Journal of Research and Development
A Multidisciplinary International Level Referred and Double Blind Peer Reviewed, Open Access
ISSN : 2230-9578 | Website: https://jrdrvb.org Volume-17, Issue-12| December 2025

Original Article

An Impact Study on the Role of Governmental Intervention for Financial Inclusion and Economic Well-Being of Moules - Entrepreneurs of Sundarbans

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Manuscript ID:
JRD -2025-171210
ISSN: 2230-9578
Volume 17
Issue 12
Pp. 61-66
December 2025
Submitted: 16 Nov. 2025
Revised: 26 Nov. 2025
Accepted: 10 Dec. 2025
Published: 31 Dec. 2025

Abstract

In this study, we came to analyze some of the possible sources of financial vulnerability that the Moules or the Indigenous honey collectors face in the Sundarbans. The aim is to investigate the impact of government support in the form of subsidy and credit inclusion on their financial well-being. The results depict that formal sources of credit from banks over informal sources can contribute better backing that can bring them out of the vicious cycle of poverty that continues for generations. A formal credit source can give a person a higher probability of achieving better earnings and economic well-being. The study also tries to analyze intergenerational mobility of occupation among Moules. The finding provides valuable insight to policymakers that can be utilized to improve their situation.

Keyword: *Sundarbans, Financial Inclusion, Intergenerational Mobility, Sustainable Livelihood.*

Introduction

Sundarbans, one of the largest mangrove vegetation in the world, is located in the delta of the Bay of Bengal, covering an area of 10,277 km2. It partially covers the state of West Bengal, most of it within the Bangladesh region. It covers 4,260 sq km across the South 24 Pargana and North 24 Pragana regions. Tidal waterways and mudflats characterize the area, hosting diverse flora and fauna. It provides many resources such as wood, fish, crab, honey, wax, and nontimber forest products., the regional people of this area depend on those to sustain their livelihood. The region's indigenous communities, known as Moules, have traditionally harvested honey from the forest, relying on their generational knowledge to navigate the dense foliage and wild threats. However, this unique profession is marred by the financial crisis and Invaders threat. With limited access to formal financial institutions like banks or cooperatives, these people have to shoulder high-interest loans reaching up to 20% from informal Money lenders or Mahajans, exacerbating their economic vulnerabilities to support their family and to store food for the month while they are out for Honey collection, but the nightmare doesn't end there after entering the forest apart from the Wild animals the dicots are the main threats often snatching collected Honey and foods, adds to their struggles.

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How to cite this article:
Majumder, A., Maiti, S. K., Mandal, D., Bera, R., Pradhan, S. S., Chatterjee, I., Podder, A., & Das, D. (2025). An Impact Study on the Role of Governmental Intervention for Financial Inclusion and Economic Well-Being of Moules - Entrepreneurs of Sundarbans. Journal of Research and Development, 17(12), 61–66. https://doi.org/10.5281/zenodo.18068341

Quick Response Code:
Website: https://jrdrvb.org/
DOI: 10.5281/zenodo.18068341
OPEN ACCESS

Journal of Research and Development
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ISSN : 2230-9578 | Website: https://jrdrvb.org Volume-17, Issue-12| December 2025

Despite all this, the Moules still go to collect honey for a sustainable life. In contrast, a large number of younger generations are not willing to continue with this traditional practice and choose to migrate to a different place for a better standard of living which can result in the extinction of this Indigenous practice. To tackle these challenges, it is crucial to implement measures that support the Moules' economic sustainability and preserve their cultural heritage.

Literature Review

Against this backdrop, an enumerative review of existing literature is essential to dive into the complexities of the Moules' livelihoods, the challenges they face, and the potential solutions to ensure their economic sustainability and cultural preservation.

(Dr. Roy, 2013) Illustrated how the Mawallis, traditional honey collectors in Sundarbans, face numerous challenges, including governance issues, wildlife threats, and exploitation by corrupt officials and money lenders. These problems weaken their traditional knowledge and socio-economic background, threatening their livelihood and cultural heritage. The study identifies key vulnerabilities and recommends measures to protect their livelihood. Urgent action is needed to preserve their socio-economic security. **(Samanta, Chakraborti, Alam, Das, 2014)** The study concentrates on the world's largest mangrove region, the Sundarbans, facing ecological fragility due to human population pressure and anthropogenic interference. The region supports various livelihoods, including agriculture, fishing, wood collection, and the Non-Timber Forest Products (NTFP) collection. Despite high population pressure, the forest cover has remained relatively stable. However, ecosystem-level changes have occurred, affecting species composition. Sustainable management practices are essential to preserve this unique ecosystem. **(Dr. Kothari)** Uphold in their study Sundarbans, a vast mangrove forest is home to honey collectors (Mouli) who risk their lives to harvest honey, facing threats from tigers, poverty, and neglect. Despite their crucial role in the ecosystem, they are marginalized and vulnerable. Their struggles and coping strategies are often overlooked, making their survival a daily challenge. This community's plight highlights the need for support and recognition. **(Karmakar, 2018)** study reflects that the Sundarbans' mangrove forest is the livelihood source and cultural backbone of its inhabitants, fostering a strong sense of community and environmental preservation. The forest's vulnerability unites the people, promoting collective action and cultural bonding. **(Mondal, Tripathy, 2023)** in their study, they discussed the impact of migration in the Sundarban region, and whether migration is a widespread survival tactic for regional households. **(Mistri and Das 2020)** the study highlights that people of the Sundarban area seasonally prefer interstate and intrastate migration to earn a better living.

Objective

The study aims to investigate the role of government support for the economic well-being of honey collectors of the Sundarban region known as Moules, Additionally examines how access to low-interest loans and subsidies from formal financial sources such as Banks, Cooperatives Contributes to higher earnings can improve the livelihood of this community. Further, we are analyzing whether the younger generation of this community is willing to continue their Traditional Job of Honey Collection, Detecting Intergenerational Mobility, Or Whether This Is A Dying Profession.

Research Methodology

In this paper, we have adopted the Qualitative Response Model to analyze the relationship between the availability of government support and financial services and the economic well-being of the Moules in the Sundarbans. We have utilized logistic regression to measure log-odds high earnings, which can be considered a measure of financial well-being. The data of this study were collected through primary surveys administered to honey collectors in Sundarbans. The dataset includes information on earnings, access to formal and informal financial sources, availability of subsidies, and low-interest loans. Relevant demographic and socio-economic variables were also included, which can explain their situation appropriately. However, by interpreting the coefficients, we can measure each variable's marginal effect. They give us an idea about the possible relation existent between them. The dependent variable takes a value of either 0 or 1; under such conditions, regular OLS can't be chosen as the suitable method because it violates the normality Assumption And Leads To Heteroskedasticity Formation. Hence, The Logit Model Is A Better Approach**.**

Analysis and Results

In the first section, we conducted a logistic regression to analyze the likelihood of attaining higher earnings represented as high_earn. It is considered the dependent variable with a value of 1 in case of high probability and 0 otherwise. In this case, the independent variables included are:

sub_n = It is a dummy variable taking a value of 1 if a person receives a subsidy and 0 otherwise.

We have taken loan sources from formal and informal institutions. to introduce the concept of credit inclusion. The variable takes the formal source of credit as the base, along with two other categories: loans from Mahajan and loans from cooperatives.

$$ln\ ln\left(\frac{P(high_{earn}=1)}{1-P(high_{earn}=1)}\right) = \alpha 1 + \alpha 2 sub_n + \alpha 3 sourceofloan2 + \alpha 4\ sourceofloan3 + \varepsilon 1 \text{.....(1)}$$

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RESULT 1

```
. logit high_earn sourceofloan2 sourceofloan3 sub_n

Iteration 0:   log likelihood = -120.96301
Iteration 1:   log likelihood =  -85.49867
Iteration 2:   log likelihood = -82.504177
Iteration 3:   log likelihood = -82.434558
Iteration 4:   log likelihood = -82.434366
Iteration 5:   log likelihood = -82.434366

Logistic regression                             Number of obs     =        199
                                                LR chi2(3)        =      77.06
                                                Prob > chi2       =     0.0000
Log likelihood = -82.434366                     Pseudo R2         =     0.3185

------------------------------------------------------------------------------
   high_earn |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
sourceofloan2 |  -1.308742   .464122    -2.82   0.005    -2.218404   -.3990792
sourceofloan3 |  -2.727455   .5438124   -5.02   0.000    -3.793307   -1.661602
        sub_n |   1.998629   .4047252    4.94   0.000     1.205382    2.791876
        _cons |  -.9189611   .3416612   -2.69   0.007    -1.588605   -.2493174
------------------------------------------------------------------------------
```

Source: Author's calculation

Intuition

The above result shows the log odds ratio of having higher earnings based on the given regressors. The statistically significant log-likelihood ratio indicates the model demonstrates a good fit. It depicts that the predictors significantly contribute to the model. The above table can give us an idea of a possible relationship between independent and dependent variables. Here, sourceofloan is a variable that has three categories. We take the source of loan from the bank as the base variable. The sourceofloan2 and sourceofloan3 represent the loans from cooperatives and Mahajans, respectively. Both the variables are significant at a 1% level. From the coefficients, compared to banks, the other sources of credit do not positively contribute towards the probability of achieving a better level of income and well-being. Apart from that, the sub_n variable indicates government subsidies to uplift their profession. A government subsidy can significantly help them achieve better income and economic well-being.

Result 2

```
. logit high_earn sourceofloan2 sourceofloan3 sub_n,or

Iteration 0:   log likelihood = -120.96301
Iteration 1:   log likelihood =  -85.49867
Iteration 2:   log likelihood = -82.504177
Iteration 3:   log likelihood = -82.434558
Iteration 4:   log likelihood = -82.434366
Iteration 5:   log likelihood = -82.434366

Logistic regression                             Number of obs     =        199
                                                LR chi2(3)        =      77.06
                                                Prob > chi2       =     0.0000
Log likelihood = -82.434366                     Pseudo R2         =     0.3185

------------------------------------------------------------------------------
   high_earn | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
sourceofloan2 |   .2701598   .1253871    -2.82   0.005     .1087826    .6709376
sourceofloan3 |   .0653855   .0355574    -5.02   0.000      .022521    .1898346
        sub_n |   7.378933    2.98644     4.94   0.000     3.338035    16.31159
        _cons |   .3989333      .1363    -2.69   0.007     .2042104    .7793326
------------------------------------------------------------------------------
```

Source: Author's calculation

Intuition

The above output calculates the odd ratios, which indicate the relative change in odds of earning a higher income with 1 unit change in the predictors. From the sourceofincome2 and sourceofincome3 variable, individuals relying on Cooperative and Mahajans for loans are much less likely to achieve a high income and sustainability level than banks. We also observe that subsidies contribute positively and significantly to better financial conditions.

In order to address our second question, we examine the factors that influence the next generation's willingness to pursue the same profession as their parents or differently, focusing on key variables such as education level, parental earnings, and training in other professions. The education level of the child is likely to influence career choices. Mobility to a higher educational category may open up broader career opportunities, leading them to break the cycle of traditions followed in their family for generations. Parental earnings can also act as a major determining factor, where

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children may either be motivated to follow in parental footsteps or may be driven to seek higher earnings in alternative fields to provide their family a better financial position and to bring them out of their poverty-stricken condition. Better training and advancement in career options in different technical fields can encourage individuals to explore less risky and income-generating career paths. We aim to provide a deeper understanding of the intergenerational transmission of careers and the shifting trends in professional choices among younger generations.

Hence,

$$ln(P\left(\frac{nextgen=1}{1-(nextgen=1)}\right) = \alpha 1 + \alpha 2\ educationofchildren6 + \alpha 3 educationofchildren2 + \alpha 4 voc + \alpha 5 high_{earn} + \varepsilon 2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(2)}$$

Where,

nextgen= The dummy variable taking the value 1 if the next generation doesn't follow parental occupation and 0 otherwise.

Educationofchildren= a categorical variable representing the education attainment of children which represents the following categories.

- Educationofchildren1= graduation level
- Educationofchildren6= HS pass
- Educationofchildren2= 10^{th} pass or less

Voc = It is a dummy variable that measures whether the offspring are getting trained in alternate professions.

Result 3

```
. logit next_gen high_earn educationofchildren6 educationofchildren2 voc

Iteration 0:   log likelihood = -137.81834
Iteration 1:   log likelihood = -84.207372
Iteration 2:   log likelihood = -83.267277
Iteration 3:   log likelihood = -83.253461
Iteration 4:   log likelihood = -83.253457

Logistic regression                             Number of obs     =        200
                                                LR chi2(4)        =     109.13
                                                Prob > chi2       =     0.0000
Log likelihood = -83.253457                     Pseudo R2         =     0.3959
```

next_gen	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
high_earn	3.039327	.7438483	4.09	0.000	1.581411	4.497243
educationofchildren6	-1.368431	.6118825	-2.24	0.025	-2.567699	-.1691633
educationofchildren2	-1.260731	.6212345	-2.03	0.042	-2.478328	-.0431339
voc	1.271068	.3968348	3.20	0.001	.4932861	2.04885
_cons	-.5577597	.5650639	-0.99	0.324	-1.665265	.5497452

Source: Author's calculation

Intuition

The above regression examines the likelihood of the next generation to carry out the same traditional profession as their parents depending on the parental income, the children's education, and whether they received any form of training in some alternate income-generating profession. The above result can give us the actual estimate but can help us analyze the possible relation between the dependent and independent variables. The next_gen variable takes the value 1 if they are willing to migrate to another profession and 0 otherwise. The coefficient of high_earn variable reflects that parents with better income stability are providing their offspring better income support that helps them get education in alternate fields. It is significant at 5% level. The educationofchildren variable is a categorical variable that measures how education influences their decision of intergenerational mobility. The base category is taken as the graduation base category. The educationofchildren6 and educationofchildren2 represent HS and 10th pass education level; both are significant at 5%. It is observed that better education attainment provides a better scope for alternative career choices. The voc variable is important at a 1% level, and it is observed that attainment of training in alternate technical fields can contribute mainly to the shift to better career options.

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Result 4

```
. margins, dydx(*)

Average marginal effects                        Number of obs     =        200
Model VCE    : OIM

Expression   : Pr(next_gen), predict()
dy/dx w.r.t. : high_earn educationofchildren6 educationofchildren2 voc
```

	Delta-method dy/dx	Std. Err.	z	P>|z|	[95% Conf.	Interval]
high_earn	.4022785	.0860288	4.68	0.000	.2336652	.5708918
educationofchildren6	-.1811224	.0776141	-2.33	0.020	-.3332432	-.0290016
educationofchildren2	-.1668675	.0793202	-2.10	0.035	-.3223324	-.0114027
voc	.1682357	.0485246	3.47	0.001	.0731292	.2633422

Source: Author's calculation.

Intuition

The above table calculates the log odds of the offspring attaining a career option different from their parents based on the given regressors. From the results, we have calculated the marginal effects of each regressor on the dependent variable, which can be calculated similarly to regression coefficients. A 1% increase in parental income increases the probability of the next generation attaining a different profession by 40.28%. A 1% increase in children getting educated till HS or 10th grade compared to graduation level decreases the probability of choosing a better career by 18.11% and 16.29%, respectively. Both the variables are significant at the 5% level. The dummy variable voc, which is significant at a 1% level, depicts that a 1% increase in vocational education increases the probability of the next generation choosing a different profession by 16.82%.

Conclusion

This paper's findings highlight the critical role of financial support, education, and training in shaping the well-being of the honey collectors. Financial inclusion in the form of a supply of loans from formal institutions such as commercial banks can enhance the likelihood of achieving better earnings and livelihood. However, credit from informal institutions that are supplied at a higher rate can act as a detriment to improvement, stressing the need for better financial inclusion. To determine the existence of intergenerational mobility, we observe that financial inclusion and proper training can influence the next generation to opt for better income-generating activities. Targeted policy intervention in education and skill development can further ensure sustainable livelihood in the future.

Policy Recommendation

Economic Empowerment:-

1. Access to formal financial institutions by establishing partnerships between formal financial institutions like banks, cooperatives, and the Moules to provide affordable credit options, reducing reliance on informal money lenders.
2. Offering subsidies or incentives to support the Moules' honey harvesting activities, such as equipment, training, or market access.
3. Establishing connections between the Moules and formal markets, allowing them to sell their honey and other forest products at fair prices.

Social Protection:-

1. Providing health and life insurance to the Moules, lowering risks associated with their hazardous occupation.

Governance and Institutional Support

2. Strengthen community institutions, such as cooperatives or self-help groups, to support the Moules' economic and social development.
3. Building inter-agency coordination among government departments, NGOs, and community organizations to ensure a unified approach to supporting the Moules.

Acknowledgment

This is a part of ICSSR Sponsored Project titled 'An Empirical Study on Life and Occupational Hazards of Moulis, Sundarbans Vulnerable Community in Collecting Mouban- a GI Product' under the special call for Vision Viksit Bharat@2047 (VVB@2047) No 100. We duly acknowledge the support of ICSSR for this academic endeavour.

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ISSN : 2230-9578 | Website: https://jrdrvb.org Volume-17, Issue-12| December 2025

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