

# The Interaction Between Agricultural Extension Services and Environmental Management Accounting: The Role of Farmer Value Orientations

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The present study aimed to examine the value orientations of farmers in Malaysia and the role that these orientations play in facilitating increased environmental management accounting under the presence of efficient and effective Agricultural Extension services. The researcher used SEM-PLS technique to develop a model showing how value orientations of farmers in Malaysia mediates between Agricultural Extension services and environmental management accounting. The research model was more validated by use of several tests like KMO, Bartlett's Sphericity test and the Cronbach Alpha tests. Furthermore, model fitness was also tested by use of confirmatory factor analysis and all the results were satisfactory. Findings showed that there was a full mediation of various constructs of Farmers Value Orientations in this model. The direct relationship between Agricultural Extension services and environmental management accounting was significant and positive and the mediation was also found to be positive. These findings imply that the farmers values in Malaysia are supportive for the use of modern technologies and services that can allow them to improve the output of the agricultural sector. The understanding of the importance of studying the relationship between agricultural extension services and outcomes like increased accounting systems has been emphasized in the present study. The findings of this study along with its limitations have paved the way for future research the field of environmental management accounting in agricultural sector. The researcher has highlighted the limitations of the study so that future researchers can eradicate them in their studies.

**Keywords:** Agricultural Extension services, environmental management accounting, farmers value orientations, Malaysia

## 1. INTRODUCTION

Improving farmers' behaviors and diverting their practices from the traditional techniques to the new and advanced technology efforts with unique equipment would have a major impact on agriculture. The production of crops with the help of green practices would be praised worldwide as well. The adaption of management and cultivation procedures would have a major effect on the competencies of farmers, and their participation in such programs will indicate their focus on learning the new techniques for implementing the change according to the modern era in agriculture as well as management of sustainability of environment (Nettle, Morton, McDonald, Suryana et al., 2021).

The farmers in the agriculture sector of Malaysia have been participating in different learning programs such as the orientations and seminars in which the farmers are provided with the techniques and tools that are effective in agriculture practices. The goals to enhance the new skills in farmers' behaviors have been produced to increase their livelihoods and the progress of agriculture departments. The farmers must be provided with useful techniques about sustainable practices that have a major impact on the future generation and the restoration of natural resources. The orientation of farmers can be done with the help of different options such as they can be rewarded to participate in the educational seminars, meetings, and awareness through digital media for the agriculture extension services (Frost, 2000).

The agriculture extension services in Malaysia have been utilized at a higher standard to increase the knowledge of farmers to promote sustainable practices in the country so that the economic and the financial sector of the country can be stabilized in such a way as the trading of green crops will increase the productivity as well as the quality of products. Therefore, the educational enhancement of farmers would help them learn the new farming skills that have been introduced in the world according to the modern era, and the government of Malaysia will also attain the agriculture extension services.

The significant regulation for promoting farmer's orientation has a considerable influence on the agriculture department and the phenomenon of encouraging agriculture extension services in Malaysia is seen to gain much importance since past recent years. At domestic level the farmer orientation is being encouraged by various industries and organizations to provide more information about environmental management accounting. In such a way the farmers can gain more knowledge to make fruitful decisions for the agriculture practices. In various circumstances, the agriculture extension services are promoted at a global level as an aspect to spread awareness to farmers (Rust, Stankovics, Jarvis, Morris-Trainor et al., 2021).

The environmental management accounting is considered favorable in mitigating various issues in the agriculture

department or eradicating the issues in making considerable decisions. The agriculture extensive services are quite helpful for farmers to gain support in learning programs and to groom their practices in agriculture by following technical and managerial skills to develop themselves in farming. Current study is based on encouraging rural adult learning programs and to provide basic information to farmers to overcome the use of traditional practices and increasing the significance of agriculture department in Malaysia. The study also discusses the significance of educating farmers for utilizing new aspects in agriculture.

In previous studies the use of agriculture extension services was not adequately discussed to provide education and knowledge to farmers as per their orientation. The farmers were much fond of practicing traditional methods as utilized by their ancestors and various evidence also confirm that still a lot of farmers use similar traditional methods to keep their customs alive. Now as the world is progressing towards sustainability and environmental management accounting is being promoted in agricultural practices, it is the utmost need to educate farmers to bring some innovative measures in their daily practices. The current study is filling up gaps of previous studies by encouraging different campaigns that demand for promoting education of farmers specifically in rural areas. The purpose of study is to highlight the significances of agriculture extension services for farmers to enhance productivity in crop fields and to encourage sustainability.

According to the information described in justification rationale and the background of study it is obvious to highlight orientation of farmers as efficient products introduced in market are to satisfy consumers with nutritional crops and grain. The agriculture extension services have a significant role in upgrading the knowledge of farmers so that they can increase their productivity and earn better livelihood through framing and promoting sustainability. The main objectives of current study are:

- To utilize farm mechanization with additional knowledge provided to farmers
- To explore new ways of profitability with the use of advanced techniques in agriculture
- To study the different aspects of environmental management accounting in agriculture

The study discusses essential consideration of agriculture extensive services as orientation provided to farmers has a great impact on the productivity of agriculture department of Malaysia. The usage of natural resources could be minimized in such circumstances if the sustainable activities are utilized by farmers in their daily practices. It is noted from past evidence that agriculture awareness provided to farmers is growing at a rate of 4% every year. Multi-functionality in various subsectors of agriculture are encouraged by consumers at a global level to promote the basic education of farmers with extensive knowledge (Gibassier & Alcouffe, 2018).

Environmental management accounting has a significant aspect in identifying considerable issues and consequences of any negative impacts of agriculture practices on human health. In such situations agriculture extensive services are needed to promote the education of farmers and to highlight the significance of utilizing new ideas in farming to increase the profitability. Farmers can develop their practical knowledge and make use of new techniques in their crop fields to enhance sustainability and to improve some managerial skills in their personality. Farmers can improve the livestock controls and increase the crop varieties in agriculture and boosting food security at a global level (Hayat, Mamun, Nasir, & Nawi, 2019).

In the respective study the structure of research would be followed by providing information about introduction of the selected topic. In the next part literature review would be explained. Next chapter would be based on methodology and further information would be based on results enhanced from research. Lastly, information will be further explained in discussion and conclusion category.

## 2. LITERATURE REVIEW

### 2.1. Theory of Value Orientation

The theory is based on the perceptions of the social groups on the general principles right and wrong. The idea of theory is further extended to the distribution or allocation of outcomes among self and others. Cultural values strongly shape the ideas and beliefs in the social groups and has an influence on individual beliefs. Institutional norms and everyday practice which reflect the underlying cultural values that are part of societies. The preference element in the value orientation is most prominently the values and ideals of each cultural group that has a significant impact on the cultural coherence. However, discrimination is also part of human nature, and this can take place in the value of orientation based on aggression, competition, equality, cooperation, and other factors. Florence Kluckhohn and Fred Strodtbeck developed a theory that based on principle that shape the actions (Watkins & Gnoth, 2011). The theory proposes that all the human societies must answer some universal problems. According to the scientist universal solutions are limited and people belonging to different cultures have different preferences. The cross cultural psyche is main basis of the theory that broadly aims to study and understand differences among human beings from different cultural backgrounds and to understand the similarities among all human beings (Bogaert, Boone, & Declerck, 2008). The theory is important to understand and ensure successful communication in social groups by understanding cultural mores of the majority. Social scientists and psychologist suggested measures for the orientation however with the time developments in the theory take place with increasing practical implications of the theory. Values are considered central to human thoughts and emotions (Van Lange, Agnew, Harinck, & Steemers, 1997). Because the present prevailing situation in the cultural value orientations highlights the incompatible cultural aspects that can create criticism and pressure towards change. Thus, the theory

has been widely used to study different cultures and has its wide practical applications in promoting understanding and enhancing negotiating skills in different ethnic groups.

## **2.2. Agricultural Extension Services and Environmental Accounting**

Over the period of last century, technology has tremendously developed the world and use of technology has become a norm in all walks of life. However, it is equally important that right use of technology to the concerned class of people must be taught to obtain the fruitful results. Therefore the advent of technology and use of technology has no exception to this rule (Birkhaeuser, Evenson, & Feder, 1991). Agriculture extension is the critical force towards the development in the agricultural sector. Agricultural extension is the application of the scientific research and scientific knowledge towards of agricultural aspect (Aker, 2011). The service and system that assists the people related to agriculture and farms by providing them adequate knowledge and education to apply improved farming techniques to elevate the production and efficacy of farming procedures. Agricultural extension services in related the environmental accounting that emphasizes on incorporating the environmental as well as economic information in the accounting. To educate the farm related people regarding the use of renewable energy resources in a way that is more economical and can help produce better results. This helps the farmers gain knowledge regarding physical gains and monetary profits by applying the new improved agricultural techniques (Ahnad & Lutz, 1989). Thus, there exists a significant relation between agricultural extension services and environmental accounting.

## **2.3. Development of Agricultural Extension Service, Management of Agricultural Extension Service and Environmental Accounting**

A procedure that is well developed and well managed to convey the agricultural research findings to the farmers that can help them achieve agricultural goals more productively and more effectively is of great importance. In the 21<sup>st</sup> century where technology has developed has the aspects of human life making it easier and more productive. It is of great importance to educate the farm related people regarding the scientific and technological developments for agriculture. Building and adopting the factors that contribute towards the farmer's resilience from the environmental shocks and educating them to use the technology to lessen the effect of any shock towards farm is considered as an important step towards the development of the agricultural extension service (Glendinning, Babu, & Asenso-Okyere, 2010). Agents who educate and teach the farmers regarding the methods to improve the farming practices and guiding them regarding the new techniques and efficient technology that can bring more fruitful outcomes must be supported (Larrinaga-Gonzalez & Bebbington, 2001). In addition to this it is also important to manage the initiatives well taken

towards the agricultural service to improve and enhance the productivity and yield generated. Development in agricultural extension service and management of the agriculture extension can motivate the farmers towards the environmental accounting.

## **2.4. Human Resources for the Agricultural Extension Service, Resources adoption and Environmental Accounting**

Agricultural extension services are considered as a multidisciplinary based human interaction, that aims to elevate and boost the livelihood of the farm related people by introducing new effective technological advances of agriculture. It mainly focuses on introducing the techniques and educating the farmers regarding their use and benefit. The staff that belongs to agricultural extension service and is on the field needs to be effective and vigilant enough while teaching and educating the farmers regarding new and improved technologies (Leeuwis & van den Ban, 2013). Therefore, the human resource of the agriculture extension must work enough to meet the criteria to screening the individuals who can educate the farmers regarding techniques that are applied to different branches of agriculture including crop management, crop yield, agricultural economic and many more. Furthermore it is of great importance to shed light on the human resource of the agricultural extension service as it also depends on credibility of the people on field that if the farmers reject their proposed new technology or adopt it (Jones, 2010). Thus, it can be concluded that human resources for the agricultural extension service that shape resources adoption also influence the environmental accounting in the farm associated people (Malla & Brewin, 2020).

## **2.5. Agricultural Extension Services: it dimensions and Environmental Accounting; Environmental Costs and Regulations, Customer Focus, Environmental Safety and Managerial Commitment**

The aim of agricultural extension services is to promote the use new technologies in the agriculture to enhance the production in ways that poses less threat to the environment and the environmental assets. Moreover, to convince the farmers and farm related people towards the use of new technologies also enhance them towards the environmental accounting. This alarms people and especially farmers to use the renewable resources the planet is gifted with. Using new techniques and technologies can help to lower the environmental cost that man has been paying for years because of his negligence (Anderson & Feder, 2007). Man has been using the natural resources without any check and balance that has led to the deterioration of the resources. Moreover, teaching the farmers towards the environmental regulation and counseling them towards their contribution to lessen the harm that man has been putting towards the planet. Ensuring the customer focus and the managerial commitment attitude of the farmers towards achieving the goals of better environment by environmental accounting is possible through effective agricultural extension services (Aldousari,

Robertson, Yajid, & Ahmed, 2017; Brown & Fraser, 2006). Therefore, agricultural extension services and its dimensions play a significant role in enhancing the farmers and farm related people towards the environmental accounting and towards the positive benefits and outcomes for the farmers as well as environment.

## 2.6. Mediating role of Farmer's Value Orientation in Social, Intrinsic, experiential, and Instrumental aspects in relation between Agricultural Extension Services; its dimensions and Environmental Accounting and its dimensions

Agricultural service extension is educating farmers and farm related people regarding the new scientific researches that have led to more useful techniques in agriculture that elevate the livelihood of the farmers (Gasson, 1973). These techniques also positively influence the attitude of the farmers towards the environmental accounting, which boosts the human efforts towards the sustainable development reducing the threats to the environment. However, the perception of the farmers towards these new scientific techniques plays a mediating role in struggle towards the more sustainable environment. While considering the attitude and perception of farmers towards the environmental accounting farmers value orientation plays a mediating role (Van de Kaa, 2001). The theory of value perception also highlights that human nature needs to come rules to control their behavior for the appropriate outcomes for the society. Therefore, agricultural extension service is an effort to educate the farmers regarding new agricultural techniques that influence the practice of environmental accounting leading to environmental accounting and environmental safety.

The following hypothesis can be generated for this study:

**H1:** Agricultural extension services have a significant impact on environmental accounting.

**H2:** Development of agricultural extension services influences environmental accounting.

**H3:** Management of agricultural extension services influences environmental accounting.

**H4:** Human Resources for agricultural extension services influences environmental accounting.

**H5:** Resources adoption influence environmental accounting.

**H5:** Agricultural extension services, it dimensions influence the environmental costs.

**H6:** Agricultural extension services, it dimensions influence the environmental regulation.

**H7:** Agricultural extension services, it dimensions influence the customer's focus.

**H8:** Agricultural extension services, it dimensions influence the environmental safety.

**H9:** Agricultural extension services, it dimensions influence the managerial commitment.

**H10:** Farmer's value orientation plays a mediating role in relation between agricultural extension services, it dimensions and environmental accounting and its dimensions.

**H11:** Farmer's social value orientation plays a mediating role in relation between agricultural extension services, it dimensions and environmental accounting and its dimensions.

**H12:** Farmer's experiential value orientation plays a mediating role in relation between agricultural extension services, it dimensions and environmental accounting and its dimensions.

**H13:** Farmer's intrinsic value orientation plays a mediating role in relation between agricultural extension services, it dimensions and environmental accounting and its dimensions.

**H14:** Farmer's instrumental value orientation plays a mediating role in relation between agricultural extension services, it dimensions and environmental accounting and its dimensions.

## 3. METHOD

### 3.1 Population and Sampling

The data that has been used in this study has been collected from farmers in Malaysia that are working in the organic agriculture sector. Sampling techniques are used to extract a sample of appropriate size from a larger population so that the data can be collected from that sample to represent the entire population. Main types of sampling include probability and nonprobability sampling. In the current study, non-probability sampling is used to select the most suitable sample set. The researcher had used the Chain referral sampling technique in which the selected sample units are asked to provide the further respondents i.e., several farmers were contacted in the first stage of sampling (100 farmers) and later they were requested to further provide contact for more potential respondents. This technique has been opted by the researcher to reach the diverse farmer population of Malaysia and save time and cost (Penrod, Preston, Cain, & Starks, 2003). The respondents are invited to fill the questionnaire and are requested to forward the link in their circle until a required sample size is achieved.

### 3.2 Data Collection

#### 3.2.1. Time horizon

The current study follows a cross-sectional time horizon as it does not require to evaluate the before and after analysis of any phenomenon. Meaning of cross-sectional or one-shot data collection is that the researcher collects the data from the participants within the same time zone. Single stage data collection was enough to represent the data requirements in this study, therefore, the cross-sectional approach was suitable for the current study.

#### 3.2.2. Data Collection

The researcher developed an online questionnaire for the purpose of data collection in this study. This technique is preferred as it is not possible to physically visit all the sites of data collection. A total of 100 farmers were initially sort listed and questionnaire links were emailed to them, out of which 81 were received at the end of first week and many new leads were also created so that more data could be collected by the chain referral technique. More responses were collected over the next two weeks. Overall, 439 responses were collected. Out of these 439 questionnaires,

425 were included in the final analysis after filtering out the incomplete or incorrectly filled questionnaires.

### 3.2.3. Questionnaire Design

In this study, the questionnaire was divided into two main parts, the first part included demographics questions and the second contained the main items that were used to collect the data for the research constructs which have been measured by using five-point Likert type scale. All these scales were written in English. The items in this study have been taken from previous studies and were adjusted and reworded according to the needs of the current study. Following the method recommended by [Campbell, Brislin, Stewart, and Werner \(1970\)](#) the questionnaire was first developed in English and then translated into Malay using the forward and back translation method. Two academicians who are fluent in both Malay and English were consulted for the translation purpose. The translated questionnaire was pretested and reviewed.

### 3.2.4. Measures

The scales for the current study were adapted and developed according to the requirements of the present study. Preexisting scales were used because their reliability and validity has already been established by several studies. However, to check the relevance and appropriateness of the scale in accordance with the context and requirements of the present study academicians were consulted to ensure the content validity of the scale. The response options for all the scales were based on a five-point Likert scale ranging from “strongly disagree” to “strongly agree”. The measures used in this study are explained as below:

- Agricultural Extension Services (AES) is the first independent variable of this study. Items for this variable are adopted and reworded from a previous research work by [Muh. Hatta, Amri, Muhammad, Ma'mun et al. \(2017\)](#). AES is measured in terms of development, management, Human resources, other resources etc.
- Farmers Value Orientations is the second independent variable of this study. Items for this variable are adopted and reworded from a previous research work by [Frost \(2000\)](#). Instrumental, Expressive, Intrinsic, and social values were measured in this study.
- Environmental Managerial Accounting was the dependent variable in this study which was measured in terms of Environmental cost, Environmental regulation, Environmental safety, Management commitment and Customer focus based on the study by [Fuzy, Habidin, Janudin, and Ong \(2019\)](#) and [Gunarathne and Lee \(2015\)](#).

### 3.3 Ethical Considerations

The ethical values help to ensure the credibility of the research ([Cortina, 2020](#)). Therefore, several steps were taken by the researcher to keep the confidentiality of the data that the researchers collected from respondents ([Creswell & Creswell, 2017](#)). The respondents were

informed, through a cover letter that was attached to the questionnaire, that the participation in this research is voluntary and were ensured that their data would be kept authentic and anonymous.

### 3.4 Statistical Techniques

The collected data has been analyzed by using SPSS and AMOS for the purpose of conducting several tests and techniques that are applied on the collected data. SEM has been used in this research for the purpose of testing the validity of the proposed hypotheses ([Bollen, 1989](#)). For analyzing the influence exerted by various latent variables, SEM has been fitted. This model has been selected because it allows for the inclusion of predictors and can handle complex research models that includes more than one dependent variable. The researcher used SPSS for demographic analysis, descriptive analysis, and factor analysis whereas the confirmatory factor analysis and structure equation modeling was conducted using AMOS.

## 4. RESULTS

### 4.1. Demographic Profile

Demographic information is usually background characteristics of respondents like age, income, education, work situation, marital status, etc. In this study, the demographic profiling is built using three factors including gender, age, and work experience. In this study, the researcher has selected farmers from the organic agricultural sector in Malaysia to collect the accurate research data. According to the demographic profile, a total of 425 respondents were included in the final data set. Analysis of the demographic details of the dataset in the current study, it was found that 75.7 percent were males (322), and 24.3 percent were females (103). 11.05 percent of the respondents were aged below 25, 52.2 percent were between the ages of 25 to 35 years, 33.5 percent were aged between 35 and 45 while 3.4 percent were over 45. The farming experience data was also collected, and the results showed that 11.5 percent of the respondents had experience of less than 1 year, 52.9 percent had an experience between 1 and 3 years, 23.2 percent had 3 to 5 years of experience and the rest 12.4 percent had over 5 years of experience in the field of organic agriculture.

**Table 1: Demographic Profile**

		Frequency	Percent
Gender	Male	322	75.7
	Female	103	24.3
	Total	425	100.0
Age	Less Than 25 Year	47	11.05
	25 to 35 Years	222	52.2
	35 to 45 Years	143	33.6
	More Than 45 Years	13	3.15
	Total	425	100.0
Experience	Less than 1 Year	49	11.5
	1 to 3 Year	225	52.9
	3 to 5 Year	98	23.2
	More than 5 Year	53	12.4
	Total	425	100.0

## 4.2. Descriptive statistics

Descriptive statistics allow a researcher to manage large datasets and helps in presenting the results in summary tables. Several descriptive tests are performed in a study to evaluate the accuracy and normality of the dataset. Normality evaluation is carried out in order to ensure that the data set is well-modelled and collected data follows a normal distribution (Park, 2015). The minimum and maximum values are used to evaluate the range of the measurement scale, i.e., between 1 and 5 for the 5-type Likert scale that has been used in this survey. The mean values are the average of response for each item. The

skewness is a measure of distortion or asymmetry in in the normal distribution of a data set (Ho & Yu, 2015). Table 2 given below shows the results for the descriptive statistics for the data of this research. The N statistics is the number of respondents, and it is 425 for all the constructs showing no value is missing or inaccurate. The mean statistics shows the responses are averaging between 3.3 and 4.9. The table also shows values for standard deviation and skewness. The skewness values are supposed to lie between the range of +1 and -1 for the validity to hold and as per the results, the data is normally distributed as skewness and the range of data (minimum and maximum) are within the prescribed thresholds.

**Table 2: Descriptive statistics**

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness
DAES	425	1	5	4.56	1.657	2.746	.150
MAES	425	1	5	4.89	1.933	3.735	-.234
HRAES	425	1	5	3.39	.994	.988	-.171
RA	425	1	5	3.31	1.126	1.268	-.177
SOC	425	1	5	3.36	1.087	1.181	-.223
INT	425	1	5	3.34	.930	.865	-.138
EXP	425	1	5	3.16	.786	.618	-.161
INS	425	1	5	3.15	.964	.930	-.120
ENVC	425	1	5	3.23	.990	.979	-.114
ENVR	425	1	5	3.1920	.79235	.628	-.179
CFO	425	1	5	3.7840	1.00611	1.012	.168
MCO	425	1	5	3.8863	.99778	.996	-.009
ES	425	1	5	3.6059	.95727	.916	.073
Valid N (listwise)	425						

## 4.3. Sample Reliability and Adequacy

Sample reliability is tested based on Cronbach's Alpha. Cronbach's Alpha is used to measure the internal consistency in the items of the research model as it can indicate how closely a set of items is related as a group

(Heo, Kim, & Faith, 2015). According to table 3 below, the Cronbach's Alpha for the current model is 0.65. this can be interpreted as 65% internal consistency in the model i.e., the items are moderately able to explain the same outcomes.

**Table 3: Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.650	.649	13

Kaiser Meyer Olkin (KMO) test is used for the evaluation and measurement of the adequacy and suitability of the data set. Table 4 enlist the results of the KMO analysis and shows that the KMO value for the sample is 0.814 which is significantly high and means that the sample is 81.4% capable of explaining the factors accurately. Bartlett's test of sphericity tests whether the correlation matrix is an identity matrix (Peri, 2012) and is carried out to evaluate whether there is presence of redundancy among the variables. Bartlett's sphericity values less than 0.05 level of significance are acceptable. Tables 4 displays that the dataset has Bartlett's significance of 0.000 showing that there is no redundancy in the dataset.

**Table 4: Sample adequacy**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.814
Bartlett's Test of Sphericity	Approx. Chi-Square	805.978
	Df	78
	Sig.	.000

## 4.4. Convergent and Discriminant Validity

Convergent and discriminant validity are the subtypes of the construct validity; the presence of both kinds of validity is necessary for establishing construct validity. Convergent validity, relevance of related factors, is evaluated based on the AVE, CR and MSV values. The discriminant validity, non-relevance of non-related factors, is evaluated by loading factors (Holton III, Bates, Bookter, & Yamkovenko, 2007). The threshold values for composite reliability are 0.7, average variance extracted is 0.5 and MSV values are supposed to be less than AVE. Whereas the decision rule for discriminant validity is that for it to be established the self-correlation value is supposed to be higher than the variable correlations.

**Table 5: Convergent and Discriminant Validity**

	CR	AVE	MSV	AES	FVO	ENV
AES	0.724	0.726	0.578	<b>0.862</b>		
FVO	0.838	0.716	0.494	0.573	<b>0.746</b>	
ENV	0.994	0.679	0.578	0.760	0.669	<b>0.854</b>

Table 5 displays the results for convergent and discriminant validity. CR and AVE are as per the recommended threshold values i.e., they are greater than 0.7 and 0.5, respectively. The MSV values are also less than AVE thus convergent validity is present. The self-correlation values for the constructs are greater than their inter-variable correlations, thus discriminant validity is also present.

#### 4.5. Confirmatory Factor Analysis

Confirmatory factor analysis has been used to test the viability of the research model as a whole (Thompson, 2004). Table 6 presents the results of the CFA for the purpose of confirming the model fitness before SEM is performed on it based on several indicators. CMIN/DF

value is reported to be 1.009, which is under the limit value of 3, GFI value is 0.765 which is greater than the limit value of 0.8, CFI and IFI are reported to be 0.966 which are greater than the recommended lower value of 0.9 and the RMSEA values are also less than the recommended 0.08 i.e., 0.082. The results show that the theoretical model is fit and can be further processed for SEM.

**Table 6: Confirmatory Factors Analysis**

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	1.009
GFI	Equal or greater .80	.765
CFI	Equal or greater .90	.966
IFI	Equal or greater .90	.966
RMSEA	Less or equal .08	.082

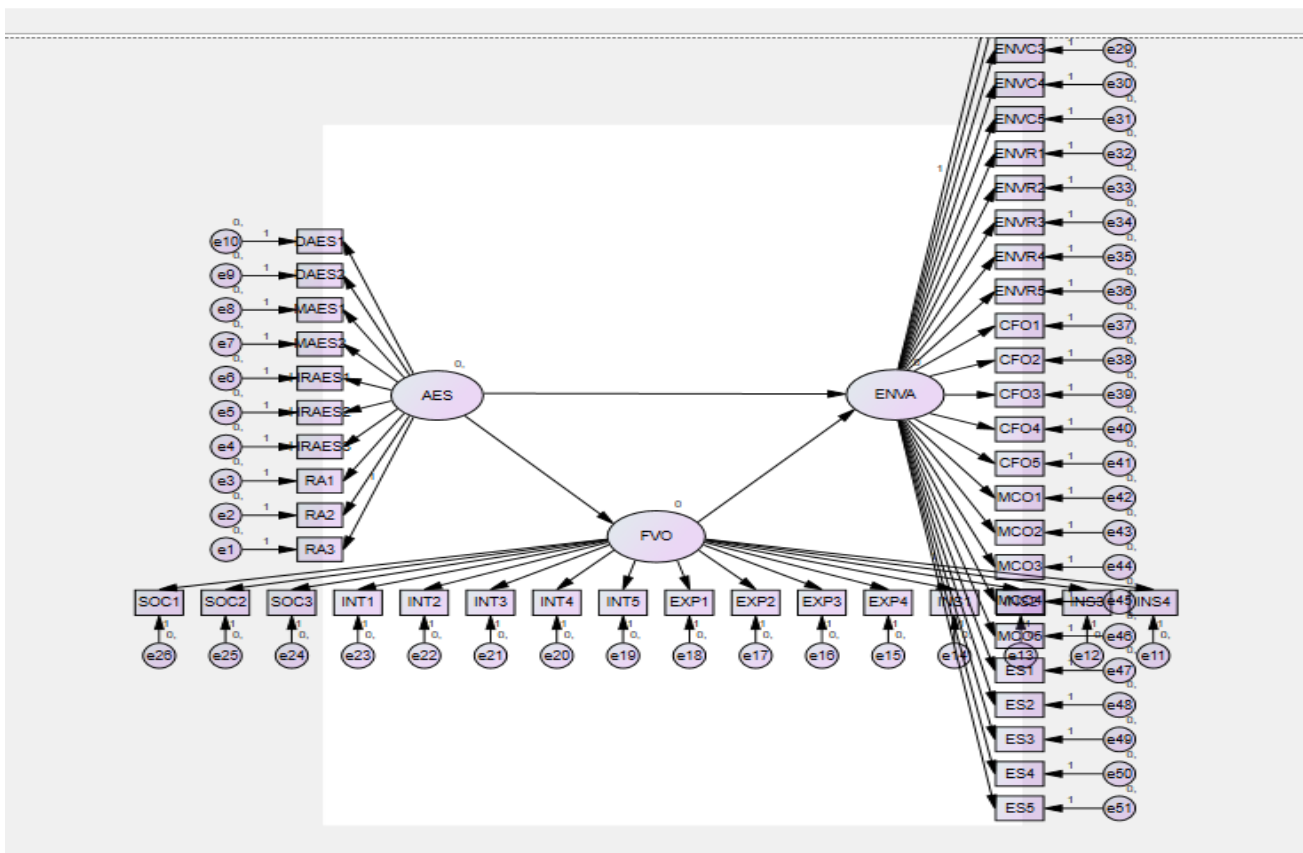


Figure 1: CFA

#### 4.6. Hypothesis Testing

The table 7 summarizes the hypothesis testing which has been done through structural equation modeling (SEM) in this study. SEM simply stated is an advanced technique of statistics that is used to measure the structural relationships existing between the latent constructs and the measured variables. There are many benefits of applying SEM such as its ability to explicitly assess measurement error in the research data and model and showcase the standard error in the findings.

The results in table 7 show that the direct effect of Agricultural extension services on environmental managerial accounting is found to be significant at 0.05 significance level. The results indicate that the increase of

one unit of Agricultural extension services will lead to an increase of 25.5% of environmental managerial accounting. Similarly, the direct effect of farmers value orientation on environmental managerial accounting is also found to be significant at 0.05 significance level. The results indicate that the increase of one unit of farmers value orientation will lead to an increase of 18.6% of environmental managerial accounting. As for the circular impact of environmental managerial accounting on Agricultural extension services, it is also found to be significant at 0.05 significance level. The results indicate that the increase of one unit of environmental managerial accounting will lead to an increase of 20.5% of Agricultural extension services.

**Table 7: Hypothesis Testing**

	Path		Estimate	S.E.	C.R.	P
ENV	<---	AES	0.255	0.096	-4.115	***
ENV	<---	FVO	0.186	0.118	-2.409	.016
AES	<---	ENV	0.205	0.095	-2.716	.007

## 5. DISCUSSION

The environmental accounting, also known as “green accounting,” is very important in today’s world of sustainable development. Many economists as well as scholars have worked to determine the significance of environmental accounting in the agricultural sectors as well as many other manufacturing sectors around the globe. The present study is also conducted to determine the impact of agricultural extension services on the environmental accounting when the farmer value orientation is considered in context of Malaysia. For this purpose, a model was developed, and different hypotheses were formulated.

The results obtained from this research study showed that the Agricultural extensions services has a significant impact on the environmental accounting. Different studies conducted in the past also supported this argument. According to [Fabregas, Kremer, and Schilbach \(2019\)](#), the development of the agricultural extension services help in promoting the knowledge as well as awareness of the farmers related to different technologies. The main aim of the extension services, is to promote the acceptance and implementation of the agricultural technologies by the farmers ([Ma, Renwick, Yuan, & Ratna, 2018](#)). The adaptation of resources by the farmers is thus done very professionally with such services. Both private as well as public organizations play an essential role in promoting these services. The HR of the agricultural extension services is also maintained and the communication between the individuals is improved by promoting the values as well as better attitude ([McDougall, Kristiansen, & Rader, 2019](#)). This has an important impact on the behaviors of the farmers. Such reformations promoted by the agricultural extension services, leads to promotion of environmental accounting thus promoting sustainable development in the country ([Pannell & Claassen, 2020](#)).

This study also showed that the beliefs leading to the values of the farmers, also play an important role in the environmental accounting. However, the obtained results showed that “Farmer value orientation” has a significant impact on environmental accounting. The beliefs of the farmers results in their self-efficacy which has an impact on their performances as well and the decision-making processes. According to [Pretty \(2018\)](#), the value orientation of the farmers help in guiding them through proper channels and providing the natural resources for developing a better environment. [Steinke, van Etten, Müller, Ortiz-Crespo et al. \(2021\)](#), also stated that the social behavior of the farmers has an important impact on their decisions taken for the environmental accounting.

However, it has been observed that the Agricultural extensions services has a significant impact on the environmental accounting when the Farmer value

orientation is also considered. This is because the proper regulatory measures are taken, and the belief system helps in promoting the safety of the customers. The values help in the managerial commitment as well as in the accounting matters ([Tschofen, Azevedo, & Muller, 2019](#)). The extension services also support this as proper guidance and awareness is provided to the farmers which leads to better and effective environmental accounting leading to an increase in sustainable development. This helps in maintaining the costs as well as developing policies for forming new quality regulations. According to many economists, the economic growth is considered to be important along with the sustainable development ([Valizadeh, Bijani, & Abbasi, 2018](#)). The “theory of value perception” also highlights that human nature needs to some rules to control their behavior for the appropriate outcomes for the society. This study helped in determining the role of values on the environmental accounting.

## 6. CONCLUSION

The sustainable development is being progressed in today’s era. Different manufacturing companies as well as agricultural sectors are taking important measures to promote sustainable development by retaining the natural resources. This help in improving the overall environmental accounting as well thus promoting the “green environment” for a better future. This helps in preventing the natural resources from being extinct so that the future generations can also enjoy the available natural resources. The focus of this research study was to determine the impact of agricultural extension services on the environmental accounting when the farmer value orientation is considered in context of Malaysia. The results obtained from this research study showed that the agricultural extension services help in providing better knowledge as well as information about the new technologies to the farmers which help them in environmental accounting. The beliefs as well as values of the farmers, also play an important role in this regard. It has been observed that the farmers with high level of self-efficacy were more likely to achieve higher and effective outcomes as compared to the farmers with low level of self-efficacy. Thus, the study helped in concluding the significant impact of agricultural extension services as well as the value orientation of the farmers, on the environmental accounting.

## 7. LIMITATIONS AND FUTURE RESEARCH INDICATIONS

The past studies conducted in the past on environmental accounting did not provide sufficient information in context of agricultural sectors. This research study helps in elaborating the impact of agricultural extension services on the environmental accounting as the agricultural sectors are considered to play a primary role in improving the environmental accounting to obtain sustainable development. Such studies should also be conducted that would have an impact on the policy development of the governments as well as their regulations. This would be very beneficial for the agricultural sectors around the globe.



For this research study, only Malaysia was considered. However, the cross-sectional studies should be promoted to obtain more vast approach to the topic by considering different point of views to fill the gap and promoting new measures and techniques for the rural farmers to improve their farming techniques to promote sustainable development. This is very effective for the future generations to come.

Many variables are considered to have an impact on the environmental accounting. However, for this research study, only agricultural extension services and the value orientation of farmers, were considered. For future studies, other variables including the political views, environmental instability etc. should also be considered to have a better understanding of the methods required to maintain the environmental accounting.

## 8. IMPLICATIONS

This research study not only helped in improving the literature review of the selected topic. But it also helped in many practical implications as well as regardless of the standards it has maintained for the theoretical implications for the future studies. This research helped the Malaysian government to develop different policies regarding the promotion of extension services as well as for the promotion of environmental accounting. Different educational programs are introduced. The recruitment system is improved as well as developed with the passage of time to have a better value system. The work-life balance is promoted by different private as well as public sectors to improve the productivity by the farmers. The knowledge of the farmers is also kept updated by means of different digital devices. This helped not only in promoting the crop productivity but also helped in improving the social behaviors of the farmers towards each other as well as others and the education played an important role in this regard. Thus, different reforms were also made by the government to promote agricultural education and make it common in all rural areas of Malaysia to have better future farmers that could lead the world towards sustainable development. This helped in promoting economic growth of the country as well in retaining the natural resources for the future generations.

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