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A Pilot Study for Identify the Factor Influencing Productive Malaysian Cocoa Farmers (PMCF) Work Performance during Covid-19 Pandemic

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Abstract
Work performance of cocoa farmers played a significant role in contributing more than 95% of cocoa production in Malaysia. The low production was reported due to the low productivity of cocoa beans produced by the farmers. This article aims to describe the process of implementing pilot study to determine the validity and reliability of the instrument for a study on determine the factor that influencing productive Malaysian cocoa farmers (PMCF) work performance. The instrument was adapted, developed, modified and restructured by the researcher based on past research with the variables namely personality traits, knowledge, practice and logistic and work performance. The instrument content also was validated by the field expert expert panel and also answering trial session. A total number of 105 respondents were selected which were 35 respondents each from, peninsular Malaysia, Sarawak and Sabah. The data from the pilot study was analysed by using SPSS 25.0 to determine the validity and reliability of the instrument items. From the, the instrument can be used for the real data collection after some minor adjustment 32 numbers of items and 65 new additional items. Based on the result of the pilot study, the instrument considered valid and reliable.
Keywords: Pilot Study, Instrument, Validity, Reliability and Work Performance

Introduction

Cocoa is one of the major commodity crops in Malaysia after oil palm and rubber (MPIC, 2020). Malaysia used to be the third producer of dry cocoa beans in south east Asia (ICCO, 2007). However, cocoa production started to decline since the 1990s gradually (MCB, 2020). Cocoa farmers have played a significant role in contributing more than 95% of cocoa production in Malaysia since 2006 (MCB, 2020). The low production was reported due to the low productivity of cocoa beans produced by the farmers (MCB, 2020). Productivity in 2020 was 0.16 tons, which means 32% achieved from the expected outcome. Cocoa farmers play significant roles in determining the high yield of their cocoa farm (Demba, 2017; Nasrulloh,

Subyantoro, & Sayekti, 2020; Mwangi, & Kariuki, 2015). In order to increase the cocoa production, government through Malaysian cocoa board (MCB) spent more expenditure on training and fertilizer to the cocoa farmers. However, the productivity in 2020 was decreased 10% from 2019 productivity (MCB, 2020). To achieve the sustainable improvement on cocoa production, there is a need to obtain feedback from productive Malaysian cocoa farmers (PMCF) on the factors that influence and affect more to their work performances.

Scanty quantitative study on farmer's performances only focuses on their personality traits such as for paddy farmers in malaysia (Hassan & Syarafina, 2015; Shah, 2016; Din et al., 2015) in demba (2017) studies. Recently, the quantitative study on malaysian extension agents' performances in cocoa sector also has been done. The study was focus on individual visible factors only namely transfer of technology (tot) and human resource development (hrd) (Din et al., 2015; Motolani et al., 2017; Pakri, 2019; Pakri et al., 2019).

All of these studies were continuously study to expand the knowledge on malaysian farmers performances based on Hassan (2011); Gebru et al (2012); Nnadi et al (2012) findings in his previously study. Hassan (2011) in his qualitative study found that paddy farmers in northwest selangor maju developed seven personality traits namely information seekers, willingness to take risk, capable of producing high capital, able to solve problems, extensive network information, dare to make decision and highly discipline were more useful in predicting paddy farmers performances. Hassan and Syarafina (2015) then expend Hassan (2011) study recommendation into quantitative study for systematic paddy farmers in Mada, Kedah Malaysia.

However, cocoa industry have a long process of a global supply chain involving various parties starting from farm to the processing which are farmers, buyers, transport companies, processors, chocolatiers and distributors. The production at the farm level is often a delicate and most important process because the crop itself is susceptible to various condition and practices. Motolani et al (2019) found in their study that improvement and optimizing the logistic of cocoa supply chain in cote' d ivoire will increase the productivity, profitability of the cocoa sector and also the farmers standard of living. Gulc (2017) mentioned that there were less study on logistic service quality has been done compared to study on logistic performance effect on chilled and non-chilled food. Positive significant relationship existed between knowledge, attitude and practice towards adoption of improved varieties of pearl millet among farmers in north-eastern nigeria (Mohammed, 2019; Din et al., 2015; Pheeraphuttharangkoon et al., 2014).

Based on all of these studies finding, there is a need to combine all of these factors in one study framework which is include PMCF individual factors such as personality traits, knowledge and practice together with other external factors (visible) namely logistics which are the sub variables are location, infrastructure and transportation. This also supported by Fatimah (2015) suggestion for future study to study more on institutional supports as a compliment of education extension circle which are r&d, extension and services, the future study should focus on improvement in supply chains, logistics, innovations, product development, marketing, promotion and sme development as the variable (Mwangi & Kariuki, 2015).

Literature Review

Work Performance

Job performance has been conceptualized as performance of specific dimensions (Hussain et al., 2017), where the result is achieved by a person which is responsible to carry out (Memon et al., 2020) the organization desired outcome in any activity that carry out based on his skills, knowledge and experiences (Munoz et al., 2019). Work performance among smallholders in agriculture extension is to produce the valued result such as i) the farm productivity and ii) smallholders adoption behaviour (Mwangi et al., 2015) iii) participation behaviour (Meraner & Finger, 2019) and iv) good agriculture practice (Neda et al., 2009). In other words, work performances means adoption behaviour, participation behaviour and productivity improvement.

By adapting Demba (2017) concept of farmers work performance, the concept of work performance of this study is defined as pmcf perception on how well they use their own resources, time, energy and their commitment towards their own cocoa farm.

Personality traits

Personality traits can give a better understanding of individual differences in the adoption decision (Malmqvist et al., 2019). Personality traits are very distinct talent or characteristic that are habitual driver behaviors (Shah, 2016). This study also adapt personality traits defined by Demba (2017) which are how farmers see themselves in terms of their discipline, ability to take risk, networking, problem solving, investment, information seeker, decision making into their commitment towards their cocoa farm.

Discipline

Zhang et al(2018) found that farmers self-discipline is more effective rather than government regulation in order to increase the agricultural production. Zhang et. al (2018) also defined that farmers self-discipline is farmers willingness to follow or support the regulations or procedures produced by government. Marbun and Purba (2021) stated that Hasibuan (2013) defined the work discipline is when an individual is alert and aware of his responsibility as an employee of an organization regulations, standards and policies either it is written on not. This study will referred to Demba (2019) for discipline operational definition which is discipline is defined as an ability to pursue what one think is right given any obstacles on the path.

Ability to Take Risk

Farmers are involves in wide and large risk management strategies due to there are wide range in agricultural production including production, market, financial and institutional risk (Meraner & Finger, 2019). Farmers willingness to take risk is depends on his behaviour and his personal characteristic in decision making either to take the risk individually by off farm or on farm activities. The operational definition for PMCF ability to take risk is their willingness to handle circumstance or problem on their farm and how they will react to the problem as defined by (Yigezu et al., 2018).

Networking

The good relation between smallholders and extension agent is very important to be maintained because this is part of the way how social capital reacts in order to achieve better

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and good productivity (Mwangi et al., 2015). Fraser et al., (2018); Balabanis and Chatzopoulou (2019) found that good relationship with extension agent can change cocoa smallholders in hilir perak attitude to increase knowledge for their cocoa farm management and production. This study defined the pmcf networking is how far the pmcf willing to connect with others in order to sharing knowledge on anything that related to cocoa farm as defined by (Mota et al., 2019).

Problem Solving
Shah et al (2013) stated that a problem solver is a person who aids, dependable and have a 'tract record' good in problems solving. Problem solver characteristics are they need to have knowledge and experience not only work-related matters but also the community and always been source of others referrals. In addition, they have to be willing with the others regardless of the time and day and are willing and want to try even higher risk. This study will use the operational definition as defined by Demba (2017) which is the pmcf ability to use knowledge, facts and data in providing the solution.

Investment
Yigezu et al (2018) mentioned that low and slow adoption among smallholders depend on their willingness to invest. This study will define pmcf willingness to invest by use its own capital for the farm activities as stated by (Munoz et al., 2019).

Information Seeker
Information seeker is when a person realizes the need to reduce the gap of understanding y searching the information more than a source in order to fill the gap. The information will be used to complete a task neither to satisfy a curiosity. Referred to Savolainen (2012), as cited in Balabanis and Chatzopoulou (2019), there are many types of information seekers namely intrinsic interest value, attainment value, utility value and relative cost value. In pmcf scenario, these four (4) types of information seekers types are relevant. However, the operational definition that will be used in this study is a pmcf that has an effort to accumulate important data related to their farming business (Malmqvist et al., 2019).

Decision Making
Set of needs, preferences and values that individual has or seeks (Yusof et al., 2017).

Knowledge
Mohamad (2019) found that adequate knowledge can change cocoa smallholders in hilir perak attitude to increase their cocoa farm production. The more theoretical knowledge farmers acquire about cocoa farming, the more efficient they became in their cocoa farm management (Pheeraphuttharangkoon et al., 2014). These statements also supported by Fadzim et al (2017) which are farmers' attitude and knowledge were related and significantly influence the intention to adopt new paddy variety. Pmcf knowledge on mature cocoa technologies, current scenario on cocoa industry, principles, techniques, education to increase their work performance at their cocoa farm

Practice
The more practical farmers acquire about cocoa farming, the more efficient they became in their cocoa farm management (Roshidah et al., 2017). This study defines practice as

Mohammed (2019) which is pmcy ability to adapt the mature cocoa technology in their cocoa farm.

Logistic
Gulc (2017) found that conducive condition also can change cocoa smallholders in hilir perak attitude to increase their cocoa farm production.

Location
Adequate logistic support do play a role to make sure the develop community in order to disseminate the technologies to the farmers (Gebru et al., 2012) which is supported by (Mwangi et al., 2015). Mwangi et. al (2015) stated that access to extension services has also been found to be a key aspect in technology adoption.

Infrastructure
Gebru et al (2012) stated that infrastructure constraint was found as one of the factor that affects the effectiveness of development agent job performances that will also affect the farmers work performances.

Transportation
Poor transportation network mentioned as one of the factor the affect job performance of extension agent (Nnadi et al., 2012).

Research Objective
Therefore, the main objective of this article is to report all the process and procedures taken to validate and improve all the variables and sub variables constructs in the proposed research framework before the real study data collection in order to contribute to the body of research in agriculture extension area.

Materials and Methods
Study Design
This study applied quantitative research method to determine the relationship between independent and dependent variables.

The Setting
The original setting to conduct the pilot study was face to face and carried out by a research team consisting of student supervisors, students and extension agents from the respective agency from one location to another location. However, the Movement Control Order (MCO) and restriction on cross zone travel has been issued due to the second wave of Covid-19 pandemic. Therefore, both Expert panel and the respective agency agreed to do data collection for pilot study data by i) face to face individually in green zone area and by ii) phone call to farmers that are in yellow and red zone iii) phone call to the chosen farmers who were in the different zone. All the data collection carried out by the respective agency's extension agents based on the respondent's convenience and current MCO situation. In order to reduce the misconduct of data collection, a working committee has been established consist of researcher and respective agency's team from each level by each zone to monitor and assist the data pilot study implementation. A *Whatssapp* group also has been created for a discussion and immediate respond for any inquiry.

The Research Instrument
Structured questionnaires have been adopted and developed to know the recent status of work performances among PMCF based on Iceberg Model integrated with the Theory of Plan Behaviour (TPB) and Theory of Performance (ToP). Some modifications from the existing questionnaire have been done to suit the study requirement. The process of questionnaire adopted, and development was divided into four phases of development, validation, pilot test and reliability test phases. The questionnaires consisted of structured open and closed-ended questions and interval level questions (more than two choices of answers). The questionnaire forms have been divided into four (4) sections of A. Profile of respondents, B. Profile of the cocoa farm, C. Independent variables – Personality Traits (Discipline, Ability to take the risk, Networking, Problem-solving, Investment, Information seeker, Decision making), Attitude, Practice and Knowledge. D. Dependent Variables - Work Performance. Each IV's and DV have 12-23 items with the total number items were 177. The first draft of instrument was face to face validity by the Expert panel in terms of content and structure of questionnaires. At the same time, the nomination of technologies content expertise application was submitted to the respective agency for their validation.

The instrument then emailed to the respective agency's expertise for the content validity within 2 weeks together with the cover letter explaining the study background, the definition of each IV's and DV, and the need of the expertise's feedbacks. After the validation, there were 32 items modification and 65 additional new items suggested based on the respective agency's technologies. Therefore, the total number of items was 242. However, the structured of the items were still maintained adapting the previous study items.

After some modification based on the expertise recommendation, the instrument then were submitted face to face to the advisory of questionnaire development for the instrument structure in terms of choice of language and wording, sentences structured, overlapping, and simple understanding. The amendments instrument was given to six different background agriculture extension agents to answer the instrument from different region via email and face to face. Any unclear items were improved to make it clearer and easier to understand. As a result, majority the trial sessions took within 25-40 minutes including the unclear items.

The Approaches
As the pilot study schedule were during the MCO due to Covid-19 pandemic 2nd wave, the researchers together with the respective agency's took a serious and depth discussion to strategize the pilot study data collection in terms of i) respondents selection ii) the procedures iii) the approaches iv) the data collection working committee v) the enumerators vi) the instruments vii) the interview session viii) the data entry process ix) the time frame. This is because the pilot study result will provide the information either the instrument can be used for the actual data collection. Besides that, the researchers also have to make sure all the process follow the MCO's Standard Operational Procedure (SOP).

The respondents
The minimum number of sample size were depends on the types of research itself which is influenced by many factors. Memon et al (2020) referred to Roscoe's (1975) guidelines mentioned that the minimum sample size for behavarioul study were 30. Malmqvist et al

(2019) stated that Hertzdog (2007) referred to Nunnaly and Bernstein (1994) that the minimum number of pilot study respondent were 30.

For this pilot study, the expert panel and the researchers agreed the total number of 105 PMCF were selected to answer the instrument which were 35 PMCF from Peninsular Malaysia, 35 PMCF from Sarawak and 35 PMCF from Sabah. Number of respondents were decided for each region which means the percentage of respondent from each zone were 1.7% for Sabah population, 3.6% respondents from each Zone in Sarawak population and 4.9% respondents from each zone based Peninsular population. Number of respondents for each zone by region is shown in Table 1.

Table 1
Number of respondents for each zone by region is shown in Table 1.

SABAH (1.7% from Sabah population)		SARAWAK (3.6% from Sarawak population)		PENINSULAR (4.99% from Peninsular population)	
Northern Zone	5	Northern Zone	2	Southern Zone	7
Western Zone	15	Southern Zone	24	Eastern Zone	7
Inland Zone	11	Inland Zone	6	Northern Zone	20
Eastern Zone	4	Middle Zone	3	-	-
TOTAL	**35**	**TOTAL**	**35**		

However, the selection of PMCF was chosen by the working committee each zone based on non-restricted area from MCO, non-flood disaster area, resources and also the respondents availability to participate the interview session.

The Procedures
1) Pre-interview Stage
Before the pilot study implementation, the researches first create a in Working Committee *Whatsapp* Group that consist of the research team chairman, the researcher and the extension agents from multiple level of the respective agency. The objective of the established of Working Committee *Whatsapp* Group was briefed shortly. The representatives from the agency then add more extension agents that have a potential to be an enumerator of the pilot study.

The researcher then gather the i) information on total of PMCF in each region ii) name list of enumerator from each zone for each region from the respective agency. From that, the numbers of 35 respondents were decided for each region which was calculated based on the percentage of respondent from each zone as shown in Table 1.

The researcher then took an initiative to create a simple template that can be a reference to guide the enumerator on the pilot study background, term use in the questionnaire, the main function on each working committee. The template and revised questionnaire was emailed

and post in Working Committee *Whatsapp* Group to all Supervisors for each region and zone before the briefing session.

The instrument, guide template and work schedule were email to each zone supervisors to disseminate among them before the briefing as a reference. The briefing was held via *Google Meet* platform that consist of the research team chairman, the researcher and the Data Collection Working Committee which were the Director, the supervisors and all the enumerators joined the briefing session. During the briefing, the explanation on aim of the study, topics, each variables definition and each item was explained thoroughly to avoid different understanding among individuals. Each unclear item or sentence structure was explained. During the briefing, some of the word and structure was changed based on the enumerator suggestion and agreed by all. The researcher amend the word on the spot

As overall, the briefing went smoothly because the briefing participants were familiar with the productive cocoa technology apart of the selection of word and the sentence structured were commonly used. The briefing session took 4 hours. The milestone of pilot study data collection were disseminate to the supervisors in order to make sure the scheduled work plan is on track.

2) During the Interview Stage

As agreed during briefing session, any update info or inquiry on current situation during interview will be updated to the researcher by phone call or Whatsapp for immediate respond. The pilot study retrieval occurs simultaneously in all areas. The interview was conducted by the enumerators from the agency because the researcher was not allowed to travel due to MCO restriction.

There were multiple challenge facing during the interview stage such i) flood at the four (4) respondents area which are Johor, Malacca and Kelantan ii) unavailable of one (1) respondent during the interview session arrangement in Betong, Sarawak iii) MCO restriction in Bintulu, Sarawak involved two (2) respondents.

The details information by percentage either the data were collect via face to face or telephone is shown in Table 2:

Table 2
Number and percentage of respondents for each approaches by region is shown in Table 2.

Region	Number and percentage of respondents	
	Face to Face	Telephone
Sabah	35 (100%)	0 (0%)
Sarawak	32 (91%)	3 (9%)
Peninsular	29 (83%(	6 (17%)

The real time data collection for the pilot study can be done by two (2) methods either by i) manual form ii) Google form. For this data pilot study, the manual form were used by 91% in Sabah, 100% in Sarawak and 94% in Peninsular while the Google form were used only 9% in Sabah, 0% in Sarawak and 6% in Peninsular as shown in Table 3.

Table 3
Number and percentage of respondents for each data collection instrument is shown in Table 3.

Region	Number and percentage of respondents	
	Manual Form	Google Form
Sabah	32 (91%)	3 (9%)
Sarawak	35 (100%)	0 (0%)
Peninsular	33 (94%)	2 (6%)

There were also some inquiries from one (1) in Sarawak respondents during the interview session. The inquiries then were referred to the researcher by the enumerator via *Whatsapp* Group platform. The researcher then explained to the enumerator via phone call and *Whatsapp* Group in order to make all the respondents get the same information.

3) Post Interview Stage

At this stage, all the data collected via manual form were key in into *Google* form for security purpose and also due to time constraint. This is because to avoid the manual form went missing if the form send via airway services as there was many missing or stranded item were reported during Covid-19 first phase of MCO. The data collected then extracted from the *Google* form into excel. The cleaning data were started by identify the missing information and confusing data entry. Majority the missing and confusing data were at Section B which is Farm Profile such as the total number of cocoa clones in the farm, the total number of cocoa trees in the farm and the farm distance from the respondent house. However, all the missing and confused data can be clear by the enumerators either based on their secondary data or they have to refer the respondent back. After the cleaning session, the data then were coded and theme based on the study objectives.

Results and Discussion

The pilot study interview session gave the opportunity to the researcher to improve the strategy, the enumerators' interviews guideline notebook, term of reference of the respondent (PMCF) criteria, recheck the name list provided by the agencies to make sure it is suit with the PMCF criteria and also the instrument before the real data collection.

There were three major finding from the pilot study interview which are i) data collection protocol ii) number of item iii) sentences structured.

For the data collection protocol, researcher found that there will be some changes for the identified respondent due to sudden announce of Covid-19 MCO restriction order in several areas. However, the total number of respondent for each zone will be retained. The researcher also assumes that the used of Google form and telephone will be use more during the real data collection. Besides that, the researcher also found that there were some wrong suitable respondent for this pilot study which means there're misunderstanding for the terms of PMCF. The researcher then asked the supervisor to identify three (3) new pilot study respondents in Ranau to do the interview. The researcher then removes all 105 pilot study respondent name list as the real data collection respondent candidate.

The second and third finding was for the improvement on the instrument itself. Based on feedback from the enumerators, majority respondents confused to answer the Question number 13, 14, 15 and 16 at Section D which are 13) *Jambatan utama di kawasan saya memudahkan urusan penghantaran biji koko dan input pertanian*, 14)*Kebun saya selalu dilanda banjir*, 15)*Parit utama di kebun saya tidak diselenggara dengan baik* and 16)*Parit ladang di kebun saya tidak diselenggara dengan baik*. The feedback was from respondents in Betong, Sarawak and Kinabatangan, Sabah. These four (4) questions basically will be answered either 'yes' or 'no'. So that, the researchers decided to improve the explanation in the enumerators' interviews guideline notebook as a reference by giving more explanations and examples of the next question that need to be asked by implement who, why, what and how types of questions.

The researcher also gather the duration of one interview session for one respondent from each zone in order to reschedule the milestone of real data collection Gantt Chart. Besides that, the researcher also gathers the feedback from each zone for which question that took time to answer by the respondent. The sentences structure of that question will be studied and revised if needed.

The data for all parameters were analysed using IBM SPSS version 25.0 to run the Frequency Analysis, Reliability Test and Factor Analysis. From this steps, there were only two (2) items need to be delete. The researcher then improves the final set of instrument before it can be disseminate for the real data collection.

Contribution of the Study
Conducting a pilot study does not ensure that the main study will be successful, but it will ensure to measure as well as answer the objectives of the study. Pilot studies serve a variety of purposes and can provide valuable insight to the study. The biggest contribution of this pilot study is the result of a set of document questionnaires that have been tested for its authenticity (In, 2017). Through the pilot study result, the instrument has been tested and proven that the instrument has good validity and reliability (Edwin et al., 2001) to be used for work performance study with some modification (In, 2017). This pilot study was related to the work performance of productive cocoa farmers are vital element of producing a good study design. Other contribution of this pilot study was the experience sharing that can provide clear guidance to other researchers especially to those who are dealing with the study at the rural area and with unexpected obstacles (Ismail et al., 2017; Malmqvist et al., 2019).

Conclusion
This pilot study was carried out to validate the process and also the instruments that will be apply and use in the real data collection. However, there we some limitation during the pilot study implementation which were i) the interview has to be done via telephone rather than face to face that. However, luckily for this study the enumerators were from the respective agencies that are very familiar with the PMCF's scenario and can communicate well to make the interview session became much easier and comfortable. Therefore, the validity of the data collected can be trusted because the data collected has been verified by the zone and region supervisor if there are confusing data. Even though the data collection was implementing all over Malaysia during MCO restriction 2.0, the communication went well among the researchers and the working committee which are from the respective agency by

fully use the *Whatsapp* technology. The milestone to finish the data collection also can be considered on time even though it was 3 days behind the target date due to the need of interview three (3) new respondents from Ranau, Sabah by fully use of Google form application. As a conclusion, the pilot study collection data was successfully implemented even though we were facing the big challenge due to Covid-19 pandemic because i) the instrument has been validate n improved to be used in the real data collection ii) support and great teamwork from the working committee that really play their roles as an extension agent to help the data collection process iii) the fully use of Information Technology applications namely Whatsapp and Google Form. It is a must to report the lesson learnt from the pilot study (Edwin et al., 2001; Ismail et al., 2017). The valuable lesson learnt from conducting this pilot study were i) we must have multiple planning to collect the data especially when we were dealing with human being ii) we do must have a good understanding of our study context to make sure we can do multiple plan including back up plan iii) as a researcher, we do need the great collaboration with many people that involved in our research or study especially an extension agent because they can help the process during the data collection iv) we must gather feedback and information and respect the opinion from the respective agencies v) we must collaborate the idea from practitioners and academician point of view to make sure our study are in the right destination with the right direction as suggested by (Fraser et al., 2018).

Conflict of Interest
There is no conflict of interest regarding the publication and authorship of this research.

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