

BUSINESS SIMULATION THROUGH KIOSK BUSINESS: INITIAL RESULTS AMONG INDEPENDENT OIL PALM SMALLHOLDERS

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ABSTRACT

Majority of oil palm smallholders belongs to the B40 category due to small scale agricultural activities. Oil palm smallholders who depend on oil crops alone will face the risk of diminishing income. Long-term steps need to be taken to ensure that their income is maintained even if the palm oil prices are falling. The only way to cope with the income shortages is through business. Hence, this business simulation used the bottom-up method pioneered by Elmore (1978) and Herjn and Porter (1978). This approach was based on the implementation network at the bottom of the stage. It was also a study of the targeted group through a process of observation together with the process of implementation. This business simulation selected two (2) independent oil-palm smallholders in Teluk Intan, Perak. Selection of the participants was based on the justified details as to identify the type of business that is appropriate to the local geography and identify the needs and wants of the community. Participants were engaged in cash-related businesses such as selling crops (bananas, tapioca and others) and agricultural-based businesses. Participants were given a kiosk to carry out business activities. Meanwhile, researchers provided training facilities, guidance and financial support in helping smallholders become successful entrepreneurs. It was expected that the operation of this project could help smallholders increase their income and this simulation would become a model for other oil palm smallholders.

Keywords: Business simulation, entrepreneurs, smallholders, bottom-up approach

INTRODUCTION

In general, B40s are group of people who earn an income of RM1,200 and RM2,500 per month and most significantly, they are from group of oil palm smallholders in Malaysia. Independent smallholders earn less due to their small scale of palm plantations and the volatile performance of the oil palm prices. Oil palm growers who rely on palm oil alone will face a declining income risk especially in the event of oil prices drop in the market.

As such, smallholders need to find alternatives to increase their source of income by doing business or working in the other sectors . According to Todaro and Smith (2009) doing business can help to increase the income and improve the standard of living of a family regardless of the scale of the business. However, this type of business should suit the local community. In addition, the need for support and assistance from the relevant stakeholders can encourage individuals to engage in business.

Having said that, business can be seen as one of the solution for the oil palm smallholders to source their daily expenses and support the increasing cost of living. Therefore, this study aims to look at the impact of smallholders' income when doing business. It will also discuss the achievement of micro business performance among the oil palm smallholders through their small scale business venture.

REVIEW OF LITERATURE

Smallholders and Income

The palm oil industry is a major driver of Malaysia's agricultural and economic sectors. The industry occupied two-thirds of the country's total agricultural land. Palm is also a major crop for private smallholders and it generates major revenue for rural people.

Palm oil is the main export products of Malaysia and has contributed RM77.8 billion or 55.5 per cent to export earnings in 2017. However, exports of palm oil has decreased significantly due to the price volatility of crude palm oil (CPO). The volatility is driven by but not limited to demand and supply of the industry. It is also influenced by external factors such as high duty imports imposed by importing countries and competition from neighboring countries.

Table 1: Price of Crude Palm Oil (RM/Tan)

Month	2018	2019
January	2,487.50	2,038.50
February	2,488.00	2,101.50
Mac	2,428.50	1,904.00
April	2,419.00	2,020.00
Mei	2,398.00	1,947.50
Jun	2,326.50	1,969.00
July	2,214.00	NA
August	2,186.50	NA
September	2,178.50	NA
October	2,084.50	NA
November	1,838.00	NA
December	1,800.50	NA

Source: Malaysian Palm Oil Board (MPOB), 2019

Palm oil production in Malaysia is increasingly under pressure due to the global demand for sustainable palm oil. Palm oil cultivation has been identified as a cause of significant reduction in the area of tropical forests, soil erosion, the impact of global warming, air pollution and water pollution. In addition, emission of palm oil industry in factories and transportation materials of palm oil products has also been identified as another source of pollution.

Tariff and non-tariff restrictions on palm oil has given impact by limiting the penetration of the local market. Evidently, the price of palm oil decreased from RM2,487.50 in January 2018 to RM1,800.50 in December 2018. In early 2019, crude palm oil prices rose slightly to RM 2,038.50, however the prices fell again to RM 1,969.00 in June 2019 (refer Table 1). The volatility of the CPO price has led to the decrease in income for 305,380 oil palm growers nationwide with a total area of 513,030 hectares (Ministry of Rural and Regional Development, 2015). Therefore, most of the smallholders receive household living aids (BSH) from the government in order to support them and their family.

Smallholders as Entrepreneurs

Palm oil smallholders are still in difficulties in term of acquiring new technologies, practicing best farm management practices, lack of financial resources and income as well as the financial ability to buy high quality fertilizers (Nagiah & Azmi, 2012; Farouque & Takeya, 2007). Recently, Azhar Ahmad et al., (2017) revealed that almost 70 percent of palm oil smallholders whom involved in business activities gained gross incomes below RM2,000 per month or RM70 per day.

MPOB and other agricultural development organizations had established some proactive measures to improve palm oil smallholder's income such as Skim Intensif Integrasi Tanaman Dengan Sawit (ITA), Skim Insentif Integrasi Ternakan Dengan Sawit (ITE) and Smallholders Cooperative Programme. However, the improvement of the participants' economy is still at the minimal stage. Coincidentally, round 35 per cent of all palm oil cultivation in Malaysia is done by small farmers and families on small scale plantations.

Palm oil smallholders' involvement in other related business activities should be able to improve their personal and family income. However, past performance from those activities is still not achieving the fruitful level. Therefore, from our point of view, palm oil smallholders must have entrepreneurial orientation (EO) and certain positive internal characteristics to support or enhanced their achievement in such agricultural based activities and projects.

The significance of palm oil industry towards the smallholders' income is huge especially for their survival. Hence, the smallholders need to be more proactive in handling this issue. According to the Theory of Reason Action (TRA) by Fishbein and Ajzen (1975), they noted that action is based on a particular reason or cause. This means that the process of forming an action involves the interaction between an individual's belief system and the consideration or evaluation of a matter, in which the response will form the reason or motive the behavior. According to a study by Azhar and his colleagues (2017), the main push factor for oil palm smallholders to do business was to increase their monthly income.

Steiner and Atterton (2014) noted that business can be the way for a community to strategies their economy. This is because business provides the opportunity for the community to generate family income and contribute to the diversity of the community's economy. According to a study conducted by Olomi (2001), showed that individuals started their business because of economic needs. In fact, businesses can also contribute significantly to eradicating poverty and directly depriving an individual of the lower income group (Watson et al. 1998).

External support factors such as financing from the government shall guarantee success to the business (Ahmad Rafliis, Mohd H. & Suraiya, I, 2009). According to Jasra and friends (2011), support for such activities as advisory services and skills assistance are essential in starting and

maintaining a business. Therefore, external factors in the form of assistance and support from government and financial institutions are fundamental to the success of small business ventures especially in rural areas.

Bottom-up Approach

Pressure and frustration are a consideration for the higher level of decision making. In other words, this approach involves the various stages of understanding the issues and desires of the subordinate until the higher levels decide on the needs of the subordinates. The bottom-up approach is conducted to know the methods in dealing with problems (Elmore 1978; Herjn, Hanf & Porter 1978). This approach is based on network performance at the lowest level. It is also a study of the target group through a process of observation so implementation process (Nikkhah & Redzuan 2009). At this stage each target group addresses current issues and provides insights on problem solving (Finger & Princen, 2013) as well as assisted by the authorities as facilitators and consultants. This method varies from the top-down approach as it will be fully managed by the government and the involvement from the community is minimal.

However, the involvement of a person's business type depends on the geography of the individual (Blair & Premus 1987). This is because, every business needs to understand the needs and wants of the community (Goodman & Steadman 2002). In addition, business operator will also need to make sure that supplies are easily accessible.

The bottom up approach is aimed at building local communities (Asif et al. 2013). In fact, this approach can deepen the pressures, desires and problems faced by subordinates in an organization such as oil palm smallholders. Bottom-up approach enables the smallholders to conduct business that they prefer and also appropriate to their community. This approach also creates a sense of accountability and ownership among the smallholders as the initial ideas and processes involve them in the decision making (Azhar, et al. 2018).

In understanding the impact of the small business upon the project recipients, we also analyze their characteristics according to their characteristics. Even though the projects recipients were in different types of business, all of them can be categorized as small entrepreneurs.

The categorization of recipients or entrepreneurs is based on four entrepreneurial traits approach based on 1) Personality Traits Approach by McClelland (1961) and Rotter (1966); 2) Multi-trait Approach by Timmons et al. (1985).

RESEARCH METHODOLOGY

Research Instrument

Based on the survey conducted by researchers, the recommended businesses should be appropriate to the cultural and social development of the local communities. As a result of the *bottom up* approach as suggested by Zapata and colleagues (2011), the oil palm community can run a business that suits the smallholders because the business idea originated with them by considering the needs and desires of the community.

Respondents

This study used a qualitative approach which carried out intensively by researchers on a social unit such as individuals. This study interviewed the respondents to obtain data. Interviews were conducted with two (2) oil palm smallholders in Teluk Intan, Perak to obtain the required information. The questionnaire was used as an interview guide and was informed to the informant prior to the interview for the purpose of preparing facts and policy material. Discussions and interviews last for two (2) hours, with each respondents taking an hour. Table 2 depicts the demographic profiles of the respondents.

Table 2: Respondents Profiles

Respondent	Age	Land	Income
A	58	4 acres	RM 800.00 month
B	59	4 acres	RM 750.00 month



Respondent A



Respondent B

RESEARCH FINDINGS

This study adopts the quantitative and the qualitative research method for its data collection and analysis. Face-to-face interview were done to find out why they were involved in business. Selected recipients of the scheme have been interviewed for their participation in program. This was part of a joint case study research project between MPOB and a team from UKM. Two recipients become the main case for this study. For confidentiality purposes they are identified as Respondent A and Respondent B.

They shared their stories on how they benefitted from the program and how the money they received was used to help them alleviate their income. They felt grateful to be selected as the recipients of micro-financing scheme and they were appreciative to the efforts taken by MPOB and UKM in helping them to improve their economy. Each of the recipients was engaged in small food kiosks. For example, Respondent A used the program to establish a banana fritters kiosk. Respondent B on the other set up small food kiosk that sell nasi lemak and the likes. Respondent A wanted to go into the food business/ restaurant business thus requiring some renovation that was needed to be done for the kitchen and customer dining area. His family was also keen on the food business and believed that they can make enough to cover for the loss of income due to uncertainty surrounding oil palm. The beginning was slow as they started with an array of dishes but concentrating on nasi lemak and fried rice. The revenue collected was sufficient to cover his needs. Respondent B operated a small business with a stall selling various types of nasi lemak. On top of selling nasi lemak, Respondent B also opened another table to sell food and tit bits just metre away,

By doing this, the research was able to identify the "bottom" problem faced by oil palm smallholder and could take necessary actions to address the low income issue. The interview started with demographics background of the respondents as per the methodology.

Information Gathered

Through the interviews, the scheme recipients mentioned that most of their basic needs have been taken care of. In a way that they feel comfortable with their current living condition compared to previously and their livelihood has changed for the better. This implies that the program has proven to be successful in helping successful applicants who were in the low-income household uplift their current state of income level. This program can be used as a model and expand to a national scale and to other recipients from the Bottom 40 (B40) all over Malaysia.

In understanding the challenges faced by the recipients, the interviewers focused on the development of the palm oil industry. The discussion was on the declining of CPO prices hence the responses from the respondents were as follows:

"The fall in oil palm price has led my income to decline to RM800 per month after maintenance costs. I used to earn RM1,300 to RM1,500 per month. Now, the income is not enough for my daily needs. Subsequently, I also faced the problems of increase in price of input items such as fertilizers and pesticides, and the cost of workers' salaries also went up. In total, I had to spend about RM500 a month on the cost of poisons and fertilizers excluding the cost of harvesting and transportation."

Respondent B, he stated:

" My land is being leased to someone to plant oil, as a result of lease payments based on revenue, due to the fall in oil prices, I have a shortage of income even though I did not bear the maintenance cost "

Due to the situation of falling oil prices, oil palm smallholders need to have alternative strategies to increase their income. Therefore, the respondents' feedback as follows:

Respondent A:

" Palm oil is my main source of income and if I only depend on the palm oil alone, I will be facing difficulties in supporting the cost of living. In order to reduce the burden, I operate a business and do small crop farming like banana to support the high cost of living at the moment. My business serves food for lunch and tea time. I choose to do this kind of business because there was no food stall in this area before but now there are many people selling food here even though the main road here is not having heavy traffic. My business location is near the main road and I have a huge business area with a convenience parking area for customers. In total, I earned RM650 per month."

Respondent B:

"Palm oil is a major source of income for me, the decline of oil prices has led to my income being depleted and to avoid income shortages, I run a small business on a small scale. I choose to run a food business, this was due to a request from my friends for a place to gather. I have many regular customers which I built a friendly relationship with them to the extent of if I close my stall for a day, they will knock my house and ask me to open the stall. My stall is next to the multipurpose hall and I am earning RM 750 a month".

The results of the qualitative analysis showed that palm oil was a major source of income for smallholders. The volatility of oil prices in the market had resulted in respondents experiencing shortage in their monthly income. So, they decided to run a small business to cover their income shortfall. However, the total revenue (palm oil and business) was still below RM 1800.00. This showed that they were still in the B40 category.

In addition, they conducted business based on factors such as identifying the type of business such as fruits collection center and small restaurants that met the local geography and based on the needs and wants of the community. In short, they engaged in business after seeing the opportunity by observing and researching the type of business that they should work on. For instance, a strategic location selection is important for business continuity. Also, having a strategic location could increase sales since it is more visible and accessible to the customers.

Next the interviewers asked income potentials from both palm oil and business to support their daily need and survival. The responses were as follows:

Respondent A:

"Based on the daily needs, the income is not sufficient to cover all. I have small children go to school which require a lot of expenses. If there is any additional source of income, it should be able to cover all."

Respondent B:

"My income is still low and it only sufficient to cover my daily necessities but I have no saving"

Kiosk-based Business

The results of the findings indicate that the best way to help increase the income is to run a kiosk-based business using cash crops. In addition to the respondents' income from palm oil, they also operate cash crops farming such as banana and corns. Therefore, the study can offer a kiosk for them to run cash-based businesses. In fact, the use of kiosk is because it does not cost as much as renting the premises. Also, it does not require a lot of space to operate, just next to the original premises of the respondents. The price of the kiosks and equipment is RM7,000. These prices indicate that the capital is available to the smallholders

The business will involve the usage of input such as bananas, potatoes, sweet potatoes, cooking oil and flour. For respondent A, he incurred a cost of RM190 to buy the inputs. The result of the sale of this business is RM527 with the net income of RM337. Hence, his total income increased to RM1837. However, respondent A only conducted his business for 12 days in a month (Table 3).

For respondent B, he incurred initial expenses of RM419 to buy his supplies. After doing business for 21 days, sales from this business amounted to RM1,041. As shown in Table 4, the net income for B is RM 622.

Table 3: Expenditure and Revenue

Information		Expenditure	Revenue
Respondent A (12 days)			
KIOSK	INPUT	190.00	
	SALE		527.00
Respondent B (21 days)			
KIOSK	INPUT	419.00	
	SALE		1041.00

Table 4: Total Monthly Income

Information	Income (RM)
Respondent A (12 days)	
Oil Palm	850.00
Original Business	650.00
Kiosk	337.00

Net Income Amount	1837.00
<i>Respondent B (21 days)</i>	
Oil Palm	750.00
Original Business	750.00
Kiosk	622.00
Net Income Amount	2122.00

Challenges in Kiosk-based Business

Respondent A:

"I faced an operational problem because my wife was not feeling well. The business operation is not certain also because of the uncertain supply of input from villagers such as banana. I ended up buying from wet market where the price is slightly higher."

Respondent B:

"I have a supply problem for banana however the supply for tapioca and sweet potato are always there. The bananas are quite difficult, these bananas come in many varieties, although there are bananas, not all are good for frying. I had to shut down my business for several days due to lack of banana supply".

Based on the interview, the respondents faced many challenges in their daily routine. There were tough times too especially during the off season. Respondents A dan B learnt that having continuous supply of raw materials throughout the year is essential. Competition is also steep. For example Respondent A admitted that were three other stalls in the vicinity and that they have been established earlier. All differ very little in the menu, but Respondent A unique quality control formula made them slowly overtake the others in terms of popularity and based on the quality control.

Next we seek to investigate the outstanding traits among the recipients of the programs. Using the personality trait model and the multi trait approach the following findings were discovered.

a. Personality Traits

Table 5 shows the personality traits of the entrepreneurs based on studies by McClelland (1961) and Rotter (1966). The highest personality traits possessed by the entrepreneurs are the needs for achievement and self-esteem/self-efficacy (100 percent). Locus of control is also an important personal trait describing the entrepreneurs as well the need for autonomy/independence (80 percent). The lowest personality traits that they have are the risk taking propensity and innovativeness and lack of vision. Thus thriving for success, an entrepreneur needs to have the needs for achievement and high self-esteem.

Table 5: Personality Traits Approach

No.	Traits	E1	E2	%
1	Needs for achievement	√	√	100
2	Risk taking propensity	√	-	50
3	Locus of control	√	√	100
4	Self-esteem/self-efficacy	√	√	100
5	Problem solving style and innovativeness	√	√	100
6	Need for autonomy/independence	√	√	100
7	Vision	√	-	50

b. Multi-Traits

Table 6 summarizes the multi-trait of the entrepreneurs based on Timmons et al. (1985). Out of 15 traits, recipients seem to have a common trait of total commitment, determination and perseverance followed by taking initiative and personal responsibility. Besides that, persistence in problem solving, internal locus of control, tolerance of ambiguity, stress and uncertainty, calculated risk-taking and risk sharing, integrity and reliability, and dealing (positively) with failure are also important traits of the entrepreneurs. The lowest traits that the entrepreneurs have are drive to achieve and grow, orientation to goals and opportunities, seeking and using feedback, decisiveness, urgency and patience, and team building and hero maker.

Table 6: Multi-trait Approach

No.	Traits	E1	E6	%
1	Total commitment, determination, perseverance	√	√	100
2	Drive to achieve and grow	√	-	50
3	Orientation to goals and opportunities	√	-	50
4	Taking initiative and personal responsibility	√	√	100
5	Persistence in problem solving	√	√	100
6	Veridical awareness and sense of humour	√	√	50
7	Seeking and using feedback	√	-	50
8	Internal locus of control	√	√	100

9	Tolerance of ambiguity, stress and uncertainty	√	√	100
10	Calculated risk-taking and risk sharing	√	√	100
11	Low need for status and power	√	√	50
12	Integrity and reliability	√	√	100
13	Decisiveness, urgency and patience	√	-	50
14	Dealing (positively) with failure	√	√	100
15	Team building and hero maker	-	√	50

This summary characteristics gives the overall picture of the recipients characteristics who had participated in the case research. On an individual basis such characteristics might not be identifiable but this consolidation report can give a different perspective of the case research project. As in almost all case research studies, the sample is relatively small but it goes a bit more in depth and provide a specific dimension as intended.

CONCLUSION

The road to success is paved with many obstacles. The cases here are the testaments to the fact that success comes to those who endures. Obstacles were endured and met with sheer grit, passions, and perseverance. Most importantly, the sweet taste of success was only made possible when these individuals were given the right tools and support where and when they needed it the most.

This study was undertaken to identify alternative mean for the independent smallholders to increase their monthly income. Through the business simulations done by sampled smallholders in Teluk Intan, Perak, their business venture helped increase the income of the smallholders. Both respondents had additional source of income by opening eateries such as selling nasi lemak and roti canai in Teluk Intan. The income of their small business was about RM800 per month. Unfortunately, the total income for both oil palm and food eateries were still within the B40 threshold level.

Hence, additional business was provided to supplement their income. A “kiosk” business was set up to sell regular crops like banana fries, tapioca and sweet potatoes. Revenue from the kiosk business had demonstrated that they could earn an average of RM500.00 a month. Through the kiosk business, the total income had increased to more than RM2000 per month. Thus, the business enabled them to earn higher monthly income and hopefully after several months in operation would move them above the B40 level.

Therefore, business is an important element that should be implemented among the oil palm smallholder as it stimulates the economy of the family. It can push the family household income from having just enough to more lucrative income. Finally, it is hoped that the business

project will help oil palm smallholders to increase their income and this business simulation will become a model for other oil palm smallholders.

Moving forward, these cases should be the formula to chart a better approach towards improving the life and economy of the people smallholders at the national level. MPOB will be able to continue its supportive arm by providing recipient-driven resources and opportunity. Most importantly, MPOB adaptation of the complementary income model should continually be improved so that hundreds more of smallholders can be groomed in the near future. These case studies serve as a model that can be replicated on a larger scale and eventually become a blueprint to groom future smallholder cum entrepreneurs, in particular, those from the Bottom 40 households. This sets forth the role of MPOB as an enabler of an initiative that portrays the commitment of MPOB towards realization of inclusive growth in among the smallholders where none is left-out and none is marginalized.

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REFERENCES

- Azhar, A. et. al. (2017). The push factors in business: The case of oil palm smallholders, *Advanced Science Letters*, 23 (1), 453-456.
- Azhar, A. et. al. (2018). Laporan Akhir, Projek Penyelidikan EP-2014-011, Kursi Endowmen MPOB-UKM.
- Ahmad Rafli Che Omar, Mohamad Abdul Hamid & Suraiya Ishak. (2009). *Pengurusan Tunai dan Cabaran Perniagaan*, dlm *Keusahawanan dan Cabaran Perniagaan di Malaysia*, pytg Yahya Ibrahim, Mohd Fauzi Mohd Jani, Sarmila Md Sum & Zaimah Ramli, Bangi; Fakulti Ekonomi dan Perniagaan.
- Blair, J. P., & Premus, R. (1987). Major factors in industrial location: A review. *Economic Development Quarterly*, 1(1), 72-85.
- Goodman, B., & Steadman, R. (2002). Services: business demand rivals consumer demand in driving job growth. *Monthly Lab. Rev.*, 125, 3.
- Elmore, R. F. (1978). Organizational models of social program implementation. *Public policy*, 26(2), 185-228.
- Hjern, B., Hanf, K., & Porter, D. O. (1978). Local networks of manpower training in the Federal Republic of Germany and Sweden.
- Jasra, J. M., Khan, M. A., Hunjra, A. I., Rehman, R. A. U., & Azam, R. I. (2011). Determinants of business success of small and medium enterprises. *International Journal of Business and Social Science*, 2(20), 274-280.
- Fishbein, M. & Ajzen (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*, 181-202.
- Olomi, D. R. (2001). Evolution of entrepreneurial motivation: The transition from economic necessity to entrepreneurship. *Business Management Review*, 7(2), 90-136.

- Asif, M., Searcy, C., Zutshi, A., & Fisscher, O. A. (2013). An integrated management systems approach to corporate social responsibility. *Journal of cleaner production*, 56, 7-17.
- Zapata, M. J., Hall, C. M., Lindo, P., & Vanderschaeghe, M. (2011). Can community-based tourism contribute to development and poverty alleviation? Lessons from Nicaragua. *Current Issues in Tourism*, 14(8), 725-749.
- Finger, M., & Princen, T. (2013). NGOs and transformation: beyond social movement theory. In *Environmental NGOs in world politics* (pp. 62-80). Routledge.
- Nikkhah, H. A., & Redzuan, M. (2009). Participation as a medium of empowerment in community development. *European Journal of Social Sciences*, 11(1), 170-176.
- Steiner, A., & Atterton, J. (2014). The contribution of rural businesses to community resilience. *Local Economy*, 29(3), 228-244.
- Todaro, P.M., & Smith, C. S. (2009). *Economic Development*. (10th ed.). Harlow: Addison Wesley.
- Watson, K., Hogarth-Scott, S., & Wilson, N. (1998). Small business start-ups: success factors and support implications. *International Journal of Entrepreneurial Behavior & Research*, 4(3), 217-238.

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