)	Observations
States		
Gujarat	0.80	393
	(0.40)	
Madhya Pradesh	0.29	157
	(0.45)	
Odisha	0.41	91
	(0.50)	
Tamil Nadu	0.64	831
	(0.48)	
Others	0.57	7
	(0.53)	
Received DDU-GKY Training		
Yes	0.68	416
	(0.47)	
No	0.60	1,063
	(0.49)	

4. Methodology

To study the effect of skill-training on employment and migration outcomes, we can estimate a simple probit regression:

$$Y_{ids} = \alpha_0 + \alpha_1 Training_{ids} + X'_{ids}\alpha_3 + D + \epsilon_{ids} \quad (1)$$

Where the Y_{ids} measures the long run (1) wage employment probability (2) migration probability and (3) the effect on female empowerment index for an individual i from district d and state s. $Training$ is a binary variable that equals 1 if the respondent has undergone DDU-GKY training and 0 otherwise. X is a vector of control variable. To deal with the endogeneity with respect to trainee selection, we use a combination of parametric and non-parametric approaches. First, we employ a canonical Differences-in-Differences (DID) model using a combination of administrative and long-run survey data:

$$Y_{ids} = \alpha_0 + \alpha_1 Training_{ids} + \alpha_2 Post + \alpha_3 Post * Training_{ids} + X'_{ids}\alpha_4 + D + \epsilon_{ids} \quad (2)$$

where, α_1 accounts for average difference between treatment and control group, α_2 captures the effect of post-treatment dummy and α_3 gives the true effect of treatment. Post takes the value 1 for the 2024 round of phone survey data and 0 for the KP portal (before training). Remaining variables are the same as in equation (1). We estimate the effect on employment and migration outcomes using equation (2) above. For measures of female empowerment, due to the lack of data on earlier rounds of the survey, we conduct a correlational analysis using equation 1. This is discussed further in section 5.3.

X vector includes age, age-squared, gender and own education. We control for family background characteristics, including mother's education, an indicator for father's employment, household monthly income, minority status, and whether the household is Below Poverty Line (BPL), any household member worked as a NREGA worker and/or belonged to a Self- Help Group (SHG). We also include as controls both measures of risk attitudes and social networks. An individual may be more likely to be employed or migrate if anyone in the immediate family has previously migrated. Thus, all regressions control for a dummy variable that takes the value of 1 if anyone in the household has previously migrated. We further control for the respondents speaking ability in two common languages of India; Hindi and English[18]. Looking at state level variation in Table 3, Gujarat and Odisha have the highest proportion of registrants who have completed training (44 percent and 41 percent respectively) while Madhya Pradesh and Tamil Nadu have the lowest (22 percent and 12 percent respectively). This suggests that there potentially exist differential state policies, impetus and expenditures towards skill-training. To account for this, we include district fixed effects (D) in the regression which allows us to control for variation in state policies at an even more granular level. Standard errors are clustered at the district level.

Causal interpretation of α_3 is based on the identification assumption that there are no changes unobservable trends between the trained and untrained individuals between 2019 and 2024, other than the effect of training. We check the robustness of the result to two different non-parametric techniques, namely, Propensity Score Matching (PSM) and Minimum Biased Estimator (MBE). PSM, given observable pre-treatment characteristics, approximates

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[18] According to the 2011 Census data, most Indian States, apart from those located in north and central India, do not consider Hindi as the primary language. However, these states have adopted Hindi as a secondary language. Similarly, while states located in the south and northeast are not Hindi-speaking, these states have adopted English as their secondary language.

randomization by balancing on observables and determines an appropriate control group (Becker and Ichino, 2002). Unlike parametric techniques, the advantage of PSM is that no underlying functional form assumptions are required to estimate the relationship between outcomes and independent variables. Matching by propensity scores assumes that Conditional Independence Assumption (CIA) holds, which means potential outcomes are independent of treatment status. [19]

If individuals choose to obtain training based on the unobserved characteristics, then the CIA does not hold. To address this potential bias, we rely on using the Minimum Biased Estimator (MBE) approach. Millimet and Tchernis (2013) proposed the minimum biased (MB) estimator, which uses a propensity score-based estimator but trims the estimation sample to reduce bias caused by the CIA failure. The value of propensity score at which the bias is minimized, the bias minimizing propensity score (BMPS), is fixed for ATT, and it is 0.5.[20] The authors recommend a method to decide on the region, which depends on the minimum percentage of treatment and control groups present in the trimmed sample (θ). We use the MB estimator to calculate the average effect of training at the recommended value of 0.05 and 0.25.

5. Results

5.1 Employment outcomes

Table 7: Effect of Skill Training on Employment Outcomes (DID)

	(1)	(2)	(3)	(4)	(5)	(6)
	wage emp	self emp	female wage emp	female self emp	male wage emp	male self emp
Post*DDU-GKY	0.071***	-0.029	0.030	0.035	0.112***	-0.050
	(0.023)	(0.030)	(0.028)	(0.033)	(0.026)	(0.032)
Post	0.274***	0.160***	0.135***	0.046*	0.336***	0.213***
	(0.011)	(0.029)	(0.014)	(0.024)	(0.018)	(0.029)
DDU-GKY	-0.007	-0.006	-0.021**	-0.012	-0.016	-0.010

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[19] Using observable pre-treatment characteristics (age, gender, marriage status, education, risk attitude, social network, minority status, and whether the household is BPL, any household member worked as NREGA worker and/or belonged to a SHG), we conduct an overlap test to fully determine the selection process and outcomes. As shown in the appendix, the test ensures the sufficient overlap in the characteristics of treated and untreated units to find adequate matches.

[20] Shown in Black and Smith (2004), Heckman and Navarro-Lozano (2004), and discussed in Millimet and Tchernis (2013). The BMPS is not fixed for ATE, and it is estimated by minimizing the bias due to unobserved characteristics. Once the BMPS for ATE has been estimated, only observations with a propensity score in a neighborhood around the BMPS are used to obtain the MB estimator for ATE. The extent of bias that must be traded off against variance necessitates a subjective decision about the support region. If the support region is too wide, the sample size will also remain large, but this will limit the extent to which the bias is reduced. If the support region is too narrow, many observations will be discarded from the analysis. The estimated ATT will be less precisely measured, resulting in larger standard errors.

	(0.007)	(0.013)	(0.010)	(0.014)	(0.010)	(0.016)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
KP controls	Yes	Yes	Yes	Yes	Yes	Yes
District effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	**6,419**	**6,419**	**2,039**	**2,039**	**4,380**	**4,380**

All regressions include district fixed effects. All controls include age, marital status, number of children, family size, mother's education, own education, monthly household income, knowledge of Hindi and English, migration status of family members, both measures of risk and social networks. Also includes KP status on NREGA, SHG, BPL and Minority. Standard errors clustered at district level in parentheses. Columns 3 to 6 see separate effect by gender. *** p<0.01, ** p<0.05, * p<0.1

Table 7 presents DID estimates for the effect of skill-training on probability of wage employment (columns 1) and self-employment (column 2). The first row presents the results from the interaction of DDU-GKY on the post treatment dummy.

To measure long run effects, we study the impact for those who obtained training before 2019 (i.e., individuals with at least 4 years post-training experience and compare them to a control group of non-trainees). Training increases the probability of wage employment by 7 percent and there is no effect on self-employment status. We find no effect of training on wages where wage is a categorical variable that takes 5 values.[21]

In the next columns, we show results for employment separately by the gender of the trainee. Training has no effect on probability of either wage employment or self-employment among women. At the same time, it increases male wage employment probability by 11 percent. A test of differences in regression coefficients between males and females yielded a chi-square value of 6.26 (P value 0.0123) significant at the 5 percent level. The effect of training on self-employment is positive and insignificant for females (0.035) and negative and insignificant for males (-0.050). But the statistical difference between the effect of training on self-employment by gender is significant at the 5 percent level of significance. The sign of the coefficients is consistent with Barua, Joshi and Singh (2020) who find a positive and significant effect of training on short run self-employment among women, but not men.

To check the robustness of the above results, we present the treatment effect estimates using two non-parametric approaches. Table 8 gives the average treatment effect (ATE) and average treatment effect on treated (ATT) of training after the propensity score matching. For the analysis, we used the follow-up phone survey data. Out of 5040 individuals, we find

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[21] Our monthly wage outcome variable is categorical. There are 5 categories: Below INR 5k, INR 5k to 10k, INR 10k-15k, INR 15k to 20k and Above INR 20k. These results are not shown in the paper but are available upon request.

adequate matches for 3,205 individuals (818 individuals completed the training before the year 2019 and 2,387 individuals were non-trainees). The results confirm the DID estimates of significant increase in long-run probability of wage-employment among trainees.

Table 8: Effect of Skill Training on Employment Outcomes (Propensity Score Matching)

Treatment effects	Wage employed (ATE)	Wage employed (ATET)
Received DDU-GKY training (before 2020)	0.05***	0.07***
	(0.02)	(0.02)
Demographic controls	Yes	Yes
KP controls	Yes	Yes
District fixed effects	No	No
Total	**3,205**	**3,205**

Controls include age, age square, gender, marital status, number of children, family size, mother's education, own education, household income, knowledge of Hindi and English, migration status, risk and network indexes. Also includes KP data variables NREGA, SHG, BPL and Minority. Standard errors shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. With district fixed effects ATE becomes insignificant, while ATET remains significant.

The ATE and ATT of skill training are further estimated using the MB and minimum bias edgeworth expansion (MB-EE) estimators in Table 9. 95 percent confidence intervals based on the percentile method are obtained by bootstrap using 100 repetitions. Following Millimet and Tchernis (2013), the preferred estimator is MB (MB-EE) for the ATE (ATT). Table 11 presents the MB estimator with $\theta=0.05$ ($\theta=0.25$) and shows that the ATE of training on the probability of being wage employed is 0.21 (0.15). The MB-EE estimator with $\theta=0.05$ ($\theta=0.25$), on the other hand, shows that the ATT of training on the probability of being employed is 0.74 (0.11). Thus, regardless of the econometric methods used, we find a positive and significant effect of skill training on the probability of being wage employed in the long run with comparable estimates across the different specifications.

Table 9: Effect of Skill Training on Employment Outcomes (MB and MB-EE estimates)

	Wage employment (ATE)	Wage employment (ATT)
MB ($\theta=0.05$)	0.207	0.067
	[-0.101, 0.271]	[-0.067, 0.152]
MB ($\theta=0.25$)	0.147	0.100
	[-0.018, 0.185]	[0.046, 0.141]
MB-EE ($\theta=0.05$)	-0.147	0.074
	[-0.237, -0.002]	[-0.048, 0.131]
MB-EE ($\theta=0.25$)	-0.003	0.109
	[-0.071, 0.078]	[0.049, 0.140]

The outcome variable is wage employment. The treatment variable is skill training before 2019. All Controls include age, gender, marital status, number of children, family size, mother's education, own education, monthly household income, knowledge of Hindi and English, migration status of family members, both measures of risk and social networks. Also include KP status on NREGA, SHG, BPL and Minority. Minimum-Biased (Minimum-Biased Edgeworth expansion) (MB (MB-EE),) estimator using $\theta = 0.05$ or 0.25. 95 percent empirical confidence intervals in brackets are obtained with bootstrap repetitions of 100.

5.2 Migration Outcomes

As discussed earlier, it is possible that individuals who migrate would have changed their phone numbers since KP registration and, thus, were less likely to be surveyed. In this case, the estimates that we show here should be considered a lower bound on the actual estimated effects. Tables 10 to 12 show the effect of skill training on probability of migration using the different methodologies, namely, DID, PSM and MBE. The outcome variable takes the value of 1 if the trainee has migrated after 2014 (as the DDU-GKY program was launched in 2014). The treatment variable is the same as in the earlier specification, whether the respondent received DDU-GKY training before 2019. All control variables are as defined before.

Table 10: Skill Training effect by gender on Migration Outcomes (DID estimates)

VARIABLES	(1) female ever migrated	(2) female ever migrated within state	(3) female ever migrated within district	(4) male ever migrated	(5) male ever migrated within state	(6) male ever migrated within district
Post*DDU-GKY	0.116***	0.071***	0.053**	0.159***	0.029	0.130***
	(0.031)	(0.022)	(0.024)	(0.036)	(0.028)	(0.035)
Post	0.075***	0.051***	0.030***	0.256***	0.181***	0.105***
	(0.012)	(0.009)	(0.007)	(0.023)	(0.021)	(0.014)
DDU-GKY	-0.022**	-0.008	-0.017**	-0.016	0.008	-0.023**
	(0.010)	(0.007)	(0.008)	(0.012)	(0.010)	(0.010)
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
KP controls	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Risk and Network controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	**1,941**	**1,941**	**1,941**	**3,932**	**3,932**	**3,932**

All regressions include district fixed effects. Controls include age, age square, marital status, number of children, family size, mothers' education, own education, asset ownership, knowledge of Hindi and English, risk and social network. Also Includes KP status on NREGA, SHG, BPL and Minority. Standard errors are clustered at district level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 10 shows the results separately by gender.[22] Interestingly, DDU-GKY training increases migration probabilities for both males (14 percent) and females (10 percent). While intra state migration probability is higher among males (12 percent compared to 5 percent), only females have a higher inter-state migration post training. However, the test of

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[22] The total effect of training on migration is shown in appendix. Trainees are more likely to migrate both across districts within a state and across states, with larger effects for within-state migration. Trainees are 11 percent more likely to migrate; 3 percent increase in migration probability across states and 9 percent across districts within the same state.

differences in mean yield is statistically significant difference only for intra-state migration, i.e. males compared to females have a higher probability of migration across districts within a state (statistically significant at 5 percent level). For the remaining two coefficients the chi-square and the associated p-values accepts the null of equal coefficients.

Table 11: Effect of Skill Training on Migration Outcomes (Propensity score matching)

Treatment effects	Ever Migrated (ATE)	Ever Migrated (ATT)
ATE	0.09***	0.12***
	(0.02)	(.03)
Demographic controls	Yes	Yes
KP controls	Yes	Yes
Risk and Network controls	Yes	Yes
District fixed effects	Yes	Yes
Total	**2,933**	**2,933**

Controls include age, age square, gender, marital status, number of children, family size, mother's education, own education, household income, knowledge of Hindi and English, both indexes of risk and network. Also includes KP data variables NREGA, SHG, BPL and Minority. Standard errors for independent and identically distributed shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 11 gives the ATE and ATT effects from the propensity score matching. Out of 4,593 individuals, we find adequate matches for 2,933 individuals (766 individuals completed the training before year 2019 and 2,167 individuals were non-trainees). The appendix provides all the relevant figures and tables to show the matching was balanced. Table 13 shows estimates using the MBE approach. The results from both specifications support the DID estimates with MBE yielding much larger coefficients.

Table 12: Effect of Skill Training on Migration Outcomes (Minimum Biased Estimator)

	Migration (ATE)	Migration (ATT)
MB (θ=0.05)	0.309	0.174
	[0.049, 0.355]	[0.065, 0.273]
MB (θ=0.25)	0.163	0.175
	[0.106, 0.216]	[0.132, 0.227]
MB-EE (θ=0.05)	0.005	0.206
	[-0.116, 0.236]	[0.094, 0.307]
MB-EE (θ=0.25)	0.086	0.175
	[0.039, 0.182]	[0.131, 0.232]

Controls include age, gender, marital status, number of children, family size, mother's education, own education, monthly household income, knowledge of Hindi and English, migration status of family members, both measures of risk and social networks. Also include KP status on NREGA, SHG, BPL and Minority. Minimum-Biased (Minimum-Biased Edgeworth expansion) (MB (MB-EE),) estimator using θ = 0.05 or 0.25. 95 percent empirical confidence intervals in brackets are obtained with bootstrap repetitions of 100.

Next, we study whether trained women were more likely to migrate for employment. Note that investment in human capital via education or training may also increase the returns in the marriage market (Agarwal and Barua, 2021). Thus, training may increase migration for

marriages if trained women are more likely to find better quality grooms outside their district/state. Since the KP data did not include the reasons for migration, we cannot estimate a DID specification. We estimate a multinomial logit regression to see the effect of training on the purpose of migration. The dependent variable (Y_i) in this specification has four categories: (1) migrated for work or in search of work, (2) migrated for marriage/family/personal reasons, (3) migrated for other economic reasons including training, to conduct business, to pursue education, and (4) those who did not migrate, which is the base category.

Table 13 shows the effect of training interacted with a female dummy on the three binary outcome variables. While training increases the probability of migrating for work (column 1) and for other economic reasons (column 3), there is no effect of training on migration for marriages. On the other hand, the interaction term suggests that trained women (relative to men) are more likely to migrate for work or in search of gainful employment. The coefficient on marriages is negative but insignificant.

Table 13: Effect of training on reasons for migration: Multinominal logit

(base category= not migrated)	(1) migrated for work or in search of work	(2) migrated for marriage or family/personal reasons	(3) migrated for other economic reasons
Female*Completed DDU-GKY Training	0.616***	-0.371	0.226
	(0.223)	(0.755)	(0.340)
Completed DDU-GKY Training	0.587***	0.251	0.408**
	(0.109)	(0.493)	(0.197)
Female	-2.181***	0.338	-0.710***
	(0.149)	(0.424)	(0.217)
Demographic controls	Yes	Yes	Yes
KP controls	Yes	Yes	Yes
Risk and Network	Yes	Yes	Yes
Observations	**4,270**	**4,270**	**4,270**

Controls include age, gender, marital status, number of children, family size, mother's education, own education, monthly household income, knowledge of Hindi and English, measures of risk and social networks. Also includes KP status on NREGA, SHG, BPL and Minority. Standard errors are clustered at district level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

We further conduct two robustness checks to reconfirm the results obtained thus far. Note that our unique data allow us to measure employment and migration outcomes at three different time periods. Thus, we can utilize the panel nature of our data to study the impact of DDU-GKY controlling for individual fixed effects. We create a balanced panel of 4,456 individuals who were part of all three rounds of our survey. For this specification we do not

control for any individual or family background characteristics since any individual heterogeneity is accounted for with the candidate fixed effects. A simple panel estimation, shown in appendix A.6, using candidate and district fixed effects shows that DDU-GKY increased employment probabilities by 4.6 percent (1 percent significance) and migration probability by 9 percent (significant at 1 percent level) confirming the results across the different models.

Finally, we check if the migration results are downward biased due to sample selection. If individuals who migrate would have changed their phone numbers, and were thus less likely to be surveyed, the estimates that we show here should be considered a lower bound on the actual estimated effects. We correct for the sample selection using Heckman correction, and confirm that DID estimates shown earlier are robust to the potential sample selection bias. These results are shown in the appendix.

5.3 Female Empowerment Index

Finally, we study the correlation between skill training and female empowerment as measured by our index generated using PCA. Note that unlike migration and employment, we cannot study the causal relation between training and female empowerment using a DID strategy, since we only measure empowerment post training. Women who are more empowered may be more likely to take training, neither of our empirical strategies allows us to disentangle the reverse causal relation between training and female empowerment. Instead, in the following analysis, we show simple estimates of the effect of DDU-GKY on female empowerment and interpret the results as correlational.

Table 14 shows the effect of skill training on the index of female empowerment. We gradually add more covariates in each column to show that the estimates are not sensitive to adding explanatory variables. There is a strong positive and significant association between training and empowerment. Further, adding a rich set of control variables only improves the precision of the estimates. In the last column we include our measures of risk and social networks. Due to the drop in sample size, the level of statistical significance drops marginally, however, the magnitude of the coefficient becomes even larger.

Table 14: Skill training and women's empowerment (Marginal Probit estimates)

	(1) women empowerment	(2) women empowerment	(3) women empowerment	(4) women empowerment
Completed DDU-GKY Training	0.059*	0.042***	0.040***	0.070*
	(0.031)	(0.014)	(0.013)	(0.038)
Demographic controls	No	Yes	Yes	Yes
KP controls	No	No	Yes	Yes
Risk and Network	No	No	No	Yes
District fixed effects	Yes	Yes	Yes	Yes
Observations	**1,173**	**1,173**	**1,173**	**870**

Table shows marginal effects from a probit regression where the outcome variable is binary and take the value 1 if women is empowered otherwise 0. All regressions include district fixed effects. Demographic controls include age, marital status, number of children, family size, mother's education, own education, household monthly income, knowledge of Hindi and English, migration status, current employment status. KP controls includes whether they belong NREGA, SHG, BPL and Minority. Network includes blood relatives and risk index is based hypothetical game. Standard errors are clustered at district level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Though not causal, these results combined with the migration outcomes suggest that skill training is extremely beneficial for women. Women who undergo skill training are not only more likely to migrate across districts for seeking employment but skill training may also have the potential to empower women to make more independent decisions and have stronger bargaining power.

6. Conclusion

This is the first causal evaluation of DDU-GKY on employment and migration outcomes in India. Our study makes a significant contribution in the backdrop of declining female labour force participation in India. While there are several demand, supply, and cultural factors which contribute to the low labour force participation of women, low rates of internal migration of women for employment are considered one of the key factors that deter the entry of women into higher education, skilling, and employment. Internal migration, when effectively managed, can be a powerful tool for poverty reduction and economic development (Skeldon 2008). In the Indian context, it can also be an effective strategy to increase female labour force participation (FLFP).

We find strong evidence that the GOI's skilling program increased migration probabilities among women. Multinomial logit estimates suggest not only that this increased migration was due to work opportunities or in search of employment, but also that training is associated with increased measures of female bargaining. At the same time, we find no evidence that there was any effect of training on actual employment probabilities among women in the long run. This has implications for public policy as it suggests that though women were able

to overcome the supply-side constraints to migration, such as access to social networks or restrictive social norms, they were not able to address the constraints that arose from the demand side. Deep-seated gender bias and preconceptions in India limit the demand for female labour in specific industries and job roles. As a result, most employment among women is concentrated in sectors such as education, healthcare, and hospitality, and women are disproportionately underrepresented in higher-paying and leadership jobs. So, if, after training, women are offered low-wage jobs or work in a hostile atmosphere where they face discrimination and sexual harassment, they would prefer to stay out of the labour force. While there have been efforts to develop helpful policies such as maternity leave and workplace sexual harassment prevention regulations, the emphasis should be on enforcement and implementation. Moreover, a key feature of DDU-GKY is migration support via the establishment of migration support centres across states. These support centres can act as a powerful bridge that matches trained women to potential employers, addressing the constraints female migrant workers face from the demand side.

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Appendix: Table and Figures

Table A.1: Check for external validity concerns

VARIABLES	Attempted calls
Females	0.002
	(0.024)
SC or ST	0.001
	(0.002)
Family yearly income less than equal to 10k	-0.006
	(0.005)
Family yearly income b/w 10k and 50k	-0.003
	(0.003)
Family yearly income b/w 50k and 2.5 lakh	-0.001
	(0.005)
Family yearly income between 2.5 lakh and 5 lakh	-0.009
	(0.011)
Do you belong to a minority?	0.001
	(0.002)
Are you a person with disability?	0.000
	(0.009)
Are you working in NREGA?	0.000
	(0.003)
Below Poverty Line?	-0.004
	(0.004)
Any member of household belongs to SHG?	-0.003
	(0.002)
Have Antayadoya card?	-0.000
	(0.003)
self education: 8th grade or below	0.005
	(0.018)
self education: above 8th grade till 12th grade	-0.001
	(0.018)
Preference for self employment	-0.003
	(0.002)
Preference for wage employment	-0.001
	(0.002)
Are you willing to move to a different state for a job?	0.008**
	(0.004)
Are you willing to move to a different district for a job?	0.001
	(0.003)
Currently Employed?	-0.012***
	(0.003)
Observations	**283,957**

The table shows the impact of observable variables (such as gender, caste, education, income, social standing, employment and migration preferences, and employment status) from the KP MIS data on attempted calls. The results imply that the calls were chosen at random, which is needed to address external validity concerns. Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

In Table A.1 each entry shows the regression results from a regression of attempted calls on each of the observable characteristics. The results imply that the calls were chosen at random, as only two of the characteristics show up as significant. Those currently employed were less likely to have been contacted for the first round of surveys. Similarly, those with a preference for migration were more likely to be contacted for the survey. All other individual and household characteristics are uncorrelated with the probability of a call being attempted.

Table A.2: Survey Data by State: Second Round Phone Surveys

States	Attempted	Answered	Surveyed	Surveyed From 12,144	Surveyed from master list
Gujarat	3,387	1,610	1,274	1,009	265
Madhya Pradesh	3,580	1,712	1,420	1,404	16
Odisha	2,367	1,222	664	659	5
Tamil Nadu	4,862	2,553	1,682	1,384	298
Total	**14,196**	**7,097**	**5,040**	**4,456**	**584**

Table A.3: Check for attrition bias: Second Round Phone Surveys

	VARIABLES	(1) Consent
	Female	-0.059
		(0.063)
	Any member of household belongs to SHG?	-0.017**
		(0.003)
	Are you working in NREGA?	-0.015
		(0.016)
KP variables	Below Poverty Line?	0.001
		(0.015)
	Do you belong to a minority?	0.001
		(0.018)
	Education: Up to 8th grade	-0.016
		(0.019)
	Education: 9th to 12th Grade	-0.010
		(0.026)
Round 1 survey variables	Speak English	0.030
		(0.033)
	Speak Hindi	-0.045
		(0.086)
	Observations	**12,005**

The table shows the impact of observable variables (such as gender, KP status on NREGA, SHG, BPL and Minority, education, speaks English and hindi) on individuals who have given consent. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Next, we compare those who gave consent for the second round of surveys to those who did not, using observable characteristics from the KP portal and the first round survey data (2019). We run the following regression on individuals who give consent.

$$Y_{ids} = \alpha_0 + X'_{ids}\alpha_2 + D + \epsilon_{ids} \quad (A1)$$

Where Y_{ids} is a binary variable and take the value 1 if the individual i from district d and state s has given consent for the survey in 2024, else 0. The observable characteristics from the KP data include minority status, whether the household is Below Poverty Line (BPL), whether any household member worked as a NREGA worker and belonged to a Self-Help Group (SHG). The observable characteristics from the round 1 survey include their education and whether they can speak Hindi and English. As shown in Table A.3 below, membership in a SHG is negatively associated with probability of giving consent by the respondent, however, all other variables are statistically insignificant. Thus, the decision to give consent for the survey is random and does not create any bias due to high attrition in the second round survey.

Table A.4: Balance of covariates before and after PSM (employment outcome)

Variables	Unmatched (U) Matched (M)	Mean		t-test		
		Treated	Control	%bias	t	p>t
Age	U	28.34	29.24	-15.0	-3.6	0.00
	M	28.34	28.21	2.2	0.46	0.64
Age Squared	U	835.19	894.22	-14.7	-3.51	0.00
	M	835.19	828.01	1.8	0.39	0.69
Female	U	0.36	0.30	13.0	3.24	0.00
	M	0.36	0.39	-6.8	-1.32	0.19
Marital Status	U	0.53	0.61	-15.9	-3.94	0.00
	M	0.53	0.51	4.5	0.89	0.37
Number of Children	U	0.72	0.94	-20.8	-4.99	0.00
	M	0.72	0.70	2.1	0.44	0.66
Adults in Household	U	4.52	4.16	4.5	1.13	0.26
	M	4.52	4.65	-1.7	-0.32	0.75
Mother's education: none	U	0.49	0.55	-13.2	-3.26	0.00
	M	0.49	0.51	-3.4	-0.69	0.49
Mother's education: 10th grade or below	U	0.42	0.34	17.3	4.31	0.00
	M	0.42	0.42	0.8	0.15	0.88
Respondent's education: None	U	0.00	0.01	-7.3	-1.64	0.10
	M	0.00	0.00	3.0	1	0.32
Respondent's education:10th grade or below	U	0.14	0.13	3.8	0.96	0.34
	M	0.14	0.16	-3.6	-0.69	0.49
Respondent's education:11th grade or above	U	0.21	0.20	3.6	0.89	0.37
	M	0.21	0.20	3.6	0.73	0.46
Father Wage Employed	U	0.07	0.07	-0.1	-0.03	0.98

	M	0.07	0.06	4.3	0.91	0.36
Father Self Employed	U	0.45	0.37	16.6	4.12	0.00
	M	0.45	0.45	0.7	0.15	0.88
Speaks English	U	0.38	0.32	12.1	3.01	0.00
	M	0.38	0.36	4.4	0.87	0.38
Speaks Hindi	U	0.85	0.67	42.4	9.83	0.00
	M	0.85	0.84	1.5	0.34	0.73
Ever migrated	U	0.37	0.26	22.5	5.68	0.00
	M	0.37	0.33	8.7	1.71	0.09
Monthly Family income less than 15k	U	0.39	0.43	-9.3	-2.28	0.02
	M	0.39	0.39	-0.5	-0.1	0.92
Monthly Family income between 16k to 50k	U	0.41	0.39	3.3	0.82	0.41
	M	0.41	0.39	2.7	0.55	0.58
Monthly Family income above 50k	U	0.04	0.03	1.9	0.47	0.64
	M	0.04	0.04	-0.7	-0.13	0.90
Any member of household belongs to SHG?	U	0.25	0.35	-22.9	-5.51	0.00
	M	0.25	0.28	-8.1	-1.68	0.09
Are you working in NREGA?	U	0.07	0.05	8.2	2.1	0.04
	M	0.07	0.09	-5.5	-0.99	0.32
Below Poverty Line?	U	0.25	0.14	27.8	7.27	0.00
	M	0.25	0.28	-7.5	-1.35	0.18
Do you belong to a minority?	U	0.07	0.07	0.7	0.18	0.86
	M	0.07	0.04	12.2	2.76	0.01
Blood relatives	U	34.92	37.59	-6.3	-1.55	0.12
	M	34.92	33.77	2.7	0.57	0.57
Friends weekly	U	6.92	8.25	-11.4	-2.64	0.01
	M	6.92	6.78	1.3	0.29	0.77
Risk Lottery Score	U	3.29	3.12	12.5	3.06	0.00
	M	3.29	3.21	6.0	1.25	0.21
Self Scored Risk	U	5.74	5.72	0.7	0.16	0.87
	M	5.74	5.63	4.0	0.82	0.41

The table shows the balancing tests with respect to each covariate used in PSM, the both unmatched (U) and matched (M) samples. The t-test results shows that the mean differences between treatment and control groups are large and statistically significant in the unmatched samples, the differences become small and are always insignificant in the matched samples. Therefore, after matching covariates are balanced.

Table A.5: Effect of Skill Training on Migration Outcomes (DID estimates)

VARIABLES	(1) ever migrated	(2) ever migrated across states	(3) ever migrated within district
Post*DDU-GKY	0.133***	0.038*	0.098***
	(0.029)	(0.020)	(0.027)
Post	0.198***	0.140***	0.079***
	(0.013)	(0.011)	(0.010)
DDU-GKY	-0.010	0.005	-0.013*
	(0.009)	(0.007)	(0.007)
Demographic controls	Yes	Yes	Yes
KP controls	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes
Risk and Network controls	Yes	Yes	Yes
Observations	**5,873**	**5,873**	**5,873**

All regressions include district fixed effects. Controls include age, gender, marital status, number of children, family size, mother's education, own education, monthly household income, knowledge of Hindi and English, risk and social networks. Also includes KP status on NREGA, SHG, BPL and Minority. Standard errors are clustered at district level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.6: Balance of covariates before and after PSM (migration)

Variables	Unmatched (U) Matched (M)	Mean Treated	Control	%bias	t-test t	p>t
Age	U	28.00	29.40	-23.8	-5.99	0
	M	28.00	28.25	-4.2	-1.02	0.306
Age-Sqaured	U	811.34	906.14	-24.1	-6.02	0
	M	811.34	826.66	-3.9	-0.97	0.331
Female	U	0.17	0.38	-50	-12.47	0
	M	0.17	0.16	0.9	0.24	0.807
Married	U	0.46	0.64	-37.7	-9.99	0
	M	0.46	0.49	-6.5	-1.41	0.16
Number of Children	U	0.55	1.02	-44.9	-11.35	0
	M	0.55	0.58	-2.5	-0.62	0.533
Adults in household	U	3.95	4.38	-5.8	-1.41	0.16
	M	3.95	4.24	-3.9	-0.97	0.332
Mother's education: None	U	0.46	0.57	-20.2	-5.32	0
	M	0.46	0.46	0.4	0.09	0.928
Mother's education: 10th grade or below	U	0.43	0.34	19.5	5.17	0
	M	0.43	0.42	1.3	0.27	0.784
Respondent's education: none	U	0.00	0.01	-10.4	-2.43	0.015
	M	0.00	0.00	1.3	0.58	0.564
Respondent's education:10th grade or below	U	0.10	0.15	-14.7	-3.73	0
	M	0.10	0.11	-2.2	-0.52	0.602
Respondent's education:11th grade or above	U	0.23	0.19	10.8	2.88	0.004
	M	0.23	0.23	-0.3	-0.05	0.957
Father Wage Employed	U	0.07	0.07	0.1	0.04	0.971
	M	0.07	0.06	2.4	0.55	0.583
Father Self Employed	U	0.41	0.39	3.6	0.95	0.344
	M	0.41	0.39	2.7	0.6	0.548
Can speak english	U	0.49	0.28	44.8	12.06	0
	M	0.49	0.50	-2.4	-0.5	0.619
Can speak hindi	U	0.70	0.73	-7.3	-1.94	0.053
	M	0.70	0.73	-6.6	-1.45	0.146
Monthly Family income less than 15k	U	0.38	0.44	-13.8	-3.62	0
	M	0.38	0.34	6.5	1.46	0.144
Monthly Family income between 16k to 50k	U	0.40	0.39	0.5	0.12	0.903
	M	0.40	0.39	0.2	0.05	0.963
Monthly Family income above 50k	U	0.05	0.03	12.4	3.47	0.001
	M	0.05	0.05	-1	-0.2	0.84
Any member of household belongs to SHG?	U	0.33	0.32	2.1	0.56	0.575
	M	0.33	0.34	-1.3	-0.29	0.774
Are you working in NREGA?	U	0.07	0.06	6.4	1.72	0.085
	M	0.07	0.07	0	0	1
Below Poverty Line?	U	0.16	0.17	-3.2	-0.82	0.409

	M	0.16	0.18	-6.9	-1.5	0.134
Do you belong to a minority?	U	0.08	0.06	9	2.45	0.014
	M	0.08	0.08	0.8	0.16	0.87
Blood relatives	U	38.2 3	6.47	4	1.07	0.286
	M	38.2 3	8.01	0.4	0.1	0.924
Friends weekly	U	8.31	7.74	4.5	1.21	0.225
	M	8.31	7.49	6.5	1.67	0.096
Self-Scored Risk	U	6.55	5.40	40.7	10.72	0
	M	6.55	6.49	2.4	0.54	0.592
Risk Lottery Score	U	3.11	3.20	-6.5	-1.71	0.088
	M	3.11	3.15	-2.5	-0.54	0.588

The table shows the balancing tests with respect to each covariate used in PSM, the both unmatched (U) and matched (M) samples. The t-test results shows that the mean differences between treatment and control groups are large and statistically significant in the unmatched samples, the differences become small and are always insignificant in the matched samples. Therefore, after matching covariates are balanced.

Table A.7: Robustness Check

| VARIABLES	(1) wage employed	(2) Ever migrated
Completed DDU-GKY Training	0.046***	0.091***
	(0.007)	(0.008)
Constant	0.088***	0.291***
	(0.008)	(0.009)
Observations	13,352	13,368
Candidate Fixed Effects	Yes	Yes
District Fixed Effects	Yes	Yes
Number of time units	3	3

Table A.8: Effect of Skill Training on Migration Outcomes (DID): Heckman Correction Model

Variables	(1) ever migrated	(2) ever migrated within state	(3) ever migrated within district
Post* DDU-GKY	0.133***	0.038***	0.097***
	(0.016)	(0.014)	(0.012)
Post	0.197***	0.139***	0. .079***
	(0.009)	(0.007)	(0.006)
DDU-GKY	-0.010	0.004	-0.013
	(0.012)	(0.010)	(0.009)
Demographic controls	Yes	Yes	Yes
KP controls	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes
Selected observations	5,873	5,873	5,873
Non selected observations	12,158	12,158	12,158
Total Observations	**18,031**	**18,031**	**18,031**

Heckman assumes that migration outcome is the dependent variable and that the independent variables include age, gender, marital status, number of children, family size, mother's education, own education, monthly household income, knowledge

of Hindi and English, measures of risk and social networks. Also includes KP status on NREGA, SHG, BPL and Minority. Standard errors are clustered at district level and shown in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The variables specified in the selection model includes the observed characteristics from the KP data and round 1 data. In the selection equation dependent variable is a binary variable and takes the value 1 if consent is given for final survey round, else 0.

Figure A1: Test of Overlap Assumption of PSM (Employment)
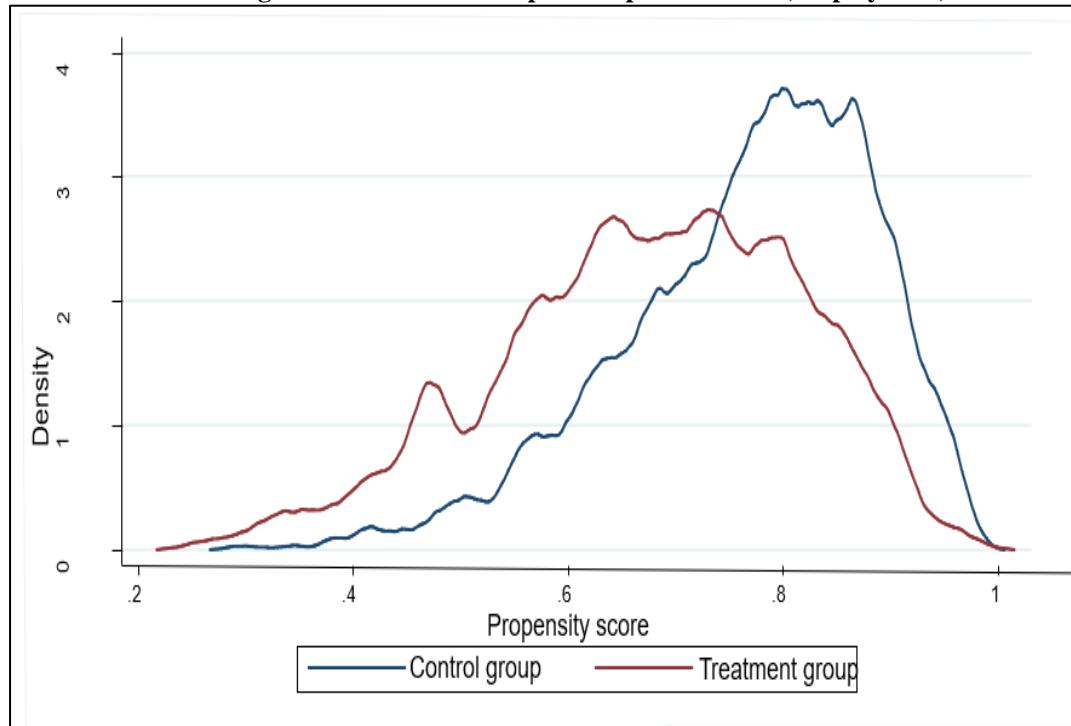
These are the plots of the estimated densities of the probability of getting each treatment level, blue plot for control group (those who didn't take the training) and red plot for the treatment group (received training before 2019). Neither plot indicates too much probability mass near 0 or 1, and the two estimated densities have most of their respective masses in regions in which they overlap each other. Thus, there is no evidence that the overlap assumption is violated. This assumption ensures that there is sufficient overlap in the characteristics of treated and untreated units to find adequate matches.

Figure A2: Balance plots for propensities before and after matching (employment)
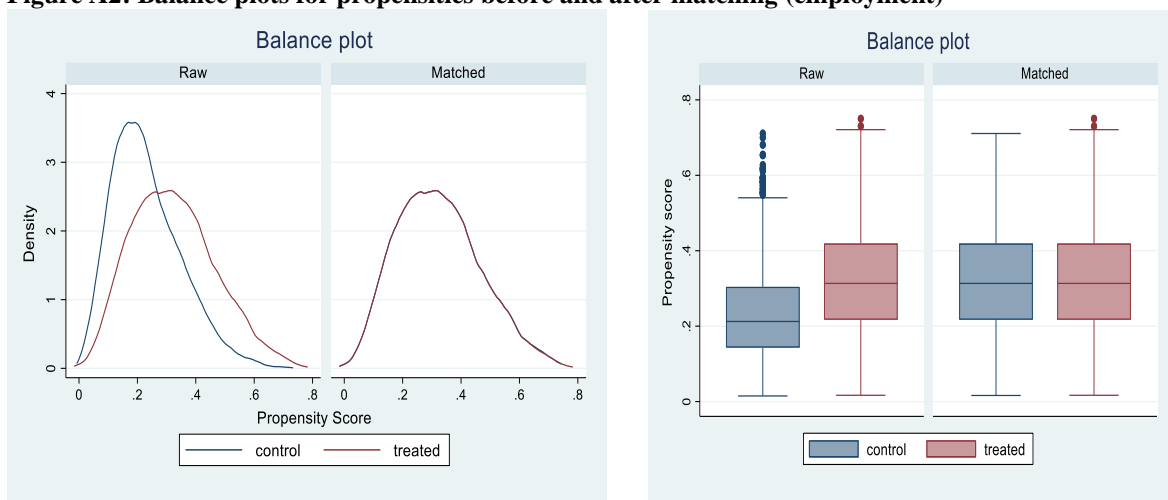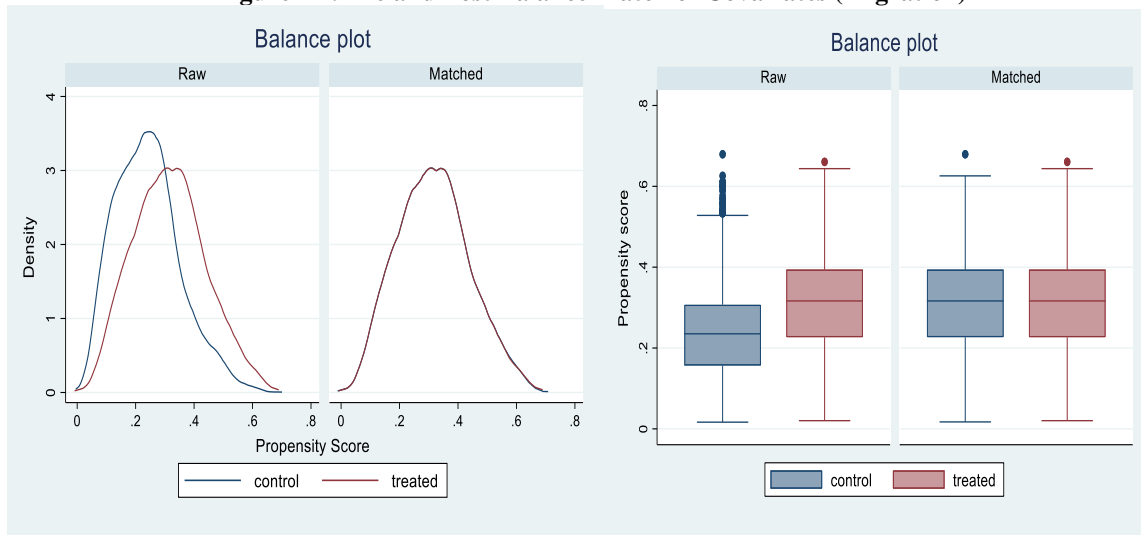

The figures indicates that the covariates may not be balanced in the raw data but after matching the covariates are balanced in treatment and control group. A covariate is said to be balanced when its distribution does not vary over treatment levels.

Figure A3: Test of Overlap Assumption of PSM (Migration)
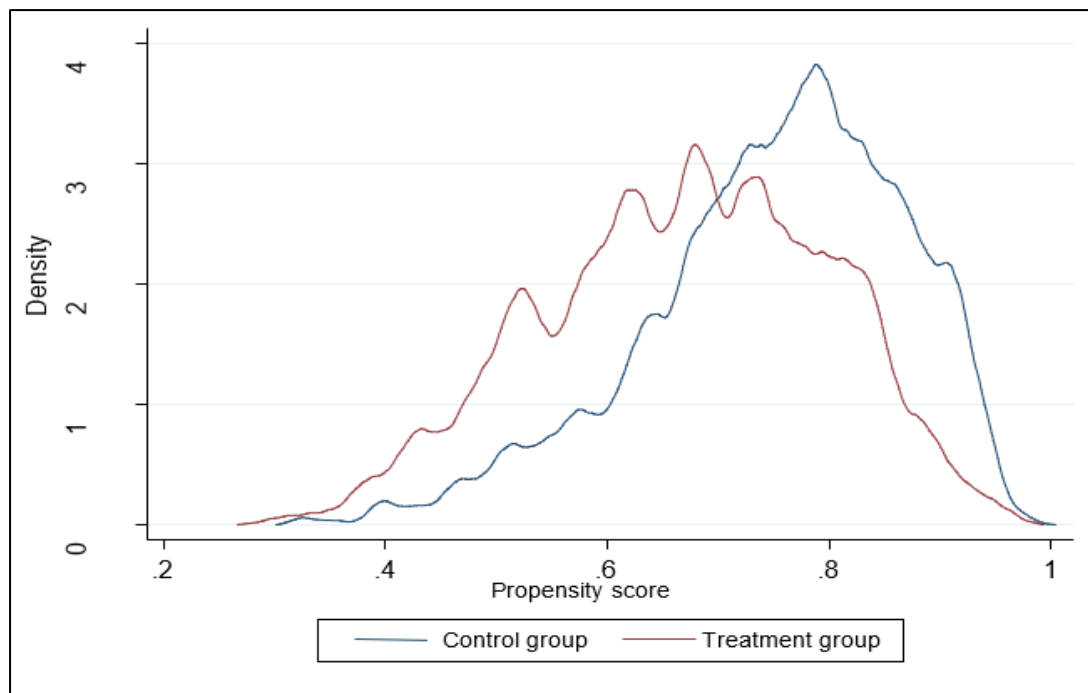
These are the plots of the estimated densities of the probability of getting each treatment level, blue plot for control group (those who didn't take the training) and red plot for the treatment group (received training before 2019). Neither plot indicates too much probability mass near 0 or 1, and the two estimated densities have most of their respective masses in regions in which they overlap each other. Thus, there is no evidence that the overlap assumption is violated. This assumption ensures that there is sufficient overlap in the characteristics of treated and untreated units to find adequate matches.

Figure A4: Pre and Post Balance Match of Covariates (Migration)

The figures indicates that the covariates may not be balanced in the raw data but after matching the covariates are balanced in treatment and control group. A covariate is said to be balanced when its distribution does not vary over treatment levels.

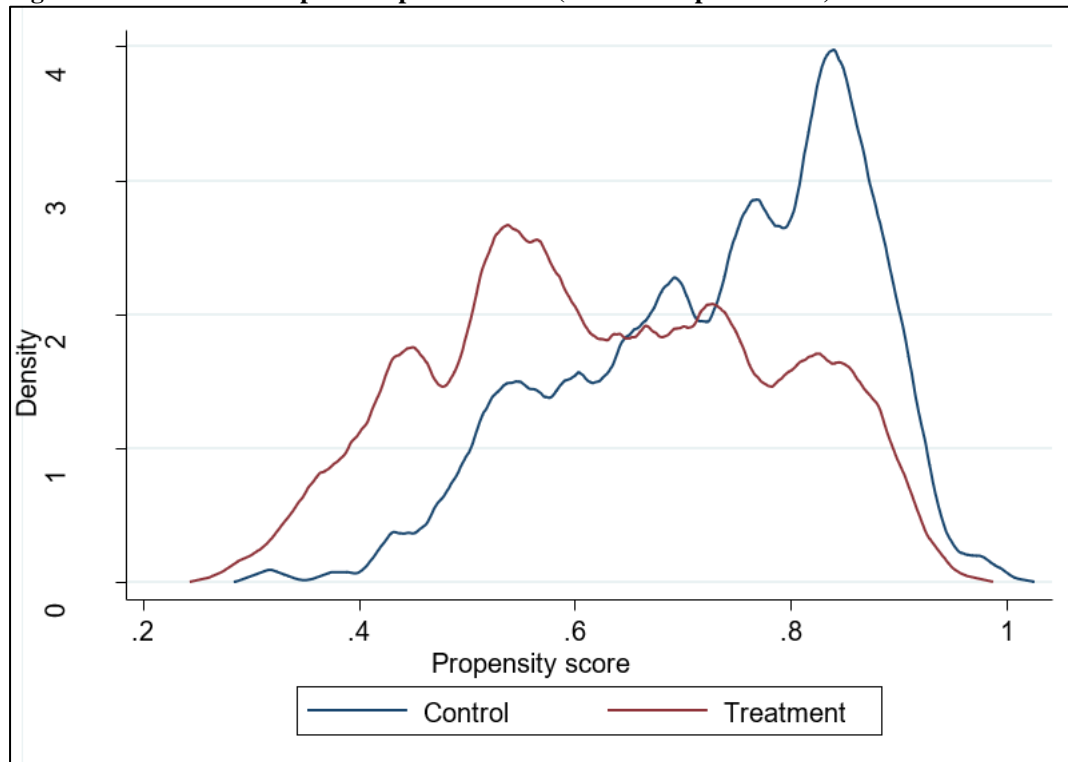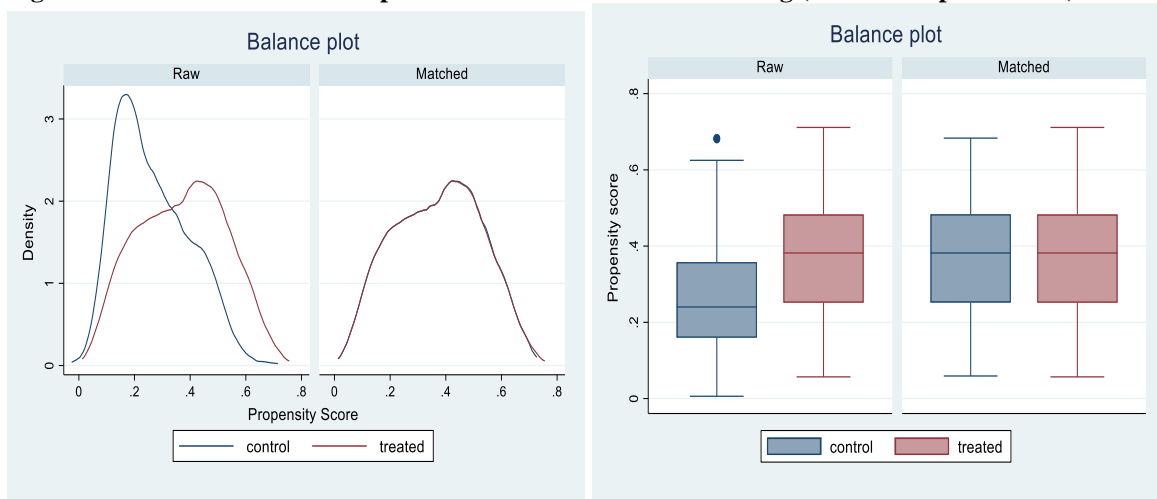**Figure A5: Test of Overlap Assumption of PSM (Female Empowerment)**

Figure A6: Balance Plots for Propensities Before and After Matching (Female Empowerment)

DDU-GKY Survey Questions

	Module 1: Identification of Individual	
	Module 1: Identification of Individual	
I.1. (0)	Surveyor Name	
I.1.1 (1)	Candidate UID (6 digit) *(Surveyors will enter this)*	
I.1.2 (2)	Call answered? *(Yes-1, No-2, Other, Specify-777)*	
I.1.2.1 (3)	Hello! Am I speaking with Mr./Ms._____? *(Yes-1, No-2) [If yes, skip to I.1.2.3)*	
I.1.2.2 (4)	Can I speak with Mr./Ms. _____? *(Yes-1, No-2)*	
(5)	What is the reason of not being able to contact the registrant? (list below) {skip to I.1.2.4 if option2, if option 3 then continue otherwise submit the form]	
(6)	Can you share his/her number? (Yes-1, No-1, others, specify-777) {if no or others submit the form}	
(7)	Write the phone number. (10 digit) and then submit the form	
I.1.2.3 (8)	Is this a good time to speak with you? *(Yes-1, No-2) [if yes, skip to I.1.3]*	
I.1.2.4 (9)	What would be a better time for us to schedule this interview? _____ (Tomorrow-1, Others, specify-777)	
I.1.4 (10)	Do I have your consent to proceed with the interview? *(Yes-1, No-2, cut the call midway-3, Others, specify-777) [if yes, go to next section else submit the form]*	
I.2 (11)	Gender *(Male-1, Female-2, Other-3)*	
I.3 (12)	How old are you? *(Age range 10 to 100, Do not know-999)*	

I.4.1 (13)	Which state are you currently in? (*Gujarat—1, Madhya Pradesh—2, Odisha—3, Tamil Nadu—4, Others specify-777*)	
I.4.2 (14)	Which district are you currently in? *(District list according to state)*	
I.5 (15)	Are you married? (*Married-1, Unmarried-2, Divorced-3, Widowed-4, Other, Specify-777, Will not answer-888, Do not know-999)* (*If Unmarried, skip to Next Module*)	
I.6.1 (16)	Do you have children? (*Yes-1, No-2*) (*If no, Skip to Next Module*)	
I.6.2 (17)	How many children do you have? *(Number)*	

4.1 reason of not being able to contact the registrant: Respondent doesn't know the KP registrant-1, KP Registrant is not currently available-2, Registrant changed the number-3, Call disconnected-4, Other, Specify-777, Will not answer-888, Do not know-999) {skip to	

Module 2: Household and Family		
HH.1 (18)	How many people living in your house (excluding you) are 18 years and older? (Number)	
HH.2 (19)	What is household's Monthly Income? *(list below)*	
HH.3 (20)	What is the highest level of education that your mother has completed? *(list below)*	
HH.4 (21)	What is the highest level of education your father has completed? *(list below)*	
HH.5 (22)	What type of main economic activity does your father engage in? *(list below)*	

HH.2 Monthly income bracket*: below INR 5k —1, INR 6k to 15k —2, INR 16k-30k—3, INR 31k to 50k – 4, INR above 50k—5, Other, specify-777, Will not answer-888, Do not know-999*

HH.3 and HH.4 Educational levels: *Not literate -1, Less than primary (below 5th grade)-2, Primary to middle school(5th to 8th grade)-3, Secondary (9th and 10th grade) -4, higher secondary (11th, 12th) -5, diploma/certificate (**technical**) course -6, Bachelors -7, Masters and above -8, Other, specify-777, Will not answer-888, Do not know-999*	
HH.5 Type of economic activity- *Unemployed-1, Self employed in agriculture-2, Self employed in non-agriculture-3, agricultural labor-4, casual labor-5, Regular wage/salary earning-6, Student-7, Domestic work-8. Retired-9, Other, specify-777, Will not answer-888, Do not know-999*	

Module 3: Education and Skill Training (DDU-GKY, RSETI)		
ES.1 (23)	What is the highest level of education you have received? *(list below)*	
(24) ES.2.1 ES.2.2 ES.2.3	Can you speak with working proficiency in Hindi and English languages? (Tick all that apply) English Hindi None	
ES.3 (25)	Who enrolled you on Kaushal Panjee portal? *(Self-1, spouse-2, family/relative- 3, friend-4, agency-5, Work Colleague-6, others, specify-777, Will not answer-888, Do not know-999)*	
ES.4 (26)	Have you taken or completed Deen Dayal Upadhayaya Grameen Kaushalya Yojana (DDU-GKY) skill training program? *(Yes-1, Started DDU-GKY but not able to complete it-2, No-3, Not heard about the DDU-GKY-4)* Skip to ES.6 if 3 or 4	
ES.5.1.1 (27) ES.5.1.2(28) ES.5.2 (29) ES.5.3 (30)	*Only if completed DDU-GKY training* When did you start the training? Month Year How long was the training period of DDU-GKY? *(list below)* How did you know about the training? *(list below)*	

ES.5.4 (31)	Are you satisfied with the training and would recommend to your family/ relative/ friends/ others? *(Yes-1, no-2, Maybe-3, Other, specify-777, Will not answer-888, do not know-999)*	
ES.6 (32)	What is the reason for not taking or completing the training? *(list below)*	
ES.7 (33)	DDU-GKY is a skill training and placement initiative of the Ministry of Rural Development. You can take a 3-month training course for free at DDU-GKY training center nearby. The training center will try to get you a job based on your training at the end of the course. The training center can be residential with food and lodging provided for free or non-residential if the training center is nearby. After knowing about DDU-GKY will you think about joining DDU-GKY training? *(Yes in next 6 months-1 , Maybe after 6 months-2, Not Interest At All-3, Do not know-999)*	

ES.1 Educational levels: *not literate -1, Primary (5th grade) or below-2, Middle school (5th to 8th grade) -3, Secondary (9th and 10th grade) -4, higher secondary (11th, 12th) -5, diploma/certificate (technical) course -6, Bachelors -7, Masters and above -8, Other, specify-777, Will not answer-888, Do not know-999*

ES.5.2 How long was the training period of DDU-GKY: *less than 3 months-1, 3 months--2, 4 to 5 months—3, 6 months—4, 7 to 8 months—5, 9 months—6, 10 to 11 months—7, 12 months—8, Will not answer—888, Do not know—999*

ES.5.3 *How did you know about the training:* *(multiple response allowed)* *Internet advertisement-1, Newspaper advertisement-2, Through parent/relative-3, Through a friend-4, Through agencies-5, Own idea/Self-started-6, Village/Town Announcement-7, Government campaign-8, Other, specify-777, Will not answer-888, Do not know-999*

ES.6 Reason for not completing the training: (*(multiple response allowed)* Issues related to *Time -1, Distance-2, Family commitment-3, Work-4, Know about DDU-GKY but no one contacted for training-5, Do not heard about DDU-GKY—6, Other, specify-777, Will not answer-888, Do not know-999*

Module 4: Employment
An individual is employed if they are working or are engaged in an economic activity- that is, an activity that leads to the production of goods and services and generation of cash or non-cash income.
An individual is unemployed if they do not have a job/livelihood that yields regular, predictable income. This includes casual unemployment, domestic work, student etc.

E.1 (34)	What is your current employment status? *(list below, if unemployed, Student, or Domestic Work, Skip to E.8)*	
E.2 (35)	Which industry/trade you work in? *(list below)*	

E.2.1 (36)	Do you get monthly income or hourly wages? *(Monthly income-1, Hourly wages-2, both-3) Skip to E.3.1 if 1or 3, skip to E.3.2 if 2)*	
E.3.1 (37)	What is your monthly income/wages from the current job(s)? *(list below)*	
E.3.2 (38)	What is your hourly wage from the current job(s)? (*list below*)	
E.4.1 (39)	How many hours you work in a day? *(2 to 3 hrs—1, 4 to 5 hours—2, 6 to 8 hours—3, more than 8 hours—4, Other, specify-777, Will not answer-888, Do not know-999)*	
E.4.2 (40)	How many days in a week you work? *(2 to 3 days—1, 4 to 5 days—2, 6 to 7 days—3, Other, specify-777, Will not answer-888, Do not know-999)*	
E.7 (41)	How did you find your current job? (*list below*)	
E.10 (42)	Did you lose a job during Covid/lockdown: *(Yes-1, No-2, Other, specify-777, Will not answer-888 Do not know-999)*	

E.1 and E.8 Current and previous employment status: *Unemployed-1, Self-employed in agriculture-2, Self-employed in non-agriculture-3, Agricultural labor-4, casual labor-5, Regular wage/salary earning-6, Student-7, Domestic work-8, Other, specify-777, Will not answer-888, Do not know-999*

E.2 Trade of work: *(multiple responses allowed) Agriculture-1, Apparel/clothing-2, Beauty & Wellness-3, Banking, financial services and insurance (BFSI)-4 , Construction-5, Electronics-6, Gems & Jewellery-7, , Handicraft-8, Healthcare-9, Infrastructure-10, Iron & Steel-11, IT-12 , Leather-13, Life Science-14, Logistics-15, Media & Entertainment-16, Mining-17, Plumbing-18, Power-19, Retail-20, Rubber-21, Security-22, Sports SSC-23, Telecom-24, Textile-25, Tourism & Hospitality-26, Other, specify-777, Will not answer-888, Do not know-999*

E.3.1 Monthly income bracket: *below INR 5k —1, INR 5k to 10k —2, INR 10k-15k—3, INR 15k to 20k – 4, above INR 20k- 5, Other, specify-777, Will not answer-888, Do not know-999*

E.3.2 Hourly income: *below INR 200—1, INR 200 to 500—2, more than INR 500—3, Not applicable-4, Other, specify-777, Will not answer-888, Do not know-999*

E.7 How did you find this job: *(multiple responses allowed) Internet advertisement-1, Newspaper advertisement-2, Through parent/relative-3, Through a friend-4, Through DDU-GKY/RSETI-5, Own idea/Self-started-6, Village/Town Announcement-7, Government campaign-8, Other, specify-777, Will not answer-888, Do not know-999*

Module 5: Employment Preferences

Now I am going to ask you questions about your employment preferences. What kind of a job activity would you like to undertake? Would you prefer:

1-Self-employment- where you are the owner of your own business and carry on a trade or business as a sole proprietor or an independent contractor. This does not include farming on your own land, but can include having a business related to agriculture. OR

2- Wage employment- where you work for an employer who pays you a regular, timely wage OR

3- You're indifferent about either of those forms of work OR

4- You don't want to work

EP.1 (43)	What kind of employment would you prefer? *(Self-1, Wage-2, Either-3, None-4, Do not know-999)*	
EP.2 (44)	How much monthly wages do you expect to get? *(list below)*	
EP.3 (45)	What do you wish to be doing 5 years from now? *(list below)*	

EP.2 Wage Bracket Monthly expectation: below INR 5k —1, INR 5k to 10k —2, INR 10k-15k—3, INR 15k to 20k – 4, above INR 20k- 5, Other, specify-777, Will not answer-888, Do not know-999

EP.3 Future aspirations: Working in self-employment-1, Private job- wage employment-2, Government Job-wage employment 3, Pursuing further education-4, Don't want to do work-5- get married—6, Other, specify-777, Will not answer-888, Do not know-999

Module 6: Migration

I will now ask you some questions about migration activities and preferences. In this context, migration is the movement of people from one place to another with the intention of settling, permanently or temporarily, at a new location.

M.1.1 (46)	Have you ever migrated? If No, Skip to M.2) *(Yes, State level-1, Yes, district level-2, Yes, state and district level both-3, No-4, Other, Specify-777, Will not answer-888, Do not know-999)*	
M.1.2 (47)	When is the first time you migrate? *(Year)*	

M.1.3 (48)	What was the reason for migration? *(list below)*
M.1.3.2 (49)	Do you need to migrate for your current work? (*Yes, outside state—1, Yes, outside distrcit—2, Yes, locally within district—3, No-4, Other, specify-777, Will not answer-888, Do not know-999*
M.1.4 (50)	What are the difficulties/problems you faced in migration? *Multiple responses allowed (Marriage-1, Husband didn't agree-2, Children-3, Other Family issues-4, Costs of moving/finance-5*, Safety issue-6, *Cultural difference-7, language-8, Don't know anyone outside village-8, Other, specify-777, Will not answer-888, Do not know-999)*
(51.0)	Did anyone help you at new location ? (Yes-1,No-2) if no skip to next modules
M.1.5 (51)	Who was the source of help at new location? *Multiple responses allowed (Family-1, Relatives-2, Friends-3, Others members of my village-4, work colleagues- 5, DDU-GKY Migration support centre-6 none-7, Other, specify-777, Will not answer-888, Do not know-999) [if none, skip to M.2]*
M.1.6 (52)	What type of help is received at new location? *Multiple responses allowed* (Food-1, shelter-2, cash-3, aid in job search-4, travel support-5, social connection-6, *Other, specify-777, Will not answer-888, Do not know-999)*

*M.1.3 Reason for migration (*Multiple responses allowed*): To pursue education-1, To search for work-2, To work-3, To conduct business-4, For marriage-5, Family/Personal-6, Covid related financial issues-7 Other, specify-777, Will not answer-888, Do not know-999*

M.2 (53)	Are you willing to move to a different state or district for work? *(Yes, willing to move to State-1, Yes, willing to move to District—2, Yes, willing to move to State or district (anywhere)—3, No-2, Do not know-999) [If No, skip to M.4.1]*
M.3.1 (54)	Which state/district would you be willing to move to? (write as described)
M.4. (55)	What is the main reason for choosing this state/district? (*list below*)
M.4.1 (56)	How will you obtain funds to cover the costs of moving to this state/district? (*list below*)
M.4.2 (57)	If borrow money (option 3 for M.4.3), who do you expect to borrow the money from? (*list below*)

M.4.3 (58)	Why don't you want to move to different place for work ? (After this question, skip to Module 7) (list below)	

M.3.2 Reason for not moving: *(multiple responses allowed) Marriage-1, Husband didn't allow-2, Children-3, Other Family issues-4, safety is a concern-5, Tarvel cost/financing problem-6, Lack of opportunity outside-7, Don't know anyone outside village-8, Information asymmetry-9, migration is risky activity for you-10, Other, specify-777, Will not answer-888, Do not know-999*

M.4.1 State Choices: *List of states and union territories,* Any State-666, *Do not know-999*

M.4.2 Reason for state choice *(multiple reasons allowed)***:** *Friend/family-1, Cost of moving-2, Work opportunity-3, Other, specify-777, Will not answer-888, Do not know-999*

M.4.3 How will cover the cost of moving *(multiple responses allowed)***:** Own savings-1, Family savings-2, Take out a loan or borrow money-3, Sell property or other assets-4, Employer will help to cover costs-5, *Other, specify-777, Will not answer-888, Do not know-999*

M.4.4 Will borrow money from *(multiple responses allowed)***:** *Bank-1, MFI-2, Informal lender-3, Government Scheme-4, Family member-5, Relative-6, friend-7, No borrowing- 8, Other, specify-777, Will not answer-888, Do not know-999*

Module 7: Risk Averseness	
RA.1 (59)	How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please answer on the scale from one to ten, where the value 1 means "not at all willing to take risks" and the value 10 means "very willing to take risks." *(self-reported score from 1 to 10) (Will not answer-888, Do not know-999)*
Module 8: Women Empowerment/HH Bargaining power	
	Decision Making (*Respondent/Self-1, partner/husband-2, other family members-3, partner+respondent-4, respondent + other family members-5, respondent + partner + other family members—6, other, specify-777, Will not answer-888, Do not know-999*)

WE.1.1 (62)	Who decides how the money will be used?
WE.1.2 (63)	Decision about making purchase for daily household needs like food, cloth etc?
WE.1.3 (64)	Decisions about family planning such as when to have children/how many children to have/children's schooling?
WE.1.4 (65)	Decision of work/job to support family?
WE.1.5 (66)	Decision of going to market/ health canter/ visit your friend's house?
WE.1.6 (67)	Decision to participate in community activities?
	Freedom from domination *(No-1, Sometimes-2, Regularly/Always-3, Will not answer-888)*
WE.3.1 (68)	Is physical support by your family available in household chores?
WE.3.2 (69)	Have you been hit by your husband?
WE.3.3 (70)	Are you afraid to disagree with your husband because he will be angry with you?
Module 9: Financial Literacy	
FL.1 (71)	If you saved INR 400 and received 10 percent interest per month, how much interest would you earn after one month? *(Answer-440,Others specify-777, Will not answer-888, Do not know-999)*
FL.2 (72)	Suppose we had a jar with three green balls and one red ball. You are playing a game and you have two choices. You can receive INR100 for certain. Or you can pick a ball from this jar with your eyes shut, and if you choose a green ball you will receive INR 200. Do you want INR 100 for certain, or do you want to have a chance of getting INR 200*? (INR100 for certain-1, INR 200 with 75percent chance of getting it -2, Others specify-777, Will not answer-888 ,Do not know-999)*
FL.3.1 (73)	In the past 6 months, have you gathered together your financial information, reviewed it in detail, and put together a specific financial plan for your long term future? *(Yes-1, No-2, Do not know-999)*
FL.3.2 (74)	If not, do you plan to do this in the next 12 months? *(Yes-1, No-2, Others specify-777, Will not answer-888, Do not know-999)*