American Journal of Rural Development, 2018, Vol. 6, No. 1, 7-13
Available online at http://pubs.sciepub.com/ajrd/6/1/2

DOI:10.12691/ajrd-6-1-2

An Analysis on the Effect of Farmer's Health on Production Performance in the Kumba Municipality of Cameroon

Ewala S. Oyang[1], Martin Paul Jr. Tabe-Ojong[2,*], Ernest L. Molua[1]

[1]Department of Agricultural Economics and Agribusiness, Faculty of Agriculture and Veterinary Medicine, University of Buea, P.O. Box 63 Buea, Cameroon
[2]Institute for Food and Resource Economics, University of Bonn, 53119, Bonn, Germany
*Corresponding author: tabeojongmartinpaul@gmail.com

Abstract Advances in productivity analysis show the importance of human capital in driving productivity and reducing inefficiency in production. Based on this premise, we profile and analyze the effect of farmer's health on production performance in the Kumba municipality of the Southwest region of Cameroon. We sought to assess the share of poor health conditions on farm performance. Problems like malnutrition, poor values and habits amongst others, usually lead to farmer's poor health. We tested this hypothesis with the use of robust statistics and the Ordinary Least square technique to capture the relationship between farmers output, poor health and other important determinants. The study found the health conditions of farmers to be a critical and positive determinant of farm performance. The amount of labour hours is also observed to positively influence farm production. Other significant variables are farm size and amount of pesticide used. We therefore recommend to policy, increased investment in the health sector to urgently and increasingly address the health conditions of farmers in a bid to improve their health conditions while targeting food production in the long run.

Keywords: *health, farmers, production*

Cite This Article: Ewala S. Oyang, Martin Paul Jr. Tabe-Ojong, and Ernest L. Molua, "An Analysis on the Effect of Farmer's Health on Production Performance in the Kumba Municipality of Cameroon." *American Journal of Rural Development*, vol. 6, no. 1 (2018): 7-13. doi: 10.12691/ajrd-6-1-2.

1. Introduction

The growth and development of most African economies is still dependent on the food and agricultural sectors [1]. Despite advances in technology, production is still very low and below the expected levels. The Global harvest institute analysis posits that by 2030, Sub-Saharan Africa unlike other regions of the world will meet just 8 percent of its food demand [2]. This is very troublesome as it drops by almost 50 percent of the projected value in 2014. Consequentially, this will lead to an upsurge in food prices, importation of food, food support and increased deforestation for purposes of agricultural production. All these consequences will be greatly felt by poor rural families and landless households. The decline in food production in these economies as described by Nkamleu et al. [1] is consistently synonymous to their economic and social stagnation. Arguably, most governments and policy makers have recently been bent on answering the daunting question of: How can productivity or efficiency in production be increased? A key step to answering this question is to comprehend the various components of production and productivity as they are the possible pathways to increased food production [2].

Cameroon like most developing nations is still greatly dependent on agriculture for purposes of income, livelihood, food and employment [3]. Despite years of policy reforms and various adjustment programs, food production is still lagging behind with the country losing its potentials as one of the bread baskets of Africa. This could arguably be due to a plethora of factors amongst which are low productivity and inefficiencies in the level of production. The country generally specializes in the production of food crops like maize, cocoyams, yams, tomatoes and cash crops like cocoa, banana, and oil palm. Despite decreases in food production and productivity, population growth is on the increase [4]. If this persists, there may be a wide gap in the demand and supply of food as already observed in food deficits marked with an upsurge in food market prices. This deficit and price upsurge could resultantly lead to hunger, malnutrition and food security accompanied with falling standards of living [5].

Recognizing the menace from shortfalls in food production, the Government of Cameroon has set aside strategies and policies to augment production while reducing the gap between demand and supply. This is well enshrined in the country's Growth and employment strategy paper and other blue prints for achieving sustainable growth and development [6]. Most of these policy documents only stress the socio-physical aspects of improving the present status-quo but pay very little attention on the role of capital in all its forms, be it intellectual, human or institutional. Most empirical studies on agricultural production and productivity only focused on the role of farm characteristics and to a greater extent both intellectual and institutional capital stock. The human capital aspect has been forgotten, making its role in policy development and analysis very limited.

Health is an important form of human capital [7]. It can also be regarded as an investment in human capital [8]. Previously, human capital was understood to only mean education and skills [9]. However, this perception is currently changing as many authors interchangeable use health and human capital. As a form of human capital, it can positively influence agricultural production and productivity through the mental, physical and social spheres. This can be through increased strength and sustained resistance to longer farming hours or cognitive reasoning. Poor health usually represents a burden to an individual [10] as he cannot meet planned activities and has varying effects on each member in a farm family. For example, to a household head, it implies loss of labour hours meant for production as well as a reduction in production. This goes to affect his expected benefits and the dependents under him who are reliant for food nourishment and sustained livelihood. For other members of the household who participate in food production, it signifies reduced labour hours as well as impaired productivity for those who can resist the illness and carry on with production.

In this paper, we characterize various pressing health issues facing farmers in the Kumba municipality and we econometrically test the impacts of poor health on the production performance of farmers. To the best of our knowledge, there has been no study on the impacts of poor health on agricultural production in Cameroon. Most existing studies [1,3] only focused on identifying major production shifters and the role of other household characteristics. This study is novel and adds to knowledge while providing robust evidence for policy debates on the importance of farmer's health in production.

For the study, we follow the non -separable farm household model developed by Singh et al. [11]. This model assumes production and consumption decisions as well as labour decisions to be non-separable, that is, a household's labor and consumption decisions are made jointly with its production decisions. If the assumption of non-separability fails, family labour will be easily substituted with hired labour. However, agricultural production in this study area relies solely on family labour since production is geared for family consumption. Excess production is only sold after satisfying family food demands. Based on the above rationale, we follow Fink and Masiye [12] and hypothesize that farmers faced with poor health will produce less as a result of less time and energy spent in their fields.

The rest of the study is organized as follows: A brief literature review of the factors driving agricultural production is outlined in section 2 with specific emphasis on the studies which profiled the role of health in agricultural production. Section 3 outlines the chosen methodology and describes the data collection process and variables used. Both the descriptive and econometric results are presented and discussed in section 4 and we close up with a conclusion in section 5.

2. Literature Review

Agricultural production has been a core theme in the field of Agricultural economics with most researchers empirically profiling the determinants of agricultural production while understanding its linkages with inputs and output markets. Production of staple food crops occupies an important part in Sub-Saharan Africa's agricultural production. However, production has been on the decline with many researchers and policy makers delving deep to understand the issue.

In a bid to comprehend the falling production levels in Sub-Saharan Africa (SSA), Nkamleu et al. [1] made use of a panel data set of 10 countries in SSA with a 28 year time period. They employed mathematical programming methods like the data envelopment analysis (DEA) and the malmquist indexes of total factor productivity (TFP). The results generally point to a decline in TFP and failure in the agricultural production in SSA. Further analysis show that productivity performance is highly dependent on technological change than technical efficiency. More so, they found French speaking countries like Cameroon, Senegal, Cote d'Ivoire, Mali and Burkina Faso to exhibit higher productivity growth than english speaking countries like Nigeria, Uganda, Ghana, Zambia and Zimbabwe. Their succinct and elaborate analysis warrants further research efforts to effectively delineate the factors affecting each component on a more specific basis.

Following the intuitive work of Nkamleu et al. [1], many economists started profiling the production and productivity of many crops in a bid to understand the necessary components that have the potential to the drive agricultural production in Africa. For example Okike et al. [13] estimated the production efficiency of 559 farms in Nigeria using the Stochastic Production Frontier approach to identify the factors driving production as well as estimating efficiency effects using an efficiency equation. Their analysis affirms the importance of farm inputs like farm size, labour, fertilizer, manure, animal traction and production costs to be significant drivers of increased productivity and efficiency in farm production.

In their study on the socio-economic characteristics affecting maize production in the Rukwa region of Tanzania, Urassa [14] explored the role of various determinants such as farm size, education, and access to key agricultural inputs as well as extension services on the production of maize. They observed low maize production levels and based on their findings report the role of education and access to agricultural inputs in turning around this low production levels. Similar results were obtained by Abah and Petja [15] in their study on the factors hindering agricultural development in the Benue state of Nigeria. They identified other significant variables like access to credit and lack of processing and storage facilities. Furthermore, researching on the drought-prone crop, sorghum which is very resistant to high temperatures and suitable for semi-arid tropics, [16] in their analysis of 120 farmers in eastern Kenya found low sorghum production to be driven by the influx of pests and diseases and the use of traditional and low yielding sorghum seeds. They also found out that most farmers lacked the income to purchase major farm inputs like fertilisers, pesticides and improved seeds. Similar results were obtained by Ntakyo et al. [17] in their economic analysis of apple production in Uganda. They found apple production to be a very profitable venture using the conventional cost benefit analysis. They further used a Cobb-Douglas production function to establish determinants of apple production. Labour availability, the application of organic manure and the farmer's experience were factors proven to drive apple production.

From the above literature review, it is evidently clear that production and productivity are increasingly been driven by farm characteristics and other socio-economic variables. However, there is increasing concerns on the role of health as a form of human capital in driving productivity growth [9]. However, very few studies have empirically modeled this relationship. Most existing studies only profiled the role of health in economic growth using time series and panel data [8,18,19]. Nevertheless, the literature on the role of health in production and productivity is emerging with lots of emphasis placed on the Human capital theory which opines that any increase in knowledge or the health stock of an individual goes to improve his productivity. This is core and serves as a hypothesis for most empirical research on health and productivity analysis.

Antle and Pingali [20] set the pace with their study on the impact of pesticide use on farmers' health and the linking impacts of farmers' health on agricultural production in Philippines. The authors employed a three step procedure on data from two potential rice producing regions to portray the negative impacts of pesticide use on farmer health and the associated positive impacts of farmer health on agricultural productivity. Based on these intuitive results, they then performed a simulation analysis to model the effect of a pesticide reduction use on productivity. They found pesticide reduction to have a negligible effect on production, most probably because of increased production gain from healthy farmers. This only goes to bolster the role of improved farmer health in agricultural production. Paying attention to three problematic health issues in developing countries, Cole and Neumayer [10] explored the impacts of malaria, malnutrition and water borne diseases on total factor productivity (TFP) using a panel data for 52 developing and developed nations and controlling for endogeneity. They found all the three above mentioned aspects of health to significantly affect TFP. Aggregating their results, the authors confirmed that health affects economic growth mainly through TFP.

More recently in 2015, Fink and Masiye [12] made use of the randomized control trial (RCT) method in analyzing the productivity impacts of safety bed nets in rural Zambia. By randomly assigning bed nets to 516 farmers, they found a significant positive effect of these safety bed nets on productivity. Specifically, the production value of farmers who obtained the bed nets increased by US$ 76. This value approximates to 14.7% of the average output. They also observed labour to be a key determinant underlying productivity shifts. This signifies that any compromise on labour either by ill-health or any other factor will lead to output losses especially in cases of no labour replacement.

Our study is thus novel and will both complement and add to the limited empirical evidence on the role of health on the production of farmers. Firstly, unlike Fink and Masiye [12] who used experimental data, we make use of cross sectional data enabling us to understand the real scenario of the farmers. Secondly, the analysis goes beyond other previous studies [8,15] who only focused on single health issues affecting the farmers by profiling a broad range of tropical health issues affecting farmers like malaria typhoid, body pains, rheumatism, elephantiasis, appendicitis, yellow fever and even farm injuries.

3. Methodology

3.1. Nature and Source of Data

The study makes use of primary data collected by surveying farmers in the Kumba municipality. This data is collected with the help of a well-structured questionnaire which is orally administered to farmers to improve the reliability of the data. A two staged sampling technique is used to randomly select 60 farmers from Kumba I, II and III. On the questionnaire are questions that capture the biographic information and characteristics of farmers, their economic status (economies of output and input used) and also their health status.

The sample size is obtained from the conventional sample size formular

$$n = \left(\frac{Z^* \propto .}{E} \right)^2 \tag{1}$$

Where n= sample size of the study

E = error = population mean - sample mean which is assumed to be 1 and δ =population standard deviation = 3.95. Assuming a 95% confidence interval, implying α=0.05. $\alpha/2$ = 0.025; In the table of standard normal distribution, z= 1.96

Hence $n = \frac{(1.96*3.95)^2}{1}$ = 59.94 = 60 farmers

3.2. Empirical Model

The choice of an appropriate econometric method is usually dependent on the type of dependent variable. Our dependent variable is continuous and varies separately for all farmers. Thus, we employ the conventional Ordinary Least Squares (OLS) technique to model the impacts of poor health on the production performance of farm households in the Kumba municipality of Cameroon. We specify a linear model specified as;

$$\begin{aligned} Y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 \\ + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \mu_1 \end{aligned} \tag{2}$$

Where

Y_i = output of the i^{th} farmer in kg

x_1= Farm size in hectares

x_2= Capital in FCFA

x_3 = Poor health, measured as the number of days the farmer lost due to sickness and could not go to the farm, multiplied by the frequency of attack

x_4 = Dummy variable representing educational level

x_5 = Labour; hours worked on the farm

x_6= Fertilizer quantity, measured in kg

x_7= Pesticide quantity in litres

μ_1= stochastic error term

$\beta_0, \beta_1, \beta_2$,- β_7 are the parameter estimates

3.3. Description of Variables

Output (Y_i) is the total quantity of farm produce by each i^{th} farmer. It is a function of all the explanatory variables in equation (1) above. It is measured in kilograms.

Farm size (x_1) is a continuous variable defined as the land area cultivated for that season and is measured in hectares.

Capital (x_2) is an independent and continuous variable measured as the amount of FCFA used for the production of crops for that season.

Poor health (x_3) is a discontinuous variable and is measured as the number of days a farmer lost due to ill-health and could not go to the farm, multiplied by the frequency of attack during production (for that season)

Educational level (x_4) is measured as a dummy variable

Labour hours (x_5) is a continuous variable, denoting number of hours worked on the farm per day.

Fertilizer quantity (x_6) is the quantity of fertilizer used on the farm for that season measured in kilograms.

Pesticide quantity (x_7) is the quantity of pesticide used on the farm in liters (for that season).

3.4. *A Priori* Expectation

The coefficient of the farm size variable, β_1 is expected to be positive. This follows from prior empirical research and theory which purports that output increases as the quantity of land cultivated increases, β_2 is expected to be positive since wealthy farmers can avail themselves of advanced tools and techniques in farm production and be capital intensive. All this will go a long way to increase production. The coefficient of the health variable (poor health) is expected to be negative, probably because sick farmers will be weak and not have the strength to engage in the energy consuming and tiring farm activities. The coefficient of the level of education variables is expected to be either positive or negative. Positive because, education increases the knowledge base of farmers especially with regards to their production. However, it could as well be negative if educated farmers opt for better paid and less tiring jobs and treat farm production rather as an off-farm activity. The coefficient of labour hours, fertilizer and pesticide application are expected to be positive as a result of their role as important inputs in agricultural production.

4. Result and Discussion

4.1. Biographic Profile of Farm Households

According to the results obtained from the 60 administered questionnaires, the results revealed that 41.7% of the farmers are males and 58.3% are females. This shows that women are more engaged into farming than men. This is similar to Yamou [21], who studied the impact of health on maize farmers' performance in Buea municipality. Also it is seen that amongst the contacted female farmers out of the 58.3%, 50% of the female farmers are engaged in food crop production and just 8.3% in cash crop production. For the males, more than half of them are into cash crop production. This reiterates the fact that females engage more into food crop production, as is the case with Shu (2015), who studied optimal combination of arable crop enterprises in Bafut sub-division of Cameroon and reported a greater proportion of females being engage in food production. This can be seen on the table below:

The findings of this study also reveal that 6.7% of the farmers are young people (below 26 years), 13.3% are between 26-35 years while 46.7% of farmers are above the age of 45. Just as Yamou [21] in her work on the effect of health on maize farmers' performance in the Buea municipality, South West region of Cameroon, most youths are exiting agriculture and migrating to urban and metropolitan cities in search of non-farm jobs, thus allowing farm production in the hands of the ageing and weak population.

Both food crops and cash crops are produced by the farmers in the study area. Food crops cultivated are maize, groundnuts, cassava, sweet potatoes, yams, cocoyams, huckleberry, spinach, water leaf and bitter leaf. Cocoa, oil palm and plantains are the cash crops grown here. We found out that 50% of the food crop farmers are into grain crops like maize and groundnut, 30 % into tubers like yams and cassava and 20% into vegetables. Cash crop farmers reported seasonal harvests of 10-50 bags cocoa per season, about 20-2000 bunch of plantains per season and approximately 30-2000 cones of oil palm per season of harvest. Most of these cash crop farmers participated in rural markets in a bid to sell their farm produce. 80% of the cash crop farmers sold all their produce and 20% sold some and ate some. For the food crop farmers, 10% of food crop farmers sold their farm output to the market; about 90% sold, ate and stored some. From this 90%, 30% where grain farmers who sold between 1-2000kg of their harvest and about 60% sold about 2000-5000kg.

4.2. Health and Farm Production Performance

All the farmers contacted complained of being attacked by at least one disease. 40.7% of the sampled farmers had been sick of only malaria during the last season, 5% had been sick of malaria and typhoid, 11.7% reported body pains, 8.3% typhoid only, 6% gastritis, 10% Rheumatism; 5.7% yellow fever, 5.7% farming injury, 1.7% appendicitis, 4.3% river blindness. This shows that a greater number of farmers were attacked by malaria. This is similar to Yamou [21] implying farmers are vulnerable to disease attack in Cameroon. Table 1 below shows the distribution of the various diseases affected farmers.

Table 1. Summary statistics for diseases affecting farmers

Illness/Attack	Frequency	Percentage
Malaria only	24	40
Typhoid only	5	8.3
Malaria & Typhoid	3	5
Body pain (back & waist pain)	7	11.7
Rheumatism	6	10
Yellow fever	3	5
Farm Injury	3	5
Gastritis	4	6.3
River blindness	3	4.3
Appendicitis	1	1.7
Elephantiasis	1	1.7
Total	60	100

Source: Field Survey, 2017

Characterizing the various diseases (Table 2), we further presents the frequency of each attack, (number of times each illness attacked a farmer) number of days lost due to ill health and the cost of health care per farmer. On average, farmers sampled in the study area are sick 17 times per farming season, losing approximately 146 days due to ill health with an accompanying expenditure of 400,000FCFA on health care (prevention + treatment cost)

Table 2. Frequency of each attack, number of days lost and cost of health care

Illness/Attack	Freq. of attack	Number of days lost	Health costs (FCFA)
Malaria	2	7.4	20,000
Typhoid only	1.8	8	21,000
Malaria/Typhoid	1.8	9	22,000
Body pain (W/B)	2	10	12,000
Rheumatism	2.5	9	50,000
Yellow fever	1	8	30,000
Farm injury	1.5	10	24,000
Gastritis	2	10	25,000
River blindness	1.5	15	35,000
Appendicitis	1	30	100,000
Elephantiasis	1	40	70,000
Total	18.1	146.44	409,000

Source: Field Survey, 2017

Mindful of the fact that agricultural production in Africa is largely dependent on family labour, and in line with the assumption of the non-separable agricultural household model, we also profiled the health status of other household members. We observed that 45% of the sampled farmers had household members who were sick while 55% of farmers reported no cases sickness attacking other household members. Out of the 45% of the sick household members, malaria had the highest proportion, 30% of household members suffered from malaria, while the remaining 10% suffered from other illnesses like typhoid, gastric, body pain influence. Hence, targeting malaria in the study area is a bold step toward reducing the number of sick farmers in the area. Farm production had a mean expenditure of 530,336.9FCFA with farmers spending an average of 360,000FCFA on health care, resulting to a 67% loss of expenditure to health care. This shows that poor health makes the farmers spend more, increasing the total cost of production. This significant loss is due to poor health conditions of farmers. This indicates that health as a form of human capital is a major input of farm production.

4.3. Health Status and Farm Performance

The study indicates that 5% of the farmer's harvest is not affected when s/he is sick while 95% complained both mild and significant yield losses. The only farmers who were not affected were those either receiving assistance throughout the period of sickness or got sick when little or no work was to be done on the farm. Those with a significant drop in yields either did not received assistance when sick or lost many days due to ill health.

Furthermore, the study revealed that farmers who are not assisted when sick lost a mean yield of 1000kg and harvested 4000kg of crop produce while farmers who are assisted lost a mean yield of 1000.87kg and harvested 5830.69Kg. Table 3 shows that farmers who are assisted in their farm when sick are better off than farmers who are not given assistance. This gives a justification for the importance of good health to farmers' performance in terms of output.

Table 3. Assisted and Non-assisted farmers

Farm assistance	Frequency	Harvest lost kg	Harvest realized
Not assisted	10	2000.5	4030.69
Assisted	50	1000	5830.8

Source: Field Survey, 2017

Despite the above interesting and relevant results, we further tested implicit relationships in an econometric model to test the presence of changes or confirming the above results after controlling for confounding factors.

4.4. Econometric Results

As explained in the methodology, we estimate a linear model for modeling the impacts of poor health on the farm performance of farmers in the Kumba municipality. Table 4 presents the coefficient and t-values of the linear model as well as the decision to reject the variable or not based on its significance in the model

Table 4. Linear Econometric Estimates of Farmers' Production Performances

Variables	Coefficient	t-value	Decision rule
Constant	803.078	1.708	Reject
Farm size	0.390***	4.060	Reject
Capital	0.111	1.315	Fail to reject
Educational Level	0.067	1.088	Fail to reject
Labour hours	0.319**	2.684	Reject
Poor health	-0.671**	-2.847	Reject
Fertilizer quantity	0.037	0.611	Fail to reject
Pesticide quantity	0.317**	2.671	Reject

F-ratio=32.861, R^2=0.8, R^{-2}=0.785, DW=2.043, N=60, df=51

Notes: ***, ** and * represents significance at 1%, 5% and 10% respectively.

Source: Field survey by Author, 2017

As seen above the magnitude of the adjusted R^2 and the F-ratio for the linear model is higher. Based on model selection rules, we treat the linear model as our lead model and proceed with the interpretation as follows.

The line of best fit is considered as the regression line which is designed to explain the extent to which the independent variables explain the behavior of the dependent variable is reported by the coefficient of multiple determination in this case known as R^2. We have an adjusted R^2 value of 0.785 showing that 78.5% of variation in farmer's production performance is due to change in the independent variables.

Based on the F-tests, which is greater than the critical value, For the F-statistics, we reject the null hypothesis of no joint significant relationship between our variables and farm production. We therefore state that our result is both statistically significant and more than 95% reliable, thus making it acceptable for policy development and implication. The Durbin Watson (DW) value is 2.003. Reading its value from the Durbin Watson table given k=9 and n-60, we falls in the region of positive inconclusive. Therefore, our estimated parameters are reliable and our model can be used for forecasting.

The coefficient of the constant term in a model is positive (803.078) and it shows that when the other factors (farm size, capital, poor health, education, labour hours, fertilizers and pesticide quantity) are held constant, the value of farm production is 803.078Kg.

The main covariate poor health captured as a dummy is negative and significant at the 5% level of probability. This is strongly in line with the *a priori* expectation which states that farmers who are not healthy will be observed with lower yields. This finding confirms the hypothesis that poor health negatively affects farm production level of farmers. Understandably, this is as a result of the time spent on the sick bed which was supposedly to be spent in the farm. Furthermore, capital meant for farm production is directed to pay for medical bills. Farmers were mostly observed with diseases like malaria which is widespread in Kumba as a result of the many nearby bushes and numerous pools of water in the municipality. This result is consistent with a panel study of the impact of malaria on TFP in 52 developing and developed nations by Cole and Neumayer [10]. Empirical findings by Abah and Petja [15] also support this hypothesis. However they focused on the role of HIV prevalence on farmers in the Benue state of Nigeria. As explained by the authors, health (HIV) affects production by lowering productivity since farming hours are converted to bed rest time or check-up time in the hospitals.

The coefficient of farm size is positive and statistically significant at the 1% level of probability indicating a positive relationship between farm size and farmers' production. In economic terms, it implies a unit increase in land size will lead to an accompanying increase in farm output by 39 units in kumba municipality. Education level as expected depicted a positive relationship with farm output. This can be explained by the fact that education increases the knowledge base of the farmers as well as the processing of vital information related to crop production. The amount of fertilizer used is positively related to the farm output implying farmers who follow agronomic practices and apply the required quantities of pesticides are observed with greater yield increases. Crop production in most parts of Cameroon is plagued with the spread of numerous pests and diseases. The application of pesticides is thus a vital practice and a promising measure to increase farm output.

It is no surprise that the coefficient of labour hours is both significant and exhibiting a positive relationship with the farm output. This is intuitive and makes sense as most farm production activities are labour intensive. As previously explained, most households are dependent on family labour for their production purposes. This result is in line with economic principles which posit labour as a critical determinant of farm production. The availability of labour makes it easy for the household to target its production and perform all its farm activities in a short period of time. The coefficient of capital is expectedly positive though insignificant. Capital relaxes the financial constraints of farm households, making it easier to obtain farm inputs like fertilisers and pesticides as well as hiring labour. Perhaps, with more capital, you can extend your scale of production and get better yields.

5. Conclusion

The study seeks to analyze the effect of farmer's health on production performance in Kumba Sub-division, South West Region of Cameroon. The role of health as a form of human capital in farm production cannot be over emphasized. This study brings to lamp light the importance of human capital (health) as an indispensible production input in agriculture and the economic development of the nation as a whole. Agriculture in Cameroon is labour intensive, making farming highly vulnerable to household labour disruptions. The study had as aims characterizing the various diseases affecting farmers in the Kumba municipality and identifying its impacts on farm production. This research is therefore considered important to farmers, agriculture and health personnel who are jointly into policy making and for enhanced rural development and better livelihoods.

The study made use of primary data collected with the help of well-structured questionnaire administered to 60 farmers, as well as information from previous surveys from delegations of health agriculture and rural development. The data is analyzed using descriptive analysis and the conventional ordinary least square technique. The size of farms, labour hours and the amount of pesticide used were all significant and positively related to farm production performance. This implies any policy to tackle increased food production should ensure the access of farmers to the above farm inputs. Critical analyses in the study reveal an inverse relationship between poor health and production performance Farmers are attacked by diseases such as malaria and typhoid amongst others. Malaria was widely reported in the study zone. Malaria is easily propagated in the presence of thick bushes and loops of standing water. This is exactly the case in the study area. We therefore recommend to policy the setting up and reviewing of actions necessary to prevent the spread of malaria by clearing all thick bushes and filling up the water loops. Furthermore, special educative sessions and trainings should be organized to educate farmers on the role of maintaining good health and hygiene especially when it comes to family health. Like many other studies, we emphasize and argue that, achieving self-sufficiency in food production and the much desired growth in the agricultural sector of the economy of Cameroon will only take place if health issues in agriculture are properly addressed.

Based on the findings of this research, the following recommendations are made:

Given the important of health as proven from the results, farmers are advised not to only focus on physical inputs as means of increasing their outputs, but also value their health; as it strongly determines the quantity of farm output. Agricultural and health departments should consider coordinating their policy making so as to overcome ill health among the rural poor and to strengthen agriculture's role in alleviating pressing hunger issues. Furthermore, policy actions aimed at training farmers in work related risk reduction measures geared at curbing infections and incapacitations accessioned by diseases, accident and strains should be promoted and encouraged. The cost of health care should be subsidized and farmers encouraged to use modern medications at the prescribed rates. Moreso, they should also be educated on the value of health as a form of human capital. Lastly, the quantity and quality of extension service rendered in the study area shall be increased so as to meet the felt needs of the farmers.

References

[1] Nkamleu, G. B., Gokowski, J. and Kazianga, H. 'Explaining the Failure of Agricultural Production in Sub-Saharan Africa', in 25th International Conference of Agricultural Economists, August 16-22, 2003, Durban, South Africa.

[2] GHI (2017). 'Global Agricultural Productivity Report: A World of Productive Sustainable Agriculture'.

[3] Tabe-Ojong, M. P. JR. and Molua, E. L. (2017). 'Technical Efficiency of Smallholder Tomato Production in Semi-Urban Farms in Cameroon: A Stochastic Frontier Production Approach', Journal of Management and Sustainability, vol. 7, no. 4, p. 27.

[4] World Bank (2014). Cameroon Data Portal: Cameroon Agricultural sheet [Online]. Available at http://cameroon.opendataforafrica.org/hxycnxc/cameroon-agriculture-sheet.

[5] Anigbogu, T. U., Agbasi, O. E. and Okoli, I. M. (2015). 'Socioeconomic Factors Influencing Agricultural Production among Cooperative Farmers in Anambra State, Nigeria', International Journal of Academic Research in Economics and Management Sciences, vol. 4, no. 3.

[6] GESP. (2009). Growth and employment strategy, Yaounde, Cameroon.

[7] Bloom, D. E. and Canning, D. (2005). Health and Economic Growth:: Reconciling the Micro and Macro Evidence, Harvard School of Public Health.

[8] Mayer, D. (2001). 'The Long-Term Impact of Health on Economic Growth in Latin America', World Development, vol. 29, no. 6, pp. 1025-1033.

[9] Tompa, E. (2011). The Impact of Health on Productivity: Empirical Evidence and Policy Implications.

[10] Cole, M. A. and Neumayer, E. (2007). 'The impact of poor health on total factor productivity', The Journal of Development Studies, vol. 42, no. 6, pp. 918-938.

[11] Singh, I., Squire, L. and Strauss, J. (1986). Agricultural Household Models: Extensions, Applications and Policy, Baltimore and London, The John Hopkins University Press for the World Bank.

[12] Fink, G. and Masiye, F. (2015). 'Health and agricultural productivity: Evidence from Zambia', Journal of health economics, vol. 42, pp. 151-164.

[13] Okike, I., Jabbar, M. A., Manyong, V. M., Smith, J. W. and Ehui S K. (2004). 'Factors Affecting Farm-specific Production Efficiency in the Savanna Zones of West Africa', Journal of African Economies, vol. 13, no. 1.

[14] Urassa, J. K. (2015). 'Factors influencing maize crop production at household levels: A case of Rukwa Region in the southern highlands of Tanzania', African Journal of Agricultural Research, vol. 10, no. 10, pp. 1097-1106.

[15] Abah, R. C. and Petja, B. M. (2015). 'The Socio-economic Factors affecting Agricultural Development in the Lower River Benue Basin', Journal of Biology, Agriculture and Healthcare, vol. 5, no. 24.

[16] Muui, C. W., Muasya, R. M. and Kirubi, D. T. (2013). 'Baseline Survey of Factors Aggecting Sorghum Production and use in Eastern Kenya', African Journal of Food, Agriculture, Nutrition and Development, vol. 13, no. 1.

[17] Ntakyo, P. R., Mugisha, J. and Elepu, G. (2013). 'Socio-economic Factors Affecting Apple Production in South western Uganda', African Crop Science Journal, vol. 21, no. 4, pp. 311-321.

[18] Narayan, S., Narayan, P. K. and Mishra, S. (2010). 'Investigating the relationship between health and economic growth: Empirical evidence from a panel of 5 Asian countries', Journal of Asian Economics, vol. 21, no. 4, pp. 404-411.

[19] Rivera, B. and Currais, L. (1999). 'Economic growth and health: Direct impact or reverse causation?', Applied Economics Letters, vol. 6, no. 11, pp. 761-764.

[20] Antle, J. M. and Pingali, P. L. (1994). 'Pesticides, Productivity, and Farmer Health: A Philippine Case Study', American Journal of Agricultural Economics, vol. 76, pp. 418-430.

[21] Yamou T.A. (2016). 'The effect of health on maize farmers in the Buea municipaliy' Bsc Dissertation (unpublished), Department of Agricultural economics and agribusiness, University of Buea.