# Determinants of Women in Agriculture

**S.M.Subbulakshmi, V.Darling Selvi**

***Abstract:*** ***Agriculture in India is significantly dependent on women. Women make up about 33 percent of cultivators and about 47 percent of agricultural labourers in rural India constituting 84 percent of the rural women force. As per census 2011, women formed 75 per cent of the agricultural sector workforce, around 80 per cent from rural India, forming cultivators (33%) and agricultural labourers (47%). This paper focuses on the determinants of women in agriculture by taking a sample of 600 rural women from Tirunelveli District of Tamilnadu who actively involved in agriculture. The researcher used reliability statistics to know the normality of the data, KMO and Bartlett's Test, factor analysis, Structural equation modeling and regression weights for analyzing and interpreting the results. The study shows that the factors such as forced factor, voluntary factor, achievement factor, support factor and satisfaction factor determine the choice of women to take up the field of agriculture as their passion. The path analysis model suggests that it is the forced factor and voluntary factor which make the rural women to take up the job of agriculture which gives them the sense of achievement through support factor and ultimately they are satisfied with the agricultural operations. It is suggested that the attitudes regarding women's roles in agriculture must change, and the onus is on policy makers to create a favorable ecosystem for women engaged in farming by ensuring greater access to physical and monetary resources.***

***Keywords: Agriculture Labors, Determinants, Model fit, Reliability, Women***

## I. INTRODUCTION

Agriculture is that the backbone of the Indian economy. Agriculture women play a significant role in building this economy. Over the years, there's a gradual realization of the key role of women labors in agricultural development and their important contribution within the field of agriculture, food security, farming, processing, nutrition, sericulture, fisheries, and different allied sectors. As per the latest census, women agri laborers fashioned seventy-five per cent of the agricultural sector hands. In rural Asian country, around eighty per cent of female relied on agriculture for her bread and butter.

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They account for thirty-three per cent of cultivators and forty-seven per cent of agricultural laborers. Rural ladies typically manage complicated households and pursue multiple ways of earnings. Their activities sometimes embody manufacturing agricultural crops, tending animals, process and getting ready food, going for wages in agricultural or different rural enterprises, aggregation fuel and water, partaking in trade and promoting, caring for relations and maintaining their homes.

Several of those activities don't seem to be outlined as "economically active employment" in national accounts however they're essential to the upbeat of rural households.

## II. WOMEN IN AGRICULTURE:

Women have created vital contributions to agriculture in India. This state of affairs of rural transformation has delivered the way of women's roles in agriculture. Agriculture is one among the most important sectors taking part in an important role within the country's economy. Especially in agriculture most of women laborers contributing their work for the development of agriculture but still in our country the women agricultural labors situation is very poor, low wages paid, some unpaid works and have no assets. Agriculture in Republic of India is considerably keen about women; they compose concerning thirty-three percent of cultivators and about forty-seven percent of agricultural laborers in rural India. Overall, the proportion of rural women who rely upon agriculture for her necessity of life is as high as eighty-four percent. However general barriers like finance, inputs, extension services and land rights have restricted their potential and recognition. Often, women don't seem to be given due recognition as farmers that hampers their ability to access productive input. Extension services typically engage with male farmers, whereas ignoring women because it is assumed that women do not manage the farm.

## III. FUNCTIONS OF WOMEN IN AGRICULTURE

Women are playing many roles as much as they can, for example they are doing agricultural related activities like transplanting the seeds and crops, irrigating the crops, application of fertilizers to the plants, harvesting, etc. Furthermore they are doing many household activities they need to run for preparing their bread and butter simultaneously they are occupied with the cattle field and milking them.

## IV. REVIEWS OF LITERATURE

Nishi Slathia (2015), portrays in the paper "Participation of Women in Agricultural Production", that "Women's wage work is taken into account a threat to the male ego and women's engagement in multiple home-based economic activities ends up in below remuneration for her work. The nature and sphere of women's productivity within the marketplace is basically determined by socio cultural and economic factors. Women don't enter the marketplace on equal terms when put next to men".

Dr. Mun Mun Ghosh, and Dr. Arindam Ghosh (2014), were opined that "active involvement and participation of women within the agricultural sector in the majority of the states with few exceptions like Kerela and West Bengal wherever women are actively collaborating in non-agricultural activities which incorporates house-hold business, service sector and so on".

Dr. Roshan Lal, Dr. Ashok Khurana (2011), explained that the "Women have contend and still play a key role within the conservation of basic life support systems like land, water, flora and fauna. The character and extent of women's involvement in agriculture varies greatly from region to region and their involvement varies wide among completely different ecological sub-zones, farming systems, castes, categories and stages within the family cycle. Women are forced to simply accept to be in agriculture in their own village below terribly unhealthy conditions as a result of they can't migrate as simply as men".

Purnamita Dasgupta and Bishwanath Goldar (2006), came out with the conclusion that "an inverse relationship between offer of labor and wage rate at low level of wage, particularly for female in rural areas. The results showed that provide of feminine labour from below personal income households in rural areas is reciprocally associated with wage rate and therefore the variety of earning members within the family".

Panghal and Mange Ram (1985), critically evaluated "the employment pattern of female labour on farms in numerous agro-climatic zones of Haryana. The study unconcealed that because the size of farm enlarged the participation of women labor conjointly increased. The increasing trend of women labor participation with the rise within the size of farm is because of the actual fact that the larger is that the size of the farm increasing the number of employed women labour".

## V. FACTORS INFLUENCING WOMEN IN AGRICULTURE

Women take part actively in farming activities and in processing farm products, in addition to their domestic and reproductive responsibilities. Women are the main and primary worker in agriculture, but their work is low paid and sometimes unpaid, due to their economic imbalance they are involving in agriculture. Most of the women involving in agriculture due to their family situation, to support their family, to be economically independent like that but they are not recognized globally. Although agriculture women play an imperative role in farming and in rising the standard of life in rural areas, their contributions usually stay hidden. Indian rural ladies share substantial responsibilities and perform a large spectrum of duties in most of the family connected activates, farming connected activities still, besides their exclusive involvement in domestic chores. Therefore, the agricultural labours are thought-about the backbone of Asian nation economy. Female labours sometimes contribute in gathering of crops, weeding, threshing, field irrigation and post-harvesting processes. The following tables explain the determinants of agriculture in the lives of sample women who directly involved in agriculture.

**Table 1 . Cronbach's Alpha on the Determinates of Women in Agriculture**

| Reliability Statistics | |
|---|---|
| Cronbach's Alpha | N of Items |
| .817 | 16 |


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**Table 2. Reliability Statistics for the Determinates of Women in Agriculture**

| No | Statements | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| 1 | Family situation | 48.81 | 34.838 | .549 | .798 |
| 2 | Traditional Work | 49.82 | 35.472 | .367 | .811 |
| 3 | To support the family | 49.08 | 33.847 | .569 | .796 |
| 4 | Self interest | 50.18 | 35.523 | .388 | .809 |
| 5 | To get job satisfaction | 51.61 | 39.242 | .096 | .823 |
| 6 | To support the agriculture | 51.11 | 38.057 | .162 | .824 |
| 7 | Par in income with spouse | 49.15 | 34.663 | .554 | .798 |
| 8 | To be my own boss | 49.19 | 34.264 | .509 | .800 |
| 9 | To avoid poverty | 49.08 | 34.359 | .561 | .797 |
| 10 | Geographical relocation | 51.74 | 39.076 | .155 | .819 |
| 11 | Convenience | 50.05 | 35.521 | .447 | .805 |
| 12 | Low level of literacy | 49.43 | 34.479 | .537 | .799 |
| 13 | Unemployment | 49.61 | 35.593 | .436 | .806 |
| 14 | To be economically independent | 48.83 | 34.073 | .657 | .792 |
| 15 | Flexible working time | 50.46 | 37.094 | .289 | .815 |
| 16 | Easy job | 50.88 | 37.462 | .388 | .810 |

Source: Primary Data

As the value of Cronbach's Alpha is 0.817, it is confirmed that the chosen variables such as family situation, traditional work, to support family, self interest, to get job satisfaction and all the sixteen statements are reliable for further testing and no variable is outlier as they have good correlation.

**Table 3 . KMO and Bartlett's Test for the Determinates of Women in Agriculture**

| Kaiser-Meyer-Olkin and Bartlett's Test | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .775 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2535.855 |
| | df | 120 |
| | Sig. | .000 |

Source: Derived

As per per Kaiser-Meyer-Olkin test, the sampling adequacy is 0.775 which is above .5 with the chi square value of 2535.855 and is statistically significant as the p value is .000 which is below 0.05.

**Table 4. Rotated Component Matrix for the Determinants of Women in Agriculture**

| Statements | Components | | | | |
|---|---|---|---|---|---|
| | Forced Factor | Voluntary Factor | Achievement Factor | Support Factor | Satisfaction Factor |
| Family situation | .689 | .039 | .217 | .204 | .180 |
| Unemployment | .668 | .205 | -.089 | .229 | .010 |
| To be economically independent | .667 | .325 | .225 | .114 | .123 |
| Geographical relocation | .520 | .000 | .023 | -.286 | -.447 |
| To avoid poverty | .515 | .176 | .439 | .023 | .105 |
| Par in income with my spouse | .462 | .219 | .393 | -.034 | .362 |
| Self interest | .056 | .810 | .054 | .123 | .020 |
| Low level of literacy | .208 | .641 | .343 | -.047 | .098 |
| Convenience | .407 | .594 | .059 | -.189 | -.013 |
| Traditional Work | .001 | .113 | .806 | .093 | -.110 |
| To be my own boss | .212 | .104 | .707 | -.003 | .320 |
| To support the family | .361 | .413 | .428 | .192 | -.187 |
| To support the agriculture | .058 | .100 | -.052 | .746 | -.023 |
| Flexible working time | .250 | -.130 | .256 | .706 | -.039 |
| To get job satisfaction | .139 | -.113 | .061 | -.266 | .746 |
| Easy job | .115 | .386 | .038 | .318 | .560 |
| Variance % | 16.255 | 12.695 | 12.402 | 9.475 | 8.878 |
| Cumulative % | 16.255 | 28.951 | 41.353 | 50.828 | 59.706 |
| % of total | 27.225 | 21.262 | 20.771 | 15.870 | 14.870 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. | | | | | |

Source: Primary Data

Forced Factor: This factor consists of six statements such as, family situation (.689), Unemployment (.668), to be economically independent (.667), geographical relocation (.520), to avoid poverty (.515) and par in income with their spouse (.462). The variance of this factor is 16.255 percent which consists of 27 percent out of total.

Voluntary Factor: The statements coming under this head are, Self interest (0.810), Low level of literacy (.641) and convenience (.594). The variance of this factor is 12.695 percent which consists of 21 percent out of total.

Achievement Factor: The statements coming under this head are, traditional work (.806), to be their own boss (.707) and to support the family (.428). The variance of this factor is 12.402 percent which consists of 21 percent out of total.

Support Factor: The Statements filtered under this factor are, to support the agriculture (.746) and flexible working time (.706). The variance of this factor is 9.475 percent which consists of 16 percent out of total.

Satisfaction Factor: The statements coming under this head are, to get job satisfaction (.746) and easy job (.560). The variance of this factor is 8.878 percent which consists of 15 percent out of total.

**Table 5 . Component Transformation Matrix for the determinants of being in agriculture**

| Component | Forced Factor | Voluntary Factor | Achievement Factor | Support Factor | Satisfaction Factor |
|---|---|---|---|---|---|
| Forced Factor | .655* | .502* | .498* | .189 | .189 |
| Voluntary Factor | .056 | -.107 | -.123 | .873* | -.456* |
| Achievement Factor | -.244 | -.385 | .275 | .398 | .747* |
| Support Factor | -.296 | .694* | -.520* | .209 | .341 |
| Satisfaction Factor | .649* | -.326 | -.625* | -.021 | .286 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. | | | | | |
| | | | | | |

Source: Derived

The Forced factor has positive relationship with Voluntary factor (.502) and achievement factor (.498), the voluntary factor has positive relationship with support factor (.873) and negative relationship

with satisfaction factor (-.456), the achievement factor has positive relationship with satisfaction factor (.747), the support factor has the positive relationship with Voluntary factor (.694) and the negative relationship with achievement factor (-.520), the satisfaction factor has the positive relationship with forced factor (.649) and the negative relationship with achievement factor (-.625). Hence it is inferred that the determinants of agriculture of the sample respondents mainly depends on Forced factor and Support Factor.

**Table 6 . Model Summary for Path Analysis**

| Model | Chi-Square | CMIN/DF | P-Value | RMR | NFI | GFI | AGFI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|
| Study Model | 12.726 | 4.242 | .005 | 0.088 | 0.971 | .992 | .958 | .982 | .074 |
| Recommended Value | | Acceptable fit [1-4] | Less than 0.05 | Less than 0.10 | >0.95 | 0.8-0.9 | 0.8-0.9 | 0.8-0.9 | Less than 0.1 |

Source: Derived

It is observed from the above table the Chi-Square value is 12.726, the CMIN/DF value is 4.242 with the significant value of 0.005. The RMR value is lesser than 0.10, closer the RMR is to 0, that is better the model fit. NFI values above .95 are good. RFI, IFI, TLI and CFI values close to 1 indicate a very good fit. The GFI for this model is 0.992, AGFI is 0.958, CFI is 0.982. RMSEA is 0.074, a value of the RMSEA of about 0.05 or less would indicate a close fit of the model in relation to the degrees of freedom. In the above table the value is higher than 0.05 so it is not close fit of the model. All these values are within the commonly accepted parameters except CMIN and hence it can be concluded that the data set exactly fits into the model.

**Table 7 . Regression Weights**

| Structural Paths | | | Estimate | S.E | C.R. | P | Result |
|---|---|---|---|---|---|---|---|
| Achievement | <--- | Forced | .291 | .026 | 11.078 | *** | Significant |
| Achievement | <--- | Voluntary | .244 | .041 | 5.963 | *** | Significant |
| Support | <--- | Achievement | .158 | .025 | 6.295 | *** | Significant |
| Satisfaction | <--- | Support | .021 | .028 | .758 | .449 | Not Significant |

Source: Derived

The above table shows the AMOS text output for the unstandardized maximum likelihood estimates of structural paths. The significance test is the critical ratio (CR), which represents the parameter estimate divided by its standard error. The parameter estimate is significant at $p \leq 0.05$ and vale of C.R is > 1.96. The probability of getting a Critical Ratio (CR) in Par1 – 11.078, Par2 – 5.963 and Par3 – 6.295 all the three are greater than 1.96 regression weight so that the path is significant at the .05 level that is estimated path parameter is significant and, p-value in the three path's are shown as (***) three asterisks it indicates significance smaller than .001. , in Par4 the CR is lesser than the value 1.96 so that it is not significant.

**Table 8. Standardized Regression Weights**

| Structural Paths | | | Estimate |
|---|---|---|---|
| Achievement | <--- | Forced | .430 |
| Achievement | <--- | Voluntary | .232 |
| Support | <--- | Achievement | .249 |
| Satisfaction | <--- | Support | .030 |

Source: Derived

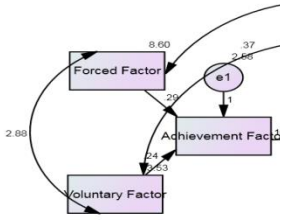
From the above table, it is seen that the standardized regression weights and the correlations are independent of the units in which all variables are measures; therefore, they are not affected by the latent choice of identification constraints.

**Table 9. Covariances**

| Structural paths | | | Estimate | S.E. | C.R. | P | Label | Result |
|---|---|---|---|---|---|---|---|---|
| Forced | <--> | Voluntary | 2.879 | .254 | 11.339 | *** | par_5 | Significant |
| e3 | <--> | Forced | .634 | .110 | 5.782 | *** | par_6 | Significant |
| e3 | <--> | Voluntary | .373 | .070 | 5.352 | *** | par_7 | Significant |

Source: Derived

From the above table, the probability of getting a critical ratio 11.339 in absolute value is less than 0.001 in Par_5, that is the covariance between Forced and voluntary total is significantly different from zero at the 0.001 level (two-tailed). Following that in the second and third label Par_6 and Par_7, the probability of getting a critical ratio are 5.782 and 5.352 in absolute value less than 0.001 in the covariance between e3 to forced and voluntary total is significant different from zero at the 0.001 level (two-tailed). Thus, the above covariance hypothesis is supported.




The model suggests that it is the forced factor and voluntary factor which make

the rural women to take up the job of agriculture which gives them the sense of achievement through support factor and ultimately they are satisfied with the agricultural operations.

## V. CONCLUSION

Swaminathan, the famous agricultural scientist describes that "it was woman who first domesticated crop plants and thereby initiated the art and science of farming". While men went out searching of food, female started gathering seeds from the native flora and commenced cultivating those of interest from the purpose of food, feed, fodder, fibre and fuel. Female have acted and still play a key role within the conservation of basic life support systems like land, water, flora and fauna. They need protected the health of the soil through organic employment and promoted crop security through the upkeep of varietal diversity and genetic resistance. One of the principal drivers pushing women into farm management is male out-migration from rural to urban areas in search of a better life. The study shows that the factors such as forced factor, voluntary factor, achievement factor, support factor and satisfaction factor determine the choice of women to take up the field of agriculture as their passion. The path analysis model suggests that it is the forced factor and voluntary factor which make the rural women to take up the job of agriculture which gives them the sense of achievement through support factor and ultimately they are satisfied with the agricultural operations. The model has good fit as the required variables are within the limit. Hence it is suggested that the attitudes regarding women's roles in agriculture must change, as must their access to physical and financial resources so that they can effectively do their jobs. Thus, the responsibility is on policy makers to form a favorable system for women engaged in farming by guaranteeing larger access to physical and monetary resources.

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