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RESEARCH ARTICLE

DETERMINANTS OF AGRICULTURE AS A DEGREE CHOICE AMONG THE YOUTH IN BUKIDNON, PHILIPPINES

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Abstract

The research was conducted to analyze the determinants of agriculture as a degree choice among senior high school students in Bukidnon, Philippines. Specifically, this aimed to describe the personal and non-personal factors of the senior high school students; examine the guiding principles of the Bachelor of Science in Agriculture (BSA) curriculum in preparing students in choosing agriculture as a degree; and analyze the determinants of choosing agriculture as a degree. Data were gathered through guided interview personally administered to 383 Grade 12 senior high school students in DepEd, District of Bukidnon. Focus group discussion and key informant interview were used. Descriptive statistical, Chi square and logit regression analysis were used to analyze the determinants of agriculture as a career choice. Findings shows that the respondents are young, mostly female, and have experiences in farming, do not own a piece of land used in agriculture, willing to engage in agriculture but are not willing to enroll in an agriculture degree. Therefore, respondents who will pursue agriculture as a degree are males and have land used for agriculture, farming experience, and a brother who is working in agriculture-related field. They are individuals who decide on their own degree, influenced by their mother's occupation and their family in decision-making. All the guidelines used by Maredia (2007) are complied by the college in the continuous development of the BS Agriculture degree program. Only the Innovativeness principle does not exist in the college. It does not yet offer distance and open access education but a six-month distance learning program for agriculture professionals may be offered. In order to attract the interest of the youth in agriculture degree, interventions must such as scholarship grants, linkages with private and other industries for on the job trainings and employment, loan system for entrepreneurial purposes of graduates.

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Introduction:-

The future of agriculture relies high on the youth sector having age ranges 15-24 years (UNESCO, 2015), the youth have a strong role and potential in providing solutions to the global challenges of agriculture. However, agriculture as a profession has become less attractive to the youth (AFA, 2015; Eissler & Brennan, 2015; FAO, 2014; Paisley,

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2014). Despite the youth's potential in providing solutions to the global challenges of agricultural development, their engagement in agriculture has become limited (AFA, 2015; FAO, 2014; GFRAS, 2017). Furthermore, the participation of the youth sector in agriculture has dwindled due to the youth's negative perception of agriculture and its consequent unattractiveness as a degree.

In East Asia, Southeast Asia, and Latin America, the youth's migration to urban areas caused a decline in the rural youth population in past 10 to 25 years (van de Geest, 2010). Various reports worldwide express that youth sector constituting large part of the total population, therefore high percentage of unemployment rate are being observed (Eissler & Brennan, 2015). Due to less percentage of the youth population in agricultural sector, a large percentage of farmers in old age keep on working in the fields of agricultural practices. In the Philippines, for example, the average age of farmers is more than 57 years (Elauria, 2015). This implies that Filipino farmers are about to retire, are physically weak and vulnerable, and may not be as active as they were in their youth in doing different farm activities. While there are ageing farmers, who can still produce agricultural products, the older farmers are less likely to try new farming technologies (FAO, 2014).

The literature suggests three main reasons for the youth's limited involvement in agriculture: a) the youth's increasing negative perception about agriculture as a source of income and employment (Abdullah, Samah & Othman, 2012; AFA, 2015; Elauria, 2015; Noorani 2015; Proctor and Lucchesi 2012; Shrestha 2001; Zamora, 2014; Chinsinga and Chasukwa, 2012 as cited in Dyer and Breja 2003; FAO, 2013; Eissler and Brennan, 2015; FAO, IFAD and MIJARC, 2014; Swarts & Aliber, 2013); b) the declining rate of enrollee and graduates of the Bachelor of Science in Agriculture (BSA) (Zamora, 2014); and c) the ineffective curricular programs in BSA in developing skills that should match with current market labor demands (Goemans, 2014; The Global forum for rural advisory services, 2017).

The decline of the youth population in the agriculture sector is generally caused by the youth's negative perception about agriculture as ; a lowly and dirty job (Cheteni, 2016; Douglas et al. 2017; Elauria, 2015; Noorani, 2015;), (b) life in agriculture is difficult and tiring job (Holz-Clause & Jost, 1995; Noorani, 2015; Proctor & Lucchesi, 2012), (c) agriculture offers low income (Douglas et al., 2017; Leavy & Hossain, 2014; Sarju, Singh & Singh, 2015) and; (d) agriculture is not a prestigious degree (Douglas et al., 2017; Garwe, 2015; Johnson, Johnson & Macauley, 2015).

Recent educational policy developments in the Philippines, such as the free tuition program in all state universities and colleges (SUCs) and the institution of the Kinder to Grade 12 Program or K-12 Program by the Department of Education, could attract the youth to pursue agriculture in college (AFA, 2015). With the free tuition policy in SUCs, there is hope that the percentage of enrollees in BSA will increase. A degree in agriculture, however, is one of the many options of degrees offered by SUCs to students. Also, choosing a profession is a critical life choice that cannot be simply induced by the offering of scholarships on agriculture (AFA, 2015). Meanwhile, agriculture is introduced in the K-12 Program, particularly Grades 11 and 12, the junior-senior high school students. In addition to previously cited factors, these recent policy developments are looked into in this study as additional influential factors.

Meanwhile, the effective performance of institutions offering higher education is also considered as a possible solution for an increased engagement of the youth in agriculture by keeping in view that rural young people have sufficient access to knowledge, information and education particularly in the developing countries (Goemans, 2014). Goemans (2014) explains that the provision of education to youth is essential in addressing challenges of today's agricultural sector by adopting latest technologies and traits. Insufficient access to knowledge, information and education is supposed to be addressed by the agricultural education programs offered by the higher learning institutions. These institutions generally aim to capacitate students for them to successfully participate in the agriculture sector.

In the Philippines, the agricultural education programs offered by the SUCs remain as the important media through which knowledge and skills could be acquired by the rural youth (Goemans, 2014). In other words, one function of an SUC, in this regard, is to make sure that the rural young Filipino students would become professionals in agriculture. In Bukidnon employment opportunities from the different potential industries are present and individual who has a degree in agriculture may also engage in any of the following jobs; farm manager, farm consultant, food sciences, agricultural engineering, agricultural sales, agricultural scientist and agricultural communications (YPARD, 2016; Williams, n.d.).

The study, therefore, is an attempt to analyze the stated problem in the case of the Province of Bukidnon where some registered Grade 12 students might pursue BSA program offered by Central Mindanao University (CMU), the leading university in agriculture in the northern part of Mindanao. Generally, this study aimed to analyze the determinants of agriculture as a degree choice among senior high school students in Bukidnon, Philippines. Specifically, this study aimed to describe the personal factors of the senior high school students; analyze the determinants of choosing agriculture as a degree; and recommend strategies to enhance the choice of BSA as a college degree.

Methodology:-

Respondents were senior high school (Grade 12) students of the public schools in Bukidnon. A list of schools offering senior high school was obtained from the Department of Education, Division of Bukidnon Region X. From the list the data shows that the total number of students enrolled in Grades 12 in all public schools in the Division of Bukidnon is 5,512. Based on the Cochran formula, a population 5,512 has a sample size of 383. Guided interview and focus group discussion were utilized. Chi-squared tests were used in the study to see if the association among the factors was significant, and a significance level of 0.05 was used in the study. This is used as it is the prerequisite before proceeding to logit regression analysis. Binary Logit Regression where the variable of interest Y is binary. The two possible outcomes are labelled as 0 and 1. This tool was used in the study in order to analyse the determinants of agriculture as a degree choice. In order to have a representative of sample from each school, ratio and proportion was used. From the sample size, the researcher employed a random selection.

Findings

Age, Sex, Household size

Age.

Table 1 shows that the average age is 18 years old with 16 being the youngest and 28 being the oldest. Majority (40.2%) of the respondents were 18 years old. This implies that the respondents were generally young and had some physical strength to engage in economic activities in the agriculture sector. This finding corroborates the results of Saliu et al., (2016) and Abebo and Sekumade (2013) who found that respondents in this age category are “very productive and very useful” in the development of agricultural sector and the economy.

Sex.

In terms of sex, majority (60%) of the respondents were female and 40 percent were male, a result similar to that of Esters (2007) who found a greater proportion of female respondents than male respondents.

Table 1:- Personal characteristics of respondents.

CHARACTERISTICS	FREQUENCY	PERCENTAGE
Age		
16	13	3.40
17	108	28.20
18	154	40.20
19	68	17.80
20	13	3.40
21	12	3.10
22	6	1.60
23	5	1.30
24-29	4	1.10
Mean		18.20
Sex		
Male	152	40.00
Female	231	60.00
Household Size		
1-5	168	43.90
6-10	205	53.50
>10	10	2.70
Mean		6.00

Household size.

The average number of the respondent's household size was six (6). More than one half (53.5%) had a family size between 6-10 members. This result implies that the respondents need support in terms of basic needs and education. Furthermore, large household sizes indicate that there is more than enough manpower to operate a family farm thereby improving a family's agricultural production and household chores (Muhammad-Lawal et al., 2009; Saliu et al., 2016).

Chi Square Test

A Chi-square test was performed to find out the association between socio-demographic factors and the intention to pursue agriculture as a degree choice among the youth in Bukidnon, Philippines. The null hypothesis was tested at $\alpha = 0.05$. Table 1 shows that the p -value (0.006) is less than 0.05 indicating the statistical significance of the association being tested. Thus, there is a significant relationship between intention to take agriculture degree and the sex of the respondents. With a total positive response of 63.2 percent, this result implies that males have a greater chance of pursuing agriculture as a degree as shown in Table 2. This suggests that the males have a higher tendency of pursuing agriculture than female respondents. This result is consistent with the findings of Mallory & Sommer (1986), who reported that males are more likely to think of working in agriculture or pursuing a degree in agriculture than females. Male are more capable of doing the tedious activities that is usually associated with farming than females (Muhammad-Lawal et. al., 2009).

Table 2 shows the association between the intention to pursue agriculture and land ownership. The relationship was found out to be significant at the .05 level (p -value = 0.04). Hence, data suggest that children of landowners have greater chances of pursuing agriculture as a degree with a total response of 60.70 percent. The data further shows that 48 percent of the respondents owned land used for agriculture.

Table 2:- Chi Square test relationship between students' personal and non-personal characteristics and degree (whether to pursue or not pursue agriculture as a degree).

Characteristics	Intention to pursue Agriculture as Degree				Total
	Yes		No		
Sex	Frequency	Percentage	Frequency	Percentage	
Male	96	63.20	56	36.80	152
Female	113	48.9	118	51.08	231
Total	209		174		383
P-Value	0.006				
Land ownership					
Yes	111	60.70	72	39.30	183
No	97	48.7	102	51.3	199
Total	209		174		383
P-Value	0.043				
Experience in farming					
Yes	156	62.7	93	37.3	249
No	53	39.8	80	60.2	133
Total	209		174		383
P-Value	0.000				
Family influence you in your degree choice					
Yes	156	58.4	111	41.6	267
No	53	45.7	63	54.3	116
Total	209		174		383
P-Value	.021				
Degree intended to enroll in college					
Agriculture	81	88.04	11	11.95	92
Non-Agriculture	128	43.99	163	56.01	291
Total	209		174		383
P-Value	0.000				

However, more than half (52%) of the respondents did not own land used for agriculture. This means that the respondents with land used for agriculture are likely to pursue agriculture as a degree as they have background in agriculture and they know how agriculture works. Respondents with land used for agricultural purposes try to engage in agriculture and generate income to support the family (Kerbler, 2012).

The relationship between experience in farming and the intention to take agriculture as a degree was also significant, with a p -value of 0.00 at a significance level of 0.05. A little less than two-thirds (65%) of the respondents had experience in farming while 35 percent had no experience in farming. The data indicate that, in general, respondents had farming experience. These findings indicate that the respondents have farming experience and that they are mostly familiar with the farming industry. This result is in line with the work of James and Denis (2015) and Abebo and Sekumade (2013) in their conclusions that respondents had experience in farming before being admitted to their university. The findings of Saliu et al. (2016) contradicts with this result, the authors found out that majority of the respondents had no experience in agriculture before entering college. However, this finding was expected as Bukidnon is a predominantly agricultural province. Furthermore, the data imply that those who have farming experience are likely to take an agriculture degree with a total response of 62.7 percent. Individuals with farming experience have knowledge on agriculture. The higher the experience in farming of an individual, the more informed they are of the benefits that can be gained from the agriculture industry (Douglas et al., 2017).

Statistical results indicate that family influence on grade 12 students have a significant ($p = 0.02$, $\alpha = 0.05$) effect on their intention to pursue Agriculture as a degree. Majority (69.7%) of the respondents answered yes when asked about their family's influence on their degree choice. This means that that one of the factors that can influence the respondents in pursuing agriculture is the advice and support of their families. Students are often reluctant to pursue or even explore diverse degree possibilities without the parental or families approval or support (Adejoh et al., 2016). This result is corroborated by the works of Esters & Bowen (2004) and Fizer (2013) who reported that the family influences individuals in deciding what degree they will undertake in college. It also corroborates the study of Njeri (2013) who mentioned that the family influence also affects students' choice of degree. Children usually seek advice from their parents since children trust them more compare to other people (Sinkombo, 2016). Mtemeri (2017) also revealed that family members had an influence on students' choice of degrees and may lead to students following the degree path of their parents, elder siblings, or other relatives.

Chi-square test results suggest that there is a significant relationship between the intention to take agriculture degree and the degree intended to enroll in college ($p = 0.000$; $\alpha = 0.05$). However, since most of the respondents choose college degree programs other than agriculture, this result implies that respondents are not willing to pursue agriculture as a degree choice. This result corroborates with the study of Pascual (2014) who concluded that the least preferred degree by the students is agriculture-related degree.

Binary Logit Regression

The most significant determinants that influence students' choice of agriculture as a degree were identified and were found to be positive at the 90% confidence level. The personal factor farm experience was found to significantly determine a student's choice of agriculture as a degree. In terms of influence, the table indicates that there are multiple influences on the degree choice decisions of the respondents. Father's occupation, mother's education, personal interest, and a brother who works in agriculture were all found to have considerable influence on students' decision to pursue a college degree in agriculture.

Farm Experience.

The farm experience is significant with an alpha value of 0.00 which is less than the p value of 0.10. It has an odds ratio of 3.01. The data imply that the higher the farming experience of the respondents, the greater the tendency of the respondents to pursue the path of agriculture. The odds ratio value of 3.01 means the number of times the respondents will pursue the degree. In this case, the respondents are 3 times more likely to pursue agriculture as a degree. This result means that farm experience or prior exposure to agriculture have an impact on pursuing agriculture as a degree. This result is similar to the findings of Wildman and Torres (2002) who mentioned that experience in agriculture influences students to choose agriculture as a major.

Influence of Mother's Occupation.

Influence of the mother's occupation is also significant with a p value is 0.046 which is less than the alpha value of 0.10. This means that the higher the influence of the mother's occupation, the higher the likelihood that they will

pursue agriculture as a degree. The data show that the occupation of the mother positively affects the decision of the respondents to pursue agriculture as a degree. This result is inconsistent the results of Ester and Bowen (2005), who found that the mother's occupation had a low influence on the students' career choice in agriculture.

Influence of Father's Occupation.

The influence of the father's occupation was also found to be significant as the p value is 0.046; however, it is a negative relationship. This means that the higher the influence of the father's occupation to the respondents, the lower the likelihood that they will pursue an agriculture as a degree. The father is usually the breadwinner of the family and provides financial support; thus, it follows that the respondents consider the father's job stability in deciding on their college degree (Pascual 2014). The result of the study is corroborated by the works Sarwar & Azmat (2013), who found that the factors that influence the degree choice are the prestige given to individuals to the type of degree, job opportunities, and their influence of parents.

Personal Interest.

Another significant factor that is found in the model is the respondents' personal interest. Its association with decision-making was also significant with a p -value of 0.00 which implies that if the students' decision to choose the degree is based on their own interests, it is likely that they will pursue an agriculture degree. In this case, the respondents already have their own decision on what they want. Meanwhile, the statement "no other person influenced me in my degree choice" was found to have a significant but negative relationship with decision-making. This means that if nobody influenced or encouraged the respondents, then they may not enroll in an agriculture-related degree. Personal interest was identified as a key determinant of students' degree choice as it recorded the highest mean value of 4.36 indicating that students agreed with the statement "Choosing the degree based on my own decision." The result is the same with that of the findings of Amani (2013), Faulker et al. (2009), and Okiror (2016), who all mentioned that students' choice of degree programs was based on their own self-interest. Most of them had their own respective decisions as to their degree choice.

Brother who works in Agriculture.

Having a brother who works in agriculture is also significant in deciding to pursue agriculture (p -value = 0.02, α = 0.10). This means that those respondents with a brother who works in agriculture will likely pursue an agriculture degree. Other studies have found that having a relative who works in a field related to agriculture is influential in choosing to major in an academic discipline (Thielen, 2012; Wildman & Torres, 2002).

The key findings of the study based on chi square and binary logit regression reveals that that the respondents who plan to pursue agriculture as a degree were males who were positively influenced by their family to enroll in Agriculture degree program. It was also found that respondents take into account the occupation of their parents. Furthermore, ownership of Agricultural lands and farming experience are able to exert considerable in influence of the respondent's decision to pursue a degree in Agriculture. The main source of income of their parents was farming while their main source of information on agriculture were their parents. In terms of intention to take agriculture courses, many of the respondents answered yes, but when they were asked on the specific courses that they want to take, they did not mention agriculture. The results obtained in this study all leads to the Social Cognitive Learning theory of Albert Bandura. The theory gravitates on the assertive influence of the respective personal interests of respondents on their choice of a college degree.

Table 3:- Binary Logit Regression.

CHARACTERISTICS	B	P-value	ODD RATIO
Farm experience	1.102	0.000	3.011
Influence of fathers occupation	-0.378	0.046	0.684
Influence of mothers occupation	0.469	0.013	1.599
Own decision in degree choice	0.403	0.007	1.497
Brother who has a work or degree in Agriculture influences me in my choice of degree	0.282	0.027	1.327
No other people influence me in my degree decision	-0.195	0.056	0.823

Input variable with a p -value < 0.10, significant predictor Odds ratios that are greater than 1 indicate that the event is likely to happen.

Guiding Principles of the BSA Curriculum in Attracting the Students to Choose Agriculture as a Degree

Academic institutions such as the College of Agriculture of Central Mindanao University (CMU-CA) make great efforts in improving its reputation in its fields of expertise. This is one formidable way of attracting enrollees to their academic programs. For the case of the CMU-CA, they have capitalized on the recognitions accorded to them by the Commission on Higher Education (CHED) specifically the Center of Excellence (COE) in Agriculture and the National University Center for Agriculture – NAFES.

In this study, the Guiding Principles (Appendix table 1) developed by Maredia (2007) were employed to assess the Agriculture curriculum implemented by CMU-CA as it relates to its efforts of attracting students to take-up Agriculture degree. The current ladderized four-year Baccalaureate degree program, the Bachelor of Science in Agriculture implemented by the CMU-CA, is a bold and **Evolutionary** step that the college took as it sought to integrate a two-year Associate certificate in Agriculture program in a regular Baccalaureate degree. This was implemented by the college long before the K to 12 Education system of the Philippine government was implemented. This innovation sought to confer among students who would fail to finish the four-year course with a Certificate in Agriculture Science (CAS) and students are equipped with sufficient knowledge and skills to qualify assessment of (TESDA). In order to make this possible, courses were taught in a manner that emphasized the provision of **Experiential Learning** activities. Hence, students are able to integrate **Multi-disciplinary** lessons they acquire from their professors from different specialization as they **build** their **skills**.

In the process of adopting a learner-centered approach in teaching college students, the faculty and students are induced to **Innovate** at different aspects of the teaching-learning process, especially since that not all facilities and equipment are available. Based on the experiences of the key informants, the implementation of experiential learning approaches has allowed students to devise simple yet practical innovations as a result of the different circumstances. Since courses were designed not just to transfer knowledge but also to build the skills of students, some courses had to be team-taught. This, on top of the heavy involvement of the students in the teaching and learning process, has, in effect, made the program heavily reliable to the **Participatory** efforts of the major stakeholders of the teaching and learning process. The industry in the neighboring community has not been an exception to these stakeholders. Finally, in the college, male and female students are accorded with the same right to be accepted, as acceptance to a desired major field by the students are adjudicated based solely on their academic merits so as to avoid gender bias. Furthermore, the University administration has encouraged all faculty and staff to use **Gender-sensitive** language in all forms of communication especially in the exercise of their official functions.

The current Baccalaureate degree program instills Environmental Stewardship by requiring all BS Agriculture students to take and pass the fundamental agriculture course “Ecological Agriculture.” In the major courses, students are also kept abreast of Philippines laws on environmental stewardship as well as the quality standards the agricultural firms need to earn to legally operate such as the Environmental Compliance Certificate and Good Agricultural Practice (PhilGAP, ASEAN GAP, Global GAP), ISO: QMS (9001:2015) for agricultural organizations.

All the guidelines by Maredia (2007) were accounted for by the college in the continuous development of the BS Agriculture degree program. Only the Innovativeness principle does not exist in the college. The college does not yet offer distance and open-access education but a six-month distance learning program for agriculture professionals may be offered. Nevertheless, compliance to these guidelines have definitely improved the attractiveness of the BS Agriculture degree offered by the CMU-CA compared to neighboring Agriculture Education Institutions in the region.

Conclusion:-

The 383 respondents were young, female, did not have land used for agriculture and the Higher Education and institution that the students intended to enroll in were far from their home. They will not pursue agriculture as degree since agriculture is not the degree that they personally chose. The personal interests of the respondents and their parents influenced their degree choice.

In terms of preparing the respondents in choosing agriculture as a degree, the curriculum is committed to the total development of people and is doing its best to help the students be a better version of themselves. In the curriculum crafting, the university follows the guiding principles for Agricultural Curriculum Enhancement by Maredia (2007). All the required principles are present and are practiced by the university. The respondents who intended to pursue agriculture as a degree were male and influenced by their family in their degree choice. Their fathers and mothers

reached the elementary level and secondary level; they had land used for agriculture and had experience in farming; their parents' main source of income was farming; and their parents were their main source of information on agriculture.

Recommendations:-

1. Scholarships, allowances or stipends on top of the free tuition privilege given by SUCs to the students should be provided to students who indicate an interest in pursuing agriculture as a profession in recognized Higher Education Institutions.
2. To strengthen the skills of the students the partnership, linkages and collaboration among the potential agricultural industries for employment opportunities as well as On-the-Job Training (OJT) opportunities can be established and it can be sustainable through the use of Memorandum of agreement or Memorandum of Understanding. Linkages can also aid in the sharing of resources such as animals and land for the purpose of the students' skills training and other experiential learning activities. Credit system should be developed to provide funds for agriculture students and graduates who are interested to engage in agriculture business
3. The curriculum should provide additional subjects and focus on agriculture as a business or entrepreneurship where the subjects will cover the whole process of production and value-adding of products to develop the business and entrepreneurial mentality of the students.
4. The innovative use of distance and open-access education should be included in the curriculum. This can consist of a six-month distance education program that will include hands-on workshops for agricultural professionals and farmers. Employers' feedback and suggestions can be incorporated in the curriculum to produce graduates who have the skills needed by the different sectors.
5. Awareness programs of colleges and universities offering a degree in agriculture should be continued to enrich prospective students. Annual degree guidance counselling can also provide occupational information to students based on their personal needs.
6. Because land, capital, and skills are essential in igniting the interest of the youth in agriculture, grants should be given to agriculture graduates who want to embark on agricultural enterprises shortly after graduation.

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