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FINANCIAL INCLUSION AND HUMAN DEVELOPMENT: TRACKING PROGRESS THROUGH SELF-HELP GROUPS

Debolina Saha[1] and Razdan Alam[2]

[1]Rabindra Bharati University, Kolkata, West Bengal, India.
E-mail: sahadebolina1120@gmail.com / debolina1120@gmail.com; sahibaalam512@gmail.com
Correspondence Author E-mail: sahadebolina1120@gmail.com

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Abstract: This study attempts to track progress of financial inclusion in India, through the women dominated Self-Help Groups (SHG), considering the dimensions like *spread* and *status*, and indicators based on the criteria of National Bank for Agriculture and Rural Development, during 2007-2021. The study constructs a composite Financial Inclusion Index (FII) following the United Nations Development Programme, to calculate year-wise FII values, and shows regional discrepancies in achieving financial inclusion through the Lorenz curve analysis. The study also utilizes Compound Annual Growth Rates of the indicators for assessing SHG activities, and establishes a significant positive relationship between FII and Human Development Index values through a panel regression analysis. The study shows though government policies stimulate the number of SHG members, SHGs with credit-linked and savings-linked, loan disbursement and savings of SHGs; focus should be on clearance of unsettled loans. Region-wise development strategies can only help the growth to be inclusive.

Keywords: Financial inclusion, Self-Help Group, Microcredit, Human development, Women empowerment.

JEL classification code: G21, G23, O1.

I. INTRODUCTION

Financial inclusion for women serves as an impetus for women's empowerment, driving inclusive growth in a developing nation like India, by enabling them

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to move from the margins to the economic mainstream. Financial inclusion refers to availability and accessibility of useful financial products and services; including credit, savings, payments, transactions, etc. to both individuals and businesses, in a sustainable way. Incidentally, microfinance acts as a key driver of financial inclusion providing credit to the vulnerable society, enhancing their saving opportunities, planning for pensions and micro insurance, etc. Participation of banks and non-governmental organizations (NGO) influence the targets of Micro Finance Institutions (MFI). Microcredit as a part of this broader concept of microfinance deals with providing extremely small amount of loans to groups of individuals to make them self-employed. It targets economically backward people in rural, semi-urban and urban areas in pursuance of raising their income levels, and thereby, standard of living. Microcredit is also known as 'microlending' or 'microloan' and very common in less developed countries, like India.

In the microcredit system, although the group members come through 'self-selection' process, they possess entrepreneurial expertise and risk captivating aptitude so that the loans are timely repaid. Peer monitoring by the group members helps successful handling of financial resources (Stiglitz, 1990). Sequentially lending to the group members minimizes the contagion effect of an individual default. The loan is also collateral-free (Ray, 1998). This system has certain drawbacks too, such as, disbursement of loan often remains a small amount because of the low rates of interest compared to the normal banking system.

The term 'Microfinance' was originated through the formation of 'Grameen Bank' in Bangladesh in the 1980s, by the microfinance pioneer Muhammad Yunus. However, the theorist Lysander Spooner, in the mid of 1800 century, illustrated the benefits of microloans to the farmers as a means of poverty reduction. Friedrich Wilhelm Raiffeisen in Germany founded the first cooperative bank to support lending to the rural farmers. In India, the National Bank for Agriculture and Rural Development (NABARD) initiated microfinance system. The forms of microfinance institutions in India include i) Joint Liability Group, ii) Self-Help Group (SHG), iii) Grameen Bank, and iv) Rural Cooperatives. This study entirely focuses on financial inclusion through SHGs in India.

A large number of poor people are attached with SHG programmes in India. SHGs are economically uniform groups formed with a common interest

of 10-20 members through self-selection. NABARD started promoting SHGs on a large scale in India from 1991-92. The Reserve Bank of India (RBI) allowed SHGs to open savings accounts in banks in 1993. Purpose of bank loans to the SHGs remains impartial. Since SHGs are primarily women dominated, loans help women to become financially independent and hold self-respect in the society.

Women work are generally confined to domestic chores, constituting reproductive and caring services. Their economic opportunities are limited due to gender dynamics within the family (Elson, 2009), differences in land and property ownership, etc. Women-run microenterprises are often redirected to husband's business because of social constraints, low level of literacy, economic backwardness, low risk-bearing capacity, restricted access to funding, and gender-based discrimination. However, women's entrepreneurship is an important untapped source of economic growth, and hence, in recent times, governmental authorities, NGOs, many national and international businesses, charities have launched programmes to support and promote women entrepreneurs. The primary goal of MFIs is to provide small-scale loans, especially to rural women, and to make them financially educated for proper utilization. Many research works have been conducted on microcredit through SGHs over and above the broad-spectrum of microfinance. From the studies of Gurumoorty (2000), Rao (2004), Galab and Rao (2003), Kuzilwa (2005), etc., it revealed how microcredit was beneficial for the poor rural women who wished to escape from money lenders and avoid rigorous banking formalities while struggling for funds.

When entrepreneurship empowers women by facilitating financial independence, decision-making power, and social recognition, it also initiates gender equality and helps reduce poverty. Women empowerment is defined in many ways. Social empowerment enables women to act individually or collectively in changing social relationships which often exclude them in society. Economic empowerment aids women to get access and control over productive resources, access to decent work, control over their own lives, meaningful participation in economic decision-making, raising voice against exploitation, etc. Political empowerment helps women in gaining power and creating group identity. However, our study focuses on economic and social empowerment of women which are based on diversity, equity and inclusion.

Alike this study, women empowerment through SHGs in India is well depicted in the research works of Puhazhendi and Satyasai (2001), covering 11 states and four different regions – North, South, East and West; Barbara and Mahanta (2001) in Assam; Manimekalai and Rajeswari (2001), Vijayanthi (2002), and Jothy and Sundar (2002) in Tamil Nadu; Ramalakshmi (2003) in Andhra Pradesh; Srivastava (2005) in Bihar, Chattisgarh, Madhya Pradesh and Uttar Pradesh; Panda (2009) in Jharkhand, Chhattisgarh and Odisha; Sarkhel and Mondal (2013) and Midye et al. (2021) in Jangal-Mahal areas of West Bengal; Saravanan and Dash (2017) on a panel of Indian States, etc. Since women empowerment is critical to growth and development of a nation, it creates values and fixes vision along with increasing productive capacities. Self-actualization, critical thinking, creativity, communication and collaboration – which come through empowerment – lead them towards success. The central and State governments in India have launched various programmes and schemes to help women entrepreneurs like Kudumbashree Mission, Trade Related Entrepreneurship Assistance and Development (TREAD), and Udyam Sakhi Network. These programmes supply credit, target business training, and give advisory support to the women entrepreneurs. National Rural Livelihoods Mission (NRLM) is one of the biggest flagship programmes in India to mitigate poverty and vulnerability through mobilizing poor rural women into SHGs. Economic Survey 2022-2023 reveals that among 12 million SHGs in India, 88 percent are all-women-member ones (Mahapatra, 2023).

Although several research works have been conducted on SHG activities, any comprehensive study on the performance of SHGs at both national and sub-national levels covering all the States and Union Territories of India, has not been done so far. Our study considers two dimensions – spread and status, to evaluate the performance of SHGs during 2007-2021. The study also sheds light on the relationship between financial inclusion through SHG activities and human development in India. In essence, human development through women empowerment with addressing human rights promotes financial inclusion which this study attempts to establish. Hence, the specific objectives of the study are to

(1) calculate composite FII values considering SHG activities, at national and sub-national levels,

(2) make a regional comparison of SHGs towards achieving financial inclusion, and

(3) correlate financial inclusion through SHGs with human development from policy perspectives.

In section II, methodology used in the study is discussed, which is followed by the section of Results and discussion. Conclusions of the study are in section IV.

II. METHODOLOGY

1. Data

Our study uses secondary data of NABARD for the timespan 2007-2021,[1] to assess SHG activities. Data on projected population, Human development Index (HDI) values and banking are obtained from the Census, Global Data Lab and RBI, respectively.

2. Dimensions and indicators in the study

To assess the role of SHGs in financial inclusion of India, two dimensions are considered, namely, i) spread, and ii) status of SHGs. The dimension – *spread* signifies SHG outreach through government support, including indicators like a) total number of SHG members, b) total number of SHGs credit-linked, and c) amount of bank loan provided to SHGs (in millions as on 31st March of each year). Subsequently, average loan per SHG (in millions) is calculated on an annual basis from the last two indicators.

On the contrary, the dimension – *status* shows the performance of SHGs, comprising indicators like a) total number of SHGs saving-linked, b) amount of savings of SHGs (in millions as on 31st March of each year), and c) amount of outstanding loan of SHGs (in millions as on 31st March of each year). Similarly, combining the first two indicators, average savings per SHG (in millions) on an annual basis is calculated. Hence, both the dimensions include two indicators each, to assess the role of SHGs in financial inclusion.

3. Regions considered for analysis

Our study illustrates a regional comparison of SHGs in achieving financial inclusion. The six regions, as classified by NABARD, are presented in Table 1.

Table 1: Regional classification of India according to NABARD

Regions	*Name of the States*
North	Haryana, Himachal Pradesh, Punjab, Jammu & Kashmir, Rajasthan, New Delhi, Chandigarh
Northeast	Assam, Meghalaya, Nagaland, Arunachal Pradesh, Tripura, Mizoram, Manipur, Sikkim
East	Bihar, Jharkhand, Odisa, West Bengal, Andaman & Nicobar Island
Central	Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Uttarakhand
West	Goa, Gujarat, Maharastra
South	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Puducherry, Lakshadweep, Telangana

Source: Prepared by authors based on NABARD

Note: 2006-2007 onwards Uttranchal became Uttarakhand; Puducherry was with Tamil Nadu up to 2008, and then it has its separate data from 2009; Lakshadweep added to Southern region and Chandigarh added to Northern region from 2010; Telengana has its separate data 2014 onwards.

4. Use of log-linear regression model

To calculate Compound Annual Growth Rates (CAGR) of the indicators during 2007-2021, across regions in India, our study uses log-linear regression model.

Model description

Let the value of the outcome variable (y, indicator value) is y_t, for any given time period t.

If the initial value of y is y_0 and y grows at the annual compound rate r, then,

$$y_t = Y_0 (1 + r)^t \quad \textbf{(i)}$$

Taking log on both sides, equation (i) becomes

$$logy_t = logy_0 + t \log(1+r)$$

Defining $\beta_1 = logy_0$ and $\beta_2 = log (1+ r)$, equation (ii) takes the form of an econometric equation like

$$logy_t = \beta_1 + t \beta_2 + U_t \quad \textbf{(iii)}$$

Here β_1 is the intercept, and β_2 is the slope coefficient which indicates relative change in the outcome variable (y_t) due to the absolute change in the independent variable (t). U_t is the random error term.

Therefore, percentage change in $y_t = \hat{\beta}(100)$. change in t

This $\hat{\beta}$ or estimated β_2 is the instantaneous rate of growth.

Since β_2 = log (1 + r), taking antilog on both sides,

antilog $\hat{\beta}$ = antilog (log(1 + r)) = (1+r)

Therefore, $r = anti\log\hat{\beta} - 1 = e^{\hat{\beta}} - 1,$ and

percentage change in $r = (e^{\hat{\beta}} - 1).100$

This r is the CAGR

5. Calculation of composite FII value

Subsequently, *max-min method of normalization* is applied to get an index value of an indicator. And then, taking geometric mean of the four indices values, assuming all the indicators have equal weights, the composite FII value for each year is calculated. This is done for the six regions separately. This method of normalization performs a linear transformation on the original data. The fundamental way to convert an indicator value (V) into an index value (I) is given by,

$$I = \frac{(V - Minimum\,Value)}{(Maximum\,Value - Minimum\,Value)}$$

I is a relative index with a scale of 0 to 1, where the ideal state is '1'. *Minimum Value* is the minimum admissible value and *Maximum Value* is the maximum admissible value of each indicator. The lower and upper bounds have constant values because of the encoded time period for analysis. Hence, any inclusion of input for normalization outside the original data range would alter the analysis. The United Nations Development Programme (UNDP) uses this approach for computation of HDI, Gender Development Index, Human Poverty Index, etc. Rahman (2012) established that the measurement technique used in HDI is also relevant for assessing financial inclusion, and hence, our study follows this technique. Moreover, the existing literature lack accord regarding the importance of indicators over one another, and thus, our study puts equal weights to each indicator. Higher the index value, higher is the rate of financial inclusion; and vice versa. Alike this study, Kuri and Laha (2011), Sahu (2013), Saha and Alam (2021, 2022) have also followed this UNDP approach in measuring financial inclusion in India.

Afterward, a comparative study has been conducted to assess the performance of SHGs in the six regions. CAGRs of the four indicators and Composite FII values are compared. Regional discrepancies in financial inclusion are captured through the Lorenz Curve analysis. The closer the actual curve to the line of equality, the inequality in financial inclusion is of lower percentage of the total area. Furthermore, with the help of correlation matrices, the relationship between FII and HDI values are established in the study. In a panel framework through a linear regression analysis, statistical significance of predictor variable (HDI value) on the outcome variable (FII value) is examined.

6. Use of panel regression model

Panel data examines both cross-sectional and time series effects, where the effects may be fixed or random. In Fixed-Effects (FE) model, the individual groups (here the regions) have different intercepts in the regression equation; while in Random-Effects (RE) model, the individual groups have different disturbances. Since it is unrealistic to assume homogeneity across units, so both the models – FE and RE were applied for the data set, and the appropriate model was selected through the Hausman test. The Hausman test basically tests whether the unique errors (U_i) are correlated with the regressors, the null hypothesis is they are not, and hence, the null hypothesis is that the preferred model is RE versus the alternative the FE.

The estimated FE model is

$$FII_{it} = \alpha_i + \beta HDI_{it} + U_{it}$$

Where, FII_{it} is the outcome variable, i indicates country, t indicates year, HDI_{it} is the predictor variable with β as coefficient, α_i is the intercept, U_{it} is the random error term which is assumed to be independently, identically and normally distributed.

The estimated RE model is

$$FII_{it} = \alpha_1 + \beta HDI_{it} + \varepsilon_{it}$$

Where, $\varepsilon_{it} = e_i + U_{it}$, and $\alpha_i = \alpha_1 + e_i$

The individual effect (α_i) is a random variable with a particular mean value (common intercept, say α_1) and a random error term (e_i).

Heteroskedasticity and contemporaneous correlation are also verified for the model validity.

III. RESULTS AND DISCUSSION

This section discusses performance of SHGs at national level and in the six regions of India, as classified by NABARD. Study at disaggregate level is imperative so as to comprehend inconsistency in achieving financial inclusion, and thereby assisting appropriate public policies towards inclusive growth. However, institutional delivery mechanisms and peoples' ability to grasp the benefits of policies are equally important; and here, the SHGs play a crucial role to bridge this gap through making people empowered.

1. Estimates of log-linear regression models for the indicators at national and regional levels

Since it is mentioned that the study considers four indicators under the two dimensions to assess the role of SHGs in financial inclusion, the regression results of log-linear models with those four indicators – total number of SHG members, average loans per SHG, average savings per SHG and amount of outstanding loans of SHGs (as dependent variables, taking their log values) are depicted in Table 2, at national and sub-national levels. Each of the dependent variable is regressed upon the time point.

Table 2 shows F-statistic with associated P-value for all the log-linear regression models. $P < 0.01$ indicates that overall, the regression result statistically significantly predicts the outcome variable. This is factual for all the regression models, excluding two indicators – average loan per SHG and amount of outstanding loans of SHGs of the Central region. R^2 value measures goodness-of-fit of linear regression model. Here also, each of the estimated models, except the Central region for the stated indicators, shows that high percentages of variation in data of the outcome variables are due to the variations in data of explanatory variables. The fitted models also represent positive association between the absolute change in time points and relative change in outcome variables (all significant at 1 percent level, excepting the mentioned two). The regression results demonstrate that every single indicator is important in swotting outreach and performance of SHGs.

2. Comparison of CAGRs of the indicators among regions

Subsequently, a comparative analysis among the six regions has been done based on CAGRs of the four indicators, and is presented in Table 3.

Table 2: Estimates of log-linear regression models

Indicators	*Estimators*	*Estimates of the regions*						
		East	*North*	*South*	*West*	*Northeast*	*Central*	*India*
Total number of SHG members	F-statistic with the associated P-value	121.30 (0.000)	49.00 (0.000)	14.00 (0.002)	34.20 (0.000)	127.35 (0.000)	56.81 (0.000)	73.30 (0.000)
	R^2 value	0.9032	0.7903	0.5185	0.7246	0.9074	0.8138	0.8494
	β coefficient with its significance level	0.0872156***	0.0715169***	0.025352***	0.0914504***	0.1351176***	0.0679757***	0.0574523 ***
	Standard error	0.0079189	0.0102171	0.0067762	0.0156371	0.0119733	0.009019	0.0067104
Average loan per SHG	F-statistic with the associated P-value	89.34 (0.000)	41.08 (0.000)	104.96 (0.000)	56.31 (0.000)	76.19 (0.000)	0.34 (0.570)	83.80 (0.000)
	R^2 value	0.8730	0.7596	0.8898	0.8124	0.8542	0.0255	0.8657
	β coefficient with its significance level	0.0935628***	0.0510654***	0.1028667***	0.0940798***	0.0754076***	0.0075681	0.0877957***
	Standard error	0.0098988	0.0079677	0.0100407	0.0125374	0.0086391	0.012974	0.0095908
Average saving per SHG	F-statistic with the associated P-value	49.95 (0.000)	19.19 (0.001)	505.59 (0.000)	50.64 (0.000)	30.80 (0.000)	111.64 (0.000)	303.03 (0.000)
	R^2 value	0.7935	0.5961	0.9749	0.7957	0.7032	0.8957	0.9589
	β coefficient with its significance level	0.1078435***	0.0823259***	0.1447325***	0.0687147***	0.0859569***	0.0865583***	0.1165291***
	Standard error	0.0152592	0.0187953	0.0064367	0.0096561	0.0154879	0.0081922	0.0066941
Amount of outstanding loan of SHGs	F-statistic with the associated P-value	240.06 (0.000)	11.01 (0.006)	545.67 (0.000)	115.78 (0.000)	30.57 (0.000)	1.13 (0.307)	873.42 (0.000)
	R^2 value	0.9486	0.4586	0.9767	0.8991	0.7016	0.0799	0.9853
	β coefficient with its significance level	0.1771084***	0.043345***	0.1447798***	0.0830432***	0.0813125***	0.0094386	0.1379104***
	Standard error	0.0114309	0.013061	0.0061979	0.0077178	0.0147065	0.0088807	0.0046664

Source: Estimated by authors

Note: Figures in parentheses indicate P-value associated with F-statistic, *** denotes statistical significance at 1% level.

Table 3: Estimates of CAGRs of the four indicators

Region	*Total number of SHG members (1)*	*Average loan per SHG (2)*	*Average savings per SHG (3)*	*Average of (1), (2) and (3) (4)*	*Amount of outstanding loans of SHGs (5)*	*Difference between (4) and (5) (6)*
North	7.42	5.24	8.59	7.08	4.43	2.65
Northeast	14.48	7.84	8.98	10.43	8.48	1.95
East	9.11	9.81	11.39	10.10	19.39	-9.23
Central	7.04	0.76	9.05	5.62	0.95	4.67
West	9.58	9.87	7.12	8.86	8.66	0.80
South	2.38	10.84	15.58	9.6	15.59	-5.99
All India level	**5.91**	**9.18**	**12.37**	**9.15**	**14.8**	-5.65

Source: Estimated by authors

Note: Central region experiences insignificant CAGRs for average loan per SHG and amount of outstanding loans.

Table 3 derives the following observations:

1. The North, Northeast, East, West and Central regions have experienced higher CAGRs than the national average for the indicator – total number of SHG members.
2. The East, West and Southern regions have experienced higher CAGRs than the national average for the indicator – average loan per SHG.
3. Only the Southern region has experienced higher CAGR than the national average for the indicator – average savings per SHG.
4. The East and Southern regions have experienced higher CAGRs than the national average for the indicator – amount of outstanding loans per SHG.
5. The CAGR is extremely low in South for the indicator – total number of SHG members.
6. The CAGR is extremely low even insignificant in Central region for the indicator – average loan per SHG.
7. The SHGs in different regions were all able to accumulate savings during the study period.

8. The CAGR is extremely low and even insignificant in Central region for the indicator – amount of outstanding loans per SHG.
9. The Northeast region performed best in increasing the number of SHG members over time.
10. The CAGRs for the indicators – average loan per SHG and average savings per SHG were highest in the Southern region.
11. The CAGR of the amount of outstanding loan was significantly low in the North region.
12. Eastern region scored highest in terms of outstanding loans per SHG.

When the increase in number of SHGs, amount of loan sanctioned by the MFIs per SHG and amount of savings per SHG exhibit affirmative performance of SHGs, outstanding loans of SHGs creates negative impacts. Therefore, while considering overall performance of SHGs, this particular aspect has been contemplated. The difference between average CAGRs of the indicators which reflect optimistic performance and CAGR of outstanding loan demonstrates the following:

13. Northern region topped in rolling towards financial inclusion (excluding Central region, for not having statistical significance of the estimates), followed by the Northeast and West regions, respectively.
14. Ever increasing outstanding loans of SHGs of the East and Southern regions overshadowed their first-rate performances.

3. Comparative analysis of the FII values among six regions

A comparison has been made at regional level for the composite FII values during 2007-2021. Table 4 shows the FII values at national and sub-national levels.

It is apparent from Table 4 that all the regions progressed well towards achieving financial inclusion during the study period, though it was most fluctuating for the North region. Moreover, the study shows that average composite FII values during 2007-2021 were same/higher than the national average level in the West and Southern regions. Among all the regions, average FII value was highest in the South and lowest in the Northeast.

Table 4: Composite FII values for the regions

Year	*Composite FII values*						
	North	*Northeast*	*East*	*Central*	*West*	*South*	*India level*
2007	0.00	0.01	0.01	0.00	0.01	0.00	0.00
2008	0.12	0.06	0.06	0.06	0.10	0.02	0.06
2009	0.24	0.06	0.06	0.07	0.14	0.09	0.09
2010	0.27	0.08	0.11	0.21	0.12	0.16	0.16
2011	0.14	0.17	0.14	0.21	0.16	0.18	0.15
2012	0.31	0.10	0.13	0.21	0.17	0.28	0.24
2013	0.31	0.12	0.09	0.27	0.28	0.34	0.29
2014	0.24	0.19	0.21	0.27	0.38	0.35	0.32
2015	0.46	0.20	0.22	0.31	0.42	0.44	0.40
2016	0.41	0.26	0.29	0.32	0.46	0.49	0.44
2017	0.36	0.34	0.42	0.37	0.44	0.58	0.53
2018	0.45	0.39	0.54	0.50	0.57	0.63	0.60
2019	0.52	0.53	0.66	0.62	0.64	0.70	0.70
2020	0.84	0.73	0.68	0.75	0.86	0.73	0.73
2021	1.00	1.00	1.00	0.95	0.92	1.00	1.00
Average	0.37	0.28	0.31	0.34	0.38	0.40	0.38

Source: Calculated by authors

4. Disparities in achieving financial inclusion through Lorenz curve analysis

Subsequently, to show the regional disparities in achieving financial inclusion through SHG activities in India, region-wise cumulative shares of FII value and cumulative shares of total population during the assessment period are calculated, and are presented in Table 5.

Alike the Lorenz curve analysis, graphical representation is made for the six regions separately to show

(a) how far each region is from the ideal state, and

(b) the nature of regional disparities during the assessment period

Figure 1 exhibits that North region was closer to the equality line to attain financial inclusion compared to the other regions. In the initial phase, though Southern region was behind the other regions, it grabbed the highest position in the later phase. Performances of West and Central regions improved over time. On the contrary, performances of Northeast and East regions were remarkably low during the assessment period.

Table 5: Cumulative shares to measure regional discrepancies in financial inclusion

Year	*North*		*Northeast*		*East*		*Central*		*South*		*West*	
	Population	*FII*	*Population*	*FII*	*Population*	*FII*	*Population*	*FII*	*Population*	*FII*	*Population*	*FII*
2007	5.94	0.00	6.13	0.17	6.16	0.24	5.93	0.00	6.29	0.00	6.06	0.12
2008	11.99	2.10	12.35	1.46	12.40	1.52	11.97	1.13	12.64	0.38	12.20	1.81
2009	18.15	6.38	18.64	2.88	18.71	2.77	18.12	2.53	19.04	1.92	18.44	4.34
2010	24.41	11.12	25.01	4.81	25.10	5.18	24.37	6.57	25.50	4.66	24.77	6.43
2011	30.78	13.50	31.46	8.78	31.56	8.23	30.73	10.70	32.02	7.65	31.19	9.23
2012	37.24	19.02	37.98	11.21	38.10	11.14	37.19	14.83	38.60	12.28	37.70	12.20
2013	43.82	24.55	44.59	14.09	44.70	13.06	43.76	20.16	45.23	17.91	44.29	17.09
2014	50.49	28.87	51.27	18.57	51.38	17.55	50.43	25.40	51.91	23.72	50.97	23.80
2015	57.27	36.91	58.02	23.18	58.13	22.42	57.21	31.52	58.64	31.03	57.73	31.20
2016	64.14	44.16	64.72	29.34	64.94	28.79	64.09	37.80	65.42	39.17	64.58	39.31
2017	71.12	50.41	71.63	37.48	71.82	37.82	71.08	44.99	72.24	48.81	71.50	47.10
2018	78.19	58.36	78.62	46.71	78.77	49.42	78.16	54.81	79.12	59.26	78.51	57.15
2019	85.36	67.57	85.68	59.26	85.78	63.65	85.34	66.90	86.04	71.02	85.60	68.44
2020	92.63	82.37	92.80	76.40	92.86	78.34	92.62	81.48	93.00	83.30	92.76	83.67
2021	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.04	100.00	100.00	100.00	100.00

Source: Calculated by authors

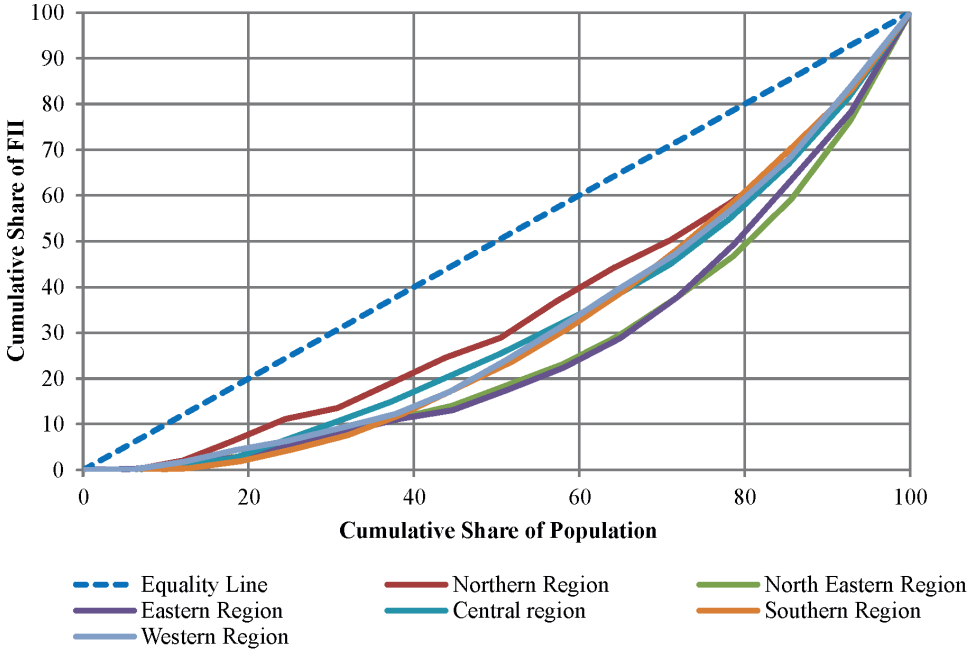


Figure 1: Lorenz curves showing disparities in achieving financial inclusion

Source: Prepared by authors

Implications of the study result

From the regional analysis, our study explores that performance of Southern region was best among all the regions regarding loan disbursement per SHG and savings per SHG. Although the region experienced several economic shocks during the study period, this decent performance was associated with low CAGR of SHG members, alongside a considerable amount of loan disbursement. NABARD report (2018-2019) stated that during 2016-2019, loan disbursement was highest for the Southern region compared to the other regions of India. Even, the report revealed that number of SHGs turned down to 38.3 percent in 2018-19 from 48.3 percent in 2014-15.[2] And therefore, amount of loans per SHG remained high during the study period and this also induced high savings per SHG. Southern region stood just behind the Western region in terms of savings as on 31 March 2019.[3] On the contrary, high CAGR of outstanding loan highlights that overall performance was not as satisfactory as expected for the Southern region while progressing towards financial inclusion.

Apparently, Eastern region followed the trajectory same as Southern region. This region demonstrated a consistent increase in loan disbursement and savings per SHG during 2007-2021. NABARD report (2018-2019) revealed that during 2017-2019, only Southern region was ahead of Eastern region in terms of loan disbursement.[4] But, since Eastern region experienced a steady increase in the number of SHG members, and SHGs with credit-linked and savings-linked, so essentially, the situation was far better than Southern region. Nevertheless, remarkable high outstanding loans of this region during the study period showed the gloominess of picture, undermining its effort towards achieving financial inclusion.

In the Western region, considerable upsurges were perceived in the number of SHG members, number of SHGs with credit-linked and savings-linked, and amount of loan disbursement during the study period. Even, a gradual increase in the amount of savings was supervened with a tremendous hike in 2020, after which it experienced a drastic fall in 2021. Therefore, CAGRs were well-meant for average loan per SHG and number of SHG members during 2007-2021. And, CAGR of the amount of savings per SHG was low and CAGR of the amount of outstanding loan was moderate; far below the national average. During 2019-2022, the region experienced high growth of outstanding loan.

Northeast region possessed high CAGR for the number of SHG members, alongside second lowest significant CAGR for outstanding loan. Total number of SHGs with credit-linked and savings-linked, amounts of loan disbursed and savings increased in a steady manner in this region during the study period. All these ensured reasonable progress of SHGs towards achieving financial inclusion.

In the North, CAGR of outstanding loan was lowest (statistically significant) during the study period. Though there were gradual increases in total number of SHG members, number of SHGs with credit-linked and savings-linked, amounts of loan disbursement, and savings; the lowest CAGR of outstanding loan ensured its good position in achieving financial inclusion.

Central region reflects that average loan per SHG and outstanding loan amounts insignificantly influenced financial inclusion. Though this region experienced a slow increase in the number of SHG members during the study period, lots of fluctuations were there for the increase in number of SHGs with credit-linked and savings-linked; especially SHGs with credit-linked. Even,

fluctuations were also perceived as regards amounts of loan disbursement and savings of SHGs, up to 2017. Afterwards, this region experienced a gradual increase of the same.

Nevertheless, ever increasing Non-Performing Asset (NPA) is a serious challenge for any developing country. In terms of geographical spread of India, South, East and Northeast regions accounted for 67 percent of MFI's loan portfolio while the remaining was covered by West, North and Central regions. Tamil Nadu held the highest loan portfolio and followed by West Bengal and Bihar. There are several reasons for the ever-increasing NPA amounts. In 2010-11, Andhra Pradesh crisis was due to some misleading behavior and negligence of MFI authorities and that dropped the recovery of loan portfolios. Again in 2016-2017, loan repayment was disturbed by some localized issues like State elections and farm loan waivers. Demonetization policy of the Central government caused a huge disturbance in liquidity and delay of loan portfolio recoveries all over India, which was measured by Portfolio At Risk (PAR). In Uttar Pradesh and Maharashtra, due to several socio-political issues, PAR (more than 180 days overdue) caused inadequate recoveries in credit market in 2017. In 2018, some other events surfaced like flood in Kerala, Tamil Nadu and Orissa which caused low recovery of loans. In 2019, in Assam, socio-political issues like anti CAA (Citizenship Amendment Act) and financial interruption in tea plantation districts were also the reasons for insufficient credit recovery plans. Furthermore, Covid-19 pandemic in 2020 damaged the labour market; especially hit the vulnerable group who couldn't reap the facilities like work from home during lockdown. Although digital means of payment were increased, lack of cash affected recovery of loans (RBI Bulletin, 2020).[5] In fact, good infrastructure and decent work environment facilitate savings habit of individuals, and tight monitoring lowers NPAs of SHGs. Our study exposes that outstanding loan of SHGs was high for the East and Southern regions, and followed by the regions like West and Northeast. Since NPAs obstruct access to future credit, this should be strictly monitored while aiming to expansion of SHG activities.

A value index describes change in a nominal value relative to its base-year value, for any indicator. CAGR is the mean annual growth rate of an indicator in a time frame, generally longer than one year. Therefore, although having extremely low CAGR for the number of SHG members and high

CAGR for the amount of outstanding loans, decent CAGRs of the other indicators certified Southern region to be in the top position on the way to accomplish financial inclusion through SHG activities. Similar study was conducted by Manohar (2015) where the author examined growth of savings, loan distribution and outstanding loan amount of SHGs, across six regions as classified by NABARD, from 2007-2008 to 2013-2014, as part of SHG-Bank linkage programme. The study concluded that share of savings, amount of loan disbursement and outstanding loan per SHG were significantly high in the Southern region compared to the other regions and national average. In addition, Northeast was the least reached out region. Sehgal & Sharma (2021), using NABARD's data from 2010-2011 to 2020-2021, established a varied performance of SHG-Bank linkage programme across regions in India; however, the study exhibited positive trends for the indicators like savings, loan disbursal, and unsettled loans during the study period.

5. Relationship between financial inclusion and human development

The relationship between financial inclusion and human development is extensively analyzed in literature. Some notable works include Kuri and Laha (2011), Raichoudhury (2016), Nnada and Kaur (2016), Kuriakose and Joseph (2020), Ababio et al. (2021), Arora and Kumar (2021), Abdelghaffar et al. (2022), Saha and Alam (2022), etc. Although the mentioned literature found a positive association between them, all such analyses considered data of banking services which induced financial inclusion. Our study uses data of SHG activities which aid financial inclusion.

In HDI, the index value is calculated taking geometric mean of the three indices values which constitute HDI, namely, *life expectancy at birth* to assess a long and healthy life, *gross national income per capita* to assess standard of living, and *educational status* to assess access to knowledge. Our study finds a high correlation between FII and HDI (0.85) during the study period at national level. To examine the same at regional level, average HDI values for each region at each time point is calculated, and are presented in Table 6.

Table 6 highlights that average HDI value remained higher than the national average for the regions like North, Northeast, West and South; excepting East and Central regions during the study period. Moreover, HDI values showed that West and Southern regions led the economy, followed by the

North and Northeast regions, respectively. Correlation between FII and HDI values during 2007-2021 was also verified for each region, and the estimates are presented in Table 7.

Table 6: Average HDI values during the study period at regional and India levels

Year	*Average HDI values*						
	North	*Northeast*	*East*	*Central*	*West*	*South*	*India level*
2007	0.63	0.59	0.57	0.57	0.63	0.65	0.55
2008	0.63	0.60	0.57	0.56	0.64	0.65	0.56
2009	0.63	0.61	0.57	0.56	0.65	0.65	0.57
2010	0.64	0.63	0.57	0.57	0.66	0.66	0.58
2011	0.65	0.65	0.58	0.57	0.67	0.67	0.59
2012	0.66	0.67	0.59	0.57	0.68	0.67	0.60
2013	0.67	0.67	0.60	0.58	0.69	0.68	0.61
2014	0.68	0.67	0.61	0.60	0.69	0.69	0.62
2015	0.69	0.67	0.62	0.61	0.70	0.70	0.63
2016	0.71	0.67	0.63	0.62	0.70	0.70	0.64
2017	0.71	0.67	0.63	0.62	0.71	0.71	0.64
2018	0.71	0.67	0.63	0.63	0.71	0.70	0.65
2019	0.71	0.67	0.63	0.63	0.71	0.70	0.65
2020	0.71	0.67	0.63	0.63	0.70	0.70	0.64
2021	0.70	0.66	0.62	0.62	0.69	0.69	0.63
Average	0.67	0.65	0.60	0.59	0.68	0.68	0.61

Source: Calculated by authors based on the data of Global DataLab

Table 7: Correlation between FII and HDI values at regional level

Correlation Coefficients					
North	*Northeast*	*East*	*Central*	*West*	*South*
0.71	0.49	0.76	0.80	0.76	0.82

Source: Estimated by authors

It is evident from Table 7 that correlation between financial inclusion and human development was low only for the Northeast region; all other regions showed a strong association between them.

Implications of the study result

The average HDI value was fair in the Northeast region which indicates that common people are literate and empowered. Even, performance of SHGs was

satisfactory in the Northeast region, conveying socio-economic progress with careful management of unsettled loans. However, financial inclusion was low in the Northeast, even with the presence of well-organized SHGs. Therefore, government should decide on allocating special funds for the Northeast people – in adequate amount and timely manner. Lack of loan disbursement in line with requirement probably undermined the capabilities of SHG members and that resulted in low correlation between financial inclusion and human development.

Although HDI values are low in the East and Central regions, the high correlation between FII and HDI values reveal that government's development strategies should be reassessed to warrant inclusive growth.

6. Estimated panel regression for the relationship between HDI and FII values

Finally, to examine statistical significance of the relationship between HDI and FII values, a linear panel regression method is applied. The study considers heteroskedasticity-robust standard errors of FE model after performing the Hausman test. The Hausman test result (Chi2[1] = 58.87, with Prob>chi2 = 0.0000) clearly indicates the significance of using the FE model.

Table 8: Estimates of FE regression model

Number of observations = 90 R-sq: Observation per group: within = 0.4975 min = 15 between = 0.3657 avg = 15.0 overall = 0.2316 max = 15 (1,5) = 63.87 corr(u_i, Xb) = -0.8049 Prob > F = 0.0005				
FII	*Coefficient*	*Standard Error*	*t*	*P>|t|*
HDI	7.247908***	0.9069116	7.99	0.000
_cons	-4.344544***	0.5871267	-7.40	0.001
Rho value = 0.63990046 (fraction of variance due to u_i)				

Source: Estimated by authors
Note: ***Statistical significance at 1% level

In Table 8, R-sq values within (0.4975), between (0.3657) and overall (0.2316) display the amounts of variation of the FII value explained by the HDI value. F-test shows whether all the coefficients in the model are different than

zero, where Prob > F = 0.0005 (< 0.05) indicates that the model is acceptable. Furthermore, the estimation results show that there is a positive association between FII and HDI values (with statistical significance at 1 percent level). The rho value (0.63990046, which shows interclass correlation) indicates that almost 64 percent of the variance is due to the differences across regions.

The Pesaran CD (cross-sectional dependence) test has also been performed which examines whether the residuals are correlated across regions (since the cross-sectional dependence may lead to a bias in test results); where the null hypothesis denies such correlation. The test statistic (11.621) with the P-value = 0.000 refutes the presence of contemporaneous correlation.

Theoretically, development planning creates the path for availability, accessibility and usage of financial services for the native people, which in turn creates job opportunities, and helps economic and social well-beings of commons. Ultimately, society experiences reduction in poverty and inequality through formation of human and social capital. Long back in the 1930s, Keynes explained the role of financial intermediaries in mitigating poverty of commons through generation of savings. Financial inclusion through SHGs in India is very particular about including women, and thus targets them to make financially independent and literate. Since SHGs have strong gender orientation, so from one hand, microcredit through SHGs helps empowerment of women. From the other hand, it also contributes to income generation through livelihood promotion and poverty reduction, and thereby, secures human development. The multidimensional impact of microcredit is presented in Figure 2.

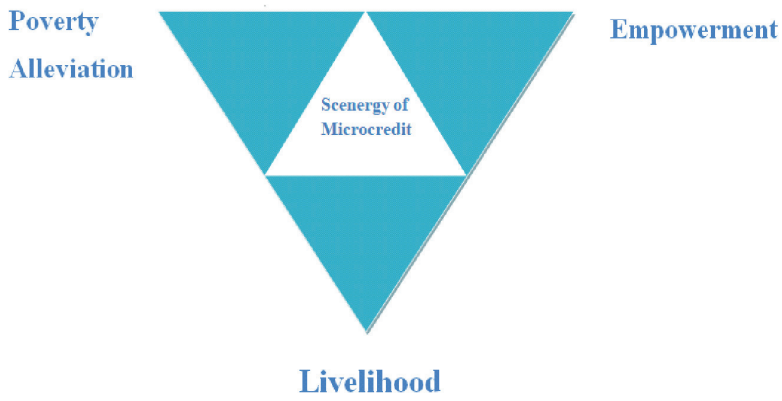


Figure 2: Impact of microcredit

Source: Prepared by authors

IV. CONCLUSIONS

Our study exhibits the role of microcredit in socio-economic development of people in a developing nation like India, especially targeting women population. It is revealed from the study that several government policies and initiatives paved the path for raising the number of SHG members, SHGs with credit-linked, SHGs with savings-linked, loan disbursement for SHGs and savings of SHGs during 2007-2021. However, special attention should be given on framing policies towards loan repayment. From the comparative analysis of the performance of SHGs in different regions of India over the dimensions – *spread* and *status*, the study finds substantial regional discrepancies in achieving financial inclusion. Finally, the study establishes a positive significant association between financial inclusion and human development. This extensive optimistic relationship between human development and financial inclusion has a great policy implication which emphasizes the fact that government policies should be more oriented towards empowering marginalized group so that the whole society can reap the benefits of financial inclusion. Moreover, our study strongly proposes that since there are huge inconsistencies among regions in achieving financial inclusion and human development, so region-wise different development strategies might work well for inclusive growth.

Although this kind of study possess great policy implications for developing nations with having similar financial structure and diversified socio-economic profile like India, expansion of time period is imperative for a more precise analysis. Even, inclusion of livelihood parameters might help better policy prescriptions while dealing with financial inclusion through microcredit. Furthermore, the study may be extended following Siwach et al. (2022), where the authors using expenditure data from programme's audit statements of Jeevika – the Bihar Rural Livelihoods Promotion Society – opined that though livelihoods and microfinance programmes for women often exhibit reduced impacts after scale-up, yet, programme scale-up might lessen average per capita cost and hold on to cost-effectiveness despite lower impact. Therefore, extension of research work in line with viability of the mission might help accomplishing the complete image of the government's SHG-Bank linkage programme en route to financial inclusion.

Declarations

- **Funding statement:** No specific funding has been received to carry out this piece of research.

- **Conflict of interests:** The authors declare that there is no conflict of interests.
- **Data availability statement:** The secondary data used in the study are from authentic sources, and are clearly mentioned in the article.
- **Permission to reproduce material from other sources:** Not applicable.

Notes

1. Since the situation changed during the COVID 19 pandemic.
2. https://www.nabard.org/auth/writereaddata/tender/SMFI%202017-18.pdf
3. https://www.nabard.org/auth/writereaddata/tender/SMFI%202017-18.pdf
4. https://www.nabard.org/auth/writereaddata/tender/SMFI%202017-18.pdf
5. https://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=19775#S2

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