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An Empirical Analysis of the Determinants of Women Labour Force Participation among the Tiwa Tribe in Assam of North East India

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Abstract: **The main purpose of this study is to examine the socio-economic determinants of women labour force participation among the Tiwa tribe in Morigaon and Nagaon districts of Assam in North East India and suggested necessary measures to the policy makers to increase women participation in labour market. We have selected four blocks from Morigaon district and two blocks from Nagaon district, where Tiwa population is highly concentrated. The study is based on primary data collected randomly. Almost 442 in the age cohort 15-64 are interviewed with the help of well structured questionnaire for the study. Besides descriptive statistics, here we use the Logistic Regression method in order to determine important socio-economic determinants of work force participation of Tiwa women. The level of education turns out to be insignificant variable in explaining women workforce participation for both married and unmarried women. It highlights poorer access to education in backward areas for earlier generation. This would require a policy that addresses the constraints facing women's to get better education and acquire more skills. Such a step can increase their employability in the formal labour markets, with favourable impacts on the sound development of their children and of course their family. Consequently, rural infrastructure is needed to be improved and government should realise the urgency of creating employment opportunities for educated women.**

Keywords: **Women workforce participation, Tiwa tribe, Assam, North East India.**

I. INTRODUCTION

India is the second-most populous country in the world with an estimated 1.26 billion persons at end-2014 [1]. However, a women work force participation rate (WWFPR) of 33 percent implies that only 125 million of the roughly 380 million working-age Indian women are seeking work or are currently employed (Census, 2011). Again, the WWFPR in urban areas is below 25 percent, and while rural participation rates are almost twice as high as urban rates, they are still lagging significantly behind the world average [2]. Among employed women, 85 percent engage in vulnerable employment, including around two thirds who work in the agricultural sector [3]. They are drawn from the socially and economically backward classes and constitute the poorest section of rural society. They are also a less articulate section of the workers mainly due to lack of organisation and low levels of education.

Assam is a melting pot of many ethnic groups, sub-ethnic groups, Castes, tribes and different communities. The cultural assimilation of these different groups has made up a distinct Assamese culture. The STs are a major contributor of religious rituals, culture, language, farming and agriculture methods to the State. 2011 Census reveals that 16 numbers of ethnic groups are notified as scheduled castes (SC) and 25 numbers of ethnic groups as scheduled tribes (ST) in Assam with a variation of 22.2 per cent increase of SC and 17.4 per cent of ST than the last census. There are 3884371 tribal people in Assam, constituting 12.46% of Assam's total population (census, 2011).The major tribes of Assam are Bodos,

Mising, Karbi, Dimasa, Sonwal Kachari, Rabha, Tiwa, Deouri etc. The Tiwas are one of the many tribes of Assam. Ethnically they belong to the Monogoloid race. The Tiwa tribe resides in the areas of Assam and Meghalaya. A remarkable peculiarity of the Tiwas is their division into two sub-groups i.e. hill Tiwas and plains dwelling Tiwas. The hill Tiwas reside in the western most area of Karbi Anlong district (Assam) and north-eastern area of Ri-bhoi district (Meghalaya). Plain Tiwas mainly reside in the plains of southern bank of Brahmaputra Valley, in Morigaon and Nagaon districts. Tiwas constitute 5.17% to total tribal population of the state. Out of 1,36,777 ST population in Morigaon district, total Tiwa population is 1,09,530 i.e. 80.07% of its total tribal population. In Nagaon district, Out of 1,15,153 ST population, total Tiwa population is 58511 i.e. 50.81% of its total tribal population. The worker participation rate among the scheduled tribes in Assam is 44% as against the corresponding figure of 44.6 % of Tiwa population (Census, 2011). Work participation rate of women greatly determines the character of socio-economic development and quality of life of a society [4]. Women of Tiwa community are very active in their household and agricultural activities. But it is seen that the process of their activities is primitive in nature due to their illiteracy, indifferent attitude in their work [5].

Nagaon district is located in the very centre of Assam. It is at the centre of the entire North-Eastern India. With headquarters at the Nagaon town, the district covers an area of 3993 square km. The district shares boundaries with Sonitpur district and the river Brahmaputra in the North, Karbi-Anlong and North-Cachar Hills in the South, east Karbi Anlong and Golaghat districts in the east and on the west it borders Morigaon district. The district lies between 25'-45" North to 26'-45"North Latitude and longitude 92'-33' to 93'-20' East. It is an old district which dates back to 1833, which is the second most populous district with 2,823,768 population (2011 census).

Morigaon is situated between 26.15 degrees North and 26.5 degrees North latitude and between 92 degree East longitude. Morigaon Town, the headquarter of the district is situated 78 Kms. from Dispur, the state capital. The district is bound by the mighty Brahmaputra River on the North, Karbi Anglong district on the South, Nagaon district on the East and Kamrup district on the West. Almost every year, Morigaon has been witnessing devastating floods causing huge loss of human lives, cattle and infrastructure. Recurring floods make the life of the rural people very difficult. The district has a population of 957,423 (2011, Census).

There is a rich body of empirical studies analysing the determinants influencing the labour force participation decisions. Some important in this context are (Bordoloi, Sharma Thakur & Saikia, 1987) [6], (Mazumdar & Guruswamy, 2006) [7], (FARIDI & BASIT, 2011) [8], (Faridi, Chaudhry & Basit, 2009) [9], (Naqvi & Shahnaz, 2002) [10], (Ghani, Kerr & O'Connell, 2012) [11], (Agenor, 2015) [13]. (Nayak, 1988) [14], (Das, S., Chandra S. J., Kochhar, K., & Kumar N 2015) [15].

The purpose of this study is to examine the socio-economic determinants of women labour force participation among the Tiwa tribe in Morigaon and Nagaon districts of Assam in North East India and suggested necessary measures to the policy makers to increase women participation in labour market.

II. DATA AND METHODOLOGY

In order to identify the socio-economic determinants which influence the women workforce participation in economic activities, we have selected two districts of Assam: Morigaon and Nagaon districts. We have selected four blocks from Morigaon district and two blocks from Nagaon district, where Tiwa population is highly concentrated. The study is based on primary data collected randomly. Almost 442 in the age cohort 15-60 are interviewed purposively with the help of well structured questionnaire for the study. The analysis is based on womens (1) who live in sample districts Morigaon and Nagaon of Assam, (2) whose age is between 15 and 64, (3) who are working for sufficiently longer period of time.

Besides descriptive statistics, here we use the Logistic Regression method in order to determine important socio-economic determinants of work force participation of Tiwa tribal women. The important variables included in the Logisitic Regression are shown below-

Dependent Variable

WWPR = Dummy variable coded 1 if the women participate in labour force; else 0.

Explanatory Variables

Educational Attainment

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EDUC I = 1 if the women level of education is upto Primary; else 0.

EDUC II = 1 if the women level of education is upto school level; else 0.

EDUC III = 1 if the women level of education is H.S. level; else 0.

EDUC IV = 1 if the women level of education is upto college .level; else 0.

EDUC V = 1 if the women level of education is P.G.and more; else 0.

Age Groups

AGE 1 = 1 if the women belongs to age group (15-30) years; else 0.

AGE 2 = 1 if the women belongs to age group (31-45) years; else 0.

AGE 3 = 1 if the women belongs to age group (46-64) years; else 0.

Presence of Closed Relatives' Education

MEDUP =Mean education of parents

EDUH = 1 if women's husband is educated; else 0.

HUBW = 1 if the women's husband is working; else 0.

HUBSL = 1 if husband is salaried; else 0.

PHAST = 1 if women has assets; else 0.

FAMUP = 1 if women belongs joint family; else 0.

NDEPT = Total number of dependents in the family.

HSIZE = Household Size in numbers.

NOCHD = Number of Children in the Family.

CHLDA = 1 if the children belongs to the age group (0-2); else 0.

CHLDB = 1 if the children belongs to the age group (3-6); else 0.

CHLDC = 1 if the children belongs to the age group (7-11); else 0.

III. RESULTS AND ANALYSIS

The elementary analysis of our study is concerned with establishing descriptive statistics of some selected variables. The elementary analysis aims to give an overview of the variables and provide the behavioural patterns of variables. Table 1 represents the results of the summary statistics of the descriptive analysis for unmarried and table-2 for those who are married. Both the tables show the more variability for less educated while less variability for highly educated. compared to those who are highly educated. On the contrary, mean education of both married and unmarried have seen more up to middle level and the same is less for educated women.

TABLE-1: DESCRIPTIVE STATISTICS FOR UNMARRIED WOMEN

Variables	Mean	Standard Deviation	CV
EDUCI	0.210526	0.413155	0.509558
EDUCII	0.421053	0.500355	0.841507
EDUCIII	0.184211	0.392859	0.468897
EDUCIV	0.052632	0.226294	0.23258
EDUCV	0.131579	0.34257	0.384094
AGE1	0.684211	0.471069	1.452463
AGE2	0.157895	0.369537	0.427277
AGE3	0.157895	0.369537	0.427277
MEDUP	2.039474	0.825126	2.471713
PHAST	0.657895	0.480783	1.368382
FAMUP	0.157895	0.369537	0.427277
NDEPT	4.263158	1.75449	2.429856
HHSIZE	6.052632	1.75449	3.449795

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TABLE-2: DESCRIPTIVE STATISTICS FOR MARRIED WOMEN

Variables	Mean	Standard Deviation	CV
EDUCI	0.38028169	0.488911245	0.777813344
EDUCII	0.422535	0.497479	0.849354
EDUCIII	0.098592	0.300235	0.328382
EDUCIV	0.056338	0.232214	0.242612
EDUCV	0.042254	0.202599	0.208558
AGE1	0.380282	0.488911	0.777813
AGE2	0.295775	0.459639	0.643494
AGE3	0.323944	0.47131	0.687327
MEDUP	0.973333	0.162192	6.001111
HHSIZE	2.418919	0.936428	2.58314
EDU H	1.873239	0.893302	2.096984
HUSBSL	0.295775	0.459639	0.643494
PHAST	0.633803	0.485193	1.306289
FAMUP	0.197183	0.400704	0.492092
NDEPT	4.422535	2.253011	1.962945
NOC	1.56338	1.306384	1.196723
CHLDA	0.323944	0.47131	0.687327
CHLDB	0.507042	0.503509	1.007018
CHLDC	0.15493	0.364413	0.425148

ECONOMETRIC ANALYSIS:

A logistic regression, an alternative econometric technique, is used to analyze the main socio-economic determinants of women work force participation in terms of some qualitative and quantitative variables.

TABLE III: Model Summary for married Women

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	417.892	.241	.359

The model summary of the Logistic estimates for married and unmarried women are presented in Table-III and Table-V respectively. Under Model Summary of Table –III, we see that the -2 Log Likelihood statistics is 417.892. This table also contains the Cox & Snell R Square and Nagelkerke R Square values, which are also the methods of calculating the explained variation. These values are sometimes referred to as *pseudo* R^2 values (and will have lower values than in multiple regressions). The explained variation in the dependent variable based on our model ranges from 24.1% to 35.9%, depending on whether we use the Cox & Snell R^2 or Nagelkerke R^2 methods, respectively. Nagelkerke R^2 is a modification of Cox & Snell R^2, the latter of which cannot achieve a value of 1. For this reason, we prefer to report the Nagelkerke R^2 value.

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TABLE-IV: Results of Binary Logistic Regression Model for Unmarried Women

	Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	EDUCI	2.722	.910	8.952	1	.003	15.204
	EDUCII	3.234	.903	12.815	1	.000	25.376
	EDUCIII	1.839	.911	4.073	1	.044	6.289
	EDUCIV	1.288	1.007	1.636	1	.201	3.627
	MEDUP	-.281	.127	4.909	1	.027	.755
	AGE1	-.172	.412	.174	1	.676	.842
	AGE2	-.639	.331	3.726	1	.054	.528
	AGE3	.967	.531	3.313	1	.069	2.630
	PHAST	.697	.262	7.054	1	.008	2.008
	FAMUP	.157	.478	.108	1	.742	1.170
	NDEPT	-.728	.129	31.772	1	.000	.483
	HHSIZE	.233	.100	5.396	1	.020	1.263
	EDU H	-.539	.870	.383	1	.536	.584
	NOC	.567	.173	10.798	1	.001	1.763
	HUSBSL	.492	.276	3.166	1	.075	1.635
	CHLDA	-.188	.458	.168	1	.681	.829
	CHLDB	.974	.416	5.477	1	.019	2.647
	CHLDC	.300	.430	.487	1	.485	1.350
	Constant	-6.944	3.096	5.032	1	.025	.001

The Wald test ("Wald" column) is used to determine statistical significance for each of the independent variables. The logit coefficients in Table IV & Table VI represent the linear effect of a unit change in an independent variable on the log odds of a dependent variable, holding all other variables constant. Exponential transformation of the logit can be interpreted as the proportional change in the odds of a dependent variable for a unit change in an independent variable [16]. The statistical significance of the test is found in the "Sig." column. The results indicate that those who have primary and school level education much higher probability of being in the labour force compared to the higher and tertiary level of education. The coefficient of primary level of education is positive and statistically significant. Women with an additional year of education up to primary education are 15.2 times more likely to participate in labour market. The high school level education turns out as positive and strong impact on women's workforce participation. Women with an additional year of education up to high school level raise their probability to participate in workforce by more than 25.3 times. And women with an additional year of education up to higher secondary level are 6.28 times more likely to participate in labour market. Most importantly the coefficient of college level or higher education has shown positive but insignificant impact on women workforce participation. Having higher education, they would like to enter into formal sector rather than seeking jobs in the informal and unremunerative jobs. Another reason for insignificant participation may be because of lack of employment opportunities up to their level of education. In order to observe the WWP response for the presence of parents' education, we take mean education of parents' as dummy variable in our Logit equation. On the theoretical ground, it is expected that the FLFP is positively related with education of parents'. However, our estimates do not justify the theoretical expectation, because the parameters of the presence of the fathers and mothers education are significant but negative impact on women work force participation decision. However, from our result we see that the participation of women workers are likely to fall by .75 time with an additional unit of parents' education. Perhaps, educated parents' may have more interest to make their daughter more educated than their own level of education. Consequently, daughters may not interest to participate in workforce during their formal academic period. In contrast, uneducated parents may seek economic help from their daughters at the cost of their education. That is why; the additional effect of parents' education on their daughters labour force participation is negative and insignificant.

The relation between presence of household assets and participation of women in economic activities are positive and statistically significant. Presence of household assets raises the probability of participation of women in workforce more

than 2 times. Women those belong to rich families are likely to participate in economic activities. The significant parameter estimates indicate that women's participation rate is more for highest status household in comparison to women from lower status households. The coefficient of household size in women's participation of economic activities is also positive and statistically significant. Larger the household size more will be the pressure related to finance and other responsibilities. In order to provide some financial support to their husband, women of large household size like to participate in economic activities. Thus, when household size increases by one, probability of women's workforce participation rate raises by more than 1.26 times. Having children of age group 0-2 reduces the probability of women workforce participation by .82 times. This negative participation is due to fact that they have to look after their children. The coefficient of the variable presence of children age group 3-6 has shown a positive and significant impact on women's workforce participation. Those women who have children of age group 3-6, their probability of taking part in economic activities have increased more than 2.64 times. Even at a growing age of their children, women come out to participate in economic activities, and this is may be due to their lower family economic status and so they have to work to support their husband and family financially.

TABLE V: Model Summary for Unmarried Women

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	72.602	.317	.619

Under Model Summary as shown TABLE-V we see that the -2 Log Likelihood statistics is 72.602. The explained variation in the dependent variable based on our model ranges from 31.7% to 61.9%, depending on our reference of the Cox & Snell R^2 or Nagelkerke R^2 methods, respectively.

TABLE VI: Results of Binary Logistic Regression Model for Unmarried Women

	Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	EDUCI	-1.370	1.032	1.763	1	.184	.254
	EDUCII	2.459	1.254	3.844	1	.050	11.688
	EDUCIII	-.512	1.076	.226	1	.634	.599
	EDUCIV	19.727	5849.373	.000	1	.997	3.694E8
	MEDUP	.729	.526	1.918	1	.166	2.073
	AGE1	-3.938	1.344	8.579	1	.003	.019
	AGE2	-1.631	1.216	1.797	1	.180	.196
	AGE3	-1.208	1.476	.670	1	.413	.299
	PHAST	-.330	.727	.206	1	.650	.719
	FAMUP	-.198	1.096	.033	1	.857	.821
	NDEPT	-2.169	.478	20.591	1	.000	.114
	HHSIZE	1.678	.386	18.918	1	.000	5.355
	Constant	-20.611	5849.375	.000	1	.997	.000

In case of unmarried women, it is evident form table-VI is that women age group of 15-30 has negative but significant relation on their participation in economic activities. This may be due to their important period of formal education. But surprisingly, number of dependent members has negative and statistically significant impact on determining dependent variable participation in economic activities. In contrast, household size has, like married women, positive and significant impact on their participation in economic activities. Larger the size of a households, higher the participation of unmarried women in economic activities. It highlights poorer access to education in backward areas for earlier generation [17].

IV. CONCLUSION AND POLICY IMPLICATIONS

The level of education turns out to be insignificant variable in explaining women workforce participation for both married and unmarried women. It can be argued that more allocation of fund on education would be a useful investment and could be a better mechanism to improve the human capital in our tribal society. With an enhancement in their human capital, they will be better equipped to participate in a more productive way in the labour market. This would require a policy that addresses the constraints facing women's to get better education and acquire more skills. Such a step can increase their employability in the formal labour markets, with favourable impacts on the sound development of their children and of course their family. Consequently, rural infrastructure is needed to be improved and government should realise the urgency of creating employment opportunities for educated women.

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