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FINAL TECHNICAL REPORT

VALUE CHAIN RESEARCH STUDY AND COST ANALYSIS OF VEGETABLE OIL CROPS in North-Western Cambodia

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The questionnaire for producers: https://kf.kobotoolbox.org/#/forms/aAhta5tBb3MDQVtEAuqUSa/landing

The questionnaire for distributors: https://kf.kobotoolbox.org/#/forms/aLduusY4ZRKmXQAyN3tHT2/landing

The questionnaire for consumers: https://kf.kobotoolbox.org/#/forms/aDxFuWQJjrz4wD8L2gkqeQ/landing

ACRONYMS AND ABBREVIATIONS

CTEP	Cambodia Team for Education Program Organization
PPP	Public-Private Partnership
FAO	Food and Agriculture Organization
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ILO	International Labor Organization
UNIDO	United Nations Industrial Development Organization

EXECUTIVE SUMMARY

The stakeholders of vegetable oil, including raw material suppliers, dealers, producers, distributors, and customers.

Raw material suppliers lack adequate marketing strategies, high manufacturing costs, and adequate reserves to prepare for planting. Dealers determine the product and are well-prepared for reserves. They also purchase crops at a lesser cost and resell them at a higher cost. Dealers have asked raw material suppliers for training in cultivation techniques, care, and harvesting to ensure that these products have a healthy market.

Vegetable oil, the provision of reserves, and the motivations for starting a business have all been thoroughly researched by oil producers. Vegetable oil is a vegetable oil made from seeds. It is acquired at a fair price, but its subsequent resale at a greater price after being oiled is notable in terms of the price. Oil producers integrate all business-related training and ask that the raw material suppliers support the expansion of the crop. Distributors carefully established reserves and the business strategy to make it work.

The majority of distributors are interested in taking part in training connected to vegetable oils, while a tiny minority are not due to their busy schedules. Customers enthusiastically support vegetable oil production and are content with the availability of both imported and regional ingredients.

The analysis for this study focuses on the value chain from raw material suppliers to consumers. This analysis can help identify potential alternatives related to refined products, including additional information on the availability and affordability of micro-technologies for the processing of vegetable oils. Price analysis and benefits of using vegetable oil products.

Vegetable oil crops and vegetable oil press costs were measured at ($). Target crops cost was slightly higher than dealers to producers, while producers to distributors had the highest cost.

I. INTRODUCTION

1. Background of the Study

In many nations, the development of agro-food industries and value chains for vegetable oil crops has created the necessary connection between the vegetable oil crop and manufacturing sectors, which in turn has sped up the growth of broader manufacturing industries by supplying raw materials for food processing, textiles, and biofuels (UNIDO, 2011). Also, the primary source of rural off-farm employment in developing nations is the agro-food industry (ILO, 2008). In various nations where high-value agro-food exports are generated, it has been discovered to have beneficial benefits on lowering poverty and empowering women (Van den Broek et al., 2016; Maertens and Swinnen, 2012). Through wage employment and spillover effects that increase on-farm vegetable oil crop productivity in terms of more money to buy inputs and an increased capacity to adopt technologies, the creation of off-farm employment opportunities in agro-industrial firms located in rural areas directly and indirectly affects rural household income (Maertens, Minten, and Swinnen, 2012).

Vegetable oil crop production in Cambodia has to be connected to markets and customers through reliable value chains in order to be sustainable. Farmers who are integrated into markets are more likely to adopt new technology than those who have minimal market engagement from the standpoint of production and efficiency (FAO, 2020a). Since they are solely concerned with meeting their own demand and that of their neighbors and/or local markets, which can be rapidly fulfilled with modest increases in production, households with limited access to markets have insufficient incentives to embrace new technologies and enhance productivity. Farmers with good market integration deal with a generalized demand for commodities and use technology to generate the profits they anticipate from selling more output (FAO, 2020a). Including smallholders into value chains benefits buyers, distributors, processors, and dealers by ensuring a more consistent flow of raw materials and more superior, homogenous goods. By these extra activities, fruit and vegetable value chains also generate off-farm job possibilities. Sorting, grading, packing, shipping, wholesale, and retailing are all examples of value-added operations for a crop of vegetable oil. These tasks are carried out by businesses of all kinds, from small to big, creating job possibilities in both urban and rural locations.

The Germany Agency for International Cooperation (GIZ) implements the DEVELOPPP – Oil Press project on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) in cooperation with the Oil Press GmbH &Co.KG, the National University of Battambang, as well as the National Vocational Institute of Battambang. The project aims to create and improve professional, technical and economic conditions for the processing of agricultural niche and by-products for the production of high-quality vegetable oils in Cambodia.

2. Research Problems/Significance

The main problem targeted by this study is to know the value chain and cost analysis of oil crops and why cooperation is necessary for raw material suppliers, dealers, producers, distributors and consumers.

3. Research Objectives

This study has specific objectives:

(1) Understand the cost of vegetable oil crops
(2) Identify and connect raw material suppliers, dealers, producers, distributors, consumers as well as the support groups behind these five main actors
(3) Facilitate the establishment of new vegetable oil products.

II. MEANS AND METHODS

As the goal of this study is to understand the value chain and cost of vegetable oil crops, technique used is qualitative.

This study employs in-depth interviews with clear and systematic question guides as the tool to interview raw material suppliers, dealers, producers, distributors and consumers. This technique enabled the study to better understand the inter-relation of each party.
The study relied on primary data, with the research within Pursat, Battambang, Banteay Meanchey and Siem Reap. Qualitative method is applied during the field research phase.

1. Target Participants

The study's target population includes forty raw material suppliers, six dealers, four producers, five distributors, and ten consumers in four target provinces, including Pursat, Battambang, Banteay Meanchey, and Siem Reap.

2. Sample Size

Initially, the researchers made the conscious choice to include raw material suppliers, dealers, producers, distributors, and consumers. This is a result of the respondents' homogeneity and the possibility of data gathering. A non-probability selection approach was then used to choose 65 respondents from the four target provinces that were the objective of the survey.
In four target provinces, including Pursat, Battambang, Banteay Meanchey, and Siem Reap, there will be forty raw mater suppliers, seven dealers, four producers, five distributors, and ten consumers. Purposive sampling was utilized to choose the sample respondents, allowing the researchers to include the most representative respondents for the study.

Table 1: Respondents for the research study

№	Party	Numbers of respondents
1	Raw material suppliers	40
2	Dealers	7
3	Producers	4
4	Distributors	5
5	Consumers	10

3. Data Collection

The data collection was conducted from the April 7-24, 2023. Some of raw material suppliers, dealers, producers, distributors and consumers were interviewed at the business workplace and some of them by KoboToolbox. Question guide and voice recorder were used as data collection tools during the interview.

4. Research Ethics

All interviewers and fieldwork members were trained in ethical data collection behavior, including confidentiality and anonymity. All selected participants were informed about the study and asked for their consent to participate and their permission to record the interviews with a voice recorder. Participants were allowed to skip questions or withdraw from the study at any time.

No identifying information of respondents was used in the analysis. Only those responsible for data analysis had access to the data.

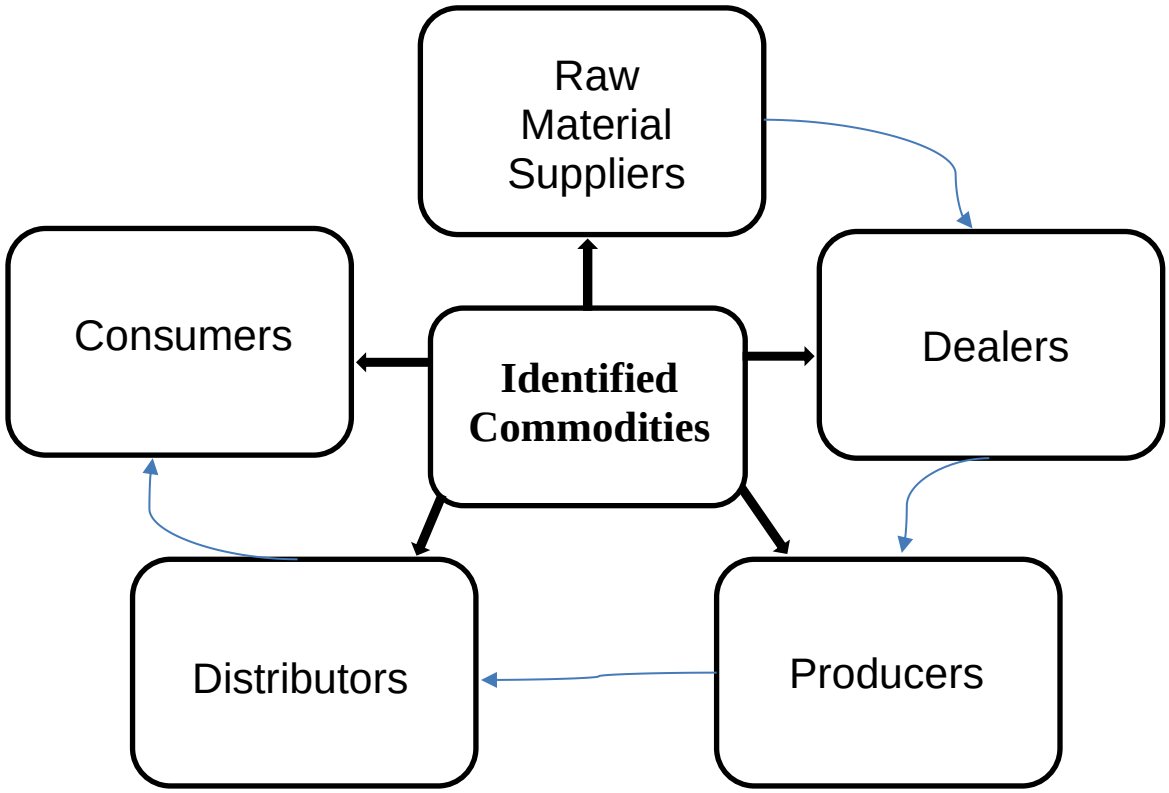
5. Scope and Limitation of Research Study

This study is limited to raw material suppliers, producers, dealers, distributors and consumers who are located in Pursat, Battambang, Banteay Meanchey and Siem Reap.

6. Analysis Framework: Approach for Value Chain Analysis

The value chain analytical framework served as the project's main direction, and it allowed for the most thorough analysis of the whole value chain given the constraints on primary data gathering that were involved. The project identified various actors, including raw material suppliers, dealers, producers, distributors, and consumers, whose activities occur along the value chain under the institutional conditions of the commodity. This identification was based on the value chain selection process.

Figure 1: Chart of the value chain analysis components



III. SELECTION AND PRIORITIZATION OF VALUE CHAINS

1. Selection process

As mentioned earlier, the selection process for the three commodities followed a two-step process, involving (1) pre-selection of six potential commodities based on assessment of regional plans; and (2) assessment of the pre-selected commodities selection criteria that serves the objectives of the project, along with an associated scoring matrix with dimensions for assessment weighted accordingly.

Prior to the questionnaire design, the research team initially selected six commodities (e.g., sesame, peanut, sacha inchi, moringa, sunflower, and okra) following (1) a review of the regional plans which focus on the priority commodities and proposed strategies, and (2) research team consultations with two GIZ officials, one lecturer of NUBB, three lecturers of NVIB and three

consultations of CTEP using telegram calls and online meeting through google meet.

2. Prioritization of value chains

A research questionnaire was then held from April 7 - 24, 2023 to raw material suppliers, raw material suppliers, dealers, producers, distributors, and end consumers that aimed at: general information, background of current product, sale and marketing, and introduce vegetable oil product.

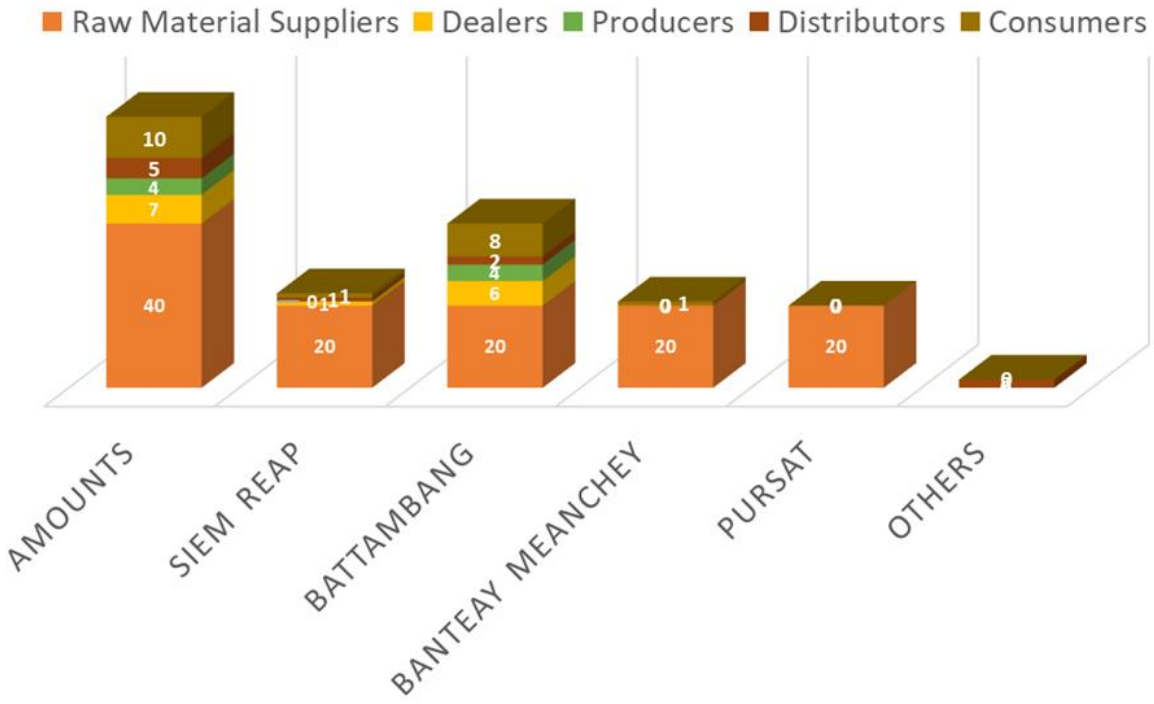
After getting the results from questionnaire the average of price for each product: black sesame, peanut, sacha inchi, moringa, sunflower, and okra. From the highest price to the lowest price were; sacha inchi, okra, moringa, sunflower, black sesame, and peanut. Finally, in terms of research access, all six commodities continued to be traded in North-Western Cambodia markets. It was agreed that this, the value chain and cost analyses would be important to explore from farmers to community-based enterprises.

IV. RESEARCH FINDING

1. Value chain information

1.1 General Information of Raw Material Suppliers, Dealers, Producers, Distributors, and Consumers

Figure 2: Chart of the participants of the four target provinces

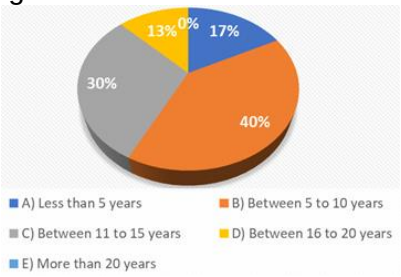


As we can see the majority of sixty-six participants from the four target provinces, forty raw material suppliers (20 from each target province), 7 dealers (6 from Battambang and 1 from Siem Reap), 4 producers from Battambang, 5 distributors (2 from Battambang, 1 from Siem Reap, 2 more from the other provinces) and 10 consumers (8 from Battambang, 1 from Siem Reap, and the last 1 from Banteay Meanchey) that completed the questionnaire.

1.2 Business Background

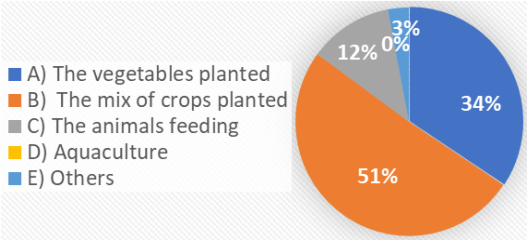
A- Raw Material Suppliers

Figure 3: Chart of the amounts of years to start raw material suppliers



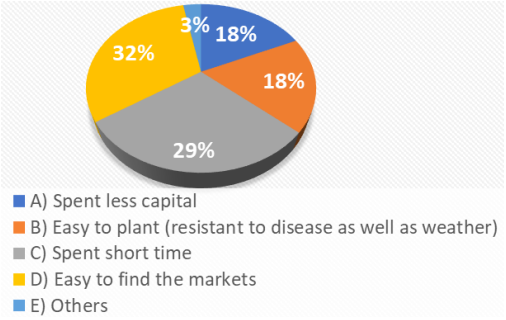
This pie chart shows that out of the 40 raw material suppliers that completed the questionnaire on the amounts of years to start raw material suppliers, 40% has started between 5 to 10 years, follow by 30% has started between 11 to 15 years, then 17% has started less than 5 years, and 13% has started between 16 to 20 years.

Figure 4: Chart of the raw material suppliers' main products



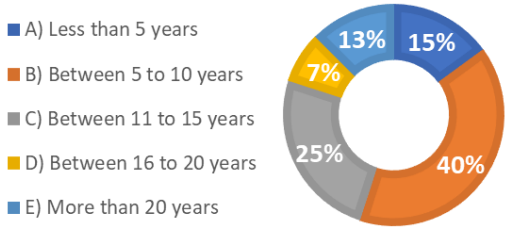
As we can see the majority of the raw material suppliers that completed the questionnaire, their main products were: 51% were the mix of crops planted while the second high percentages 34% planted vegetables then the third percentages 12% the animals feeding and the other products were 3%.

Figure 5: Chart of the reasons of choosing these products



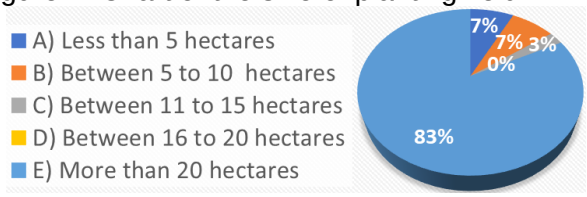
As we can see the majority of the raw material suppliers that completed the questionnaire on the reasons of choosing these products, 32% was answered that it was easy to find the markets, 29% was answered that it spent short time, 18% was answered that it spent less capital, another 18% was answered that it was easy to plant (resistant to disease as well as weather), and the other reasons were 3%.

Figure 6: Chart of the period of planting products



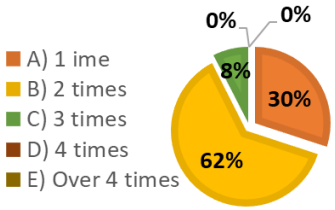
As the pie chart has shown the raw material suppliers have planted their main products, a total of 40% grew/fed between 5 to 10 years, 25% grew/fed between 11 to 15 years, 15% grew/fed less than 5 years, 13% grew/fed more than 20 years, and 13% grew/fed between 16 to 20 years.

Figure 7: Chart of the size of planting field



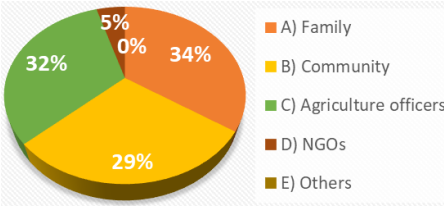
As we can see the majority of the raw material suppliers that completed the questionnaire on planted field size, 83% was more than 20 hectares, while less than 5 hectares and between 5 to 10 hectares were 7%, and 3% was between 11 to 15 hectares.

Figure 8: Chart of the periods of planting per year



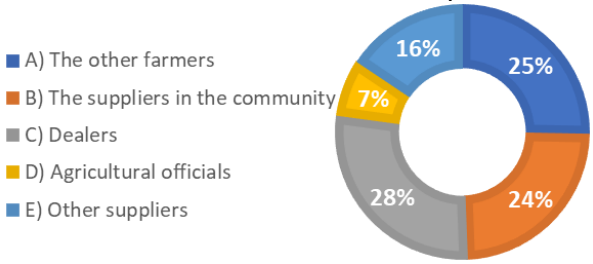
As the pie chart has shown out that the raw material suppliers that completed the questionnaire on the periods of planting per year, out of 62% was planted twice a year, while 30% was planted once a year, and 8% was planted third a year.

Figure 9: Chart of the planting/feeding techniques



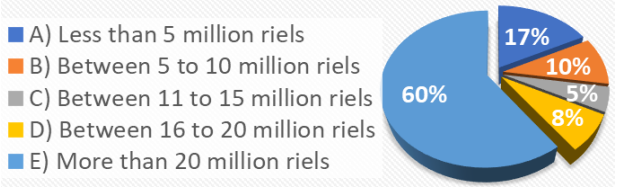
The pie chart has shown the raw material suppliers have got the knowledge of planting/feeding; 34% was from family, 32% was from agriculture officers, 29% was from community, and 5% was from NGOs.

Figure 10: Chart of the sources of crops for raw material suppliers



As we can see the majority of the raw material suppliers that completed the questionnaire on the sources of crops, 28% bought from the dealers, 25% bought from other farmers, 24% bought from suppliers in the community, 16% bought from other suppliers, and 7% got free from agricultural officials.

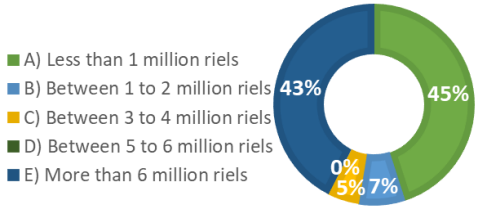
Figure 11: Chart of the total of capital for planting in a year



The pie chart has shown the raw material suppliers that completed the questionnaire on total capital in a year, 60% prepared more than 25 million riels, 17% prepared less than 5 million riels, 10% prepared between 5 to 10 million riels, 8% prepared between 16 to 20 million riels, and 5.00% prepared between 11 to 15 million riels.

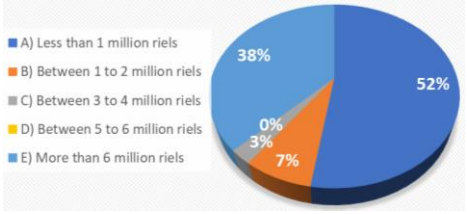
❖ **The raw material suppliers' expenses in a planting season**:

Figure 12: Chart of the labors' expenses



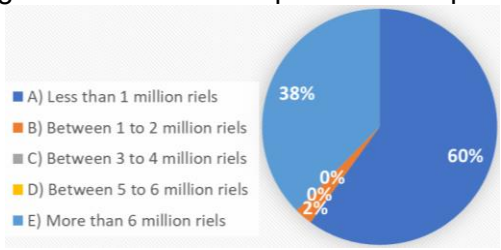
The pie chart has shown the raw material suppliers that completed the questionnaire on labors expense, 45% spent less than 1 million riels, 43% spent more than 6 million riels, 7% spent between 1 to 2 million riels, and 5% spent between 3 to 4 million riels.

Figure 13: Chart of the fertilizers' expenses



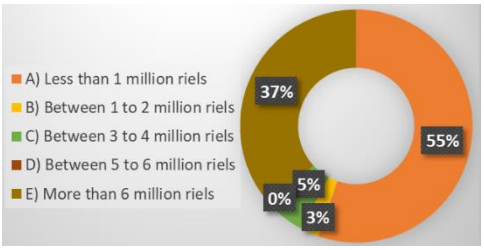
The pie chart has shown the raw material suppliers that completed the questionnaire on fertilizers, 52% spent less than 1 million riels, 38% spent more than 6 million riels, 7% spent between 1 to 2 million riels, and 3% spent between 3 to 4 million riels.

Figure 14: Chart of the pesticides' expenses



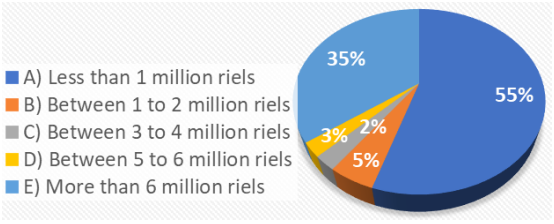
The pie chart has shown the raw material suppliers that completed the questionnaire on pesticides, 60% spent less than 1 million riels, 38% spent more than 6 million riels, and 2% spent between 1 to 2 million riels.

Figure 15: Chart of the crops' expenses



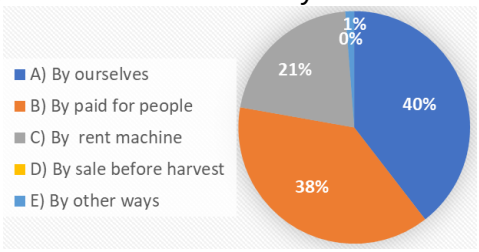
The pie chart has shown the raw material suppliers that completed the questionnaire on the crops, 55% spent less than 1 million riels, 37% spent more than 6 million riels, 5% spent between 3 to 4 million riels, and 3% spent between 1 to 2 million riels.

Figure 16: Chart of the other expenses (machinery, gasoline, water, land rent ...)



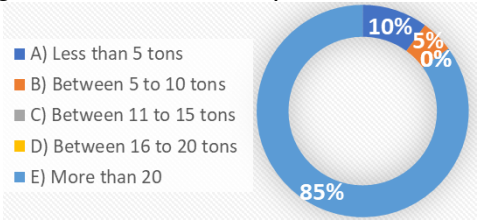
The pie chart has shown the raw material suppliers that completed the questionnaire on the other expenses, 55% spent less than 1 million riels, while 35% spent more than 6 million riels, follow by 5% spent between 1 to 2 million riels, then 3% spent between 3 to 4 million riels and 2% spent between 5 to 6 million riels were 2.50%.

Figure 17: Chart of the ways of harvesting



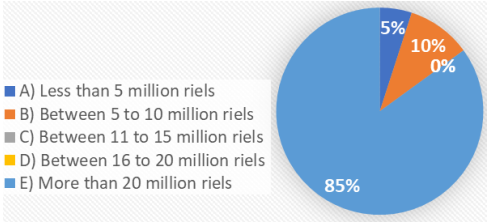
The pie chart has shown the raw material suppliers that completed the questionnaire on the way of harvesting, 40% of raw material suppliers harvested by themselves, while 38% of raw material suppliers harvested by paid for people, then 21% of raw material suppliers harvested by machine, and 1% harvested by other ways.

Figure 18: Chart of the post-harvest result (ton)



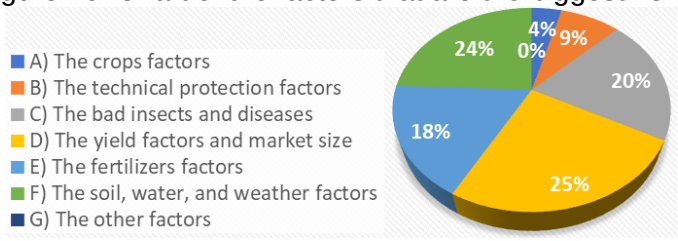
As we can see the majority of the raw material suppliers that completed the questionnaire on the post-harvest result, 85% was more than 20 tons, while 10% was less than 5 tons, and 5% was between 5 to 10 tons.

Figure 19: Chart of the post-harvest result in a planting season



As we can see the majority of the raw material suppliers that completed the questionnaire on the post-harvest result in a planting season, 85% received more than 20 million riels, while 10% received between 5 to 10 million riels, and 5% received less than 5 million riels.

Figure 20: Chart of the factors that are the biggest risk in growing vegetable oil crops



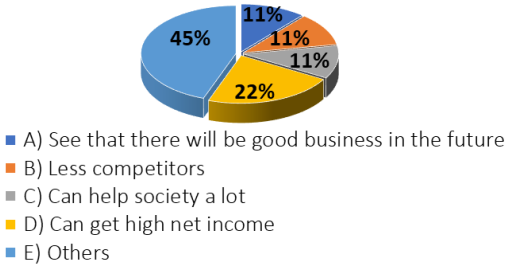
As we can see the majority of the raw material suppliers that completed the questionnaire on the factors that are the biggest risk in growing vegetable oil crops, out of 25% was the yield factors and market size, while 24% was the soil, water, and weather factors, follow by 20% was the bad insects and diseases, then 18% was the fertilizers factors, after that 9% was technical protection factors, and 4% was the crops factors.

Figure 21: Chart of the solutions to prevent the above risks

The pie chart has shown the raw material suppliers that completed the questionnaire on the solutions to prevent the above risks, out of 36% researched potential problems and find solutions to prevent, while 26% contacted government experts to discuss potential risks and find preventative solutions, follow by 16% participated in training courses or workshops related to the prevention of various risks in the agricultural sector, however 15% contacted NGO experts to discuss potential risks and find preventative solutions, and 7% was the other solutions.

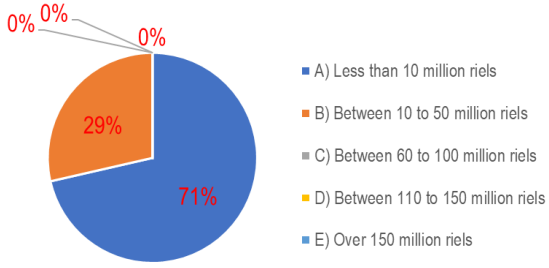
B- Dealers

Figure 22: Chart of the reasons to run this business



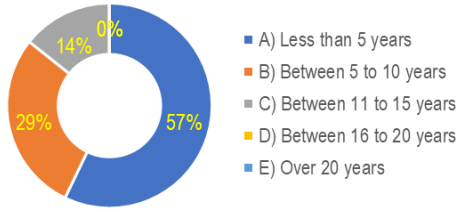
This pie chart shows that out of seven dealers that completed the questionnaire on the reasons to run this business, 45% was the other reasons outside the design, while 22% was believed that they could get high net income through this business and the rest of them were 11%; they saw that there will be good business in the future, less competitors, and could help society a lot.

Figure 23: Chart of the capitals to run the business



This pie chart shows the dealers that completed the questionnaire on total capital to run company/business, out of 71% had less than 10 million riels, and 29% had between 10 to 50 million riels.

Figure 24: Chart of the amount of year to run the business



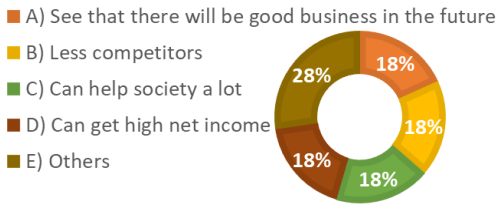
This pie chart shows that out of the dealers that completed the questionnaire on the amount of year to run the business, out of 57% was less than 5 years, while 29% was between 5 to 10 years, and 14% was between 11 to 15 years of running this business.

C- Producers

Figure 25: Chart of the capital of the company/business

The pie chart has shown that the producers that completed the questionnaire on the capital of the company/business, out of 50% has prepared the capital over 200 million riels, follow by 25% has prepared less than 50 million riels, and another 25% has prepared between 110 to 150 million riels.

Figure 26: Chart of the main reason to invent this company/business



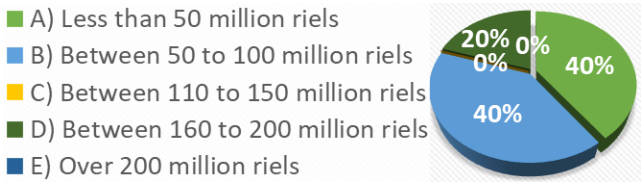
As we can see the majority of the producers that completed the questionnaire on the main reason to invent this company/business, out of 28% was the other reasons outside the questionnaire design, and the rest of them was 18% in a row: they see there will be good business in the future, less competitors, can help society a lot, and can gain high profitability.

Figure 27: Chart of the knowledge on vegetable oil press

The pie chart has shown that the producers that completed the questionnaire on the knowledge of vegetable oil press, out of 40% has received external training, while another 40% has received the knowledge from the other factors outside the questionnaire design, and 20% has received the knowledge from non-profit organizations.

D- Distributors

Figure 28: Chart of the capital of the company



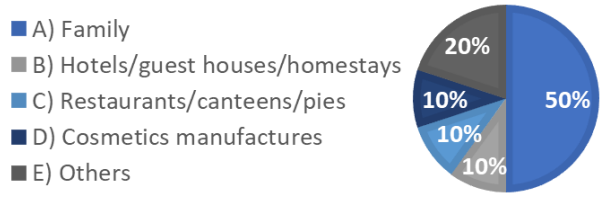
The pie chart has shown that the distributors that completed the questionnaire on the capital of the company, out of 40% has prepared less than 50 million riels, while another 40% has prepared between 50 to 100 million riels, and 20% has prepared between 160 to 200 million riels.

Figure 29: Chart of the main reason to invent this company/business

As we can see the majority of the distributors that completed the questionnaire on the main reason to invent this company/business, out of 43% was the other reasons outside the design, while 29% was seen that it will be processing well in the future, follow by 14% could help society, and another 14% could get high net income.

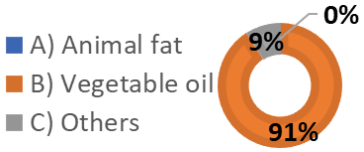
E- Consumers

Figure 30: Chart of the types of business



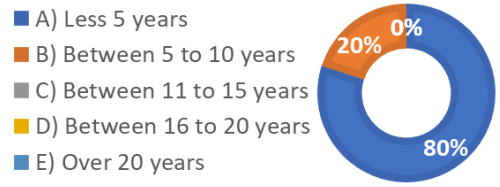
As we can see the majority of the consumers that completed the questionnaire on the types of business, out of 50% was family, while 20% was other business out of design, follow by 10% was hotels/guest houses/homestays, then another 10% was restaurants/canteens/pies, and the last 10% was cosmetics manufactures.

Figure 31: Chart of the usage types of oil



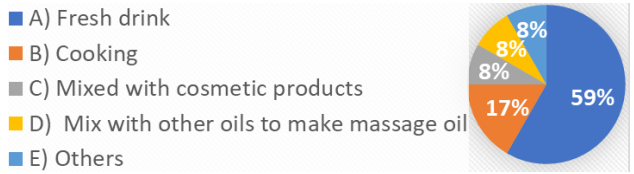
As the pie chart has shown the consumers that completed the questionnaire on types of usage oil, out of 91% used vegetable oil and 9% used the other types of oil, so it means that some people use the other oil out of the questionnaire design in the present.

Figure 32: Chart of the amounts of year for using this oil



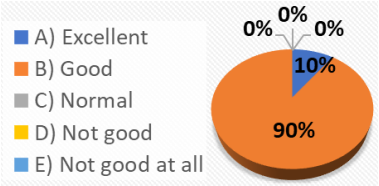
As the pie chart has shown the consumers that completed the questionnaire on the amounts of year for using this oil, out of 80% have used less than 5 years and 20% have used between 5 to 10 years.

Figure 33: Chart of the purposes of using vegetable oil



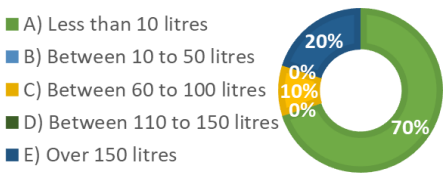
As the pie chart has shown the consumers that completed the questionnaire on the purposes of using vegetable oil, out of 59% used for the fresh drink, while 17% used for cooking, follow by 8% used to mix with cosmetics products, then another 8% used to mix with other oils to make the massage oil, and the last 8% used for the other purposes.

Figure 34: Chart of the quality of vegetable oil press



As we can see the majority of consumers that completed the questionnaire on the quality of vegetable oil press, out of 90% answered that it was good and 10% answered that it was excellent.

Figure 35: Chart of the demand per month



As the pie chart has shown the consumers that completed the questionnaire on the demand per month, out of 70% needed less than 10 liters per month, follow by 20% needed over 150 liters per month, and 10% needed between 60 to 100 liters per month.

Vegetable oil is the oil that is most frequently utilized in consumer-related businesses, such as hotels, guesthouses, bars, restaurants, cosmetics stores, and other consumer-related businesses. Raw material suppliers are those that produce all goods with the intention of providing them to the market, but the cost of manufacturing is considerable. Dealers place orders for all the

goods that the raw material suppliers and harvesters have made, and the majority of businesses are able to provide favorable results due to strong reserves. Producers of vegetable oils purchase crops from dealers and raw material suppliers, and distributors resell vegetable oil to customers or to markets overseas. Consumers claim that practically everyone has good quality in addition to the quality of vegetable oil, and the majority of the monthly consumption needed is less than five liters.

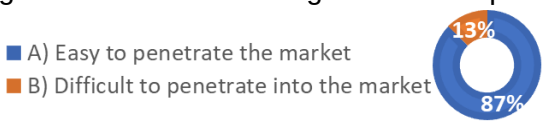
1.3 Marketing

A- Raw Material Suppliers

Figure 36: Chart of the immediate sale or stock after harvested

The pie chart has shown the raw material suppliers that completed the questionnaire all of them were sale after they harvested their crops.

Figure 37: Chart of the vegetable oil crops situation in the market



As we can see the majority of the raw material suppliers that completed the questionnaire on the vegetable oil crops situation in the market, out of 87% was easy to penetrate the market and only 13% was difficult to penetrate into the market.

Figure 38: Chart of the vegetable oil crops supply for local market or overseas market

The pie chart has shown raw material suppliers that completed the questionnaire on the vegetable oil crops supply for local market or overseas market, out of 97% was supplied to local market and only 3% was supplied for overseas market.

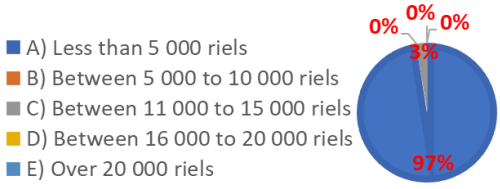
Figure 39: Chart of the selling techniques

The pie chart has shown the raw material suppliers that completed the questionnaire on the selling techniques, out of 53% has shown that the dealers came to buy at their places, while 46% has shown that they bring to sell, and only 1% was sold in online media.

Figure 40: Chart of the buyers

As we can see the majority of the raw material suppliers that completed the questionnaire on the buyers, out of 75% sold to the dealers, while 17% sold to producers, and 8% sold to others out of the questionnaire design.

Figure 41: Chart of the prices for crops per kilogram



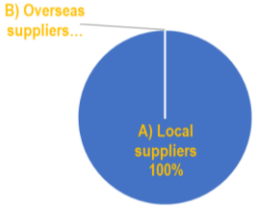
As we can see the majority of the raw material suppliers that completed the questionnaire on the prices for crops per kilogram, out of 97% sold less than 5 000 riels and 3% sold between 11 000 to 15 000 riels.

Figure 42: Chart of the expected prices of crops per kilogram

As we can see the majority of the raw material suppliers that completed the questionnaire on the expected prices of crops per kilogram, out of 62% expected to sell between 5 000 to 10 000 riels, while 25% expected to sell less than 5 000 riels, follow by 8$ expected to sell between 11 000 to 15 000 riels and 5% expected to sell between 16 000 to 20 000 riels.

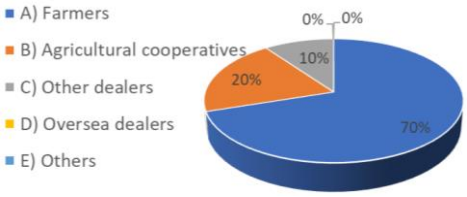
B- Dealers

Figure 43: Chart of purchasing from local or overseas suppliers



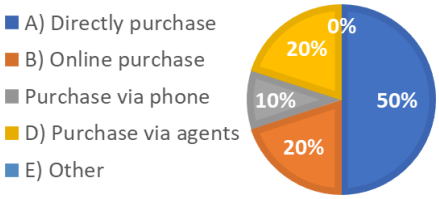
As we can see the majority of the dealers that completed the questionnaire on the purchasing from local or overseas suppliers, a 100% was purchasing from local suppliers.

Figure 44: Chart of the suppliers



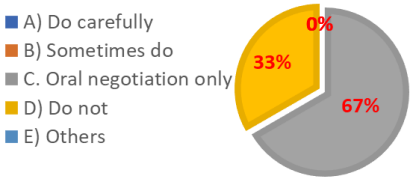
This pie chart shows the dealers that completed the questionnaire on the suppliers, out of 70% was supplied by farmers, while 20% was supplied by agricultural cooperatives, and 10% was supplied by other dealers.

Figure 45: Chart of the purchasing technique



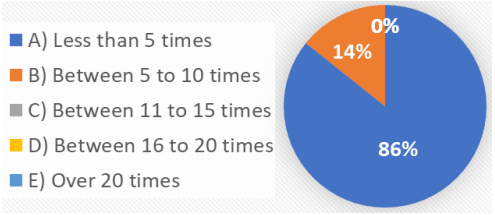
As we can see the majority of the dealers that completed the questionnaire on the purchasing technique, out of 50% purchased directly to raw material suppliers at their places, while 20% used the online purchasing, another 20% purchased via agents and 10% purchased via phone.

Figure 46: Chart of the purchasing contract



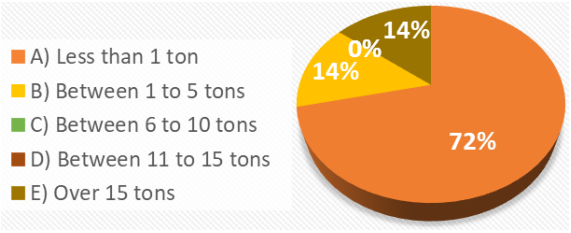
As we can see the majority of the dealers that completed the questionnaire on the purchasing contract, out of 67% did the oral negotiation only, and 33% did not do the purchasing contract with suppliers.

Figure 47: Chart of the purchasing times per month



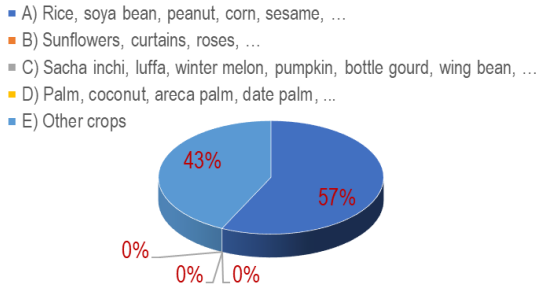
As we can see the majority of the dealers that completed the questionnaire on the purchasing times per month, out of 86% purchased less than 5 times per month, and 14% purchased between 5 to 10 times.

Figure 48: Chart of the purchasing amount per month



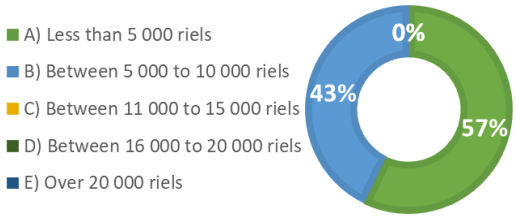
This pie chart shows the dealers that completed the questionnaire on the purchasing amount per month, out of 72% was purchased less than 1 ton per month, while 14% was purchased between 1 to 5 tons per month, and another 14% was purchased over 15 tons per month.

Figure 49: Chart of the purchasing crops



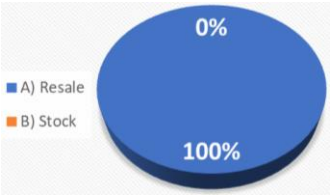
This pie chart shows the dealers that completed the questionnaire on the purchasing crops, out of 57% was rice, beans, corns, sesames …, and 43% was the other crops.

Figure 50: Chart of the purchasing price per kilogram



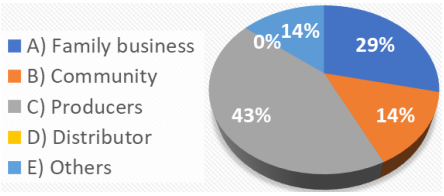
This pie chart shows the dealers that completed the questionnaire on the purchasing price per kilogram, out of 57% was purchased less than 5 000 riels per kilogram, and 43% was purchased between 5 000 to 10 000 riels per kilogram.

Figure 51: Chart of the purchasing crops to resale or stock



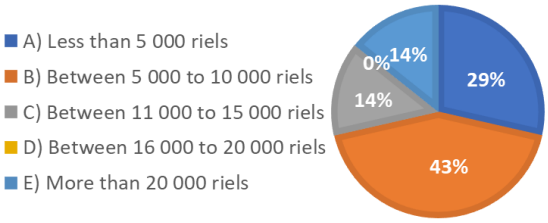
This pie chart shows the dealers that completed the questionnaire on the purchasing crops to resale or stock, out of 100% was purchased to resale immediately.

Figure 52: Chart of the target customers



This pie chart shows the dealers that completed the questionnaire on the target customers, out of 43% was producers, while the other 29% was the family business, then 14% was community, and the last 14% was the other customers.

Figure 53: Chart of the crops selling prices per kilogram



As we can see the majority of the raw material suppliers that completed the questionnaire on the crops selling prices per kilogram, out of 43% sold between 5 000 to 10 000 riels, while 29% sold less than 5 000 riels, follow 14% sold between 11 000 to 15 000 riels, and last 14% sold more than 20 000 riels.

C- Producers

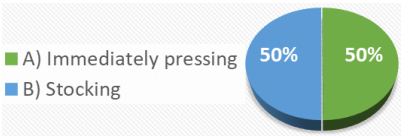
Figure 54: Chart of purchasing from local or overseas suppliers

As we can see the majority of the producers that completed the questionnaire on the purchasing from local or overseas suppliers, a 100% was purchasing from local suppliers.

Figure 55: Chart of the suppliers

This pie chart shows the producers that completed the questionnaire on the suppliers, out of 50% was supplied by farmers, while 25% was supplied by dealers, and another 25% was supplied by others out of the questionnaire design.

Figure 56: Chart of the crop's usage (immediately pressing or stocking)

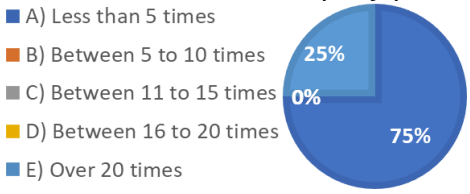


As we can see the majority of the producers that completed the questionnaire on the crop's usage (immediately pressing or stocking), out of 50% has stocked them, and the other 50% has used them immediately.

Figure 57: Chart of the stocking period of crops

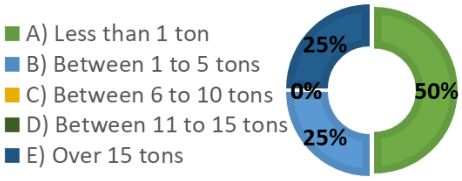
As we can see the majority of the producers that completed the questionnaire on the stocking period of crops, out of 50% could stock less than 6 months, and the others 50% could stock between 6 to 12 months.

Figure 58: Chart of the company purchasing time(s) per month



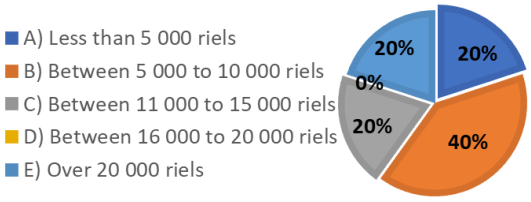
The pie chart has shown the producers that completed the questionnaire on the company purchasing time(s) per month, out of 75% was purchasing less than 5 times per month, and 25% was purchasing over 20 times per month.

Figure 59: Chart of the company purchasing amounts (tons) per month



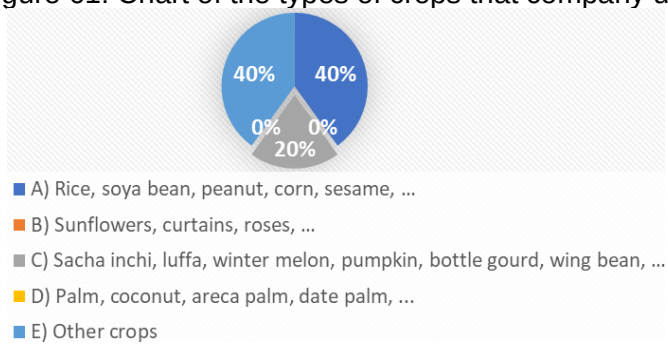
The pie chart has shown the producers that completed the questionnaire on the company purchasing amounts (tons) per month, out of 50% was purchasing less than 1 ton, while 25% was purchasing between 1 to 5 tons, and the other 25% was purchasing over 15 tons per month.

Figure 60: Chart of the chart of the purchasing prices per kilogram



As we can see the majority of the producers that completed the questionnaire on the purchasing prices per kilogram, out of 40% purchased between 5 000 to 10 000 riels, while 20% purchased less than 5 000 riels, follow by one more 20% purchased between 11 000 to 15 000 riels, and the last 20% purchased over 20 000 riels per kilogram.

Figure 61: Chart of the types of crops that company used to press the oil

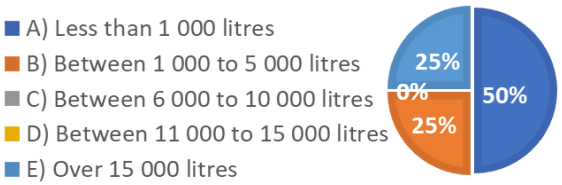


The pie chart has shown the producers that completed the questionnaire on the types of crops that company used to press the oil, out of 40% has pressed from rice, soya bean, peanut, corn, sesame…, while another 40% was pressed from the others crops outside the list, and 20% was pressed from sacha inchi, luffa, winter melon, pumpkin, bottle gourd, wing bean….

Figure 62: Chart of the reasons that the company picked out those types of crops for pressing

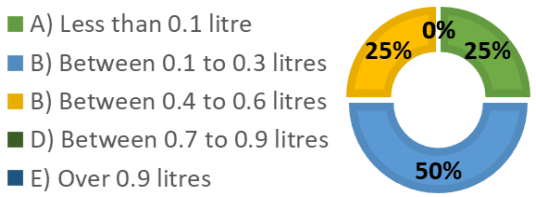
As we can see the majority of the producers that completed the questionnaire on the reasons that the company picked out those types of crops for pressing, out of 25% was easy to press, while the one more 25% was aim to promote agricultural products, follow by the last 25% was the other reasons out of the design, how ever 13% was because of there have many health benefits factors, and 12% was because of there have a good market.

Figure 63: Chart of ability for the oil pressing per month



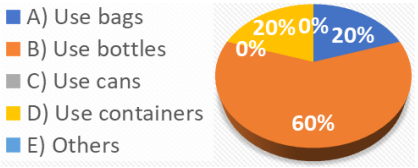
The pie chart has shown the producers that completed the questionnaire on ability for the oil pressing per month, out of 50% could press less than 1 000 liters, while 25% could press between 1 000 to 5 000 liters, and another 25% could press more than 15 000 liters per month.

Figure 64: Chart of the averages of vegetable oil (liter) could produce of the crop per kilogram



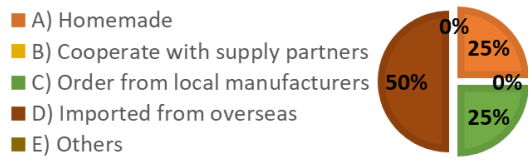
As we can see the majority of the producers that completed the questionnaire on the averages of vegetable oil (liter) could produce of the crop per kilogram, out of 50% could produce between 0.1 to 0.3 liters, while 25% could produce between 0.4 to 0.6 liters, and another 25% could produce less than 0.1 liter.

Figure 65: Chart of the vegetable oil press packaging



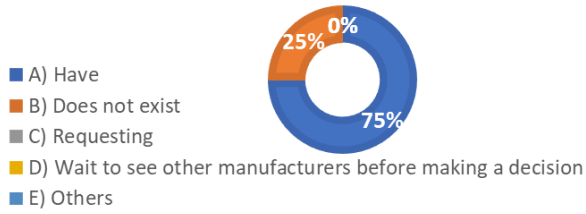
The pie chart has shown the producers that completed the questionnaire on the vegetable oil packaging, out of 60% packaged by using the bottles, while 20% packaged by using bags, and 20% packaged by using containers.

Figure 66: Chart of the sources of packaging



As we can see the majority of the producers that completed the questionnaire on the sources of packaging, out of 50% was imported from abroad, while 25% was produced by themselves (homemade), and another 25% was ordered from local manufacturers.

Figure 67: Chart of the certificate of vegetable oil quality

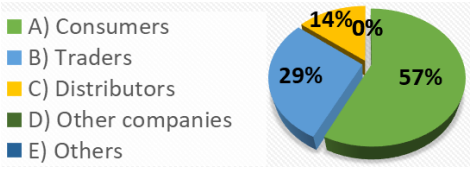


The pie chart has shown that the producers that completed the questionnaire on the certificate of vegetable oil quality, out of 75% has been received the certificate of quality, and only 25% has not been received it yet.

Figure 68: Chart of the target markets

As we can see the majority of the producers that completed the questionnaire on the target markets, out of 67% sold to local markets, and 33% exported abroad.

Figure 69: Chart of the target customers



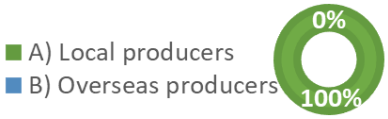
The pie chart has shown the producers that completed the questionnaire on the target customers, out of 57% was consumers, while 29% was the traders, and 14% was the distributors.

Figure 70: Chart of the prices for vegetable oil press per liter

As we can see the majority of the producers that completed the questionnaire on the prices for vegetable oil press per liter, out of 50% sold more than 150 000 riels per liter, while 25% sold less than 10 000 riels, and the last 25% sold between 110 to 150 000 riels.

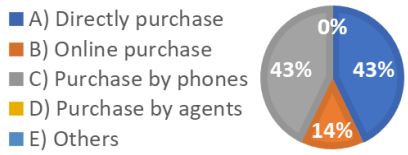
D- Distributors

Figure 71: Chart of the purchasing from local or overseas producers



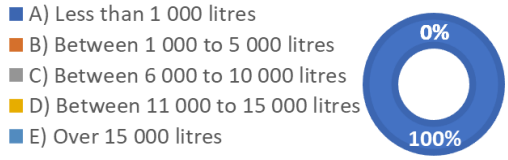
As we can see the majority of the distributors that completed the questionnaire on the purchasing from local or overseas producers, a 100% of them was purchasing from the local producers.

Figure 72: Chart of the purchasing techniques



The pie chart has shown that the distributors that completed the questionnaire on the purchasing techniques, out of 43% went to purchase directly, while the other 43% purchased by phones, and 14% used the online purchase.

Figure 73: Chart of the purchasing vegetable oil amounts (liters) per month



The pie chart has shown that the distributors that completed the questionnaire on the purchasing vegetable oil amounts (liters) per month, all of them have purchased less than 1 000 liters.

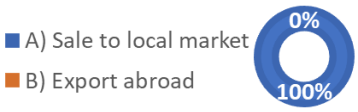
Figure 74: Chart of the purchasing prices per liter

As we can see the majority of the distributors that completed the questionnaire on the purchasing prices per liter, out of 40% purchased between 110 000 to 150 000 riels per liter, while 20% purchased between 10 000 to 50 000 riels per liter, follow by another 20% purchased between 60 000 to 100 000 riels per liter, and the last 20% purchased over 150 000 riels per liter.

Figure 75: Chart of the purchasing vegetable oil to resale or stock

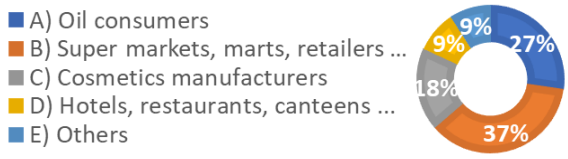
This pie chart shows the distributors that completed the questionnaire on the purchasing vegetable oil to resale or stock, out of 100% was purchased to resale immediately.

Figure 76: Chart of the target markets



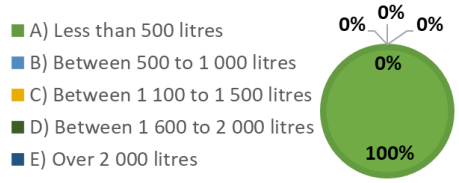
This pie chart shows the distributors that completed the questionnaire on the target markets, out of 100% was sold to local markets.

Figure 77: Chart of the target customers



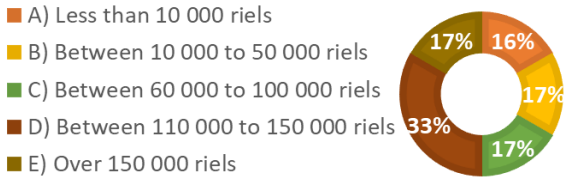
The pie chart has shown that the distributors that completed the questionnaire on the target customers, out of 37% was the super markets, marts, retailers …, while 27% was the oil customers, follow by 18% was the cosmetics manufacturers, then 9% was the hotels, restaurants, canteens …, and also the 9% was the others out of the design.

Figure 78: Chart of the vegetable oil selling amounts per month



As we can see the majority of the distributors that completed the questionnaire on the vegetable oil selling amounts per month, all of them were sold vegetable oil less than 500 liters.

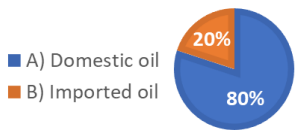
Figure 79: Chart of the vegetable oil selling prices per liter



The pie chart has shown that the distributors that completed the questionnaire on the vegetable oil selling prices per liter, out of 33% sold between 110 000 to 150 000 riels, while 17% sold between 10 000 to 50 000 riels, follow by another 17% sold between 60 000 to 100 000 riels, then the last 17% sold over 150 000 riels, and 16% sold less than 10 000 riels per liter.

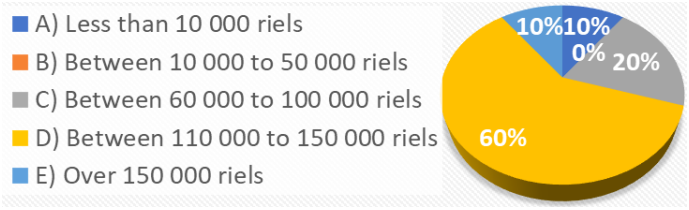
E- Consumers

Figure 80: Chart of the usage vegetable oil press resources



As we can see the majority of the consumers that completed the questionnaire on the usage vegetable oil press resources, out of 80% used the domestic oil products and 20% used the imported oil products.

Figure 81: Chart of the purchasing prices of vegetable oil press per liter



As we can see the majority of the consumers that completed the questionnaire on the purchasing prices of vegetable oil press per liter, out of 60% purchased between 110 000 riels, while 20% purchased between 60 000 riels to 100 000 riels, follow by 10% purchased less than 10 000 riels, and another 10% purchased over 150 000 riels per liter.

The market's figure indicates that each stakeholder comprises raw material suppliers, dealers, producers, distributors, and consumers. The price of most seeds is less than 5 000 riels per kilogram, with very few being sold at between 11,000 to 15,000 riels per kilogram. The expected price that raw material suppliers want to sell per kilogram is usually between 5 000 to 10 000 riels, then less than 5 000 riels, followed by between 11 000 to 15 000 riels and a portion. Dealers made complete orders from local suppliers, most of whom were farmers, some of whom were farming communities, and a small part were dealers. The ordering method is not negotiated, only orally negotiated, and most dealers place orders less than five times a month.

Most orders are less than 1 ton and a small portion is between 1 to 5 tons and more than 15 tons per month. The seeds that dealers buy include rice, soybeans, peanuts, corn, sesame, and a large part are other crops. For crops purchased and not stored, dealers resell immediately. Vegetable oils are mainly sold from local suppliers, such as farmers and dealers. The selling price of crops per kilogram includes between 5 000 to 10 000 riels, followed by 11 000 to 15 000 riels and the price is over 20 000 riels per kilogram.

Producers order seeds from local suppliers, and half of the seeds are refined into oil immediately and the other half is stored. Most producers place orders less than five times, and a minority order over 20 times a month. Depending on the production capacity per month, most can produce less than 1 000 liters, some can produce between 1 000 to 5 000 liters, and some can produce over 15 000 liters. Reasons for using seeds as oil presses include easy to grind, high quality local products, good market, and health benefits. Vegetable oils are produced from plant seeds and are packed in bottles, bags, and containers.

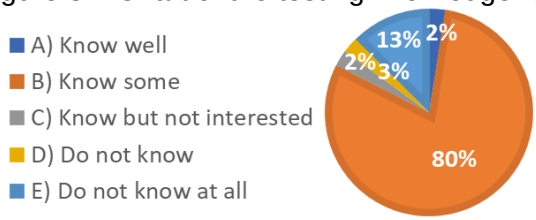
Most producers have certification certifying the quality of their oils, with most being domestic market producers. The target customers for most producers are direct consumers, dealers, and distributors. The price of vegetable oil sold per liter is high, with small parts selling for less than 10,000 riels, large parts selling for over 150,000 riels, and a small part selling for less than 10,000 riels. Distributors order tea oil products from local producers and sell them through direct orders, phone orders, and online orders. Prices for vegetable oil per liter are between 110 000 to 150 000 riels, with some smaller parts sold for less than 10.

The distributor's target customers include supermarkets, retailers, cosmetics manufacturers, hotels, restaurants, and those in need of other oils. They can sell less than 500 liters of oil per month, of which one liter is sold at prices between 110 000 to 150 000 riels. Consumers consume vegetable oil.

1.4 Oil Awareness

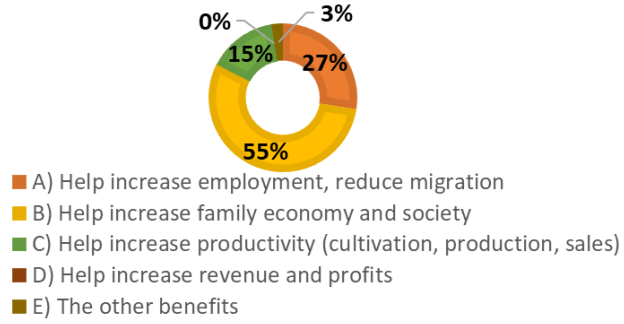
A- Raw Material Suppliers

Figure 82: Chart of the testing knowledge related to the crops that could produce the oil



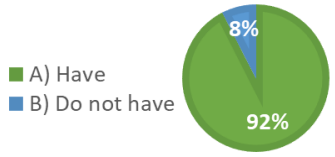
As we can see the majority of the raw material suppliers that completed the questionnaire on the testing knowledge related to the crops that could produce the oil, out of 80% has known some information, while 13% did not know at all, follow by 3% did not know, after that 2% knew well, and the last 2% knew but not interested.

Figure 83: Chart of the benefits of crops that could produce oil to family, community and economy



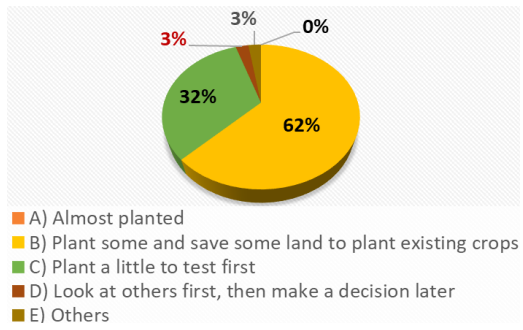
The pie chart has shown the raw material suppliers that completed the questionnaire on the benefits of crops that could produce oil to family, community and economy, out of 55% helped to increase family economy and society, while 27% helped to increase employment and reduce migration, then 15% helped to increase productivity (cultivation, production, sales), and 3% was the other benefits.

Figure 84: Chart of the plans to expand new products for the community



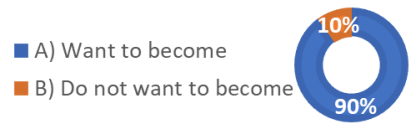
As we can see the majority of the raw material suppliers that completed the questionnaire on the plans to expand new products for the community, out of 92% has already plan for the new products and only 8% did not have any plans for the new products.

Figure 85: Chart of the raw material suppliers' expectation on the new products



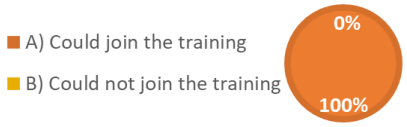
The pie chart has shown the raw material suppliers that completed the questionnaire on the raw material suppliers' expectation on the new products, out of 62% will be plant some and save some land to plant existing crops, while 32% will be plant a little to test first, then 3% will be looking at others first then make a decision later, and the last 3% will be using the other decisions out of the design.

Figure 86: Chart of the perceptions of raw material suppliers to become growers, producers or distributors of these oil crop products



As we can see the majority of the raw material suppliers that completed the questionnaire on the perceptions of raw material suppliers to become growers, producers or distributors of these oil crop products, out of 90% answered that they want to become and only 10% answered that they do not want to become growers, producers or distributors of these oil crop products.

Figure 87: Chart of the perception for joining vegetable oil press training

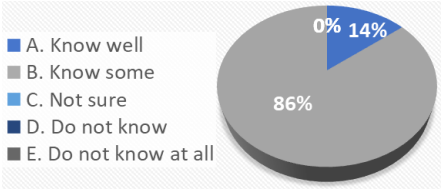


As we can see the majority of the raw material suppliers that completed the questionnaire all of them are willing to join vegetable oil press training.

Finally, participants of raw material suppliers have asked for some budgets, seeds, agricultural equipment, training seminars, assistance in finding the market for new goods after the harvest, and more.

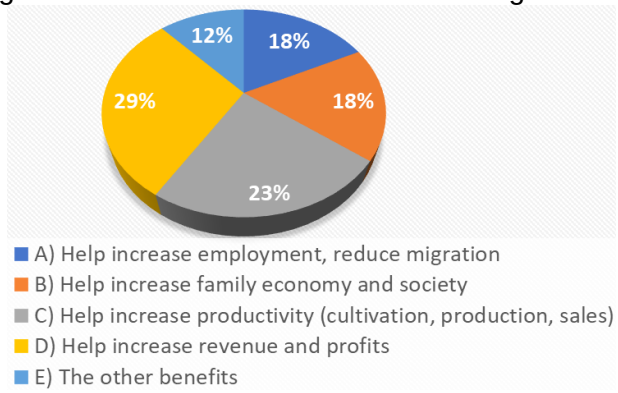
B- Dealers

Figure 88: Chart of the knowledge test on some crops that could produce oil



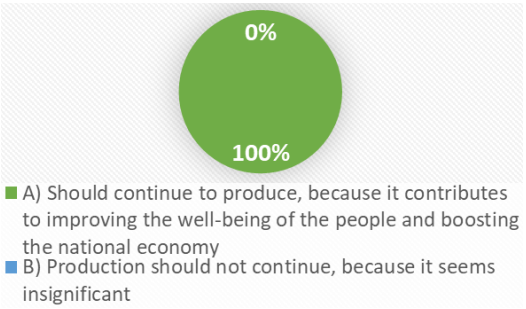
This pie chart shows the dealers that completed the questionnaire on the knowledge test on some crops that could produce oil, out of 86% has known that some crops could produce oil, and 14% has known well on the crops that could produce oil.

Figure 89: Chart of the benefits from doing business on vegetable oil crops



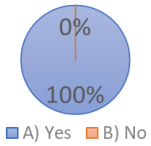
As we can see the majority of the dealers that completed the questionnaire on the benefits from doing business on vegetable oil crops, out of 29% answered that it could help to increase revenue and profits, while 23% answered that it could help to increase productivity (cultivation, production, sales), follow by 18% answered that it could help to increase family economy and society, then another 18% answered that it could help to increase employment and reduce migration, and 12% was the other benefits.

Figure 90: Chart of the pursuing on vegetable oil pressing



This pie chart shows the dealers that completed the questionnaire, 100% supported on continuing to produce vegetable oil press because it contributes to improving the well-being of the people and boosting the national economy.

Figure 91: Chart of the perception on joining vegetable oil press training

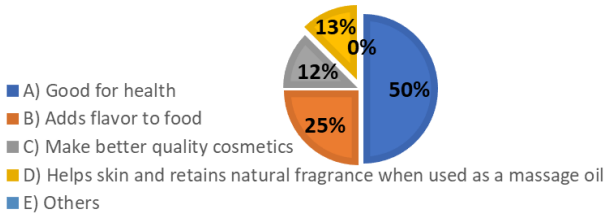


As we can see the majority of the dealers that completed the questionnaire, 100% will be happy to join vegetable oil press training.

Participants in dealers' requests on educating farmers in crop care and helping them locate markets for their products are the remainder of the category.

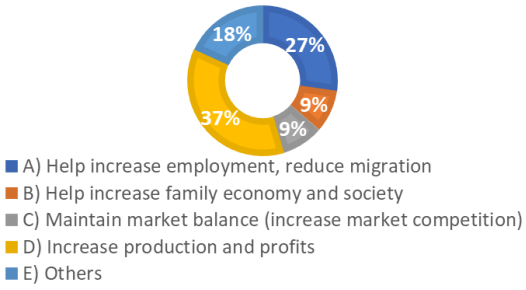
C- Producers

Figure 92: Chart of the benefits of consumers from using vegetable oil press



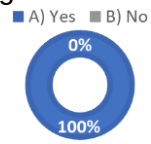
The pie chart has shown that the producers that completed the questionnaire on the benefits of consumers from using vegetable oil press, out of 50% was helped to provide the good health, while 25% was added flavor to food, follow by 13% was helped skin and retained natural fragrance when used as a massage oil, and the other 12% was made better quality cosmetics.

Figure 93: Chart of the benefits to the other net-working



As we can see the majority of the producers that completed the questionnaire on the benefits to the other net-working, out of 37% was increased production and profits, while 27% helped to increase employment, reduce migration, follow by 18% was the other benefits, then 9% was helped to increase family economy and society, and another 9% was helped to maintain the market balance (increase market competition).

Figure 94: Chart of the perception on joining vegetable oil press training workshop

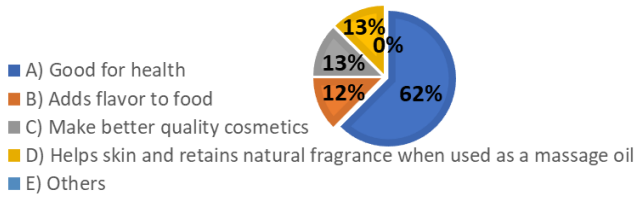


As we can see the majority of the producers that completed the questionnaire on the perception to join vegetable oil press training workshop, a 100% was able to join vegetable oil press training workshop.

Finally, producers' group participants asked that they persuade raw material suppliers to plant sacha inchi, assist in spreading the word about and promoting vegetable oil products, locate markets, and spread the word that everyone may press their own vegetable oil.

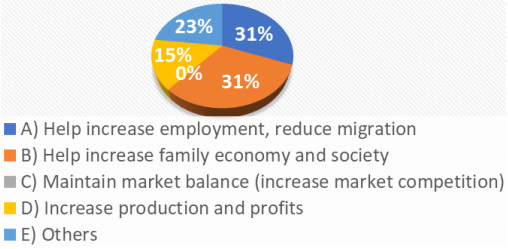
D- Distributors

Figure 95: Chart of the benefits that received from using vegetable oil press



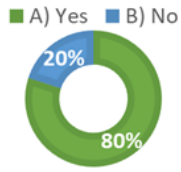
The pie chart has shown that the distributors that completed the questionnaire on the benefits that received from using vegetable oil press, out of 62% received good health, while 13% could make better quality cosmetics, follow by another 13% helped skin and retained natural fragrance when used as a massage oil, and 12% helped to add flavor to foods.

Figure 96: Chart of the benefits to the other net-working



As we can see the majority of the distributors that completed the questionnaire on the distributors' expectation on consumers benefits from vegetable oil products, out of 31% could help to increase employment, reduce migration, while another 31% could help to increase family economy and society, follow by 23% was the other benefits out of the design, and 15% could help to increase production and profits.

Figure 97: Chart of the perception on joining vegetable oil press training workshop

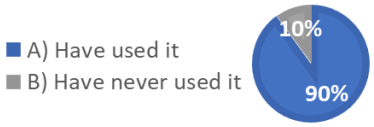


As we can see the majority of the distributors that completed the questionnaire on the perception to join vegetable oil press training workshop, out of 80% was able to join vegetable oil press training workshop, and 20% was not able to join vegetable oil press training workshop because they were busy with the business.

The distributors that responded asked for assistance in doing further research on the pressing of vegetable oils, in locating new markets to assist farmers in selling their goods, in acquiring additional or new producers, and in creating new products to assist farmers.

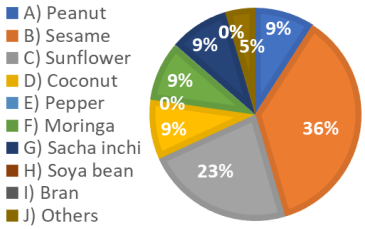
E- Consumers

Figure 98: Chart of the consumers experiences on vegetable oil press



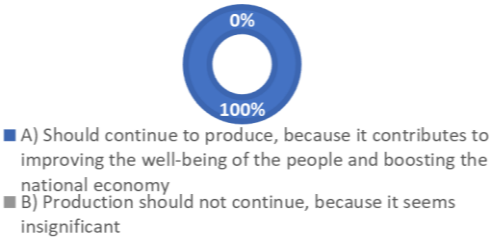
As the pie chart has shown the consumers that completed the questionnaire on the experience of using vegetable oil press, out of 90% has used it before and only 10% that has never used it before.

Figure 99: Chart of the using vegetable oil pressed from



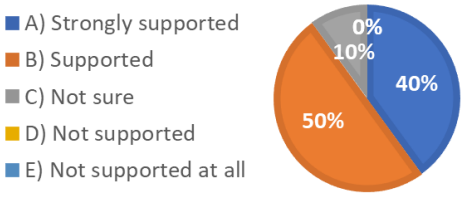
As the pie chart has shown the consumers that completed the questionnaire on the using vegetable oil that pressed from, out of 36% pressed from sesame, while 23% pressed from sunflower, follow by four different percentage; 9% pressed from peanut, coconut, moringa, and sacha inchi, and 5% pressed from the other crops.

Figure 100: Chart of the opinion for pursuing on vegetable oil pressing



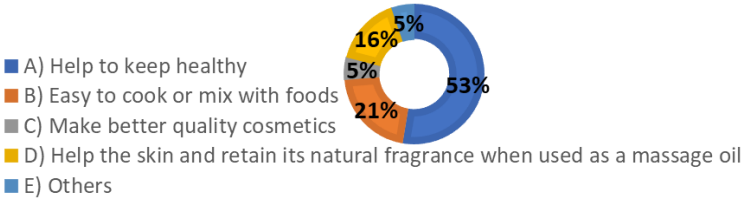
As we can see the majority of the consumers that completed the questionnaire, all of them were supported on this project because it contributes to improving the well-being of the people and boosting the national economy.

Figure 101: Chart of the consumers supportation on domestic vegetable oil press



As we can see the majority of the consumers that completed the questionnaire on the consumers supportation on domestic vegetable oil press, out of 50% was supported on domestic vegetable oil press, while 40% was strongly supported on domestic vegetable oil press, and only 10% was not sure about it.

Figure 102: Chart of the benefits from using vegetable oil press

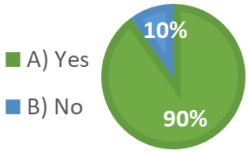


As the pie chart has shown the consumers that completed the questionnaire on the benefits from using vegetable oil press, out of 53% helped to keep healthy, while 21% was easy to cook or mix with foods, follow by 16% help the skin and retained its natural fragrance when used as a massage oil, then 5% was made better quality cosmetics, and the last 5% was the other benefits more.

Figure 103: Chart of the benefits to other net-working and economy

As we can see the majority of the consumers that completed the questionnaire on the benefits to other net-working and economy through this project, out of 33% help to increase employment and reduce migration to work in the other countries, while 22% helped to increase production and profits, follow by another 22% was the other benefits, then 17% helped to increase family economy and society, was, and 5% maintained market balance (increase market competition).

Figure 104: Chart of the perception on joining vegetable oil press training workshop



As the pie chart has shown the consumers that completed the questionnaire on the perception on joining vegetable oil press training workshop, out of 90% will be able to join the workshop and 10% won't be able to join the training because they have to focus on their key business, but they were happy to have local ingredients supplies.

Finally, participants enthusiastically backed this initiative because they welcomed the availability of local ingredients, while others wished to boost domestic production to boost family income, improve society, and reduce labor force migration to other nations. In order to improve the amount of agricultural goods produced in our nation, they also asked that technical planting procedures be taught to raw material suppliers through this initiative.

The market's figure indicates that each stakeholder comprises raw material suppliers, dealers, producers, distributors, and consumers. The majority of raw material suppliers are aware of some of the crops they provide that may be utilized to produce oil, and have offered a variety of advantages, such as raising productivity and profits, preserving market equilibrium, enhancing the family economy and society, raising domestic employment, and lowering migration. Additionally, only a small number of raw material suppliers do not desire to transition into vegetable oil manufacturers, and all merchants agree that the production of vegetable oil in our nation should continue since it helps to raise overall standards of living and strengthen the economy. Vegetable oil producers have emphasized the advantages of using it, such as health benefits, food flavoring, improved cosmetic quality, skin care, and higher-quality cosmetics. Distributors have requested that they convince raw material suppliers to grow sacha inchi, help promote and publicize vegetable oil products, find markets, and disseminate the news that anybody may press their own vegetable oil.

Benefits of using vegetable oil include increased employment, family economy and society, increased productivity as well as profits, and many other advantages. Trainings and seminars linked to seed oil extraction in the future will be attended by many distributors who are looking for help finding new markets to help farmers sell their commodities, finding extra or new producers, finding new products to help farmers, and conducting further study on the pressing of vegetable oils. Vegetable oil has many advantages, such as health benefits, simplicity in food preparation, support for the skin and preservation of the natural scent when used as a massage oil, and increased employment and decreased migration. Customers enthusiastically support its production, while some sought to increase domestic production to increase family income, enhance society, and decrease labor force migration. Participants eagerly supported this project as they appreciated the availability of local components, while others sought to increase domestic production to increase family income, enhance society, and decrease labor force migration.

2. Cost analysis of vegetables oil crops

Table 2: The cost from raw material suppliers per kilogram

Nº	Crops	Prices
1	Black Sesame	4 000 – 6 000 R
2	Peanut	3 000 – 5 000 R
3	Sacha Inchi	12 000 – 20 000 R
4	Moringa	16 000 – 20 000 R
5	Sunflower	10 000 – 12 000 R
6	Okra	5 000 – 6 000 R

As we can see the majority of the cost from raw material suppliers per kilogram: out of six crops; black sesame cost valued between 4 000 to 6 000 riels, while peanut cost valued 3 000 to 5 000 riels, however sacha inchi cost valued between 12 000 to 20 000 riels, by the way moringa cost valued between 16 000 to 20 000 riels, last but not least sunflower cost valued between 10 000 to 12 000 riels, and okra cost valued between 5 000 to 6 000 riels.

Table 3: The cost from dealers per kilogram

Nº	Crops	Wholesale prices	Retail prices
1	Black Sesame	6 000 – 7 000 R	7 000 – 8 000 R
2	Peanut	5 000 – 6 000 R	6 000 – 7 000 R
3	Sacha Inchi	25 000 – 30 000 R	35 000 – 40 000 R
4	Moringa	20 000 – 30 000 R	30 000 – 40 000 R
5	Sunflower	12 000 – 15 000 R	15 000 – 20 000 R
6	Okra	6 000 – 7 000 R	7 000 – 10 000 R

As the table above has shown the cost from dealers per kilogram divided into two different prices. The wholesale prices of six crops; black sesame cost valued between 6 000 to 7 000 riels, while peanut cost valued 5 000 to 6 000 riels, however sacha inchi cost valued between 25 000 to 30 000 riels, by the way moringa cost valued between 20 000 to 30 000 riels, last but not least sunflower cost valued between 12 000 to 15 000 riels, and okra cost valued between 6 000 to 7 000 riels. And the retail prices of six crops; black sesame cost valued between 7 000 to 8 000 riels, peanut cost valued 6 000 to 7 000 riels, sacha inchi cost valued between 30 000 to 40 000 riels, moringa cost valued between 30 000 to 40 000 riels, sunflower cost valued between 15 000 to 20 000 riels, and okra cost valued between 7 000 to 10 000 riels.

Table 4: The cost from producers per liter

Nº	Oil	Distributors Prices	Consumers Prices
1	Black Sesame	70 000 – 90 000 R	90 000 – 120 000 R
2	Peanut	40 000 – 60 000 R	60 000 – 80 000 R
3	Sacha Inchi	320 000 – 350 000 R	350 000 – 400 000 R
4	Moringa	100 000 – 150 000 R	150 000 – 200 000 R
5	Sunflower	40 000 – 50 000 R	50 000 – 60 000 R
6	Okra	?	?

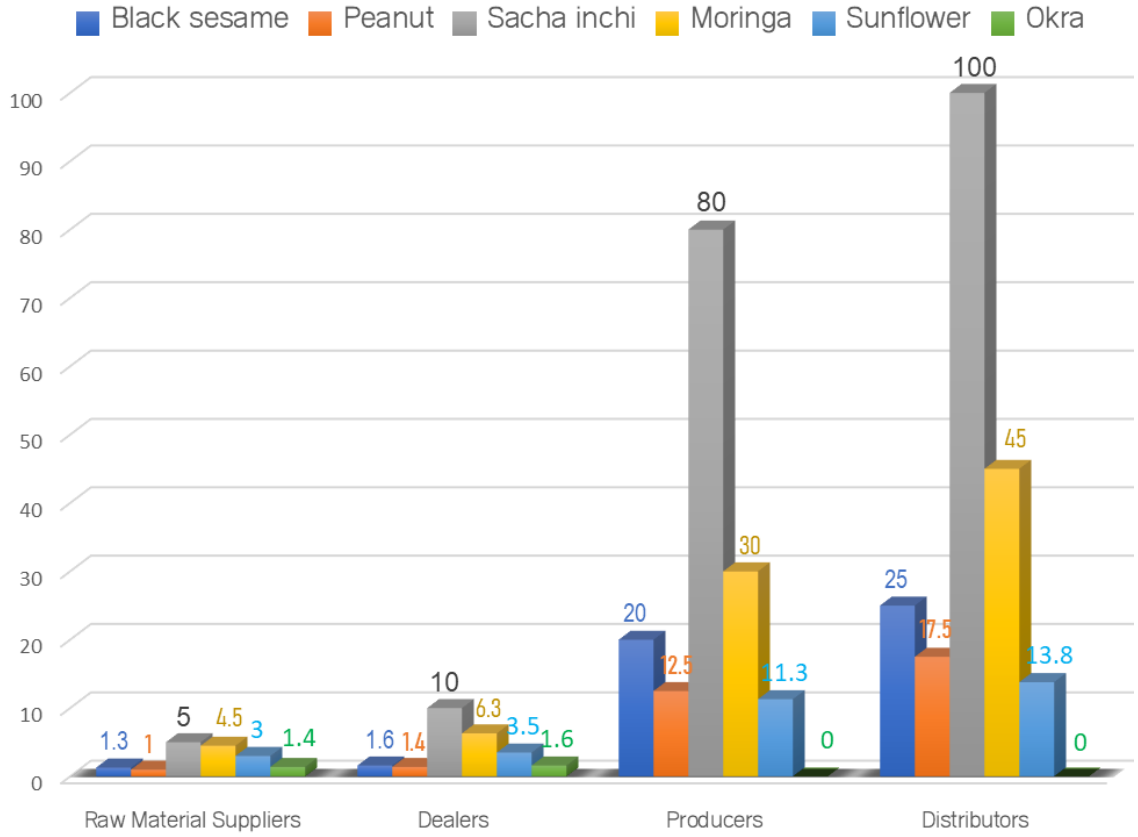
As we can see the majority of the cost from producers per liter divided into two different prices. The distributor prices of six crops; black sesame cost valued between 70 000 to 90 000 riels, peanut cost valued 40 000 to 60 000 riels, sacha inchi cost valued between 320 000 to 350 000 riels, moringa cost valued between 100 000 to 150 000 riels, sunflower cost valued between 40 000 to 50 000 riels, and okra did not have any information on the cost valued. And the consumer prices of six crops; black sesame cost valued between 90 000 to 120 000 riels, peanut cost valued 60 000 to 80 000 riels, sacha inchi cost valued between 350 000 to 400 000 riels, moringa cost valued between 150 000 to 200 000 riels, sunflower cost valued between 50 000 to 60 000 riels, and okra did not have any information on the cost valued.

Table 5: The cost from distributor per liter

№	Oil	Domestic prices	International prices
1	Black Sesame	90 000 – 120 000 R	120 000 – 200 000 R
2	Peanut	60 000 – 80 000 R	80 000 – 150 000 R
3	Sacha Inchi	350 000 – 400 000 R	400 000 – 500 000 R
4	Moringa	150 000 – 200 000 R	200 000 – 300 000 R
5	Sunflower	50 000 – 60 000 R	60 000 – 100 000 R
6	Okra	?	?

As the table above has shown the cost from distributor per liter divided into two different prices. The domestic prices of six crops; black sesame cost valued between 90 000 to 120 000 riels, peanut cost valued 60 000 to 80 000 riels, sacha inchi cost valued between 350 000 to 400 000 riels, moringa cost valued between 150 000 to 200 000 riels, sunflower cost valued between 50 000 to 60 000 riels, and okra did not have any information on the cost valued. And international prices of six crops; black sesame cost valued between 120 000 to 200 000 riels, peanut cost valued 80 000 to 150 000 riels, sacha inchi cost valued between 400 000 to 500 000 riels, moringa cost valued between 200 000 to 300 000 riels, sunflower cost valued between 60 000 to 100 000 riels, and okra did not have any information on the cost valued.

Figure 105: Chart of the vegetable oil crops/vegetable oil press cost valued ($) from each party



As we can see, the majority of vegetable oil crops and vegetable oil press costs for each party were valued at ($). The cost of target crops from raw material suppliers to dealers was slightly higher, but the cost from dealers to producers was extremely high, and the cost from producers to distributors was higher up. The cost between raw material suppliers and dealers was somewhat low, but the cost between producers and distributors was quite high when you compare them altogether.

V. CONCLUSION

Based on each stakeholder, including raw material suppliers, dealers, producers, distributors, and customers, is depicted in a pie chart.

The majority of the products are not grown using modern methods, according to the raw material suppliers, as most of them are based on outdated or amateurish imitations. Raw material suppliers also lack adequate marketing strategies, high manufacturing costs (Figure 12 to 16), and adequate reserves to prepare for planting (Figure 11). The dealers determine the product (Figure 36 to 39). In terms of the comprehension of new products, decisions regarding cultivation are being made slowly, particularly because people are still watching to see if others are planting or not (Graph 85). However, raw material suppliers want to broaden the range of their farming and turn into producers or processors based on the output of their crops (Figure 86). Finally, raw material suppliers have asked to assist them by giving them funding, crops, technical training (planting, caring for, and harvesting), and assistance in locating a market that can be sold at a fair price, regarding their output.

Despite the fact that the majority of dealers have only been in operation for less than five years (Figure 24), they are well-prepared for reserves (Figure 23). This might be attributed to the traders' expertise as well as the planning and comprehension of the particular market requirements to make the firm successful (Figure 22). Each trader also purchases crops at a lesser cost and resells them at a higher cost (Figure 50). Additionally, dealers have urged our nation to keep producing oil from seeds because it improves national economic conditions and the well-being of the populace (Figure 90). They are well aware of the seeds that may be crushed into oil. Additionally, dealers have asked raw material suppliers for training in cultivation techniques, care, and harvesting to ensure that these products have a healthy market both now and in the future.

In particular, vegetable oil (Figure 25), the provision of reserves (Figure 27), and the motivations for starting a business (Figure 26) have all been thoroughly researched by oil producers. Additionally, regional suppliers were contacted by oil companies to order crops for quick storage and refinement (Figure 56). Additionally, depending on the type of seeds, oil producers also state how much of a kilogram of seeds may be squeezed into oil (Figure 64). On the other side, this business also values the packaging's origin (Figure 66). The majority of manufacturers are also licensed to certify the vegetable oil's quality. The acquisition of seeds at a fair price, but their subsequent resale at a greater price after being oiled, is notable in terms of the price. Oil producers go into more detail about the advantages of vegetable oils and decide to integrate all business-related training (Figures 92 to 94). Finally, the oil producers asked that the raw material suppliers support the expansion of the crop and publicize the advantages of oil made from seeds.

To make it work, the distributors carefully established the reserves and the business strategy (Figures 28 and 29). Important marketing tactics are implemented with attention. A price at which buying and selling can result in sizable gains (Figures 73 and 79). The two main divisions of sales are wholesale and retail. Additionally, the majority of distributors are interested in taking part in training connected to vegetable oils, whereas a tiny minority are not since they are already preoccupied with business (Figure 97). Finally, distributors argued that additional studies into oilseeds may assist raw material suppliers expand their markets and develop new goods.

Oil is another item that people purchase for their homes, hotels, guesthouses, bars, restaurants, cosmetics, and other uses (Figure 30). The two primary sources of the vegetable oil utilized are largely domestic products and a little amount of imported oil (Figure 80), with the majority of the domestic oil being more expensive than the imported oil. Additionally, because crop oil production advances both the present and future economic well-being of the nation, customers

enthusiastically support its production (Figure 100). Future trainings or workshops on crop oil extraction will be attended by almost all consumers, with just a tiny minority declining due to their busy schedules. They are content with the availability of both imported and regional ingredients (Figure 104). In order to strengthen the national economy and lower migration, customers are demanding more local manufacture.

Overall, the cost analysis and valuing chain investigation have shown certain flaws, which are as follows:

(1) Raw material suppliers lack sufficient funding to ensure a seamless growing, maintenance, and harvesting procedure
(2) Raw material suppliers lack significant expertise in the upkeep, maintenance, harvesting, and use of other technologies
(3) The mechanisms and irrigation systems to lower labor expenses and product management are still lacking.
(4) A lack of funding for the creation of intelligent infrastructure, including resource gathering, processing, and marketing
(5) There is currently a dearth of supplementary services, such as marketing development services.
(6) There is still a lack of cooperation from all parties involved in making the product process more productive and economical.

VI. RECOMMENDATION

The analysis for this study focuses on the value chain from raw material suppliers to consumers. This analysis can help identify potential alternatives related to refined products, including additional information on the availability and affordability of micro-technologies for the processing of vegetable oils. Price analysis and benefits of using vegetable oil products.

On the basis of some of the above-mentioned flaws, study on value chains and cost analysis may prompt us to provide the recommendations that follow:

(1) Provide funding to raw material suppliers to ensure a seamless growing, maintenance, and harvesting procedure
(2) Provide training to raw material suppliers on the process of cultivation, maintenance, harvesting and use of various technologies
(3) Promote irrigation mechanisms and systems to reduce labor costs and product management
(4) Support investment in the development of intelligent infrastructure, including harvesting, processing and marketing materials
(5) Strengthen additional services, marketing development services
(6) Expand and strengthen cooperation from all stakeholders to make the product process more efficient and affordable.

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ពោធិចក្រ
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