Construction of Empowerment Index: A Case of Farm Women

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Abstract: *This paper makes an attempt to assess the empowerment of farm women in terms of socio-economic status. The required data for the study was drawn from the two most dynamic, one with highly diversified agri-enterprise (Kolar) and other with less diversified agri-enterprise (Mandya) agricultural districts of Karnataka State. The empowerment index revealed that the women empowerment was more in high agri-enterprise diversification region, compared to less agri-enterprise diversification region this has been significantly influenced by income earned by women, women literacy, access to family income and land ownership. To compute reliability of the index constructed, Spearman Split half reliability test was employed. The reliability coefficient of empowerment index for two regions was found to be 0.935 and 0.923, indicating perfect reliability of the index constructed.*

Key words: *Women empowerment Index, Spearman Split half reliability test, farm households*

INTRODUCTION

Empowerment is a complex concept, which vary over time and place (between countries and even between rural and urban areas).

Empowerment does not mean taking over others (men or in laws) or dominating others, it's simply strengthening women to believe in her innate ability to cope up with the difficulties and challenges of life; by earning income, taking independent decisions and face the difficulyies with the courage.

The concept of women empowerment was introduced at the International Women's conference in 1985 at Nairobi (Mokta, 2014). Empowerment of the deprived especially of women, begins with their ability to voice their opinion through participation in decision making, backed up by access to education (Sengupta, 1998). "Women's empowerment and their full participation as the basis of equality in all spheres of society are fundamental for the achievement of equality and development" (www.un.org). The empowerment process although consists of various components it begin with economic independence and education.

Empowerment as illustrated in oxford dictionary empower means to give power, make able, give strength and confidence too. Women empowerment is a multi-dimensional and multi-layered concept. Women empowerment is a process in which women secure substantial share of control over assets, decision making, intellectual [access to information, ability to think, understand, knowledge,] and financial resources. Women empowerment also means improvement of status of women in the family, in the community and in the society as a whole.

Women work on farm as well as off-farm, the income that is earned by women exclusively goes for food intake of household, children education and for other household expenditure. Further, women possessing title to land ensures economic security to herself and children, as women always concerned with welfare of households. The present study mainly focus on, knowing the level of women empowerment. The outcome of the study is expected to provide inputs for policy makers to appreciate the farm women's crucial socio-economic role and it also enables the policy makers in devising

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appropriate policies towards empowerment of women.

METHODOLOGY

Sampling

Primary data was collected from 160 respondents. Personal interview method was followed to collect the primary data using pre-tested schedule. The study was taken up in two most dynamic, one with highly diversified agri-enterprise (field crops: ragi, horsegram, fieldbean, redgram, fodder jowar, maize, paddy; vegetables: tomato, potato, cabbage, coriander, onion; flowers: marigold, rose; fruits: mango, tamarind, cashew; sericulture, moriculture, dairy, sheep, poultry, wage earnings) (Kolar district) and the other with less diversified agri-enterprise(field crops: ragi, paddy, horsegram; commercial crop: sugarcane, sericulture, moriculture, dairy, goat, wage earnings) (Mandya district) agricultural districts of Karnataka State. These two districts were purposively selected because of existence of distinct cropping pattern. From highly diversified agri-enterprise region, Bangarpet and Malur taluks were selected since they consist of large number of female landholders accounting for 7305 and 7170 respectively. From less diversified agri-enterprise region (Mandya district), Mandya and Malavalli taluks were chosen purposively as they consists of large number of female land holders 21579 and 19472 respectively.

Analytical Tools

The analytical tools employed in the present study are elaborated under the following headings.

Empowerment Index

To find the level of empowerment of rural women, an empowerment index was constructed by considering the set of variables that constitute the empowerment. To construct empowerment index the weighted indices were worked out.

Assigning weight needs too much expertise in the subject and some conceptual base for giving weight and was really challenging task. Inspite of this, the variables were given weights by dividing actual score of each variable with maximum score of the same variable (Sakamma, 2013). Hence the weight assigned was found to be more precise as it varies across each respondents and variables. Further this weight was multiplied with the values of each variable and summated.

The empowerment index was worked out by dividing the index of each respondent with highest index.

$$Empowerment\ Index_i = \frac{\sum\limits_{j=1}^{P}\left[\left(A_{ij}/H\right)A_{ij}\right]}{p\ Max\left[\sum\left[\left(A_{ij}/H\right)A_{ij}\right]\right]}$$

Where i   =   1, 2, …………………80

i = number of respondents

Aij = Actual value/score of ith respondent and jth variable

H = [max (A$_{ij}$)] = Maximum Value/ score of ith respondent and jth i variable

p = Number of variables

Women were categorized into high and low empowerment based on the magnitude of the empowerment index. Women who had an index greater than or equal to 0.5 were categorized under high level of empowerment, those who had an index lesser than 0.5 under low empowerment.

The variables considered for working empowerment index and the scores assigned are as follows:

i. **Age of women** – number of years of age was considered

ii. **Education of women** - According to level of education, the respondents were classified into: Illiterates - Who is not able to read and write – 0, Primary school – Who had 1-4 standard of formal schooling – 1, Middle school –Who had 5-7 standard of formal schooling – 2, High school - Who had 8-10 standard of formal

schooling – 3, PUC – two years of formal college – 4, Degree and above - 5

iii. **Education of men(spouse)** - According to level of education, the respondents were classified into: Illiterates - Who is not able to read and write – 0, Primary school – Who had 1-4 standard of formal schooling – 1, Middle school –Who had 5-7 standard of formal schooling – 2, High school - Who had 8-10 standard of formal schooling – 3, PUC – two years of formal college – 4, Degree and above – 5

iv. **Caste** – The sample respondents were classified based on caste into: Women belonging to SC and ST – 1, Women belonging to other caste – 2, (other caste include Vokkaliga, Reddys, Kumbara, Acharya, Lingayat, Gangatagas, Brahmin)

v. **Family type** - The respondents were classified based on family type into: Women belonging to joint family – 1, Women belonging to nuclear family – 2, [Nuclear family refers to parents and unmarried children living together and Joint family refers to parents and married children living together].

vi. **Presence of children** – If female children present – 1, If male and female children present – 2, If male children present - 3

vii. **Participation in organization** – Based on institutional participation sample respondents were classified as: No participation – 0, Participation – 1

viii. **Ownership of land** – based on land ownership sample respondents were classified as:

Land owned by women – 1, Land not owned by women – 0

ix. **Access to credit:** Women having access to credit - 1, Women not having access to credit - 0

x. **Assets owned (household assets, farm assets, house)** – assets owned by women are taken in value terms

xi. **Access to family income :** Women not having access over family income – 0, Women having access over family income - 1

xii. **Income earned by women**–income earned by women taken in rupee terms

xiii. **Frequency of income:** Income earned weekly - 5, Income earned monthly (wage earning, dairy) - 4, Income earned quarterly (once in three months) - 3 (sericulture,vegetables, flowers irrigated crops rabi), Income earned half yearly (6 months crops kharif and summer) - 2, Income earned yearly (annual crops) - 1

xiv. **Savings** – savings by women taken in rupee terms

xv. **Bank account** – Having bank account by women – 1, Bank account not present – 0

xvi. **Total benefits derived from women welfare/developmental programmes:**

Benefits not received – 0, Benefits received - 1

Table 1
Details of decision related to crops, livestock, household activities, farm, household finance

Sl no	XVII. Crops	XVIII. Livestock	XIX. Household activities	XX. Farm finance	XXI. Householdfinance
1	Selection of crops	Type of cattle to be raised	Food preparation	Purchase and sale of land	Expenditure on Education
2	Varietal selection	Number of cattle to be raised	Health and hygiene	Investment on land (Well, farm building, irrigation structure, channels, fencing)	Expenditure on health

(*contd...*)

(*Table 1 contd...*)

Sl no	XVII. Crops	XVIII. Livestock	XIX. Household activities	XX. Farm finance	XXI. Householdfinance
3	Quantity to be produced	Breed of cattle	Family planning	Investment on subsi diary enterprise	Expenditure on household articles
4	Area	Quantity of milk to be retained for home consumption	Participation in social organisations	Improvement on land (soil and water conservation, levelling, quantity of fertilizers pesticides to be applied)	Expenditure on ceremonies
5	Hired labour to be employe	Number of sheep/goat to be raised	Participation in ceremonies	Farm credit required	Expenditure on celebration of festivals
6	Quantity of farm prod-uce to be retained for home con-sumption	Number of poultry birds to be raised	Celebrating festivals	Purchase and sale of farm machinery	Expenditure on ornaments and clothes
7	Quantity of seeds to be sown	Consumption of poultry meat, eggs	Children's Education	Borrowing and repay-ment of loan	Savings
8	Quantity and of fert-ilizer to be applied	-	-	-	-
9	Quantity of Pesticide to be applied	-	-	-	-
10	Time of seeds to be sown	-	-	-	-
11	Time and of fertilizer to be applied	-	-	-	-
12	Time of Pesticide to be applied	-	-	-	-
13	Storage of produce	-	-	-	-
14	Marketing of produce	-	-	-	-

xvii to xxi. **Decision making:**

If the respondent is not involved in decision making - 0

Involved in one decision making - 1

Involved in two decision making - 2

Involved in three decision making - 3

Involved in four decision making - 4

Involved in five decision making - 5

Involved in six decision making - 6

Involved in seven decision making - 7

Involved in eight decision making - 8

Involved in nine decision making - 9

Involved in ten decision making - 10

Involved in eleven decision making - 11

Involved in twelve decision making - 12

Involved in thirteen decision making - 13

Involved in fourteen decision making - 14

Spearman-Brown Split half reliability test

In order to compute reliability of the index constructed, split half reliability test was employed. For the purpose of computation, the empowerment index scores were divided into two halves in random manner and correlation coefficient was estimated for the two halves using correlation. The correlation coefficient was fitted into the Spearman-Brown split half reliability test which is given by formula,

$$r_{sb} = 2r_{xy} / (1 + r_{xy})$$

In this formula, r_{sb} is the split-half reliability coefficient, and r_{xy} represents the correlation between the two halves of the scale (here refers to empowerment score). If the *Spearman-Brown split half* coefficient is more than 0.9 the index is considered to be perfect reliable and otherwise less reliable.

Step wise multiple linear regression model

To know the factors influencing empowerment several functional forms were tried, however multiple linear regression was found to be the most suitable form. The model considers women empowerment score as a function of age of women, education of women, income earned by women, participation in number of farm and livestock decision making, participation in number of farm financial decision making, participation in number of household decision making, participation in number of household financial decision making, dummy variables pertaining to caste, family type, organizational participation, land ownership, access to family income, frequency of income, benefits derived from women welfare/developmental programmes. (Principal Component Analysis) was used to reduce the number of variables and variables which had more than or equal to 0.65 variation were selected to run step wise regression).

The function used for the study is:

$$Y_i = a + b_1 x_1 + b_2 x_2 + b_3 D_1 + b_4 D_2 + b_5 D_3 + b_6 D_4 + b_7 D_5 + b_8 x_8 + b_9 D_6 + b_{10} D_7 + b_{11} x_{11} + b_{12} x_{12} + b_{13} x_{13} + b_{14} x_{14} + e$$

The variables chosen to run the step wise multiple linear regression for empowerment score is as follows:

Y_i = Women empowerment index score

X_1 = Age of the women (years)

X_2 = Literacy of women (years of schooling)

D_1 = Dummy (caste) =1 if women belong to SC and ST, otherwise 0 for women belong to other caste)

D_2 = Dummy (family type) =1 if women belong to nuclear family, otherwise 0 for women belonging to joint family)

D_3 = Dummy (organizational participation) =1 if women participate, otherwise 0 for women not participating

D_4 = Dummy (land ownership) =1 if women own land, otherwise 0 for women not owning land)

D_5 = Dummy (access to family income) =1 if women has access to family income, otherwise 0)

X_8 = Income earned by women (rupees)

D_6 = Dummy (frequency of income) = 1 if income earned by women yearly, 2 if income earned by women half yearly, 3 income earned by women quarterly, 4 income earned by women monthly, 5 if income earned weekly otherwise 0 if no income earned)

D_7 = Dummy (benefits derived from women welfare/developmental programmes) = 1 if benefit received, otherwise 0)

X_{11} = Participation in number of farm and livestock decision making

X_{12} = Participation in number of farm financial decision making

X_{13} = Participation in number of household decision making

X_{14} = Participation in number of household financial decision making

e = error

RESULTS AND DISCUSSION

The respondents were post-stratified into high and low empowerment categories based on empowerment index constructed by considering set of socio-economic variables. In general, women empowerment is low in India which is not exception to study area and within the available empowerment, it was classified into high and low empowerment categories. From the result (Table 2) it was found that only 57.5 per cent of farm women were high empowered in case of highly diversified agri-enterprise region and 42.5 were less empowered. Out of 57.5 per cent high empowered farm women, 67.4 per cent belonged to rainfed and 32.6 per cent to irrigated situation. In the case of less diversified agri-enterprise region, 33.8 per cent of farm women were high empowered and 66.2 per cent belonged to low empowerment. Out of 33.8 per cent of high empowered farm women, 63 per cent belonged to rainfed situation and 37 per cent to irrigated situation.

It was found that women empowerment was high in highly diversified agri-enterprise region, compared to less diversified agri-enterprise region (Table 2). This can be attributed to the influence of study region, as it is characterized by diverse agri-enterprises like dairy, sericulture besides crops, due to rainfed situation and women play a pivotal role specially in dairy and sericulture. Besides, it is a common practice to give an animal usually cow or buffalo as part of women's dowry. The livestock and sericulture serve multiple functions as a source of income, savings and contribute to food security. So that women earn extra income from dairy and sericulture and thus sustain family income during periods of production and price risk.

Spearman Spilt half reliability test

To ascertain the reliability of constructed empowerment index, Spearman split half reliability test was performed. The reliability coefficient of empowerment index for highly diversified agri-enterprise region and less diversified agri-enterprise region (Table 2) was found to be 0.935 and 0.923 respectively, indicating perfect reliability of the index constructed.

Factors influencing women empowerment: Step wise multiple linear regression

The results (Table 3) revealed that the women empowerment in highly diversified agri-enterprise region has been significantly influenced by income earned by women, participation in number of crop and livestock decision making, decision making in household finance, literacy, decision making in farm finance, access to family income, decision

Table 2
Classification of respondents into different categories of empowerment based on empowerment index

(in numbers)

Particulars	High empowerment		Low empowerment		Pooled	
	I	R	I	R	I	R
Highly diversified agri-enterprise region	46(57.5)		34(42.5)		80 (100)	
	15 (32.6)	31 (67.4)	25 (73.5)	09 (26.5)	40 (50)	40 (50)
Reliability coefficient of EI (Highly diversified agri-enterprise region)			0.935			
Less diversified agri-enterprise region	27 (33.8)		53 (66.2)		80(100)	
	10 (37.0)	17 (63.0)	30 (56.6)	23 (43.4)	40 (50)	40 (50)
Reliability coefficient of EI (Less diversified agri-enterprise region)			0.923			

Note: EI represents empowerment index, Figures in parentheses represent percentage to total, I=Irrigated farm, R = Rainfed farm

making in household activities and land ownership.

In less diversified agri-enterprise region (Table 4) women empowerment has been significantly influenced by income earned by women, participation in number of crop and livestock decision making, family type, literacy and caste. The intercept was found to be highly significant and negative for both the regions (Tables 3 & 4). Significant and negative intercept indicates if women do not earn income, not participate in decision making, illiterate, if she does not have access to income, and if she do not own land, then women empowerment is suppressed. In the sense, women need to seek permission of other households/spouse to take up any activities, either to spend, to earn, to perform any work. In certain cases they are not even, allowed to attend their work due to male dominance, which clearly indicates that women are more disadvantaged when compared to men in all spheres of life. Similarly, in less diversified agri-enterprise region, income earned by women, crop and livestock decision making, family type, education and caste do matter in empowering women.

Table 3
Factors influencing women empowerment: Stepwise multiple linear regression – highly diversified agri-enterprise region

Sl. no.	Particulars	B – coefficients
	Number of observations	80
1	Intercept	-0.174***(-2.46)
2	Net Income earned by women (Rs)	0.251***(7.78)
3	Number of decisions regarding agriculture and animal husbandry	0.418***(8.10)
4	Number of decisions taken regarding household finance	0.037***(6.93)
5	Literacy of women (years of schooling)	0.008***(2.78)
5	Number of decisions taken regarding farm finance	0.011***(3.87)
6	Access to family income (Yes =1, No =0)	0.252***(2.66)
7	Number of decisions taken regarding household activities	0.029**(2.67)
8	Land ownership (yes =1, No = 0)	0.270**(2.51)
9	R^2	0.93

Note: Figures in parentheses indicate t-value, ***, **
Significant at 1 &5 per cent

Table 4
Factors influencing women empowerment: Stepwise multiple linear regression –less diversified agri-enterprise region

Sl. no.	Particulars	B – coefficients
	Number of observations	80
1	Intercept	-0.116***(-2.20)
2	Income earned by women(Rs)	0.051***(6.99)
3	Number of decisions regarding agriculture and animal husbandry	0.014***(3.95)
4	Family type(1=nuclear, 0=joint)	0.167**(2.73)
5	Literacy of women (years of schooling)	0.090***(2.34)
6	Caste (1=SC/ST, 0=others)	0.175**(2.13)
7	R^2	0.94

Note: Figures in parentheses indicate t-value, ***, **
Significant at 1 &5 per cent

The findings of the present study are in line with that of previous study by Kiran *et al*. (2012) where family type, land holding, socio-political participation, socio-economic status, family type and decision making pattern were the significant factors influencing women empowerment.

CONCLUSION

The empowerment index constructed is used to classify women into high and low empowered categories the weight assigned was found to be more precise as it varies across each respondents and variables. Women empowerment was high in highly diversified agri-enterprise compared to less diversified agri-enterprise region because of highly diversified cropping pattern combined with diverse agriculture and allied activities followed in highly diversified agri-enterprise region. Further women empowerment was high across rainfed situation compared to irrigated situation. This is because of the resource constraint under rainfed condition which forces women to take up several income generating activities which insulates women and her households, against worse conditions. High empowered women aims at maximizing the income by taking up various income generating activities in addition to crop production such as, dairying, backyard poultry, sheep rearing/goatry, kitchen gardening, flower vending, picking of pongamia

and castor seeds, working on others farm for wage, tailoring, petty shops. Thus, they use resources efficiently and spread the risk across various enterprises instead of taking only one activity.

The step wise multiple regression analysis revealed that income earned by women, land holding, education and decision making were some of the important variables influencing women empowerment. Thus, in order to further increase the women empowerment more number of entrepreneurship development programmes should be provided in rural areas by Women and Child Welfare Department, Gram panchayat and SHG's which in turn facilitate women to earn more income. This income will be used by women for the livelihood of households. Land rights - existing laws irrespective of sharing of ancestral property including land, should be strictly enforced/ implemented to provide rights to women over property and awareness regarding the provisions of act should be created among women.

In addition, it is also required that land and asset ownership should be made joint ownership which not only increases women empowerment, it also safeguards household livelihood security. Education has multidimensional impact not only on enhancing women empowerment but also efficiency and on overall livelihood security of household. Hence, they should evolve a special package to increase literacy level of female child to reduce school drop outs. Besides existing incentives, additional incentives may be provided for higher education.

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