A Nexus between Microcredit and Income through Self-Help Group Model: A Special Reference from Odisha

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ABSTRACT

Microcredit offered by Self-Help Groups plays a very important role in the upliftment of women. The paper aimed to understand the demographic profile of the Self -help group borrowers and at the same time examine the impact of microcredit offered by SHGs on their monthly income in the Balasore district of Odisha for which ordinal logistic regression was applied. This econometric model helps to find out the factors that contribute to the probability of being in a higher income group. The result thus demonstrates that the amount of loan, year of experience, family size, and age affects the monthly income**.**

Keywords: Microcredit, Self -Help Groups, Ordinal logistic regression, Odisha.

JEL Classification- G21, 131,138

INTRODUCTION

Self Help Group – Bank Linkage Programme (SHG- BLP) promoted by NABARD has emerged as the world's largest Microfinance programme in terms of the number of beneficiaries and micro-credit extended. (Report on trends and progress of banking in India, 2020-2021). SHG's includes millions of women into the fold of financial inclusion by making them to be members of the group initially and then linking them with various financial institutions (Inclusive finance status report odisha, 2020). The government of Odisha has taken the initiative to promote self-help groups by the creation of mission Shakti which started in the year 2001 to empower women and to give them a position to start and make a difference in a society. (Inclusive finance status report odisha, 2020).SHGs programme contributed a lot towards the progress of Odisha by empowering the women through accelerating their income generation livelihood activities. According to NABARD, as on 31st March 2022, 14.2 Crores families were covered under the SHG-BLP programme through 119 lakhs Self -help groups out of which 87% were women with saving deposits of Rs 47240.48 crore and 67 lakhs group with collateral free loan outstanding of Rs 151051.30 crore (Status of Microfinance in India , 2021-2022). It is noteworthy to mention one of the flagship Programme of the government of Odisha to empower women as social empowerment cannot be made possible without economic empowerment. Microfinance improves the economic and social situation of women (Niels Hermes, 2011)**.** A successful and sustainable microcredit intervention improves lives and plays an important role in improving the rural economy (M. Wakilur Rahman, 2015). Nearly 70 lakh women have been organized into 6 lakh groups in Odisha state so far (Mission Shakti). Interest supervision scheme was launched by Government of Odisha in the year 2013 when loans were provided at an annual interest of 2% for loans up to 3 lakh, later on, the annual interest rate was reduced to 1% from 1st April 2015. Again this scheme was revised in 2019 with 0% rate of interest per annum provided the loans are repaid on time. (Mission Shakti)

PROBLEM STATEMENT

SHG's model of India, the most important tool for empowering women to move from subsistence to sustainability has achieved recognition worldwide. It is one of the instruments of government towards bringing millions of women into the fold of financial inclusion It helps the borrowers to engage themselves in various income generation activities thereby increasing their income level. The impact of microcredit differs from one study to another thus attempt has been made to analyze the impact of microcredit in the rural setup of Odisha, where agriculture is considered to be prominent activity.

RESEARCH QUESTION

- Is the microcredit offered by SHG's Group help in increasing their monthly income level?

LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESIS

Khan et.al (2023) examines the impact of microfinance on various dimensions of women empowerment and the results revealed that participation of women in microfinance significantly leads to their economic, political and psychological empowerment but found ambiguity over social empowerment. **Rajpal & Tamang 2021** reveals that the maximum respondents utilize the opted loan in the agriculture sector which has a significant impact on income, expenditure, saving & employment also suggested to make a comparative study in another district of Odisha. **Santoso et.al (2020)** pointed out that the purpose of the loan, the monthly income of household, monthly expenditure & medium interest rate affect the monthly income of the borrowers. **Samineni et.al (2020)** reveals that Odisha performs better in women's empowerment indicating efficient use of credit however progress in empowerment is not yet achieved due to unequal access and control over the resources. **Veshne et.al (2019)** depict that SHGs are helping women in becoming economically independent thereby bringing stability to their income. **Samantaray et.al (2018)** reveals that there was not too much technological & economical development of women and also the socioeconomic attributes had not much contribution towards various aspects of the development of the women. **Al-Shami et.al (2017)** revealed that the duration of microfinance had a significant impact on women's empowerment in household and business decisions and when combined with training; microfinance helps borrowers to increase their income but found no control over minor finance by women. Another author named **Aruna et.al (2016)** analyse the role of microfinance through SHG's on women empowerment and shows an improvement in their household income however, the loan amount was mainly utilized for their domestic & household purpose. **Rahman et.al (2014)** suggests that microcredit programme increased participant income, consumption, and asset position. **Rooyen et.al (2012)** systematically reviewed fifteen studies to get evidence of the impact of microcredit and micro saving on poor people. The author found that microcredit has both positive and negative impacts on income however he fails to comment on whether group or individual lending models are more effective. **Xia et.al (2011)** results depict that household welfare has substantially improved for the borrowing group however the beneficiaries are non-poor household hence the results of reducing poverty through microcredit is doubtful. **Rahman et.al (2010)** founds that amount of credit, age, and number of family members are influencing household income however education and distance of branch from the client place have no significant effect on the income.

In this study, an attempt is made to study the demographic profile of Self Help Group members and examine the impact of microcredit on their monthly income. This paper has been conducted in the Balasore district of Odisha as few studies are conducted in this area which is evident from prior studies. Thus, the study will add a little more to the existing paper available in this domain.

OBJECTIVES OF THE STUDY

- To examine the demographic profile of SHGs members.
- To measure the impact of components of microcredit on borrower's monthly income

Based upon the literature reviews, the following five null hypotheses were developed:

$H0_1$: Loan amount does not have any significant impact on monthly income level.

$H0_2$: Year of experience in SHGs does not have any significant effect on monthly income

$H0_3$: Education level does not have any significant impact on monthly income.

$H0_4$: Age of the respondent does not have any significant effect on monthly income.

$H0_5$: Family size does not have any effect on income level

RESEARCH METHODOLOGY

Data

Both primary as well as secondary data have been used to conduct the study. A structured Questionnaire has been prepared consisting of the demographic profile of the respondents.

Study Area

The study was conducted in the Balasore district of Odisha state and out of 12 blocks; two blocks namely, Basta and Baliapal were selected to collect responses from the female borrowers of SHG's groups. These two blocks are selected based on the purposive sampling method.

Variable used in the study

Dependent variable

Family income: is the monthly family income of borrowers.

Independent variable

- Loan size: is the amount of loans SHGs give to their clients annually.
- Family size: is the total number of family members
- Education: level of education is represented. It shows whether someone has acquired primary, upper primary, secondary, graduate or uneducated.
- Age: is the number of years that a person has lived.
- Years of experience: is the number of years associated with SHGs as member.

Tools and Techniques:

Ordinal Logistic Regression method is applied to study the factors that contribute to change in monthly income of the respondent who borrows money from self- help group. Monthly income is taken as dependent variable which is measured in ordinal scale. Independent variables are amount of loan, year of experience, family size, level of education, age of respondent which are also measured in ordinal scale. The logistic regression models for the factors that contribute to the probability being in a higher income group is adopted from the paper (Noor Syafinas Muda, 2022) are as follows:

$$\text{logit } (\gamma j) = [\frac{\Pr(Y \geq yj \,|x)}{1 - \Pr(Y \geq yj \,|x)}] = \theta j - \beta i X$$

Where, $\Pr (Y \geq yj)$ is the cumulative probability of the event $(Y \geq yj)$

Y is the dependent variable which is monthly income having 5 categories

θj is the respective intercept parameter

X is the independent variable that is X_1 = loan amount, X_2 = year of experience, X_3 = family size, X_4 = education, X_5 = Age

Assumptions to be satisfied before application of Ordinal Logistic Regression:

- The dependent variable is measured on an ordinal scale.
- Independent variables are continuous, categorical or ordinal.
- No multicollinearity

Table 1: Variance Inflation Factors Analysis

INDEPENDENT VARIABLES	VIF VALUES
Loan amount	1.126
Year of experience	1.084
Family size	1.370
Education	2.473
Age	2.897

- Proportional odds assumption through test of parallel lines

From Table 2 we can conclude that for our model, the proportional odds assumption appears to have held because the significance of chi-square test statistic is 1.000>.05

Table 2: Test of Parallel Lines[a]

Model	-2 log likelihood	Chi-square	df	Sig.
Null hypothesis	.000			
General	.000b	.000	57	1.000
a.Link function :complementary log-log				
b. the log-likelihood value is practically zero. there may be a complete separation in the data. The maximum likelihood estimates do not exist.				

Table 1 and 2 shows that the assumption of multicollinearity (variance inflation factor analysis) and proportional odds assumption (test of parallel lines), were satisfied before performing the ordinal logistic regression

DATA ANALYSIS AND INTERPRETATION

**Demographic characteristics of the respondent**

Table 3 shows the individual characteristics of the surveyed SHG's borrowers who are female. The majority of the respondents are under the age group of 31 to 35 (34.3 percent) and 42 borrowers are above 40 age group (30 percent) with 54 borrowers having 2 to 5 years of experience in the SHGs model and 42 borrowers having 5 to 7 years of experience as member in SHGs. Likewise, 66 respondents are having secondary education and 34 out of the total are graduated.48 respondents are engaged in small business activities and the rest 42 are in some other form of occupation. It is noteworthy to mention that least of the respondents are engaged in the agriculture sector. The amount of loan which most respondents borrowed is Rs 15000 to Rs 20000 and 46 respondents borrowed amount of Rs 10000 to Rs15000 however most of the borrowers utilize the loan amount in some sort of domestic household work and others in agriculture activities. Few borrowers also use this loan amount for their child education and child marriage & others for their self-employed owned small business. 96 out of 140 total respondents have directly benefited from the loan amount. Most of the surveyed households have 3 to 5 family members (69.3 percent) with the majority of the household's monthly income between Rs 15000 to Rs 20000 (36.4 percent).

Table 3 showing the attributes of the sample Respondent

Particulars	N	Percent
Age		
21 to 25	6	4.3
26 to 30	19	13.6
31 to 35	48	34.3
36 to 40	25	17.9
Above 40	42	30
Marital Status		
Married	133	95
Unmarried	1	7
Widow	6	4.3
Education level		
No formal education	2	1.4
primary	10	7.1
upper primary	28	20
secondary	66	47.1
Graduate	34	24.3
Family size		
Individual	2	1.4
below 3	27	19.3
3 to 5	97	69.3
5 to 7	14	10
above 7	0	0
Monthly income		
Rs 5000	10	7.1
Rs 5000 to Rs 10000	21	15
Rs 10000 to Rs 15000	46	32.9
Rs 15000 to Rs 20000	51	36.4
Above Rs 20000	12	8.6
Occupation		
Daily Labor	25	17.9
Agriculture	24	17.1
Business	48	34.3
Private Job	1	7
Others	42	30
Loan amount		
Upto Rs 5000	2	1.4
Rs 5000 to Rs 10000	8	5.7
Rs 10000 to Rs 20000	37	26.4
Rs 20000 to Rs 30000	43	30.7
Rs 30000 & above	50	35.7
Purpose of loan		
Domestic household	52	37.1
Micro-entrepreneur	15	10.7
Student education	15	10.7

child marriage	18	12.9
Agriculture	39	27.9
Others	1	0.7
Beneficiaries of loan		
Self	96	68.6
Spouse	10	7.1
Children	25	17.9
Other Family	9	6.4
year of experience		
Less than 1 year	1	0.7
1 to 2 years	11	7.9
2 to 5 years	54	38.6
5 to 7 years	42	30
Above 7 years	32	22.9

**Figure 1 : Occupation of the Respondent**
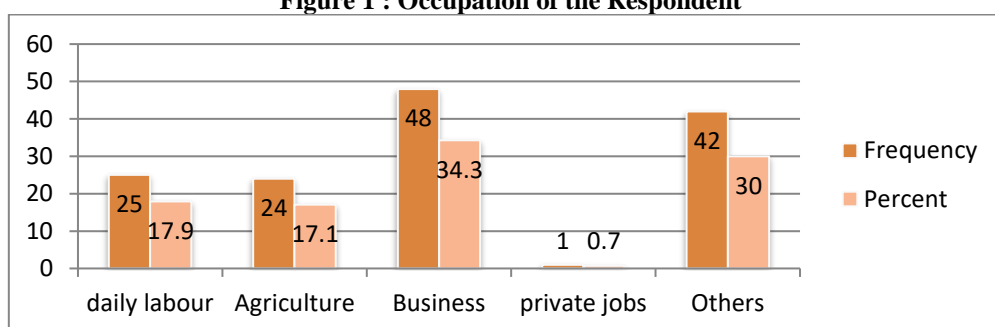
Source: Data compiled from Ms Excel

The above figure 1 shows the occupation of the respondent. It is revealed that the majority of the respondents are engaged in business activities which constitute 48 members whereas 42 respondents are engaged in some other sort of activities. Only 25 members are daily labour which is 17.9 percent and the remaining borrowers are in agricultural and private jobs.

Figure 2 show the purpose for which SHG's member availed loans from SHG's group. It is found that the majority of the respondent borrowed loans for domestic/ household purposes i.e 52 members out of 140 which is 37.1 Percent & 39 respondents availed loans for agriculture purposes. The remaining members used the loan amount for micro-entrepreneur activities, student education and marriage purpose.

Figure 2: Purpose of loan taken
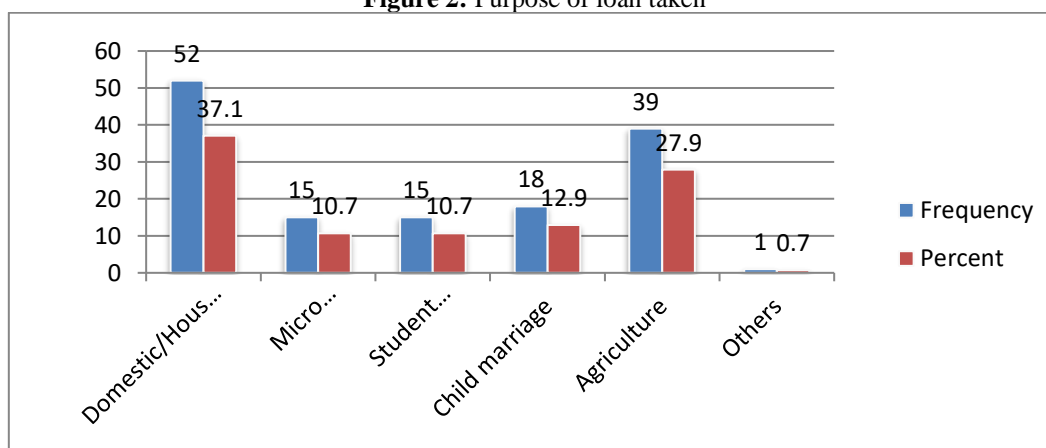
Source: Data compiled from MS-Excel

Table 3 shows the model fitting information where the chi-square Statistic value 352.852 with p-value .000 (P < 0.05) thus shows better prediction than intercept only model.

Table 3
Model fitting information

Model	-2 log likelihood	Chi-square	df	Sig.
Intercept only	352.852			
Final	.000	352.852	19	.000

Link function: complementary log-log

The table below shows the result of goodness of fit where the p-value of Pearson and deviance chi-square are 1.000 respectively which are more than 0.05 (P > 0.05) therefore the observed data is having goodness of fit with the fitted model thus our data is a well fitted model.

Table 4
Goodness-of-fit

	Chi-square	Df	Sig.
Pearson	221.881	301	1.000
Deviance	191.440	301	1.000
Link function : complementary log-log			

Pseudo R square value of McFadden is .889 which reveals that all the factors together explain 88% of the variation in borrowers' monthly income. It shows that all the factors affect the level of income.

Table 5: Pseudo R-Square

Cox and snell	.920
Nagelkerke	.977
Mcfadden	.889
Link function: complementary log-log	

Table 6 shows the result of ordinal logistic regression on factors affecting the monthly income level. It is seen from the table that loans amounting to Rs 30000 or above will increase monthly income whereas there will be no change in their monthly income when the loan amount is below Rs 30000 but will increase when provided with above 30000 loans (amount of loan= 5) whereas all other categories of the amount of loan have odd ratio less than one indicates that low amount of loan does not contribute towards an increase in their monthly income. Microcredit offered by SHGs have significant effect on monthly income and the result is inconformity with the results of (AKM Ghulam Hussain, 2019), (Abera Alemu, 2023), (Danang Budi Santoso, 2020) . It is seen from the table that the experience level shows negative coefficient values (with experience above 7 years as the reference category) which suggests that those borrowers having experience above 7 years have higher chances of increase in their monthly income as compared to those having lesser experience however those having experience of 5 to 7 years in SHGs having odds ratio of 1.315 which indicates that these categories have 1.315 times higher chances of being in higher income groups. it is also stated that family size also affected the monthly income as the result shows that an individual has a 3.34 times higher chance of increasing monthly income with an odd ratio of 3.340 and the result is also same when the family size is 2 to 3 member, whose odd ratio is 1.033 (p < 0.05) thus having 1.033 times chances to be in the higher income groups compared to large family size (family member = 4) category. It can be said that high family dependency on loan amount results in a decrease in monthly income. Education level also shows a negative coefficient value with graduate level as a reference category which indicates that all the lower educational levels do not lead to an increase in their income level. The odds of being in the higher income level for respondents with no formal education is 0.908 times chances to be in a higher income group compared to graduate respondents. Lastly, a higher age category was found to have a negative effect on the income level. the odds of being in the higher income group for the age category =1 having 21-25 age is 2.238 times higher as compared to the high age category=5 that is above 40 age group. It can be said that those respondents who are between the age group of 21 to 35 have high chance of increasing their monthly income.

* **Significant at 0.05 %**

Table 6 parameter estimates

		estimate	Std.error	wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Familyincome = 1.00]	-4.112	.618	44.227	1	.000	-5.324	-2.900
	[Familyincome = 2.00]	-2.646	.559	22.437	1	.000	-3.740	-1.551
	[Familyincome = 3.00]	-.822	.517	2.524	1	.112	-1.836	.192
	[Familyincome = 4.00]	1.323	.511	6.713	1	.010	.322	2.324
Location	[AmountofLoan=1.00]	-5.399	1.531	12.435	1	.000*	-8.399	-2.398
	[AmountofLoan=2.00]	-2.818	1.111	6.430	1	.011*	-4.996	-.640
	[AmountofLoan=3.00]	-1.898	.469	16.366	1	.000*	-2.817	-.978
	[AmountofLoan=4.00]	-.858	.385	4.954	1	.026*	-1.614	-.102
	[AmountofLoan=5.00]**	0ᵃ	.	.	0	.	.	.
	[experience=1.00]	-.704	1.703	.171	1	.679	-4.042	2.633
	[experience=2.00]	-.766	.997	.590	1	.443	-2.721	1.189
	[experience=3.00]	-1.227	.407	9.104	1	.003*	-2.023	-.430
	[experience=4.00]	.274	.367	.559	1	.455	-.445	.994
	[experience=5.00]**	0ᵃ	.	.	0	.	.	.
	[Family size=1.00]	1.206	.996	1.468	1	.226	-.745	3.158
	[Family size=2.00]	1.033	.491	4.428	1	.035*	.071	1.996
	[Family size=3.00]	1.047	.420	6.227	1	.013*	.225	1.870
	[Family size=4.00]**	0ᵃ	.	.	0	.	.	.
	[Education=1.00]	-.096	.969	.010	1	.921	-1.995	1.802
	[Education=2.00]	-.271	.573	.223	1	.637	-1.394	.853
	[Education=3.00]	-.295	.436	.458	1	.499	-1.150	.560
	[Education=4.00]	-.386	.313	1.528	1	.216	-.999	.226
	[Education=5.00]**	0ᵃ	.	.	0	.	.	.
	[Age=1.00]	.806	.696	1.341	1	.247	-.558	2.170
	[Age=2.00]	.037	.399	.009	1	.926	-.746	.820
	[Age=3.00]	.626	.314	3.984	1	.046*	.011	1.240
	[Age=4.00]	-.557	.389	2.049	1	.152	-1.320	.206
	[Age=5.00]**	0ᵃ	.	.	0	.	.	.

** Reference category

DISCUSSION

SHGs, one of the leading microcredits programme helping millions of women beneficiaries. The study was conducted in the Balasore district of Odisha to study the demographic profile of the SHGs members and at the same time examine the factors contributing to change in monthly family income. The results indicate that access to microcredit does help in increasing their monthly income however this loan amount produces a better impact on raising their monthly income when they borrowed a higher amount of loan. The result also depicts that the higher the year of experience in SHGs as memberships higher will be the amount of loan sanctioned from SHGs which ultimately increases their monthly family income. The present study underlines the importance of the SHGs group and how it helps in the upliftment of women in society. Other factors like family size, education and age of the respondent as well found significant to increase the monthly income of the respondent.

The government of Odisha towards empowering the women economically started a mission Shakti initiative. It has a clear objective of empowering women through gainful activities by providing credit. It is revealed from the study that older members in SHG's group get larger loan amounts than the member having one to two years of experience and that amount is used for various income-generating activities. This paper is an addition to the existing studies in this area however it has some limitations. The paper was only confined to one of the districts of Balasore which is in Odisha. The study could have been undertaken taking some other district as well also the time constraint to collect the primary data was found to be one of the limiting factors.

CONCLUSION

This paper studies the impacts of microcredit offered by self-help groups on the monthly income of the borrowers by using ordinal logistic regression. The result depicts that amount of loan, experience, family size and age affects the monthly income. it is noteworthy to mention that any amount offered by SHGs whether small or big amount brings significant changes in the borrower's monthly income however older groups get high loan amounts than newly formed groups or have experience of only one to two years as members in SHGs. the findings of this study have some implications for the government, SHGs and MFIs institutions. Firstly, members of groups must be provided with adequate training and educated them to utilize the borrowed fund in some income-generating activities as SHGs also focuses on the rural area where agriculture is prominent activity. They should also be encouraged not to utilize the borrowed amount for domestic/household purposes. Authorities also show concern that more young educated women from rural areas need to join such groups to strengthen the groups also government needs to regularly follow up on such microcredit offering banks about their working & performance at the ground level.

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