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## **Education and Labour Market Activity of Women in Botswana**

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**Botswana Institute for Development Policy Analysis**

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# TABLE OF CONTENTS

Abstract .....	iv
1. Introduction .....	1
2. Related Literature .....	3
3. Empirical Model Specification .....	5
4. Data Sources and Descriptive Statistics .....	6
5. Results and Discussions .....	8
Education .....	8
Control Variables .....	10
Age: .....	10
Location: .....	11
Marital status: .....	11
Household size: .....	11
Household head: .....	11
6. Conclusions and Policy Implications .....	12
References .....	14

## ABSTRACT

This study examines the prevalence of female participation in labour market activities and investigates the role played by education in this participation. Using the 2015/16 Botswana Multi Topic Household Survey data and a multinomial logit model, the study found that women with tertiary education are more likely to be wage employed relative to self-employment, whereas those with lower to no education are more likely to be unemployed or out of the labour force. This is because higher education is normally considered a prerequisite for most wage jobs. It is therefore imperative for the government to continue educating women beyond secondary level as it will better equip them to participate in more meaningful labour market activities. On the other hand, there is need to stimulate the demand side of the labour market in order to accommodate the rising numbers of women with high levels of education. In order to encourage participation of women in high rewarding self-employment activities, there is need to intensify empowerment schemes that are largely oriented towards their self-employment.

**Key Words:** Education, Women, Labour, Market Participation, Multinomial Logit Model, Botswana

# 1. INTRODUCTION

Female labour market participation is an important indicator of women economic empowerment. It provides a guide on the extent to which women are involved in economic activities. Promoting women's access to employment is deemed to create a clear pathway towards social inclusion and gender equality. In most countries, female participation has been at the centre of labour market debates. Issues of gender wage gap and gender in employment have attracted attention from researchers and policy makers. A recent phenomenon however, is the increasing participation of women in the labour market which is visible even in low income countries.

Like in other countries, female labour market participation has been rising in Botswana over the past decade. The 2001 Population and Housing Census recorded 242, 957 women who were economically active. In 2005, this number increased to 320, 597 as recorded in the 2005/6 Labour Force Survey. The latest survey, the Botswana Multi Topic Household Survey of 2015/16 shows that currently 422, 541 women participate in the labour force. What is interesting is, increased participation of women started at that time when the economy was hit by a crisis. Following the 2008/9 economic recession, the government of Botswana initiated a hiring freeze in order to secure existing jobs and prevent salary reductions. Over that period, employment opportunities in the formal sector became inadequate. Yet, the informal sector grew significantly, and women became increasingly involved in self-employment activities.

The increase in female labour market participation can be better examined in terms of employment and unemployment trends. In terms of employment, female participation has fluctuated at an increasing rate over time. Since 2008, the proportion of females employed in Botswana increased from 43% to 49% in 2016 (Statistics Botswana, 2017). Nevertheless, gender disparities are still visible in the labour market. Currently the female labour force participation rate is 56%, which is lower than that of males at 67.8% (Statistics Botswana, 2016). This is a clear indication that women are misrepresented in the labour market. Moreover, more women than men are found in elementary occupations and clerical support services. Similarly, a high proportion of women participate in unpaid or low-paying forms of self-employment. In terms of unemployment, more women than men in Botswana do not have regular employment, but are actively seeking work. Currently the rate of female unemployment is 19.1% as opposed to 16.3% for men (Statistics Botswana, 2016).

Given the above synopsis, it is unlikely that the rise in female participation be an outcome of demand for female workers. Thus, it is fitting to investigate what pushes women into the labour market in spite of the disparities that prevail. There has been a plethora of studies on factors influencing participation decisions of women in the labour market over the years (Ntuli, 2007, Yakubu, 2010 and Ackermann and Velelo, 2013 of South Africa; Kapsos et al., 2014 of India; Tingum, 2016 of Cameroon; Lim, 2017 of Malaysia; and

Osuna, 2018 of Nigeria). Several factors have been identified to influence female labour market participation, including among others age, education, marital status, fertility and geographical location. However, the importance of education in raising female participation has been accentuated across studies. This is because education is a form of human capital investment and thus empowers women to participate in the labour market. Knowledge acquired through education helps women to be innovative and be able to perform economic activities. According to Olowa and Adeoti (2014), educating women has a positive effect on their labour supply decisions. A general observation is that education serves as an essential job requirement, hence it coaxes women into seeking employment.

In our view, increased participation of women in Botswana's labour market is a reflection of government heavy investment in education. Over the years, the government of Botswana invested generously towards education and skills development, with the Ministry of Education receiving the largest share of the total annual budget. In the 2019/20 budget, more than 27% of the budget has been allocated towards education and training (Republic of Botswana, 2019). Similarly, the government of Botswana, through the Revised National Policy on Education of 1994, sponsored students to study at local private tertiary institutions from 2007/8 to date. Moreover, the government through the National Policy on Vocational Education and Training emphasised increased female participation at vocational and technical colleges of which the aim was to promote programmes that facilitate self-employment among women. Owing to these, tertiary school enrolments increased over the years in Botswana. Specifically, female enrolments grew at a faster rate than male enrolments (Republic of Botswana, 2015). For example, in 2015/16 academic year, 57.9% of tertiary students were female (Statistics Botswana, 2016).

Notwithstanding the above, there is limited empirical work on how education influences labour market activities of women in Botswana. Siphambe (2000) shows that education influences occupational segregation of workers by gender. In another study, Siphambe and Motswapong (2010) found that education influences overall female participation and choice of employment sectors including the public, parastatal, non-governmental and agricultural sectors. The study by Makepe and Oageng (2012) also concluded that both lower and higher education increase the probability of female participation in agriculture. These studies used the 2005/6 Labour Force Survey and reviewed all factors that influence female participation in the labour market. The present study uses data from the Botswana Multi Topic Household Survey of 2015/16 and focuses mainly on the role played by education in influencing participation of women in the labour market. This study contributes to existing literature by integrating a variety of labour market activities (wage employment, self-employment, unemployment as well as non-participation) in examining the prevalence of female labour market participation in Botswana.

The rest of this paper is organized as follows. Section 2 reviews the literature on the role played by education in female labour market participation. Section 3 discusses the

methodological approach used in this study while section 4 outlines data sources and descriptive statistics of variables used in the model. Section 5 discusses empirical results while section 6 present the conclusion and policy recommendations.

## 2. RELATED LITERATURE

Empirical work on labour market activities of women is diverse and has generated inconsistent results as to what actually influences female participation. Some research zoom into specific determinant factors, while others provide a general overview of female participation in the labour market. In what follows, we consider only studies that evaluated the role played by education in influencing labour market decisions of women.

Over the years, improvements in education systems of many countries changed the way women were perceived: as homemakers who were responsible for household chores like taking care of their husbands, raising children and working in family farms. A lot of women are now encouraged to participate in the labour market and be involved in income generating activities. Yet, women in some countries are still guided by the social norms, and efforts to advocate for their empowerment have proved futile. In what Mukherjee (2015) considered as a comparative analysis between female education and employment in Japan, China and India, it was established that in spite of extensive development in education, women are deterred from participation in the labour market by social norms. Women still lack equal labour market opportunities notwithstanding increased access to education.

However, most studies found a positive association between education and female labour market participation. Osman and Sanusi (2016) provided evidence in support of the human capital theory that women labour force participation depends on their educational profile. The study investigated not only the role of education in female labour force participation, but also identified the extent to which educational profile of women could explain their participation. Based on a household survey data for North Cyprus and a binomial logistic regression, the study found that as the level of education for women increased, their participation in the labour market increased.

Nagac and Nuhu (2016) examined the role of education on female labour force participation in Nigeria. Using a binary logistic regression model, the study found that educated females have higher probability of being in the labour force than uneducated ones. According to the study, primary school, middle school and high school graduates are more likely to participate in the labour force compared to those who never attended school. Nevertheless, participation in the labour force by women with higher education did not differ from those with no education.

Olowa and Adeoti (2014) also studied the effect of education status of women on their labour market participation in rural Nigeria. Specifically, the study identified labour

market activities of women and examined the influence of education on labour market participation. It was found that participation of women in the labour market increases as education increases. That is, women with higher levels of education were more likely to participate in activities of the labour market.

Shapiro, Gough and Nyuba (2011) evaluated whether women with the same level of education to that of men had equal chances of accessing jobs in the modern sector of Kinshasa. Using a multinomial logit model, the study considered both men and women as participating in the modern sector, informal sector, the unemployed and those out of the labour force. As opposed to working in the informal sector, the study concluded that increased educational attainment improves access to jobs in the modern sector of the economy. However, the study found gender disparities in terms of job access in the modern sector. Below university-level education, women were found to be less likely to have modern jobs than men with the same qualifications. Nonetheless, among those with university education, the gap was found to be small.

Bbaale and Mpuga (2011) evaluated whether education acquired by a woman influences her labour force participation and the choice towards wage employment. This study which was based on evidence from Uganda used a multinomial logit model on three employment categories of women being; working at home, wage employment and self-employment. Relative to self-employment, the study found that women with primary education were more likely to work at home and less likely to be wage employed. The study also showed that with post-secondary education, it is more likely that women attain wage employment.

Faridi, Malik and Basit (2009) also confirmed that education has an effect of female labour market participation. Their study examined the impact of different levels of education on female labour force participation in Pakistan using a logit regression model. It was found that female labour force participation and education are positively correlated. The results showed that as the level of education increased, and women attained higher education, their level of participation increased. Precisely, the study found that highly educated women are 75 percentage points more likely to enter the labour market.

Atieno (2006) analysed factors explaining the participation of women in different activities in the labour market. The focus of this paper was on participation in the informal sector of Kenya. In order to allow for identification of factors that determine participation in various labour market sectors, Atieno employed the multinomial logit model. The study found that female participation in public and private sectors increased with years of schooling. Similarly, years of schooling positively influenced participation in the informal sector. On the other hand, years of schooling did not have any effect on doing unpaid family work and working in the agriculture sector.

Sackey (2005) estimated a multinomial logit model on employment choice of women in Ghana. The main aim of this study was to analyse trends in participation rates and

education enrolment as well as estimate a reduced-form model of female labour force participation. Education was found to be a significant determinant of employment for both rural and urban women. For wage employment, additional years of schooling resulted in increased participation, whereas they resulted in a decline in self-employment.

Aromolaran (2004) considered effects of female schooling on non-market productivity and labour market participation in Nigeria. By age groups and education level, their study examined how own and husband's education affects women's participation in wage employment, self-employment and total employment. It was found that additional years of post-secondary education increased wage market participation whereas primary schooling enhanced participation in self-employment.

### 3. EMPIRICAL MODEL SPECIFICATION

In order to analyse the role of education on female labour market participation, we assume existence of various labour market activities, including non-participation. This study therefore seeks to establish the probability of an individual female participating in a particular labour market activity, and adopts a multinomial logit model as specified below:

$$1. P_{ij} = P(Y_i = j) = \frac{\exp(\beta_j' X_i)}{1 + \sum_{j=0}^{J-1} \exp(\beta_j' X_i)}, \quad j = 1, 2, \dots, J - 1$$

where  $P_{ij}$  is the probability that an individual female  $i$  will participate in activity  $j$ .  $\beta_j$  represents parameters to be estimated and  $X_i$  represents characteristics of individual  $i$ .

The *dependent variable* represents female participation in the labour market. We consider women as either being; wage employed, self-employed, unemployed or out of the labour force. In the context of Botswana and for purposes of this study **wage employed** women are those paid in cash or kind, working in either central government, local government, parastatal sector, private sector and non-government organisations. **Self-employed** women are those who work in own or household enterprises. These may be non-farm enterprises or family farms. **Unemployed** women are those who are actively seeking employment, but have not yet found it. This includes women who are currently available to start work or start a business and have made an effort to look for a job or start a business in the past four weeks. Women are considered to be **out of the labour market** if they would like to work, but have not made an effort to look for a job or start a business in the past four weeks. This comprise of women who are undergoing internship, those who have lost hope in finding any kind of work, those who are unable to find work requiring their skills, students, the disabled and the sick among others.

The *principal explanatory variable* is education. This is a categorical variable indicating the highest level of education for women. For purposes of this study, a woman could either possess tertiary, secondary, primary or no education. Other explanatory variables that are used to control for factors that may have an impact on female labour market participation include age, geographical location, household size, and marital status. Table 1 provides a detailed description of the variables used in the model.

**Table 1: Variables used in the Model**

Variable	Description
Female Labor Market Status	
Wage employed	1 if woman is wage employed, otherwise 0
Self-Employed	1 if woman is self-employed, otherwise 0
Unemployed	1 if woman is unemployed, otherwise 0
Out of the labor force	1 if woman is out of the labor market, otherwise 0
Education (highest level of education)	
No Education	1 if no education or non-formal education, otherwise 0
Primary	1 if primary/pre-school and 0 otherwise
Secondary	1 if secondary and 0 otherwise
Tertiary	1 if tertiary/university and 0 otherwise
Age	number of years
Age <sup>2</sup>	Age Squared
Location	
City/town	1 if woman stays in a city/town, otherwise 0
Urban village	1 if woman stays in an urban village, otherwise 0
Rural village	1 if woman stays in a rural village, otherwise 0
Marital Status	
Married	1 if married, otherwise 0
Living Together	1 if cohabiting, otherwise 0
Separated	1 if separated, otherwise 0
Divorced	1 if divorced or separated, otherwise 0
Widow	1 if widowed, otherwise 0
Never Married	1 if never married, otherwise 0
Household Size	The number of people in a household
Household Head	1 if the woman is the head of the household, otherwise 0

#### 4. DATA SOURCES AND DESCRIPTIVE STATISTICS

This study uses the 2005/16 Botswana Multi Topic Household Survey dataset for analysis. This dataset contains a sample of 24270 respondents, where 11674 are males and 13046 females. Since the interest of this study is on women of the working age (15 to 65 years), the sample for females further reduced to 7158 after data cleaning and

dropping missing observations. Table 2 provides summary statistics of variables used in the model.

As indicated in Table 2, many (39%) women participated in wage employment, followed by 26% who were out of the labour force, 24% who were unemployed and about 11% who were self-employed. In terms of education, majority (59%) of women obtained secondary education, followed by tertiary education (21%), primary education (19%) and those who did not have any educational qualification (1%). The average female age in this sample is 33 years. Most (44%) women resided in urban villages, followed by rural villages (31%) and cities or towns at (26%). With regard to the marital status, 51% of the respondents were never married, 26% cohabiting, 17% married, 3% widowed, 2% separated and 1% divorced. The average household size is 5, with the smallest household having 1 person and the largest 23 people. On average, 32% of women were household heads.

**Table 2: Descriptive Statistics of Variables used in the Model**

Variable	Mean	Standard Deviation	Min.	Max.
Female Labor Market Status				
Wage employed	0.391	0.488	0	1
Self-Employed	0.112	0.315	0	1
Unemployed	0.239	0.427	0	1
Out of the labor force	0.258	0.438	0	1
Education				
No education	0.014	0.118	0	1
Primary	0.187	0.389	0	1
Secondary	0.590	0.492	0	1
Tertiary	0.209	0.407	0	1
Age	33	12	15	65
Age <sup>2</sup>	1268	925	225	4225
Location				
City/town	0.255	0.436	0	1
Urban village	0.440	0.496	0	1
Rural village	0.305	0.460	0	1
Marital Status				
Married	0.166	0.372	0	1
Living together	0.261	0.439	0	1
Separated	0.017	0.127	0	1
Divorced	0.011	0.105	0	1
Widow	0.032	0.176	0	1
Never married	0.513	0.499	0	1
Household size	5	4	1	23
Household Head	0.324	0.468	0	1

$n = 7158$

## 5. RESULTS AND DISCUSSIONS

This section presents results from the multinomial logit regression. In order to test if all parameters are jointly equal to zero, we used a Wald test. The chi-square statistic was significant at 1% and we rejected the null hypothesis that parameters are not simultaneously equal to zero. This implies that including more variables creates a statistically significant improvement of the model fit. The Likelihood-ratio (LR) test which compares the log likelihoods of two models (constrained versus full model) was also done. It was found that adding more explanatory variables results in a significant improvement of the model fit, that is, the full model was found to fit the data significantly. The model also explains about 15% of the variation in the dependent variable as depicted by the Pseudo R<sup>2</sup>. This signifies that the contribution of independent variables to the explanation of the dependent variable is satisfactory.

The assumption of Independence of Irrelevant Alternatives (IIA) was also tested using the Hausman test via *suest* (seemingly unrelated estimation). IIA is a property of the multinomial logit model which states that; the relative probability of choosing between two options is independent of any additional alternatives (Benson, et al., 2016). This assumption requires that omission of categories in the multinomial model does not affect the relative risks associated with the explanatory variables in the remaining categories (Hausman and McFadden, 1984). The null hypothesis that excluding one of the labour market activities from the model leads to a systematic change in the coefficients was rejected. This implies that the likelihood of choosing either labour market activity does not depend on the presence of other activities.

Since coefficients of the multinomial logistic regression can only be interpreted in relative probabilities, we present in this section the average marginal effects in order to enable us to reach conclusions about actual probabilities. For analysis, the self-employed group of women is used as the comparison/base category. Below is a comprehensive analysis of the results as presented in Table 3.

### EDUCATION

Pursuant to previous literature (Olowa and Adeoti, 2014; Faridi and Sackey, 2005), the importance of education in influencing labour market decisions of women cannot be overemphasised. The results indicate that, women with no education, compared to those with secondary education, are 9 percentage points more likely to be unemployed. However, no education does not differ significantly with wage employment and being out of the labour force. Relative to being self-employed, women with primary education compared to those with secondary education are 8 percentage points less likely to be wage employed. On the contrary, women with primary education compared to those with secondary education are respectively 5 percentage points more likely to be unemployed and out of the labour market relative to being self-employed.

At tertiary level, the importance of education is more pronounced. Women with tertiary education compared to those with secondary education are 12 percentage points more likely to be wage employed relative to being self-employed. They are on the other hand, 7 percentage points less likely to be unemployed relative to being self-employed. From these results, it is apparent that higher education automatically qualifies women for wage employment, whereas women with low education are bound to be unemployed or out of the labour force relative to self-employment. A plausible explanation for this is that most wage jobs in Botswana are in the formal sector where higher education is the major prerequisite for job attainment. Equally, most female job opportunities are in private households or enterprises, which normally absorb women with lower to no education.

These results are a testimony to the current situation in the economy of Botswana. For a very long time Botswana has produced graduates who prefer to be wage employed; rather than the desired innovators who can enter into self-employment. This therefore explains the reluctance of university graduates to enter into self-employment. Likewise, self-employment opportunities in Botswana (government funded) are normally open to people with lower educational qualifications. Hence, the overrepresentation of women in low-paying forms of self-employment.

**Table 3: Female Labour Market Status: Multinomial Logit Marginal Effects**

Variable	Wage employed	Unemployed	Out of the Labor Force
Education (secondary education omitted)			
No Education	-0.025	0.086*	-0.049
Primary	-0.081***	0.046***	0.046***
Tertiary	0.116***	-0.069***	0.011
Age	0.054***	0.002	-0.064***
Age <sup>2</sup>	-0.001***	-0.0001**	0.001***
Location (rural village omitted)			
City/town	0.079***	-0.045***	-0.015
Urban village	0.046***	-0.027**	0.004
Marital Status (never married omitted)			
Married	-0.070***	-0.076***	0.088***
Living together	0.009	-0.0002	-0.028**
Separated	0.030	0.016	-0.023
Divorced	-0.019	0.083	-0.081
Widow	-0.002	-0.029	0.008
Household Size	-0.012***	0.009***	0.002
Household Head	0.116***	-0.074***	-0.048***
Prob. Chi <sup>2</sup>	0.000***		
Pseudo R <sup>2</sup>	0.153		
Number of observations	7158		

Note: Self-employment is the base category.  $P < 0.01$ \*\*\*  $p < 0.05$ \*\*  $p < 0.10$ \*

## CONTROL VARIABLES

**Age:** Our findings also show that female participation in wage employment is likely to increase with age. An increase in age by 1 year would increase the probability of being wage employed by 5 percentage points. Being unemployed does not differ with age. On the other hand, an increase in age by 1 year would decrease the probability of being out of the labour force by 6 percentage points. This may be because as women age, the more qualified they become and are able to assume formal job positions. Additionally, women who are out of the labour force comprise students, those in apprenticeship and internship training; who still have the prospects of acquiring employment. Our results of age squared show that as women grow older, they have a lower chance of participating in wage employment and being unemployed, whereas they have a higher chance of being

out of the labour force. This may be because as women age, some resign/retire from work and some lose hope of finding any work in future (discouraged job seekers).

**Location:** A woman's location is important in explaining her participation in labour market activities. Women who reside in cities and urban villages compared to rural villages are respectively 8 and 5 percentage points more likely to be wage employed as opposed to being self-employed. Similarly, residing in a city and an urban village compared to a rural village reduces the probability of being unemployed relative to being self-employed by 5 and 3 percentage points respectively. Being out of the labour force for females residing in cities and urban villages does not differ from those living in rural areas. This may be linked to education, where women living in cities and urban villages have access to quality education and are consequently exposed to diverse wage and self-employment opportunities. Alternatively, this could be explained by availability of more job opportunities in cities, towns and urban villages as compared to rural villages.

**Marital status:** Compared to those who were never married, married women are 7 percentage points less likely to be wage employed relative to being self-employed. Likewise, they are 8 percentage points less likely to be unemployed as opposed to being self-employed. On the other hand, married women are 9 percentage points more likely to be out of the labour market. A plausible explanation for this is that, married women may need to care for their children, with their spouses providing the financial support. Even so, married women possibly will participate in self-employment activities rather than being solely unemployed.

**Household size:** Contrary to the expectation, our results on the size of the household reveal that an additional member of the household reduces the chance of a female being wage employed by a 1 percentage point, whereas it increases the chance of being unemployed by 0.9 percentage points. This may be because other household members are able to provide for the family hence low demand for jobs by the female member. It may also reflect the societal norms for women to be housekeepers when other household members are working.

**Household head:** If a woman is a household head, she is 12 percentage points more likely to be wage employed as opposed to being self-employed. On the other hand, she is 7 percentage points less likely to be unemployed compared to being self-employed. Moreover, female household heads are about 5 percentage points less likely to be out of the labour force compared to being self-employed. This implies that relative to being self-employed, being a female household head increases the probability of participating in wage employment by 12 percentage points, but lowers the probability of being unemployed and out of the labour force by 7 and 5 percentage points respectively. This result explains the obligation of female household heads to participate in income generation activities (wage employment and self-employment) in order to provide for their families.

## 6. CONCLUSIONS AND POLICY IMPLICATIONS

This study of Botswana, represents one of the few efforts to date that analyse the role of education on female labour market participation. Estimates from the multinomial logit model indicate that factors that influence participation of women in labour market activities are diverse. However, education as the principal explanatory variable in this study has been seen to play an important role in distributing women among wage employment, self-employment, unemployment and non-participation in the labour market.

Relative to self-employment, women with higher qualifications are more likely to be wage employed, whereas those with lower to no education are less likely to be wage employed. Alternatively, women with higher education are less likely to be unemployed, whereas those with lower education are more likely to be unemployed or out of the labour force as opposed to being self-employed. This segregation of women into specific labour market activities may reflect to an extent the organization of the education system in Botswana. Up to secondary school level, students in Botswana receive general education which does not necessarily prepare them for specific industries and does not address labour market needs. It is only at tertiary level where students are given an opportunity to explore the different professional and technical qualifications; which favours only those who would have made it through to colleges and universities at that time. As a result, efforts to vocationalise secondary education in Botswana must be intensified, i.e. incorporate more practical subjects into the secondary school curricula. There is also need for provision of relevant technical courses for secondary school leavers who are unable to proceed to universities.

The results also imply that high female educational attainment is associated with improved access to the highly sought jobs in the formal sector. But because of limited job opportunities in Botswana, increased female education may result in oversupply of female labour which may result in women being propelled to participate in low-paying forms of self-employment. This therefore calls for a need to stimulate the demand side of the labour market in order to accommodate the rising numbers of women with high levels of education. For example, there is need to promote development of the private sector in order to absorb the growing numbers of unemployed females. There is also need to intensify women empowerment schemes that are largely oriented towards self-employment in order to encourage participation of women in ideal and high rewarding self-employment activities.

From a general perspective, the results imply that increased access to education is an imperative investment and should be helpful in realizing women economic empowerment. Therefore, providing quality female education beyond secondary level will better equip women to participate in more meaningful labour market activities. Since investment in education and human capital development can be linked to

overall poverty reduction, it is important to ensure that the educational attainments of women are sustained in order to increase their employability and consequently their welfare.

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