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ARTICLE

Self Help Groups and Economic Development: Theories and Empirics

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ABSTRACT

Self-Help Groups (SHGs) have emerged as a significant mechanism for promoting financial inclusion and economic empowerment, particularly among women in developing economies. This study constructs a microeconomic comparative framework to evaluate the impact of SHG membership on financial inclusion and income generation. By contrasting two scenarios—individuals with SHG membership versus those without—we model savings, credit access, and investment behaviour through a utility maximization framework subject to budget constraints. The theoretical results demonstrate that SHG membership facilitates greater access to credit, incentivizes savings and investment, and ultimately leads to higher income levels. To validate the model's predictions with real-world scenarios, an econometric analysis is conducted using primary survey data from 600 households across two underdeveloped regions of West Bengal. The econometric findings corroborate the theoretical insights, affirming that SHG membership contributes positively to income enhancement and socio-economic inclusion. These results underscore the role of SHGs as instruments of inclusive development and financial empowerment.

Keywords: Self-Help Groups; Financial Inclusion; Economic Empowerment; Microeconomic Modelling; Utility Maximization; Credit Access; Savings Behaviour; Investment Decisions; Econometric Analysis; Regression Analysis; Socio-Economic Development

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1. Introduction

Majority of the Indian rural population live in an uncertain condition, deprived of basic amenities and isolated from various modern facilities [1]. The agrarian rural life and its development are mainly dependent upon interconnections of several sectors which include agriculture, fishery, livestock, food security, horticulture, energy, etc. They jointly contribute to the growth and development of the rural populations and livelihood earnings [2]. Even if rural sectors contribute significantly to the share of national income, rural populations are, by and large, challenged with access to market, financial services, banking facilities; health services and educational infrastructures. Along with these drawbacks, every rural people perform several family responsibilities, including working in fields and at home [3]. Rural people should have the right to enjoy a life at par with those of the urban population and enjoy equal facilities, including financial facilities and access to proper market access and complete information like those of urban people [4]. Hence, the rights of rural people have occupied the centre stage of policy-making and debate in India [5]. Propagandists of Self-Help Groups (SHGs) argue that the arrival and spread of SHGs have not only elevated the social position of the rural poor but also brought them into the mainstream economy and included them in the societal norms [5]. This inclusion process established an environment of social and financial empowerment which enabled rural individuals and groups to make financial as well as social decisions and act on those efficiently [6]. The most interesting fact about SHGs is that it has empowered the rural women more and improved their socio-economic status and conditions [7]. SHGs allow individuals and groups to create plans and perform in a strategic way to fulfil such plans and the successful outcome of such plans creates more plans which empower the rural population [8]. Empowerment generated through different rural sectors work together and reinforce each other to uplift the socio-economic conditions of the rural society [9].

A significant proportion of India's rural population continues to live in deprivation, lacking access to basic infrastructure, financial services, and market connectivity. Despite the rural sector's substantial contribution to national income through agriculture, livestock, and allied sectors, systemic inequalities persist, limiting socio-economic mobility. In response, Self-Help Groups (SHGs) have emerged as decentralized, community-driven institutions designed to promote financial inclusion, enhance economic agency, and facilitate social empowerment—particularly among women. The proliferation of SHGs across India, especially in underdeveloped regions, has generated widespread policy interest due to their potential to meet multiple Sustainable Development Goals (SDGs), including poverty alleviation, gender equality, and financial inclusion. A growing body of literature documents the positive impacts of SHGs on individual and household-level welfare, noting improvements in access to credit, savings behaviour, and participation in local markets. However, while empirical studies confirm these benefits, there remains a need to consolidate theoretical understanding with robust, data-driven validation.

SHGs or Self-Help Groups are a group of 10–20 individuals who live in a common area and belong to a common socio-economic or financial condition or status – which, of course, can be referred to as marginalised or underprivileged [8]. Different agencies like co-operative banks, Non-Government Organisations (NGOs) help these small groups to become financially as well as socially independent. Although SHGs are mainly formed by rural women with an eagerness to break the vicious cycle of poverty by means of joint, cooperative activities as a group, they can have male members as well. Microfinance, on the other hand, refers to a small amount of loans provided to financially backward people and groups which could be referred as 'micro-credit', 'micro-loans', etc. Such micro loans also work for the improvement of the socio-economic conditions of the rural poor, especially women [8,10]. Financial inclusion refers to delivering basic banking and financial services to the underserved, non-served rural, marginalised people at an affordable cost or no cost. Rural people of backward areas are deprived of basic financial knowledge and services, different government and non-government agencies work together to break the long-reigning backwardness [11].

Since the eve of liberalisation in 1991, Indian governments and their policies have focused on inclusive growth although 'inclusive growth' as the main objective was brought to light and was highly promopted in the eleventh five-year plan [12]. Among the Indian states, there was the existence of very poor performance as far as financial inclusion is concerned because they did not showcase a very bright picture with very low mean and high deviation [12]. But, over the years due to the flagship initiatives of the government of India like Pradhan Mantri Jan Dhan Yojana, Micro Units Development and Refinance Agency (MUDRA), Direct Cash Benefit Transfer of different government welfare schemes to the bank accounts of beneficiaries have improved the scenarios to a great extent [11]. But, one can say with certainty that things have remained below the desired standard and level. SHGs are highly interconnected and work together to ensure the main objective - financial inclusion and economic development, that is, for achievement of inclusive development and Sustainable Development Goals (SDGs) [8].

In West Bengal, over 65% population belong to the rural areas, therefore SHGs play an important role in the process of financial inclusion and economic development. As per NABARD's report on Status of Microfinance in India, 2021–22, one can see that the state of West Bengal is in fourth position in India as per as number of SHGs and members in SHGs are concerned, West Bengal, as a state, holds the second rank in total credit and savings of all SHGs at the all India level [13,14] . Again, the detailed scrutiny of data shows that women are in a much better position compared to men when it comes to different aspects of SHGs. Out of total SHGs in West Bengal, above 90% SHGs are women-run SHGs and they hold the share of over 87% membership in all SHGs followed by the share of over 91% savings [13,14]. These facts vividly depict the fact that women dominate the functioning of SHGs by holding the larger share in all aspects which is another prime reason for further promotion in the activities of SHGs, since it certainly performs the activities of women empowerment, reduces gender disparity, makes women financially independent and above all fulfils the objective of financial inclusion for the marginalized population, especially women. These data also establish the fact that male dominated SHGs are around 10% followed by over 12% share of memberships and slightly over 8.5% share of savings. Although, these figures look very meagre when compared to the share of women, when we compare the absolute values, and not the percentage values, the figures are significant, since the total number of SHGs are around 1.1 million and a number of members are over 12 million followed by the savings of nearly half-million in Indian Currency in 2021–22 only [13]. It is a fact that in 2022–23 West Bengal witnessed a huge rise in no. of SHGs which increased to almost 1.15 million, implying a rise of around 31% [14]. It is quite evident that the figures of women-run SHGs and consequently, the amount of credit savings held by such SHGs have also gone up, at least in absolute numbers.

The study of SHGs is necessary from several aspects. It empowers the members to make choices, act on those choices and finally convert those choices into developmental outcomes – this process of empowerment is very much applicable to SHGs [15]. The fact that SHGs provide small loans to individuals and groups, helps them to establish new enterprises or business which again result in different aspects of economic development of their families – including health, education and gender empowerment. It also enables the women to hold a strong position in the society and family financially and allows them to take part in every activity effectively - such a process of inclusion is desired as it ensures the achievement of SDGs [16]. The fact that socio-economic development has become a solution to several societal issues including rapid growth of population and women empowerment, SHGs act as a perfect catalyst in this process, especially in developing economies in India, especially in the backward segments for marginalized people [11]. SHGs alone can be helpful in achieving 6 SDGs which includes the first five SDGs of no poverty; zero hunger; good health and well-being; quality education and gender equality and obviously SDG –17 of capacity building, financial inclusion and resource mobilization. Such an influential thing deserves more research.

Studies on developmental aspects of SHGs have gained currency, of late, and caught attention of the economists as well as policy-setters. But given the broader impacts of SHGs, the issue demands further research. Again, there is a paucity of effects of SHGs in the state of West Bengal, especially at the district level, involving primary data. It is a well understood as well as documented concept that SHGs have an impact at the microeconomic level that improves family's socio-economic standards and welfare. But, there are lack of studies that theorises it.

Although previous research has broadly recognized the developmental potential of SHGs, critical gaps persist. Much of the existing scholarship either lacks rigorous theoretical modelling or fails to engage with primary data at the grass-root level or regional level. Furthermore, studies rarely employ a comparative framework that links theoretical predictions with empirical validation, especially in the context of socio-economically marginalized districts. In West Bengal—a state with high SHG density and significant rural poverty—there is a marked absence of district-level studies that combine microeconomic modelling with household-level econometric analysis. These omissions limit our understanding of how and to what extent SHG membership translates into measurable socio-economic gains. Addressing these gaps is essential not only for academic advancement but also for more effective policy formulation.

This study responds to these limitations, which are its motivations, by developing a comparative microeconomic model to examine and theorise the effects of SHG membership on financial inclusion and household earnings, and by validating the model by using primary data from 600 households across two backward districts of West Bengal—South 24 Parganas and Purulia. These districts were chosen for their geographic and socio--economic diversity, yet shared developmental challenges. Both districts are backward from socio-economic aspects while the first district has over 93000 SHGs and the latter has over 44000 [17]. The research aims to assess the extent to which SHGs influence financial behaviour and socio-economic outcomes, particularly among women. The dual methodological approach—integrating theory with econometric analysis—positions this study to contribute both to academic discourse and to evidence-based policy design.

The empirical findings of this study offer both confirmation and refinement of existing literature on the developmental role of SHGs. Consistent with prior research, the data reveal that SHG membership significantly improves household savings, access to credit, and income levels—particularly among rural women[6,7,10]. However, this study includes nuance by highlighting district-level analysis and disparities: while SHG members in South 24 Parganas demonstrate stronger financial outcomes along with higher participation from marginalized and backward communities due to better market integration and state-supported infrastructure, members in Purulia experience more modest gains along with moderate level of participation from the backward segments constrained by geographic remoteness and limited institutional support. These differences underscore the limitations of viewing SHG impact as uniform across regions, a tendency evident in much of the macro-level literature. Moreover, the primary data reveal that the benefits of SHG membership are amplified when accompanied by targeted government interventions such as subsidized credit, marketing platforms, and training programs—an insight that aligns with but also deepens the arguments found in recent policy-oriented studies. Thus, the combination of theoretical modelling and empirical results in this paper not only validates core claims in the SHG literature but also extends the field by demonstrating the importance of local conditions and policy complements in shaping outcomes.

The remainder of this paper is structured as follows- Section 2 reviews relevant literature, Section 3 presents A brief profile of the study area based on SHGs. Section 4 presents the theoretical model, Section 5 outlines the econometric analysis and discusses empirical findings, and Section 6 concludes with implications and future research directions.

2. Literature Review

The existing body of research overwhelmingly underscores the vital role played by Self-Help Groups (SHGs) in fostering socio-economic development across developing economies. Empirical evidence consistently highlights the contributions of SHGs not only at the national level but also across diverse regional contexts [18].

A significant portion of the literature focuses on various operational dimensions of SHGs—such as credit disbursement, savings mobilization, gender composition, and temporal growth patterns—thereby capturing their extensive expansion and success, especially in states like West Bengal [8]. The majority of these studies have concentrated on the impact of SHGs on women, emphasizing their role in enhancing women's awareness of socio-economic and political rights, promoting financial literacy, and fostering collective responsibility and social cohesion within groups [11,18]. These effects collectively empower women to make independent decisions and participate meaningfully in economic activities. The groups to work with are known as “in-groups” and the groups not to work with are known as “out-groups” [18].

The global recognition of women's development as a developmental imperative has led to the proliferation of women-centric projects by NGOs and other organizations. These initiatives have been instrumental in improving women’s access to technology, education, healthcare, and financial resources, further reinforcing their socio-economic agency [19,20]. In this context, SHGs function as platforms for overcoming structural barriers and ensuring inclusive development. Evidence from Pakistan further supports these findings, demonstrating similar patterns of empowerment and poverty reduction through SHG participation [21].

Several studies also emphasize the enabling role of government policies and formal banking institutions. Government initiatives have encouraged rural populations to open bank accounts, thereby facilitating financial access [11]. Moreover, the SHG–bank linkage program has significantly contributed to the growth of SHGs, with public and private banks actively participating in credit disbursement [8,22]. State-specific research, including on Maharashtra, corroborates that SHGs align closely with the Sustainable Development Goals (SDGs), functioning as a grassroots mechanism for inclusive development [23].

Region-specific studies provide more granular insights. Mondal (2020), for instance, offers a comparative analysis of SHGs in West Bengal relative to other eastern Indian states, focusing on key indicators such as number of SHGs, loan disbursal rates, and accumulated savings [24]. The findings suggest that the synergy between microfinance and SHGs has a multiplier effect on regional economic development, with projections indicating continued growth in SHG-related metrics [25].

Block-level analyses further enrich the understanding of SHG dynamics. A study in two blocks of Hooghly district highlights micro-credit availability at favourable interest rates as a primary motivator for SHG participation. Notably, the study finds that smaller families tend to make faster financial decisions, and educational attainment plays a pivotal role in determining leadership within SHGs and access to economic power [26]. Bera (2011) offers a rare pre- and post-membership comparative analysis in a backward district of West Bengal, quantitatively demonstrating the transformative impact of SHGs on household income and social status [26]. Similarly, research on the Khanakul block in Hooghly reveals the positive influence of SHGs promoted by NABARD, local panchayats, and NGOs on women’s lives [27].

In Coochbehar, the importance of SHG–bank partnerships are underscored in a study that not only advocates microfinance as a poverty alleviation tool but also stresses the integral role of banks in SHG success [28]. Bagli and Dutta (2013), in their primary survey of marginalized women in the Bankura district, reinforce the value of credit and savings facilities within SHGs in elevating women’s socio-economic status [12]. Their findings position SHG-centric microfinance as the most effective pathway toward financial inclusion.

Beyond savings and credit, SHGs have also been associated with increases in income, employment, consumption, and expenditures—indicators that reflect their broader economic impact [29], as indicated by a study in Lataguri Region of West Bengal. Importantly, the benefits of SHGs are not limited to rural settings. Studies confirm their effectiveness in addressing financial exclusion in urban and semi-urban areas, including municipal and slum regions, where formal financial systems are often inadequate [7,30].

There is a growing scholarly consensus linking SHGs to the achievement of multiple SDGs. Researchers and policy experts alike have investigated the potential of SHGs to sustainably increase incomes and consumption, particularly among the lowest income groups [31]. Malnutrition and health issues—prevalent among the poor—are also addressed through SHG participation, as financial independence enables investment in health and nutrition [32,33]. SHGs simultaneously tackle multiple interrelated challenges—poverty, hunger, inequality in health and education—by enabling financial and social empowerment [34].

Moreover, the income generated through SHGs has played a crucial role in reducing child labour and facilitating access to education, thereby breaking the cycle of generational poverty [35]. In this dual capacity, SHGs help reduce gender inequality and financial exclusion (SDG 5 and SDG 17), while also contributing indirectly to SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 4 (Quality Education) [36,37].

Despite limited research in districts like Purulia and South 24 Parganas, available studies affirm the effectiveness of SHGs in these regions. In Purulia, more than 80% of SHG members report significant benefits—over 82% in educational advancement, more than 90% in income improvement, and around 46% in awareness of social rights and responsibilities [38]. In South 24 Parganas, different SHG models have been successfully adapted across local contexts, yielding positive socio-economic outcomes, especially for rural women [39].

3. SHG Related Profile of the Study Area

A brief description of the category wise division of SHG members', in the year 2022–23, in our studied districts in West Bengal is shown in the following diagrams –in **Figure 1** and **Figure 2**. These two Figures describe the success of SHGs in empowering the marginalized communities. From the following two Figures it is evident that SHGs have immensely benefitted and improved the conditions of poor communities. In both districts, percentages of people who are members of SHGs are generally from backward communities. It can be seen that in both districts the percentage of scheduled caste, scheduled tribe, minority and person with disability members are quite high which itself signifies the inclusivity feature of SHGs in West Bengal. The year wise growth rate in the numbers of SHGs in these districts has also significantly increased. In South 24 parganas, SHGs have enjoyed a growth rate of 4.88% between 2021–22 and 2023–24. In Purulia district, this growth rate is 6.08% during this period and in West Bengal the growth rate is 5.77% during 2022–23 and 2023–24. These values are calculated based on data available from reports published by state and central governments. The **Figure 1** tells that in south 24 parganas, out of 9 lakh 85 thousand and 846 total members in SHGS, the backward communities constitute above 70%. In Purulia, this proportion is around 45% because The whole district of Purulia is considered as backward both financially and socially. In such a district, the people of general castes or "unreserved" castes are also very backward. In Purulia, even the people of General Castes seek to join SHGs and want to avail its benefits.

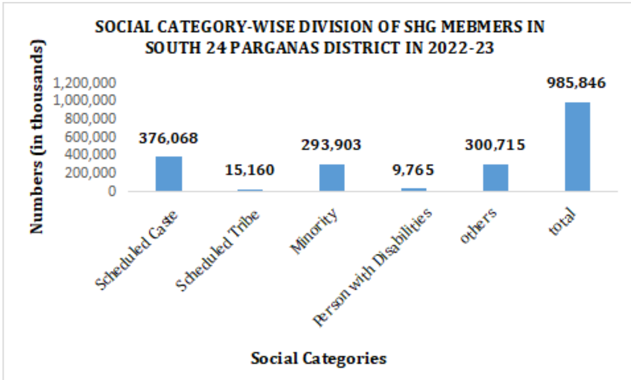

Figure 1. Division of SHG members in different social categories in South 24 parganas district in 2022–23.

Source: Government of India, Ministry of Rural India, National Rural Livelihood Mission

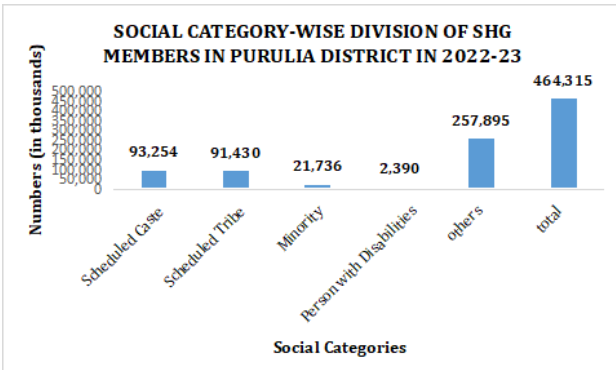

Figure 2. Division of SHG members in different social categories in Purulia district in 2022–23.

Source: Government of India, Ministry of Rural India, National Rural Livelihood Mission

If we look at the year-wise growth rate of borrowers from SHGs in these two districts, then there are severe variations observable. In 2019, south 24 parganas ranked 3 in the state of West Bengal but in 2021 its rank was 16, whereas during this period Purulia came up from 21 to 19 [8]. As far as savings in SHGs is concerned, both districts have shown substantial growth rate during this period [8].

Under the given backdrop, there is a requirement of studies about the effects of SHGs in the society. Our present study does so, first by developing a microeconomic theory which captures the basic functional benefit of SHG and followed by that, this study performs an econometric analysis on 600 households, covering these two districts of West Bengal and discusses the effects of SHGs from various socio-economic perspectives.

4. Microeconomic Model on Effects of SHGs

In this section, we develop a microeconomic model to show the financial outcomes of various variables on the lives of two groups of individuals – one who is a member of an SHG and the other who is not a member of SHG. Let us first consider the case of 'No SHG Membership'.

4.1. No SHG Membership

Let us consider an individual who is not a member of any SHG. Therefore, he faces a standard credit and savings problem. Let us denote the individual's income as Y and let us also assume the individual can save a certain part of his income in informal savings sources or mechanisms (such as keeping money in boxes at home). It is quite evident that the individual borrows from an informal credit market at a comparatively higher interest rate. The individual's utility function is denoted as –

$$U = u(C, L) \quad (1)$$

Where, U is the level of utility and C is consumption and L denotes the fixed Leisure.

Let us denote the individual's budget constraint as –

$$C = Y - S \quad (2)$$

Where, S is the savings of the individuals.

Here Y is the exogenous variable and Savings is the Choice Variable.

Here, leisure is fixed and the individual's primary decision is how much to save. However, in the absence of SHG membership, an individual faces limited access to credit. Hence, the savings rate is constrained by the level of income.

Let us substitute the budget constraint in the utility function and rewrite it as –

$$U = u(Y - S, L) \quad (3)$$

Since non-SHG members borrow informally at a high interest rate (informal), the effective return on savings or cost of borrowing is high. This discourages both borrowing and saving. Hence, an individual (who is not a member of SHGs) solves the following optimization problem:

Hence the optimal savings rate ($S^{\#}$) can be derived from maximizing the utility.

$$S^{\#} = \arg\max_{0 \le S \le Y} u = (Y - S, L) \quad (4)$$

Subject to $r_{informal}$.

First Order Condition for utility maximisation gives us –

Assuming that U is differentiable and concave,

$$\frac{dU}{dS} = \frac{d}{dS} u(Y - S, L) = -u_C(Y - S, L) \quad (5)$$

Setting for First Order Condition gives us –

$$\begin{aligned} -u_C(Y - S^{\#}, L) = 0 \\ Or, u_C(Y - S^{\#}, L) = 0 \end{aligned} \quad (6)$$

But, $u_c > 0$ always, which implies there is no interior solution or there is the existence of a corner solution at $S^{\#} = 0 \; or, C^{\#} = Y$ Where, $C^{\#}$ is the optimal Consumption level.

This reflects that due to high $r_{informal}$ saving offers little benefit (low return), and borrowing is expensive (high repayment). Therefore, the individual aims to consume as much of current income as possible.

Given the high opportunity cost of saving (due to low returns or high cost of accessing liquidity in the future), the optimal level of saving $S^{\#}$ will be low or even zero to maintain present consumption.

4.2. With SHG Membership

In the presence of SHG membership, an individual has dual benefits - a safe access to credit at a cheaper rate as well as a safe savings mechanism. This encourages the individual to borrow at a cheaper or lower rate compared to the informal sources and invest that in productive income generating activities which ultimately increases the income as well as the optimal savings rate ($S^{\#}$).

Hence, under these circumstances the modified budget constraint becomes –

$$C = Y - S + L_{SHG} \quad (7)$$

Where, L_{SHG} is the loan from SHG at a lower rate. The individual can use it for income-generating activities such as purchasing raw-materials for agriculture or beginning a small business, etc. Such activities are expected to increase an individual's income in the near future.

We can rewrite the utility function by using the modified budget constraint as –

$$U = u(Y - S + L_{SHG}, L) \quad (8)$$

Now, the optimal savings and borrowing decisions are decided by maximizing the utility function subject to the modified budget constraint and the credit rules of SHGs. Hence, the individual maximises both optimal savings and optimal loans from SHGs. This can be expressed as –

$$\left(S^{\#}, L^{\#}_{SHG}\right) = \arg\max u(Y - S + L_{SHG}, L) \quad (9)$$

Subject to borrowing limits and interest costs governed by r_{SHG}

The first order conditions give us –

With respect to savings, we get –

$$\frac{\partial U}{\partial S} = -u_C\,(Y - S + L_{SHG}, L) \quad (10)$$

With respect to loan from SHG, we get –

$$\frac{\partial U}{\partial L_{SHG}} = u_C\,(Y - S + L_{SHG}, L) \quad (11)$$

Here, u_c is the marginal utility of consumption. The first order conditions become optimal when marginal utility of consumption is balanced with the opportunity cost (for example, rate of interest).

Because $r_{SHG} < r_{informal}$, the cost of borrowing is lower, that is, borrowing has a positive marginal utility as long as – Return from investment of loan > r_{SHG}.

If borrowing from SHG is productive, that is, if the investment of the loaned amount generates more income than the rate of interest (r_{SHG}), it will imply that the individuals will borrow more and save more, since they can raise future income or current consumption. This is the economic intuition.

From the perspectives of First Order Conditions and solving for $S^{\#}$, we get –

$$S^{\#} = Y - C^{\#} + L^{\#}_{SHG} \quad (12)$$

Where, $L^{\#}_{SHG}$ is the optimal loan from SHGs.

If we go for a comparative analysis between the two scenarios.

The utility level of non-SHG members is given as -

$$U_{non} = u(Y - S^{\#}_{non}, L) \quad (13)$$

Where, $S^{\#}_{non}$ is the optimal savings level of the non-SHG members.

And the utility level of SHG member is given by –

$$U_{SHG} = u\left(Y - S^{\#}_{SHG} + L^{\#}_{SHG}, L\right) \quad (14)$$

These equations capture how individuals derive utility from consumption and leisure. SHG members have access to borrowing ($L^{\#}_{SHG} > 0$) and safer saving, allowing greater flexibility in consumption.

Given the fact that

$L^{\#}_{SHG} > 0$

$r_{SHG} < r_{informal}$

and

Return from the investment of loan > r_{SHG}

This implies that SHG loans are productive and cost-effective. So, SHG members increase consumption by borrowing wisely –

$Y - S^{\#}_{SHG} + L^{\#}_{SHG} > Y - S^{\#}_{non}$ which implies that $C_{SHG} > C_{non}$. Hence, given better access to credit and productive loan use, SHG members enjoy higher consumption and thus higher utility, that is, $U_{SHG} > U_{non}$.

In constrained environments, improved access to affordable credit significantly enhances welfare. SHG members can borrow at lower rates and invest in activities yielding higher returns than the interest rate. This boosts current consumption while maintaining leisure, leading to a higher utility level compared to those limited to informal, high-cost borrowing or minimal saving.

4.3. Extension of the Basic Model - Cases with interest rates

4.3.1. Case of Non-SHG Member

The utility function of an individual who is not a member of any SHG is given by equation (1).

The budget constraint reflects that an individual can either save (reducing consumption) or borrow (increasing consumption) but must pay interest on borrowed funds. The net available consumption becomes

$$C = Y - S + L_{informal}\,(1 - r_{informal}) \quad (15)$$

This captures the net purchasing power from informal borrowing after accounting for interest costs.

If we substitute this budget constraint in the utility function, we get the new utility function.

The utility function for a non-SHG member who borrows from informal market is written as –

$$U_{non} = u(Y - S + L_{informal}(1 - r_{informal}), L) \quad (16)$$

The utility function reflects the fact that due to the high interest rate informal borrowing yields less effective consumption, thereby ensuring diminishing utility. Again, the constraint $L_{informal} \geq 0$ ensures that individuals only borrow when needed and feasible.

This model captures how limited financial access shapes consumption decisions. Non-SHG members face high borrowing costs through informal loans, which reduce the amount of consumption per borrowed unit due to interest payments. This affects their overall utility, often pushing them to avoid borrowing or to consume less. Including these financial frictions in utility modelling helps highlight welfare disparities based on credit access.

4.3.2. Case of the SHG members

Let us define the utility function of the SHG members as –

$$U_{SHG} = u(C, L) \quad (17)$$

SHG members can save or borrow, but loans from SHGs are cheaper. The effective consumption or the budget constraint is-

$$C = Y - S + L_{SHG}(1 - r_{SHG}) \quad (18)$$

This reflects how much of the loan contributes to consumption after interest payment.

Substituting the budget constraint into the utility function, we get –

$$U_{SHG} = u(Y - S + L_{SHG}(1 - r_{SHG}), L) \quad (19)$$

This shows that SHG borrowing enhances consumption more effectively than informal loans.

Given $r_{SHG} < r_{informal}$, it is evident that $(1 - r_{SHG}) > (1 - r_{informal})$. Hence, for equal loan amounts – $L_{SHG}(1 - r_{SHG}) > L_{informal}(1 - r_{informal})$. It implies that SHG members get more consumption per borrowed unit, raising their utility.

Lower borrowing costs in SHGs make each unit of loan more effective in supporting current consumption. Unlike informal credit with high interest, SHG loans reduce the financial burden, thereby improving net consumption and overall welfare. This financial advantage translates directly into higher utility when credit is used productively or to smooth consumption.

4.3.3. Optimization for Non-SHG and SHG Members

Non-SHG members choose savings S and informal loan $L_{informal}$ to maximize utility.

$$\left(S^{\#}_{non}, L^{\#}_{informal}\right) = \arg\max u(Y - S + L_{informal}(1 - r_{informal}), L) \quad (20)$$

This reflects their constrained utility maximization, accounting for costly borrowing.

The First Order Conditions (F.O.C.) are

With respect to savings –

$$\frac{\partial u}{\partial S} = -u_C(Y - S + L_{informal}(1 - r_{informal}), L) \quad (21)$$

With respect to informal loan –

$$\frac{\partial u}{\partial L_{informal}} = u_C(Y - S + L_{informal}(1 - r_{informal}), L)(1 - r_{informal}) \quad (22)$$

SHG members similarly choose savings S and SHG loan L_{SHG} to maximize utility.

$$\left(S^{\#}_{SHG}, L^{\#}_{SHG}\right) = \arg\max u(Y - S + L_{SHG}(1 - r_{SHG}), L) \quad (23)$$

Because SHG borrowing is cheaper, its impact on consumption is more favourable.

Hence, the first order conditions are –

With respect to savings -

$$\frac{\partial u}{\partial S} = -u_C(Y - S + L_{SHG}(1 - r_{SHG}), L) \quad (24)$$

With respect to SHG loan –

$$\frac{\partial u}{\partial L_{SHG}} = u_C(Y - S + L_{SHG}(1 - r_{SHG}), L)(1 - r_{SHG}) \quad (25)$$

These express the optimal marginal conditions for SHG members' decisions.

Households maximize utility over consumption and savings/borrowing by balancing the marginal cost and marginal benefit of each decision. When interest rates differ, as between SHG and non-SHG loans, the effective return or cost of consumption changes. Lower interest rates increase the marginal utility from borrowing, making it optimal to borrow more and save less, enhancing consumption utility.

4.3.4. Comparison

Let us compare the marginal utility derived from additional consumption funded through loans for SHG and non-SHG members. The effective amount of consumption from a loan depends on the interest rate.

We can write the SHG loan funded consumption as –

$$L_{SHG}\,(1 - r_{SHG}) \tag{26}$$

The consumption of informally loan funded can be written as –

$$L_{informal}\,(1 - r_{informal}) \tag{27}$$

Hence, the marginal utility from a loan is –

$$u_C(Y - S + L_{SHG}\,(1 - r_{SHG}), L)(1 - r_{SHG}) \tag{28}$$

The marginal utility from consumption from loan taken from informal sector can be written as-

$$u_C\big(Y - S + L_{informal}\,(1 - r_{informal}), L\big)(1 - r_{informal}) \tag{29}$$

Given that $r_{SHG} < r_{informal}$, it implies $(1 - r_{SHG}) > (1 - r_{informal})$ .This means a rupee borrowed through SHGs translates into more net consumption than a rupee borrowed informally. Since the marginal utility of consumption is positive and decreasing (concave utility), getting more consumption (through a lower r) gives higher marginal utility.

Hence, we can say-

$$\begin{aligned} &u_C(Y - S + L_{SHG}\,(1 - r_{SHG}), L)(1 - r_{SHG}) \\ &> u_C\big(Y - S + L_{informal}\,(1 - r_{informal}), L\big)(1 - r_{informal}) \end{aligned} \tag{30}$$

This inequality shows that SHG members gain greater marginal utility from each additional unit of borrowed funds due to the lower interest rate, that is, $u_C^{SHG} > u_C^{informal}$.

Lower interest rates enhance the value of each borrowed unit, allowing borrowers to consume more from the same loan amount. This increases utility by improving current consumption possibilities. SHG members benefit from formal, low-interest loans, which raises their utility compared to individuals constrained to informal borrowing with high costs. This kind of financial access is a key factor in improving economic well-being and reducing household vulnerability.

5. Econometric Analysis

5.1. Survey Procedure & Data Collection

The study also contains a very interesting econometric analysis. We have conducted a primary survey in four blocks of two districts – South 24 Parganas and Purulia. In the first district we have surveyed in Basanti and Gosaba blocks and in the second district we have surveyed in Baghmundi and Jaipur blocks – all four blocks have presence of SHGs. From each block we have surveyed 150 households out of which 75 were members of SHGs and rest of the 75 were not a member of any SHG. This implies that out of 600 surveyed households, 300 were members of SHGs and rest of the 300 were not. This was purposefully done to capture the effect of SHGs on the livelihood earnings of the member households. The survey was carried out fromthe November-December, 2024 and purposive stratified random sampling technique was used. Hence, a blend of both of purposive sampling and stratified random sampling was inherent in the sampling process. Purposive sampling was used for finding the non-member households whereas stratified random sampling was followed in the selection of member households. For the sake of dealing with the problem of endogeneity issue, we have considered equal groups, in all areas where we have conducted survey. In this way we have mitigated the problem of endogeneity to a large extent but, in future, this research could be extended by applying instrumental variable approach or 2SLS approach which fully eliminates endogeneity. During the survey, we have collected data on household's income, SHG membership, land ownership, years of education household size and other socio-economic aspects. A brief profile of the survey is given below in **Table 1**.

Table 1. Profile of Field Survey.

District	Block	No. of Households Surveyed	SHG Members	Non-SHG Members	Male SHG Members	Female SHG Members
South 24 Parganas	Basanti	150	75	75	15	60
	Gosaba	150	75	75	12	63
Purulia	Baghmundi	150	75	75	7	68
	Jaipur	150	75	75	10	65
Total		600	300	300	44	256

Source: Primary Survey

5.2. Econometric Model Specification, Regression Results and Analysis

In our analysis we have considered the income of the households, from all sources, as our dependent variable. We have converted the values of income into their natural logarithmic values. The values are transformed into log values for considering of the skewness in income distribution. One can see that apart from SHG Membership, rest of the independent variables are also control variables. The details about the description of different variables used in the regression are given below in **Table 2**.

Table 2. Description about Different Variables.

Variables	Description	Category
Income (ln_{income})	Log value of Household's income from all sources	Dependent Variable
SHG Membership (shg_m)	A Binary Variable 1, if Household has SHG member 0, if Household has NO SHG member	Independent Variable
Education (edu)	Number of years of schooling of the respondent	Independent Variable
Household Size (hh_{size})	Number of Individuals in the family	Independent Variable
Land Ownership (L)	The amount of land owned by the household (in acres)	Independent Variable
Savings (S)	A Binary Variable 1, if Household saves money every month 0, if Household does not save money every month	Independent Variable
Credit Access (C)	A Binary Variable 1, if Household has access to formal credit 0, if Household does not have access to formal credit	Independent Variable
Access to Market (M)	A Binary Variable 1, if Household has access to market to sell products 0, if Household does not have access to market	Independent Variable

Source: Developed by authors

The econometric model for estimation is specified as below –

$$\ln_{income} = \beta_0 + \beta_1\, shg_m + \beta_2\, edu + \beta_3\, hh_{size} + \beta_4\, L + \beta_5\, S + \beta_6\, C + \beta_7\, M + \varepsilon \tag{31}$$

Where,

β_0 is the intercept term.

β_1 to β_7 are the coefficients of the independent variables.

ε is the error term.

The model (equation 13) was estimated using Ordinary Least Square method. The results are presented in **Table 3**.

The result of the regression gives us interesting results. All the variables are significant which also gives meaningful implications. The co-efficient of SHG membership indicates the membership is associated with a 23.4% rise in income, holding the other variables constant. Education has a very significant role because an additional year of schooling increases income by over 11%. However, an extra household member reduces the family income by 6.7%. Land ownership always has a positive role to play in income generation in the marginalised society and having acres of land raises the income by around 14.5%. Similar things can be said about savings – a regular habit of saving or a regular ability to save helps in the income generation of the family by around 9% - which is really meaningful. Having access to credit and access to market increases income by over 12% and 10.9%, respectively. The high value of R-square itself signifies the goodness of the fit of our model.

Our findings of the econometric analysis resemble with as well as support the basic concept of our microeconomic model because the basic fact that SHG membership helps in education, savings and they together contribute to the increase in income is very much evident. Again, it is well documented that access to cheaper credit because of SHG membership helps to borrow more and use that money for productive activities like agricultural land which again generates earning opportunities through easy access to market. Thus, all the positive sides of SHGs work together simultaneously and all those theory-based aspects are captured in our econometric analysis.

Table 3. Results of the Regression Analysis.

Variable	Coefficient	Standard Error	t-statistic	p-value	Significance Level
shg_m	0.234	0.045	5.20	0.000	1%
edu	0.112	0.021	5.33	0.000	1%
hh_{size}	−0.067	0.012	−5.58	0.000	1%
L	0.145	0.023	6.30	0.000	1%
S	0.089	0.017	5.23	0.000	1%
C	0.123	0.019	6.47	0.000	1%
M	0.109	0.008	13.62	0.000	1%
Constant	4.567	0.112	40.75	0.000	1%
R^2 = 0.89					
N = 600					

Source: Computed by authors

6. Conclusions

6.1. Theoretical Implications

This study adopts a dual approach—developing a microeconomic comparative model and conducting an econometric analysis using primary survey data from 600 households—to assess the impact of Self-Help Group (SHG) membership on financial inclusion and earnings. The theoretical model establishes that SHG membership enhances individuals' access to credit and markets, which subsequently increases savings and earnings. The econometric analysis reinforces these theoretical insights with empirical findings, validating the model's predictions. Together, the two approaches substantiate the role of SHGs as effective mechanisms for fostering financial inclusion and socio-economic empowerment, particularly in underdeveloped regions. These findings contribute to the broader theoretical literature on community-based financial institutions and their capacity to address market failures in developing economies.

6.2. Managerial and Policy Implications

The results underscore the policy relevance of promoting SHGs as instruments of inclusive development. In the context of West Bengal, where a significant portion of the rural population remains financially and socially marginalized, SHGs offer a viable solution for breaking the cycle of poverty. The government of West Bengal, in coordination with the central government, has initiated targeted interventions such as specialized credit facilities, subsidized marketing spaces, and promotional opportunities at regional, national, and international fairs and at important tourist places. These initiatives not only enhance the financial viability of SHGs but also facilitate the integration of their products into mainstream markets. Policymakers should continue to scale up these supportive measures while ensuring that the inclusive nature of SHGs is preserved and strengthened.

6.3. Ideas for Future Research

Future research could expand the sample size or include additional marginalized regions to enhance the generalizability and policy relevance of the findings. Methodologically, the econometric framework may be refined through the use of Instrumental Variable (IV) techniques or a Two-Stage Least Squares (2SLS) approach to address potential endogeneity concerns more rigorously. Additionally, longitudinal studies tracking SHG members over time would offer valuable insights into the long-term impacts of SHG membership on household welfare. Further comparative studies across different states or countries could also help delineate context-specific versus generalizable features of SHG effectiveness.

Author Contributions

Conceptualization, N.C. and D.K.; methodology, N.C.; software, N.C.; validation, N.C., formal analysis, N.C.; investigation, N.C.; resources, N.C.; data curation, N.C.; writing—original draft preparation, N.C and D.K.; writing—review and editing, N.C. and D.K. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

The secondary data used in this study are openly available and cited accordingly. The primary data collected for this research are not publicly available due to privacy and confidentiality restrictions.

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Conflicts of Interest

The authors declare no conflict of interest.

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