Analysis of Socio-Economic Factors Affecting Banana Production: Evidences from Lowlands of Uba Debretsehay Woreda, Gamo Gofa Zone, SNNPRS

Amen Diakon Debebe
MA in Devt Studies, Lecturer at Wolaita Sodo University

Desalegn Dagne
MSc in Economics, Government Expert at Gammo Gofa Zone

Abstract
This study was aimed at investigating the factors influencing production of banana for Uba Debre Tsehay Woreda, Gammo Gofa zone of SNNPRS with the specific objectives of identifying and analyzing the factors influencing production of banana in the study area. In order to attain these objectives the study made use of primary and secondary data. The data were generated by individual interview schedules and focus group discussions using pre-tested semi-structured questionnaires and checklists respectively. This was supplemented by secondary data. Descriptive and the Cobb-Douglass production function were used to analyze the socio-economic factors affecting banana production in the area. The study has identified the main factors affecting banana yield. The regression results showed that level of education, household size and fertilizer were positively related output at 1% and 5% level of significance whilst experience in banana production and price were negatively related to output at 10% and 1% level of significance. The farmers were also faced other constraints as obtained from FGD's like lack of market access, distance to market and lack of road to the main outlets. Therefore extension work should focus on encouraging farmers to use the household productive labour force efficiently, and inputs like fertilizer should be provided to increase the yield of banana. Again the findings suggest that effective market information service and infrastructure development access has to be established to overcome the fluctuating price.
Keywords: Socio-Economic factors, Banana Production, Uba Debretsehay Woreda

1.1. BACKGROUND OF THE STUDY

Banana is popular globally not only for its nutritional value but also for its economic importance especially to small and marginal farmers in developing countries. It is grown in over 130 countries across the world in an area of 10.1 million ha producing 121.85 million tons (FAO, 2009). World banana production is concentrated in Africa, Asia, the Caribbean and Latin America because of the climatic conditions. Among the various continents, Asia has the lion's share of 60% of the global production. Approximately one third of the bananas produced globally are grown in sub Saharan Africa, where the crop provides more than 25% of food energy requirements for more than 100 million people.

Currently banana in Ethiopia covers about 59.64% (53,956.13 hectares) of the total fruit area, about 68% (478,251.04 ton) of the total fruit produced, and about 38.3% (2,574.035) of the total fruit producing farmers. On the other hand about 68.72% (37,076.83 hectares) of land covered by banana, about 77.52% (370,784.17 ton) of the banana production, and 22.38% (1,504,207) of the banana producers in Ethiopia are found in the Southern Nations Nationalities and Peoples Regional State (SNNPRS) (CSA, 2014). Gamo Gofa, Bench Maji, and Sheka zones are among the major banana producing zones of the SNNPRS, of which Gamo Gofa zone alone covers over 70% of the total banana marketed across the major outlets in Ethiopia (CFC, 2004).

Although in Ethiopia the living standard of the local value chain actors (banana producers, brokers, traders, retailers) and service providers [Cooperatives, transports] has substantially improved in recent years , they still face many challenges. For instance, yield per unit areas of land is declining due to improper agronomic techniques, such as overstocking, lack of soil amendments, improper irrigation techniques and mono cropping.
As a few studies are available on factors affecting banana production in our country, this study is intended to fill the gap by making statistical assessment on banana production in Gammo Gofa Zone, Uba Debre Tsehay Woreda.

1.2. Statement of the Problem

As per Yilma (2009), the production of fruits is not widely and evenly distributed across the various regions of Ethiopia. The cultivation is also seasonal and the supply is scanty and volatile even in areas where irrigation is possible. The knowledge gap on fruit production techniques and processing is wide. Additionally Bezabih and Hadera (2007) stated that a production of horticultural product is seasonal and price is inversely related to supply, during the peak supply period, the price decline. The situation is worsened by the pershablity of the products and

poor storage facilities.

Fruit production in Uba Debre Tsehay Woreda is mainly constrained by seasonality where surplus at harvest is the main characteristics of the product (mainly banana). The nature of the product on one hand and lack of organized marketing system on the other often resulted in low producers' price. Even though banana is economically and socially important, banana production and the factors affecting the production of the fruit have not yet been studied and analyzed in Uba Debre Tsehay Woreda.

Therefore, this study has the purpose of investigating socio-economic factors affecting production of banana in Uba Debre Tsehay Woreda.

1.3. RESEARCH OBGECTIVES
The overall objective of this study is to investigate the socio-economic factors that affect production of bananas in Gammo Gofa Zone, Uba Debre Tsehay Woreda. The specific objectives of the study are
- ✓ To analyze the socio-economic characteristics of farmers who are producing banana in Uba Debretsehay Woreda;
- ✓ To identify the social factors that affect banana production in the study area.
- ✓ To identify the economic factors that affect banana production in the study area.

1.4. REVIEW OF RELATED LITERATURE:
1.4.1. Production Function Model
The relationship between various factors and the output in agriculture is commonly determined by a production model. Mpawenimana(2005) indicated that in agriculture the production input consists of land, labor and capital as the basic factors of production. Malassis(1975) outlined that as more land is brought under production, output increases.
Simple form of production function is as follows:

$Q = f(Ld, K, L)$………………………………..equation (1)

Where: Q = production output; K= capital; L= labor and Ld= land.

1.4.2. Cobb-Douglas Production Function
Cobb-Douglas production function is regarded as a distinctive case of a production function and is homogeneous of the degree one (Henderson & Richard, 1980). This means that if we change the inputs by some amount, the output will change by the same amount as the inputs. Most production functions are believed to be curvilinear (Mafoso, 1999). The Cobb-Douglas production function is given by:

$Q = AL^{\alpha}K^{\beta}$………………………………equation (2)

Where: Q = Output; A = Technology used to produce the output; L = Labor and K = Capital and α & β are elasticity's. The functional relationship has to be specified so as to find the impact of factors on banana production. The study used Cobb-Douglas production function because of its simplistic.

1.4.3. Review on Theoretical and Empirical Studies
Kathirvel (2008) analyzed the economic factors limiting to banana production with the help of Garrett Ranking technique. He pointed out that credit inadequacy was the major problem (rank 1) in the production of banana. High fertilizer cost was the next important problem (rank 2). The small size of farm holdings, the lack of technical guidance was the least important problems.

Joel Mpawenimana (2005) in his study analyzed the socio-economic factors influencing the production of bananas in Kanama district in Rwanda. After estimating the relationship between the output of bananas and various socio-economic factors, the findings showed that various socio-economic factors have to be reviewed in order to improve the production of bananas in the country. The results described that land, physical capital, fertilizer and price, have positive relationship with the banana output.

1.5. RESEARCH METHODOLOGY
A mixed method research design was applied that combined qualitative and quantitative approaches. A multi-stage sampling technique was used to select sample banana producers. The total population size that produces banana fruit is 1172. To determine the sample size Yamane Tora (1967:886) sampling formula assuming a 95% confidence level, e specifies the desired level of precision between 5%-10%.

$no = \frac{N}{1+N(e)^2}$…………………………………………..equation (3)

Where no = Sample size; N = Total number of households in the selected Kebeles; e=Precision level or sampling of error 7.5% (0.075);

$no = \frac{1172}{1+1172(0.075)^2} = no = \frac{1172}{1+1172(0.005625)} = \frac{1172}{1+6.5925} = \frac{1172}{7.5925} = 154$

Econometric Analysis
Factors affecting banana production were analyzed using a multiple linear regression model. The following regression model was assumed.

$$\ln Q = \alpha_0 + \alpha_1 lnLd + \alpha_2 lnG + \alpha_{3ln}ED + \alpha_4 lnHH\ size + \alpha_5 lnMACC + \alpha_6 lnEXP + \alpha_7 lnP + \alpha_8 lnEXS + \alpha_9 lnLn + \alpha_{10} lnF + U \dots\dots\dots\dots\dots equation\ (4)$$

Where:
1. Q = total output of banana produced in quintals
2. Ld = Land area planted under banana in hectares
3. G = gender (where 0-female and 1-male) of the HHH
4. ED = level of education attained by HHH
5. HHS = household size
6. MACC = market access
7. EXP = experience in banana production in years
8. P = banana price (where 1- good and 0-not good)
9. EXS = extension service access
10. Ln = loan (credit) access
11. F = use of fertilizer
12. α_0 = constant
13. $\alpha_1 - \alpha_{10}$ = are the coefficients to estimate the relationship between the output and the different variables
14. U = random error term

1.6. DATA ANALYSIS AND DISCUSSION

In conducting the study, 154 questionnaires were distributed out of which 154 were returned and answered. Therefore, the response rate was 100%.

1.6.1. Socio-Economic Factors that Influencing Banana Production

1.6.1.1. Education Level of the Household Head

About 20.77% of the sample household heads were not attained any formal education. However, 50.09% and 19.47% had joined primary and secondary school respectively where as 9.74% are post secondary trained. This increased educational entitlement has also improved the ability to acquire new idea in relation to improved production of the households, due to that the educational background of the sample household heads is believed to be an important feature that determines the readiness of the household heads to accept new ideas and innovations.

1.6.1.2. Extension Services

Extension services were very important in the study because of impacting technical knowhow to the farmers. The frequency of extension services (Table 1) ranged from None, Bi-annually quarterly to monthly.

Table 1: Extension services received on banana production

Code	Frequency	Response	Percentage
0	None	101	65.58
1	Bi-annually	47	30.52
2	Quarterly	6	3.9
3	Monthly	0	0.00
	Total	154	100

Source: authors' survey results, 2017

Thus, results obtained in Table 1 prove that there is no substantial extension service delivery in the study areas concerning banana production.

1.6.1.3. Access to and Use of Credit Availability

Credit is important to facilitate the introduction of innovative techniques and for input marketing arrangements. Even if one micro-finance and one governmental bank are available in the study area no credit is reported by the respondents from formal banks; lack of definite credit service is reputed (known) in the study area.

Table 2: Access to and use of credit availability

Code	Frequency	Response	Percentage
0	No	99	64.28
1	Yes	55	35.71
Total		154	100

Source: survey result, 2017

As indicated in Table 2, 64.28% of banana growers were not access to credit. And 35.71% of the respondents were access to credit.

1.6.1.4. Access to Market

This is a distance measured in kilometers to reach the nearest market. The study revealed the infrastructure in Uba Debretsehay Woreda is generally not satisfactory and it is comparatively far away to nearby fruit markets (Table 3); which in turn has led farmers for high transport cost. This problem has further pushed to decrease

banana production by the farming households.

Table 3: Market accessibility

Code	Frequency	Response	Percentage
0	No	56	36.36
1	Yes	63.63	63.63
Total		154	100

Source: survey result, 2017

According to the survey result in table 8, 63.63% of banana producing respondents were not access to market which shows there is problem of infrastructure in the study area such as road connectivity, communication and market accessibility. This might be one of the factors influencing banana production in the area**.**

1.6.1.5 Area Planted Under Banana

Farmers in Uba Debretsehay district have limited land holdings. About 50% of banana farmers in the district own 0.25 hectares or less and 32.46% and 11.68% of respondents have land size of 0.26-0.5 hectares and 0.6-1 hectares respectively. Approximately 6% of the respondents have banana land size of a hectare. This indicates that where there is limited output of banana production as there is shortage of land in the study area. Where there is limitation set by land, farmers have to economize in use of the limiting factor or substitute man-made inputs for it like fertilizer.

1.6.1.6. Experience of the HHH in Banana Production

Table 4: Years of experience of the respondents in banana production

Code	Frequency	Response	Percentage
0	1.years	6	3.89
1	1-6years	61	39.61
2	7-10years	54	35.06
3	Above 10 years	33	21.42
	Total	154	100

Source: survey result, 2017

Table 4 above shows that 3.89% of the household head have less than a year experience in banana production. Moreover 39.61% of the respondents have years of experience below 6 years. However, cumulatively 56.48% of household heads had experience of 7 years and above in producing banana. Therefore, these are groups able to participate in economic transactions higher than others thus becoming more profitable, because experience in fruit farming was expected to have a positive influence on production and profitability. As farmers become more experienced in production of fruits through their involvement, their probability to participate in economic transactions will be higher thus becoming more profitable.

1.6.1.7. Price Banana

Higher prices for banana output motivate farmers to upgrade the quantity of the fruit produced. It was expected that price increases would incentivize farmers to produce more banana output, thus selling price was hypothesized to positively influence the productivity of banana producing farmers.

Table 5: Feedback of farmers on price of their banana yield

Code	Respondents feedback	Frequency	Percentage
0	Good	49	31.81%
1	Not good	105	68.19%
	Total	154	100%

Source: survey result, 2017

Table 5 shows that 68.19% of household heads participated in the study responded that the price of their banana production output is not good. This would have resulted in decreasing of production rate of banana in the study Woreda.

1.6.2. Descriptive statistics of some selected continuous variables

Table 6: Descriptive statistics of some selected continuous variables

Characteristics	Minimum	Maximum	Mean	Standard deviation	Variance
land (hectares)	0.125	1.5	0.520292	0.373081	0.139189
Yield (quintal)	24	60	43.3974	8.0472	64.7579
Household size	1	12	7	2.6386	6.96227
Distance to the market	1	12	5.428	2.996	8.978

Source: survey result and own computation, 2017

The above table indicates that the minimum land area covered under banana of the farmers involved in the sample data is 0.125 hectares while the average land size covered by banana is 0.52 hectares. The minimum amount of yield is 24 quintals per hectare. The minimum size of household is 1 while the average family size is 7. The minimum distance from farm to the nearest market is 1 kilometers. The average distance to the nearest market is 5.428 kilometers.

1.6.3. Econometric Results

Regression analysis was performed to test the extent to which the following independent variable- Sex of the farmer, educational status of the farmer, extension service provision, access to and use of credit availability, market access, cultivated land size in hectares, experience of the HHH in banana production in years, use of fertilizer, condition of price, HH size and market accessibility- affected banana yield.

1.6.3.1. Results of Multiple Linear Regression Model

A multiple log linear regression model with eleven predicator variables was regressed against a dependent variable banana output. This was done to identify significant socio-economic factors that could influence banana production in Uba Debretsehay Woreda.

Table 6: Results of Multiple linear Regression Model

Variable	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Constant	21.00633	9.688383	2.17	0.032	1.845685	40.16697
Land size	.9283261	1.334269	0.70	0.488	-1.710448	3.5671
Market access	-1.794192	3.022729	-0.59	0.554	-7.77222	4.183836
Extension service	-.4829399	2.542974	-0.19	0.850	-5.51216	4.54628
Educational level	29.18723	4.884763	5.98	0.000***	19.52667	38.84778
Household size	1.080381	.4665606	2.32	0.022**	.157668	2.003095
Gender	-.8826548	5.943762	-0.15	0.882	-12.63759	10.87228
Experience	-9.831853	5.770343	-1.70	0.091*	-21.24382	1.58011
Price	8.268704	3.205619	2.58	0.011**	-14.60843	-1.928977
Fertilizer Use	1.977583	2.92441	0.68	0.005***	-3.806	7.761166
N	154					
R^2	0.5383					
Prob(F-sta)	0.0000					

Note: Superscripts ***, ** and * show statistical significance at 1%, 5% and 10% respectively.   Source: the researcher's survey result, 2017

As shown blow (table 6) out of the nine predictor variables, five were statistically significant and these are education of the household head, household size, experience, price and fertilizer. Some of the signs of the estimated coefficients were consistent with a priori expectations while in some they were contrary to the expectations.

1.7. Conclusion

The main objective of this study was to investigate the socio-economic factors influencing the production of banana in Uba Debre Tsehay Woreda,Gamo Gofa zone,SNNPRS of Ethiopia. The first objective was looking at demographic characteristics of Uba Debre Tsehay banana farmers. It was found out that out of the 154 households that were interviewed 96.1% were male headed and 3.9% were female. Form the result it can be concluded that households in Uba Debre Tsehay Woreda are male dominated. The dominant age range was between 15 to 45 years and this shows that banana production in Uba Debre Tsehay is done by youth and adolescent age group. Average household size was seven. The results also showed that majority of the farmers were illiterate (20.77%) and not completed primary education (41%) while 9.09%, 11.68%, 7.79% and 9.74% had primary, not completed secondary school and post secondary educations respectively. Therefore it can be concluded that most of the famers were illiterate. The average land size under banana cultivation was 0.520292 hectares. The smallest owners had 0.125 hectares and largest had 1.5 hectares, therefore it can be concluded that banana producers in the study area have small land holdings.

Most of the banana producers in the study area were ageing and inexperienced in banana production (43.5%). Most of the banana producers in the study area (65.58%) have no contact on a regular basis with extension agents. Also a greater proportion of banana growers in the Woreda (64.28%) were not access to credit. That is most farmers do not receive financial assistance in the form of credit from formal sources. About 63.63% of banana producing households were not access to market where as 36.36% of them were access to market. There is a great problem of market accessibility as 63.63% of banana producing respondents are not access to market. And again farmers growing banana were not applying fertilizer (70.77%) in their banana farm.

A multiple linear regression was run to estimate the relationship between banana output and variable socio-economic factors. Based on the results, education, household size, fertilizer and price have positive relationship

with the banana output where as experience had a negative relationship with output. As the result of the findings, these significant socio-economic factors have to be reviewed in order to improve the production of banana in the study area in particular and in the country in general. Experience in banana production in this study showed a negative significance to banana output. One reason to this is that banana sector has been hindered by so many factors which are discouraging farmers to continue growing banana. Therefore, it can be concluded that banana is no longer a profitable fruit to grow.

Land size under banana cultivation and distance from the farm to the nearest market showed a positive coefficient but was not significant to banana output. This implies that these factors have no effect on banana production.

Based on the results from the study, it can be concluded that fertilizer application, educational status, household size, experience in production and price are the main socio-economic factors affecting banana production in Uba Debre Tsehay Woreda. The government should give emphasis on these factors of production so as to increase the production of banana.

1.8. Recommendation

Based on the findings of the study carried out concerning the socioeconomic factors affecting banana fruit production in Uba Debretsehay Woreda, SNNPRS, Ethiopia, some policy intervention areas and recommendations should be forwarded. Therefore, the following recommendations are stated as follows:

❖ Promoting education in production and marketing of banana product is a crucial factor in improving the marketing performance of the producers.
❖ Large households will be able to provide the labour that might be required by banana production.
❖ Since the land is fixed, the government should encourage the use of fertilizer, and it can do this by providing incentives for the setting up of cooperative societies in order to provide fertilizers to banana producers at an affordable price, so as to increase the level of production.
❖ The government should intervene and ensure that farmers benefit from their banana produce by helping them to improve their banana productivity and sell their produce at fair prices.
❖ Banana farming experience of households negatively and significantly affected household banana production. This shows that households who have been in banana production for many years are less motivated to continue in banana production. The policy implication of the variable is that old aged household heads should be educated through extension services to enhance banana production.

1.9. REFERENCES

C.A.Wongna.(2009). *Analysis of factors affecting the production of Cashew in Wenchi municipality, Ghana*: Institute of Entrepreneurship and Enterprise Development,

CFC (Common Fund for Commodities) (2004). *Development of Organic banana production and export in Sudan and Ethiopia to the Middle East and Europe*: FC /CC/34/FISGB/10. Appraisal Report, Addis Ababa, Ethiopia

CSA (Central Statistical Agency of Ethiopia) (2014). *Agricultural Sample Survey Report on Area and Production of Major Crops:* Volume I, V II and V III, Statistical Bulletin 572. Addis Ababa, Ethiopia.

Falcon and Peter,T.(1975). *The Political Economy of Rice Production and Trade in South East Asia: Agricultural Development Theory*. New Haven, Yale University Press

FAO (2001, 2009). *Food and Agriculture Statistical Data Bases* (FAOSTAT): In: Http: //Faostat.Fao.Org

Heisman, G. (1995). *Research Method in Psychology, Fourth Edition*. Houghton Mifflin Company. Boston, USA.

Henderson, J. and Richard, E.(1980). *Microeconomic Theory: A Mathematical Approach*. (3rd Edition) Mc Graw-Hill Book Company.

Joel Mpawenimara (2005). *Analysis of Socio Economic Factors Affecting the Production of Bananas in Rwanda:* A Case Study of Kanama Ditrict, *Economic and Political Weekly*, 2(1): September 2005, Pp.33-34

Kapuya, T. Davison, S. Admire, J. Tolbert, M. Kingstone, M. Lulam. (2010). *The Grain Industry Value Chain in Zimbabwe:* Prepared for the Food and Agricultural Organization of the United Nations with finding from the EU ALL ACP Agricultural Commodities Program.

Kathirvel, N. (2008). *Banana Production in Karur Distric, Kisen World, 35 (3)*: March 2008, Pp.13-14.

Mafoso, L. (1999). *Economic Analysis of Factors Influencing Egg Production in Maseru Urban*: Dissertation Submitted In Partial Fulfillment For The Award of Bachelor of Science In Agriculture. National University of Lesotho; Roma, Lesotho

Malassis.(1975). *Agricultural Policy and Wheat Production*: A Case Study of Pakistan Vol.27, No.3, 2011

Mutamba, M. (1999). *Household Resource Allocation in Agriculture and Wood Land Use in Chivi District:* Impact of Producer Price Movements on Woodland Resource Utilization in Zimbabwe's Communal Areas, Harare.

Muthupandi, V.   (2009). *Cultivation and Marketing Problems of Banana in Tamil Nadu*: A Study With Reference To Madurai District, Unpublished Ph.D. Thesis Submitted To Madurai Kamaraj University, Madurai.

Wyckof,J.B. and Rukuni, M. (1992). *Food Security Research in Southern Africa: Policy Implications.* UZMSU Food Security Research Project, University Of Zimbabwe, Harare.

Yamane, Taro. (1967). *Statistics, An Introductory Analysis*, 2nd Ed., New York:Harper and Row

Zenebe Woldu, Ali Mohammed, Derebew Belew, Zekarias Shumeta, Adam Bekele (2007). *Assessment of Banana Production and Marketing in Ethiopia*: *International Journal of Sciences*, Basic and Applied Research (IJBAR), Volume 24, NI 3, PP. 283-307, 2015.