IMPACT OF FEMALE ENTREPRENEURSHIP ON PRODUCTION AND INCOME IN APICULTURE INDUSTRY

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ABSTRACT

The study was conducted in the Central Province of Zambia in February/March, 2015. The study aimed to investigate the impact of female entrepreneurship on production and income in apiculture industry. The study revealed that the participation of female entrepreneurs was much lower than male entrepreneurs. But, the impact of female entrepreneurship on production and income was more than the male entrepreneurs in apiculture industry. The study suggested for using modern technology like top bar hives, which requires less physical activity and could be installed closer to homes, for more participation of females in apiculture activities to increase employment opportunities and income to reduce poverty.

Key Words: Apiculture; Female Entrepreneurship; Production; Income; Technology

INTRODUCTION:

While many African States have made important strides in passing laws to ensure greater gender equality, the challenge ahead for the continent is to ensure economic empowerment is more widespread, notably for women (AfDB, 2015). Disparities in employment, education, political participation and legal rights severely constrain women in their ability to contribute to Africa's development (AfDB, 2013). Country policy and Institutional Assessment gender equality rating,

(1=low to 6=high) in Zambia was measured at 3.0 in 2013. Gender equality assesses the extent to which the country has installed institutions and programmes to enforce laws and policies that promote equal access for men and women in education, health, the economy and protection under law (World Bank, 2013). The results of the base line study indicate that women beekeepers made more money than men in 2010 and that the levels of women's participation in beekeeping activities has increased from 16% in 2008 to 30% in 2010 (ZHC, 2011).

In Zambia the labor force participation rate was 74.6 percent. It was 82.9 percent for male and 79.3 percent for female in rural areas. The percentage distribution of the employed persons by industry shows that in Agriculture, Forestry and Fisheries in rural areas it is 88.2 percent for male and 93 percent for female. Out of total labor force in agriculture 66 percent were male and 77 percent female (CSO, 2012). But the Apiculture industry in Zambia is dominated by male. Culturally, beekeeping is generally considered to be an exclusively male domain and male beekeepers sometimes even object to women becoming beekeepers. There are also a number of practical constraints that hinder women from participating in this economic activity. First, handling traditional bark hives requires physical strength and since climbing is often required for the collection of honey, beekeeping is not considered suitable for women for modesty reasons. Secondly, harvesting honey from traditional beehives also requires long absences from home which conflicts with women's domestic chores (SNV, 2012).

In Zambia, honey production has steadily increased from 200 MT to 2000 MT in 2011/2012. Yet, this is just a fraction of Zambia's full production potential, estimated at 20,000 MT, which could generate more than EUR 25 million in export revenues. Zambian organic honey maintains a niche market in Europe, with exports increasing from 500 MT in 2005 to 1,100 MT currently. Only 20% of the estimated production is marketed through formal market channels in Zambia (SNV, 2012).

The study by Qaiser, et.al., (2013) in Pakistan revealed that there are some social and cultural barriers which restrict women to go out in the fields for the management practices of beekeeping. Goldenberg (2004) concluded that in Zambia women from female-headed households are increasingly taking to honey-hunting in order to supplement their incomes. Margaret Rose and Thelma (2002) revealed that the development and promotion of beekeeping through the involvement of NGO's has ushered in women's participation. Claire and Malani (2012) found an

opportunity for women to participate in the honey value chain by introducing modern top bar hives as an appropriate beekeeping technology for women as they require less physical activity and can be installed closer to their homes. As a result, women are now better integrated in the honey value chain and have started to benefit from this additional income source. At the household level men have also welcomed women's participation in beekeeping as it contributes towards food security and improved income for the family.

IMPORTANCE OF THE STUDY:

This study assumes important in understanding the extent of gender inequality in apiculture in Zambia, the capacity of the female entrepreneurs in production of honey and earning net income in comparison with male entrepreneurs and how gender equality could be achieved in Apiculture industry to enhance production and employment opportunities. This study fills the gap in the existing literature by explaining the differences in the production of honey and net income between female and male entrepreneurs. It is also useful to the policy makers, planners and administrators in preparing the plans and programmes for encouraging the female to take up apiculture practices for gender equality in apiculture industry to reduce poverty in Zambia.

OBJECTIVES:

The specific objectives of study were to:

1. Investigate the factors affecting net income of the entrepreneurs in apiculture industry
2. Know the socio-economic conditions of entrepreneurs in apiculture industry
3. Find out the impact of female entrepreneurship on production of honey and net income
4. Ascertain the difference between male and female entrepreneurship with respect to honey production
5. Enquire the net income of female entrepreneurs in comparison with their male counterparts.

METHODOLOGY:

This study used multi-stage random sampling technique for selecting the sample. In the first stage Central Province was selected. In the second stage KapiriMposhi district was selected. There

are six agricultural blocks in KapiriMposhi district. They are: Mulungushi, Changondo, Chipepo, Lounchu,Lukanga and Nkole. In the third stage, out of these six blocks, Mulungushi Block was selected for this study due to higher number of apiculture activities (about 40%). The Mulungushi Block consists of six agricultural camps. They are: Imansa, Kakulu, Luanshimba, Lukanda, Kaunga and Kambosha. In the fourth stage, out of these six camps, two camps, namely, Lukanda and Luanshimba, were selected due to higher apiculture activities. In the fifth stage, a total of 128 apiculture activity households were selected - 82 from Lukanda and 46 from Luanshimba. The required data were collected through questionnaire and interview with the respondents. The information was collected in February/March 2015 for the recent bee keeping season, i.e., September to December, 2014. Estimation of the factors influencing production and net income involved the use of ordinary least square regression models.

The traditional technology includes fixed comb-hives and the modern technology used was movable frame hives, top bar hives, smokers and protective cloth in honey production. The sources of cost of production of honey were technology cost, imputed value of family labor, cost of hired labor, cost of empty containers and transport. The source of revenue includes the value of quantity of honey and beeswax sold.

MODEL SPECIFICATION AND ESTIMATION:

Estimation of the factors influencing net income of the bee farmers involved the use of ordinary least square regression techniques and specified by equations:

$$Y=\beta_0+\beta 1be+\beta 2t+\beta 3ct+\beta 4hl+\beta 5fl+\mu$$

Where:

Y= Net Income

be= beekeeping experience (years)

t= training in beekeeping (No. of days)

ct= cost of technology (in Kwacha)

hl= cost of hired labor (in Kwacha)

fl= cost of family Labor (imputed value in Kwacha)

βo= is a constant

β1 to β5= Regression parameters that were estimated

μ= Error term associated with data collection which was assumed to be normally distributed with zero mean and constant variance.

DATA ANALYSIS AND DISCUSSION:

Factors Affecting Net Income:

The following results showed that when all the independent variables were zero, the income level was 329.8894 Kwacha. The income increases by 15.40401 Kwacha for an additional year of experience in beekeeping. The income increased by 21.25744 Kwacha for one additional day of training in beekeeping. When all the other independent variables are constant, the income reduced by 5.76671 Kwacha for an additional kwacha in technology cost. The income increased by 0.602546 Kwacha for one additional kwacha in hired labor cost but it increased by 2.994260 Kwacha for an increase in family labor cost by one kwacha. The family labor is significant in explaining the model.

Table (1): Factors affecting Net Income

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	329.8894	112.8849	2.922353	0.0042
EXPERIENCE	15.40401	11.12775	1.384287	0.1689
TRAINING	21.25744	35.26279	0.602829	0.5478
TECHNOLOGY	-5.766718	5.800598	-0.994159	0.3222
HIRED	0.602546	0.477716	1.261305	0.2097
FAMILY	2.994260	0.580063	5.161954	0.0000
R-squared	0.482592	Mean dependent var		661.7177
Adjusted R-squared	0.460668	S.D. dependent var		506.3556

S.E. of regression	371.8637	Akaike info criterion	14.72211
Sum squared resid	16317347	Schwarz criterion	14.85857
Log likelihood	-906.7708	F-statistic	22.01197
Durbin-Watson stat	1.429433	Prob(F-statistic)	0.000000

Socio-economic conditions of beekeepers:

Table (2) shows the socio-economic conditions of beekeepers.

Table 2: Socio-economic conditions of apiculture practitioners

Distribution	Value	Percentage
Mean age of beekeepers (years)	43.4	-
Gender:		
(a) Male	106	82.81
(b) Female	22	17.19
(c) Total	128	100.00
Marital Status:		
(a) Married	119	92.96
(b) Un-married	04	3.12
(c) Divorced	02	1.56
(d) Widow	03	2.36
(e) Total	128	100.00
Main Occupation:		
(a) Agriculture	125	97.65
(b) Beekeeping	03	2.35
(c) Total	128	100.00
Subsidiary Occupation:		
(a) Agriculture	03	2.35
(b) Beekeeping	125	97.65

(c) Total	128	100.00
Average Land ownership (ha)	13	-
Level of Education		
(a) Illiterate	20	15.62
(b) Primary	46	35.93
(c) Secondary	52	40.62
(d) Tertiary	10	7.83
(e) Total	128	100.00
Training in Beekeeping (days)	1.52	-
Experience in Beekeeping (years)	5.58	-

Source: Primary data

The total number of beekeepers was 128 and their mean age was 43.4 years. The age distribution of the beekeepers showed that 3.12 percent were between 15-24 years, 21.87 percent between 25-35 years; 58.6 percent between 36-60 years and 16.41 percent above 60 years. 82.81 percent were men and only 17.19 percent were female. This implies that majority of beekeepers were above middle age and beekeeping was a male dominated sector. These findings were similar to Ajao and Oladimeji(2013);Babatude et. al (2007); Ebojet et.al., (2008) Chale et.al., (2013); and SNV (2010). 92.96 percent were married, 3.12 percent were un-married, 1.56 percent were divorced and 2.36 percent were widows. The main occupation of the beekeepers was agriculture (97.65%). They were taking beekeeping activity as subsidiary occupation. The average land ownership of the beekeepers was 13 ha. It was interesting to know that majority of beekeepers studied up to secondary level (40.62%). The mean days of training in beekeeping was 1.52 and experience in beekeeping activity was 5.58 years.

IMPACT OF FEMALE ENTREPRENEURSHIP ON PRODUCTION:

The following table (3) shows the impact of female entrepreneurship on production.

Table (3): Impact female entrepreneurship on production:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000000	1.273616	0.000000	1.0000
FEMALE	19.19565	1.478616	12.98218	0.0000

R-squared	0.580088	Mean dependent var	7.120968
Adjusted R-squared	0.576646	S.D. dependent var	19.67194
S.E. of regression	12.79968	Akaike info criterion	7.952715
Sum squared resid	19987.48	Schwarz criterion	7.998203
Log likelihood	-491.0683	F-statistic	168.5369
Durbin-Watson stat	1.542511	Prob(F-statistic)	0.000000

The model explaining the impact of female entrepreneurship on production of honey was significant. For one additional female entrepreneur the production of honey increased by 19.2 liters. The impact of female entrepreneurship on honey production was significant since the probability was less than 5 percent level of significance. Since the co-efficient C was zero, the production was zero when there was no female .

IMPACT OF FEMALE ENTREPRENEURSHIP ON NET INCOME:

The table (4) shows the impact of female entrepreneurship on net income.

Table (4): Impact of female entrepreneurship on net income:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	639.2871	50.37011	12.69179	0.0000
FEMALE	60.46513	58.47764	1.033987	0.3032

R-squared	0.008687	Mean dependent var	661.7177
Adjusted R-squared	0.000562	S.D. dependent var	506.3556
S.E. of regression	506.2134	Akaike info criterion	15.30779
Sum squared resid	31262743	Schwarz criterion	15.35328
Log likelihood	-947.0830	F-statistic	1.069129
Durbin-Watson stat	1.464276	Prob(F-statistic)	0.303187

Note: 1 USD=7.3 Kwacha

The model explaining the impact of female entrepreneurship on net income was significant. For one additional female entrepreneur the net income increased by 60.46 Kwacha. The impact of female entrepreneurship on net income was significant since the probability was less than 5 percent level of significance.

DIFFERENCE IN PRODUCTION BETWEEN FEMALE AND MALE

ENTREPRENEURS:

The table (5) shows difference in production between female and male entrepreneurs

Table (5): Difference in Production Between Female and Male Entrepreneurs

	Female Production(Liters)	Male Production(Liters)	Difference (Liters)
Total	889.898	3638.5	
Number	23	105	
Average	38.69121739	34.65238095	4.038836439

The above table (5) shows that the production of honey by female entrepreneurs (38.69) was higher than the male entrepreneurs (34.65). The difference being 4.03 liters, i.e., the production of each female entrepreneur was 4.03 liters more than male entrepreneur.

DIFFERENCE IN NET INCOME BETWEEN FEMALE AND MALE

ENTREPRENEURS:

The table (6) shows difference in net income between female and male entrepreneurs

Table (6): Difference in Net Income Between Female and Male Entrepreneurs

	Female Income (Kwacha)	Male Income (Kwacha)	Difference (Kwacha)
Total	17485	66313	
Number	23	105	
Average Income	760.2173913	631.552381	128.6650104

The above table (6) shows that the net income of female entrepreneurs (K. 760.21) is higher than the male entrepreneurs (K. 631.55). The difference being K 128.66, i.e., the net income of each female entrepreneur is K 128.66 more than the male entrepreneur.

CONCLUSIONS AND SUGGESTIONS:

(a) The factors affecting net income showed that the experience in beekeeping, training, hired labor and family labor had positive impact on net income of the apiculture practitioners. The impact of family labor on income was statistically significant. Where as, the technology had negative impact on net income, explaining that technology did not have importance since majority of apiculture practitioners were using traditional technology which was provided by a Non-Government Organisation.

It is suggested that modern technology could be used to increase honey production. The Government and NGOs could sensitize for the use of modern technology, like top bar-hives.

(b) The majority of beekeepers were above middle age. The female and youth were not participating in apiculture practices. The number of males was four times higher than their female counterparts. The conclusions were in conformity with the study by Ajao and Oladimaji (2013), Babatude, et.al. (2007), Ebojet, et.al (2008), Chale, et.al. (2013) and SNV (2010).

It is suggested that female and youth should be encouraged to take up apiculture activities for gender balance and youth employment creation in this industry. They should be given training in beekeeping and in using modern technology, like top-bar hives, which requires less physical activity and could be installed closer to houses. This would encourage the female entrepreneurs to take up beekeeping activities.

(c) The impact of female entrepreneurship on production of honey and net income was significant.

(d) The production of honey by female entrepreneurs was higher than the male entrepreneurs It was higher by 4.03 liters for each female entrepreneur than male entrepreneur.

(e) The net income of female entrepreneur was higher than male entrepreneur by K 128.66.

Hence it is suggested that the apiculture industry could be used as a source to increase the income in rural areas and to reduce poverty.

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