

TECHNICAL EFFICIENCY OF WOMEN SELF HELP GROUPS (SHG) GENERATING POULTRY ACTIVITY IN AMRAVATI DISTRICT OF MAHARASHTRA

ABSTRACT

Women are vital part of the Indian economy and employment to build their empowerment, Thethe provision of loans and financial services to the poor is an important aspect of the development agenda of any economy. Rural women of India have been benefited by the Self Help Groups (SHG). The SHG can approach any bank for availing loan facility to undertake a suitable activitysuitable activity. The loan is repaid out of the profits earned. An study was carried out for year 2016-2017 for Amravati division. Study was undertaken in rural areas of Amravati division, 50 SHGs, which were engaged in selected agriculture based activity poultry. In order to analyseanalyses the objectives of the study, primary data was collected with the help of Personal interview of self help groups. Those Self help groups were selected for the study which should have an activity in existence of at least 10 years, In poultry SHGs the elasticity of ana cost per borrower and an subsidy, this both variables positively significant contribution in the gross loan. Negative Marginal value productivity of assets, borrow per member and net returns are determine to decrease the use of these variables and scope to increase this variable, & its executed negative significant contribution in determining the gross loan ,its adversely affects the loan refund. Among selected SHGs, the results indicatesindicate the variations in technical efficiency 0.7632-0.9966 across the individual SHGs.

Comment [u1]: What is the objective of the study? Or where is the objective?

Comment [u2]: Borrow or loan by member

Key words: Self help groups, Technical efficiency, Gross loan, Subsidy, Returns, Women

Comment [u3]: Return on investment (ROI)

INTRODUCTION

In India, majority of the people live in rural area and are engaged in agriculture, earning a subsistence wage. The provision of loans and financial services to the poor is an important aspect of the development agenda of any economy. Upliftment of the poor by promoting self employment and social security has for a long time been the concern of democratically elected Governments in countries like India. India has been able to develop its own model of microfinance organization in the form of savings and credit groups known as Self-Help-Groups (SHGs) which are bank linked. Rural women of India have been benefited by the Self Help Groups (SHG). The SHG can approach any bank for availing loan facility to undertake a suitable activitysuitable activity. The group loan is distributed among the members to run a small business. The loan is repaid out of the

Comment [u4]: Author should talk about the poultry industry and SHG. Why SHG? Why poultry?

36 | profits earned. "Microfinance sector **has grown** rapidly over the past few decades. Nobel
37 | Laureate Muhammad Yunus is credited with laying the foundation of the modern **MFIs** with
38 | establishment of Grameen Bank, Bangladesh in 1976". over the past two decades. Women SHGs
39 | which can have income generating activities from their savings and beneficiaries income to repay the
40 | loan, accelerating the socio economic growth of the members and raising socio economic status in
41 | society is the prime reason for members joining the SHG, SHGs borrowing systems are more
42 | responsive and efficient, SHGs performance using the economic analysis for the existent. Ability and
43 | willingness of SHGs to maximize their gross loan portfolio to use the inputs like SHGs members and
44 | cost per borrower to produce, they facilitate the comparison across similar economic SHGs,
45 | measurement reveals variations in efficiencies among SHGs further analysis can be undertaken to
46 | identify the factors responsible for the variations and identification of such factors is valuable for policy
47 | formulation for improvement of SHGs efficiencies.

Comment [u5]: Spell out the abbreviation then used it in your text

49 MATERIAL AND METHODS

50 | The mode of any investigation is to draw the useful conclusion the light of objectives
51 | of the study in order to arrive the meaningful conclusion, it is essential to the investigator to adopt
52 | appropriate method or procedure, keeping in this view, the study on Technical efficiency of Self Help
53 | Groups generating agriculture Poultry activity in Amravati division of Maharashtra was undertaken
54 | with the following objectives.

- 55 | - To ascertain the technical efficient self-help groups and identify the possible determinant of
56 | technical efficiency of self-help groups.

Comment [u6]: I assume that these are your objectives. Kindly placed it in your abstract and introduction.

57 | Study was undertaken in rural areas self help groups of Amravati division, which were
58 | engaged in selected agriculture based activity poultry. The five districts were selected for the **study**
59 | **Amravati study Amravati**, Akola, Washim, Buldhana and Yavatmal.

60 | The data needed for the **study was** collected from SHGs members by
61 | personal interview method using pre tested schedule for the purpose. Self help groups which are
62 | engaged in agriculture based activities to **analyse** the technical **efficiency, with**
63 | respect to purpose wise relating to portfolio lending by SHG's providers, utilization pattern of
64 | borrowed funds by the Self help groups, loan availed and repayment, rate of interest, service charges
65 | and other costs involved in borrowings, cost and returns involved in each activities selected groups
66 | efficiency and identified the determinants of variations in efficiencies among SHGs. Total of 50
67 | women SHGS has been selected agriculture based activities and there 10 years existent in five
68 | districts of Amravati division for economic analysis.

69 Analysis of data

To fulfill the specific objectives of the study, the data generated was subjected to statistical analysis using the following analytical tools and techniques

In order To ascertain the technical efficient self-help groups and identify the **possible determinant** of technical efficiency of self-help groups. Stochastic Frontier **Model** has been employed.

Stochastic frontier approach

Output oriented technical efficiency shows the **firms** ability to obtain maximum output from a given amount of inputs. Technical inefficiency affects allocative efficiency and a negative cumulative effect on economic efficiency operates. Hence the concept of technical efficiency is important for the better performance of the economic units. Technical efficiency is measured by the distance a particular firm is from the production frontier. A firm that sits on the production frontier is said to be technically efficient. The concept of technical efficiency is important to firms because their profit depends highly upon their value of technical efficiency.

Is a method of **economic modeling** It has its starting point in the **stochastic** production frontier models simultaneously introduced by Aigner, Lovell and Schmidt (1977) and Meeusen and Van den Broeck (1977). Is a method of **economic modeling**. It has its starting point in the **stochastic** production frontier models simultaneously introduced by Aigner, Lovell and Schmidt (1977) and Meeusen and Van den Broeck (1977).

Comment [u7]: ??? Confusing

The production frontier model without random component can be written as:

$$y_i = f(x_i; \beta) \cdot TE_i$$

Where,

y_i is the observed scalar output of the producer $i, i=1, \dots, I$, x_i is a vector of N inputs used by the producer i , $f(x_i, \beta)$ is the production frontier, and β is a vector of technology parameters to be estimated.

TE_i denotes the technical efficiency defined as the ratio of observed output to maximum feasible output. A stochastic component that describes random variables affecting the production process is added. The stochastic production frontier will become:

$$y_i = f(x_i; \beta) \cdot TE_i \cdot \exp \{v_i\}$$

We assume that TE_i is also a stochastic variable, with a specific distribution function, common to all producers.

We can also write it as an exponential

$$TE_i = \exp \{-u_i\},$$

Where,

$u_i \geq 0$, since we required $TE_i \leq 1$.

107 Thus, we obtain the following equation:

108 $y_i = f(x_i; \beta) \cdot \exp \{-u_i\} \cdot \exp \{v_i\}$

109 The technical efficiency of i^{th} firm at t^{th} time period is given by

110 $TE_{it} = \exp(-U_{it}) = \exp(-z_{it} \delta - W_{it})$

111 Now, if we also assume that $f(x_i, \beta)$ takes the log-linear [Cobb-Douglas](#) form, the
112 model can be written as:

113
$$\ln y_i = \beta_0 + \sum_n \beta_n \ln x_{ni} + v_i - u_i$$

114 We have followed Battese and Corra (1977) specification for variance parameters

115 $\Sigma s^2 = \sigma v^2 + \sigma^2$

116 $\gamma = \sigma^2 / \sigma s^2$

117 The value of γ lies between 0 and 1. Zero value of γ shows that variance of the
118 efficiency effects is zero and deviations from the frontier are entirely due to noise.

119 Value $\gamma = 1$ indicates that all deviations are due to technical efficiency

120 For output variable we have taken gross loan portfolio (measured in Rupees). cost
121 per borrower (CPB), assets, borrow per member, net returns and subsidy are taken as input
122 variables. all variable were measured in rupees.

123 **Specification of model**

124 Stochastic frontier model of technical efficiency are given below:

125 $\ln GLP_{it} = \beta_0 + \beta_1 LCPB_{it} + \beta_2 LASSET_{it} + \beta_3 LBPM_{it} + \beta_4 LNR_{it} + \beta_5 LSUB_{it} + V_{it} - U_{it}$

126 Where,

127 \ln natural logarithm (i.e. logarithm to the base e).

128 GLP_{it} represents all outstanding principals due for all outstanding members loans of i^{th} SHGs
129 at time period t.

130 $LCPB_{it}$ represents logarithm of cost per borrower (operating expense/ Number of active
131 borrowers) measured in Rupees of i^{th} SHGs at time period t.

132 $LASSET_{it}$ represents logarithm of total of all net asset account of the i^{th} SHGs at t^{th} time
133 period measured in Rupees

134 $LBPM_{it}$ represents logarithm of loan borrow per member of i^{th} SHGs at time period t.
135 measured in Rupees

136 LNR_{it} represents logarithm of net returns of i^{th} SHGs at time period t measured in Rupees

137 $LSUB_{it}$ represents logarithm of Subsidy taken by i^{th} SHGs at time period t, measured in
138 Rupees

139 β_i Parameters to be estimated

140 V_{it} are independent and identically random errors

U_{it} are non- negative random variables.

Allocative efficiency

Allocative efficiency refers to the ability and willingness of a firm to use this inputs optimally given the input prices. Allocative efficiency defined in terms of profit maximization, given the technology allocative efficiency refers to the achievement of optimum output so has to maximize gross loan.

$$\text{Allocative efficiency} = \text{GLP}_0 / \text{GLP}_E$$

GLP_0 = Observed maximum gross loan portfolio among all selected SHGs.

GLP_E = Estimated loan or potential gross loan portfolio at the level of input used by SHGs who obtained maximum gross loan .

Economic efficiency

the measure of economic efficiency can be divided in to two component viz., technical efficiency, price or allocative efficiency. It is combination of technical and allocative efficiency($EE = \text{Technical efficiency} \times \text{Allocative efficiency}$).

Marginal value productivity (MVP)

The MVP was computed by multiplying the coefficients of the given resources with ratio of the geometric mean of the output to the geometric mean of given resource for example the MVP of X_i would be

$$\text{MVP}(x_i) = b_i \frac{\overline{Y}(\text{GM})}{\overline{X_i}(\text{GM})}$$

Given,

GM = represents the geometric mean

MVP =Marginal value productivity

b_i =is the corresponding elasticity of x_i

$\overline{X_i}(\text{Gm})$ is the geometric mean of the i^{th} resources

$\overline{Y}(\text{GM})$ = is the computed value at geometric mean

Technical efficiency of poultry SHGs

Marginal likelihood estimates of the parameters of the production frontier in Table 1 shows the elasticities of frontier gross loan portfolio with respect to cost per and subsidy were estimated at the means of input variables to be 0.5117 and 0.1665 respectively. Given the specification of stochastic or Cobb-Douglas frontier model results shows that the elasticity of mean value of gross loan was estimated to be an increasing function of cost per borrower and an subsidy, this both variables positively significant contribution in the gross loan its indicates that

this variables to help the loan refund. Negative Marginal value of productivity of assets, borrow per member and net returns are determined to decrease the use of this variables and scope to increase this variable, the variable asset, borrow per member and net returns executed negative significant

Table 1. Maximum likelihood estimates of stochastic frontier production function of Poultry SHGs

Sr. No.	Explanatory variables	β_i	Coefficient	St. Error
1	Constant	β_0	3.8841	0.1826
2	Log cost per borrower	β_1	0.5117***	0.0779
3	Log assets	β_2	-0.0607**	0.0228
4	Log borrow per member	β_3	-0.0789*	0.0424
5	Log net return	β_4	-0.1144***	0.0438
6	Log subsidy	β_5	0.1665***	0.0349
Log likelihood			71.03	
		R^2	0.8444*	
		γ	0.9997	0.0018
		σ^2	0.0060	0.0020
Average Technical efficiency			0.9053	

*** significance at 1%, ** significance at 5%, * significance at 10%

contribution in determining the gross loan its indicates decline assets, borrow per member and there by reduction in net returns, its adversely

Table 2. Marginal value productivity of poultry SHGs

Sr. No.	variables	MVP
1	Cost per borrower	21.4472
2	Assets	-0.2285
3	Borrow per member	-0.7372
4	Net return	-0.1185
5	Subsidy	0.4219

affects the loan refund and hence the size of SHGs is limited and loan outstanding of **SHGs borrower** increases, in views of this it is necessary to increase the assets and borrow per member for SHGs income generating activities which will be the make the SHGs members to increase the net income to refund, therefore assets, borrow per member and net returns are the possible determinant of gross loan portfolio. The returns to scale parameters was found to be 0.4242 implying increase in the input variables

UNDER PEER REVIEW

198 | would results to less than ~~proportionate~~than proportionate increase in the gross loan of the poultry
199 | SHGs.

200 | The minimum and maximum efficiencies for all selected SHGs are presented in Table
201 | 3 based on estimated function technical efficiency of individual SHGs has been estimated, the results
202 | indicates the

203 | **Table 3. Efficiency distribution of Poultry SHGs**

Efficiencies	Efficiency level
Technical efficiency	0.9053
Allocative efficiency	0.6072
Economic efficiency	0.5542
Maximum Technical efficiency among selected SHGs	0.9966
Minimum Technical efficiency among selected SHGs	0.7632

204 |
205 | variations in technical efficiency 0.7632-0.9966 across the individual poultryindividual poultry
206 | SHGs. The minimum technical efficiency in selected SHGs sample was 0.7632 (76.32%), while
207 | maximum was 0.9966 (99.66%). The average technical efficiency for entire sample of poultry SHGs is
208 | 0.9053 indicating 0.0947 (9.47%) inefficiency implies to there is scopeis scope to increase the gross
209 | loan portfolio. prevails an allocative inefficiency to the extent of 39%among average SHGs in
210 | comparison with the SHGs who obtain maximum gross loan. The allocative efficiency 0.6072
211 | (60.72%), which indicates the allocative inefficiency is 0.3928 (39.28%) it can be from that there was
212 | scope to increasing poultry SHGs loan and the 0.5542 (55.42%) is economic efficiency and it found to
213 | 0.4458 (44.58%) economically inefficient poultry SHGs indicating which have scope to improve the
214 | economic efficiency.

215 | Frequency distribution of selected sample efficiency of SHGs poultry activities was
216 | presented in Table 4, in technical efficiency from

217 |
218 | **Table 4. Frequency distribution of sample efficiency of Poultry SHGs**

Sr. No.	Efficiency Index	No of SHGs		
		Technical Efficiency	Allocative Efficiency	Economic Efficiency
1	0.15-0.20	-	-	-
2	0.20-0.25	-	-	-
3	0.25-0.30	-	1	9

4	0.30-0.35	-	11	3
5	0.35-0.40	-	1	2
6	0.40-0.45	-	1	2
7	0.45-0.50	-	3	3
8	0.50-0.55	-	1	
9	0.55-0.60	-		8
10	0.60-0.65	-	8	5
11	0.65-0.70	-	10	5
12	0.70-0.75	-	4	7
13	0.75-0.80	2	1	2
14	0.80-0.85	8	9	3
15	0.85-0.90	11	3	
16	0.90-0.95	14		
17	0.95-1.00	15	1	1

Comment [u8]: No value???

all 50 SHGs majority of 15 SHGs were ranges between 0.95-1 efficiency level followed by 14 SHGs were ranges between 0.90-0.95 technical efficiency, 8 SHGs comes under the range 0.80.85 and only 2 SHGs ranges 0.75-80 respectively, technical efficiencies of majority of poultry SHGs were higher because low cost of borrowing of loan, increasing variations in technical efficiency estimates is indicating the some of the SHGs use their resources inefficiently in SHGs loan process but majority of SHGs use their resources efficiently. In allocative efficiencies majority of 11 SHGs ranges between 0.30-0.35, followed by 10 SHGs were ranges between 0.65-0.70, 9 SHGs ranges between 0.0.80-0.85, 8 SHGs ranges in 0.60-0.55, 4 SHGs ranges in 0.70-0.75, 3 SHGs from both ranges 0.45-0.50 and 0.85-0.90, 1 SHGs allocative efficiency from each range 0.25-30, 0.35-0.40,0.40-0.45, 0.50-0.55,0.75-0.80, 0.95-1.00, respectively, wide variations in allocative efficiency not proper allocation of resources and more scope to improve allocation of resources of poultry SHGs. In economic efficiencies majority of 9 SHGs ranges between 0.25-0.30, followed by 8 SHGs ranges between 0.55-0.60, 7 SHGs ranges between 0.70-0.75,5 SHGs from both ranges 0.60-0.65 and 0.70-0.75, 3 SHGs economic efficiency from each range 0.30-35, 0.45-0.50 and 0.80-0.85 and 2 SHGs economic efficiency from each ranges 0.35-0.40, 0.40-0.45, 0.75-0.80 and one SHGs ranges between 0.95-1.00, respectively. The wide variations in economic efficiency is indicating to which have more scope to improve economic efficiency of poultry SHGs.

CONCLUSIONS

1. In poultry SHGs the elasticity of mean value of gross loan was estimated to be an increasing function of cost per borrower and an subsidy, this both variables positively significant contribution in the gross loan.

2. Negative Marginal value productivity of assets, borrow per member and net returns are determine to decrease the use of these variables and scope to increase this variable, the variable asset ,borrow per member and net returns executed negative significant contribution in determining the gross loan its indicates decline assets, borrow per member and there by reduction in net returns, its adversely affects the loan refund.
3. The average technical efficiency was 0.9053, the average allocative efficiency was 0.6072 and average economic efficiency was 0.5542.

POLICY IMPLICATIONS

In views of this it is necessary to increase the assets and borrow per member for SHGs income generating activities which will be the make the SHGs members to increase the net income to refund, therefore assets, borrow per member and net returns are the possible determinant of gross loan portfolio. The amount needs to be fixed according to the income generating activities and borrow per member increases contribute more to their family income.

Comment [u9]: Preferable as conclusion of the study not for policy implications

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