

## **CALL FOR PROPOSAL**

Council of Palm Oil Producing Countries (CPOPC) is an intergovernmental organization for palm oil producing countries that was established due to the awareness of the need of mutual cooperation among palm oil producing nations. Indonesia and Malaysia, the world's biggest palm oil producers, are the founding members of the Council as well as the current members along with Honduras.

The three countries recognized significant contribution of palm oil sector in generating export revenue, raising the income level of rural smallholders, addressing poverty, creating employment and new business opportunities.

CPOPC is cooperate in research and development which is part of its scopes and functions. This year CPOPC will pursue three (3) studies (TORs attached) and the Secretariat is looking for three (3) potential researchers to submit their study proposal to carry out those studies in 2023.

Please send your up to date CV and study proposal to [venny.roselina@cpopc.org](mailto:venny.roselina@cpopc.org); cc to: [satria.bahar@cpopc.org](mailto:satria.bahar@cpopc.org). Deadline of submission is on 30 June 2023.

### **TERMS OF REFERENCE**

#### **RESEARCH PROPOSAL FOR 2023**

#### **1. A STUDY ON THE ADOPTION AND ADAPTATION OF TECHNOLOGIES FOR OIL PALM SMALLHOLDERS TO ENHANCE THEIR PRODUCTIVITY**

##### **A. BACKGROUND**

Indonesia, together with Malaysia, produce more than 80% of the global palm oil supply and meet more than 30% of the world's vegetable oil consumption. This production comes from plantations owned by large businesses, state schemes or government-owned plantations and smallholders.

Smallholders have a great impact on the economy of both countries and become the conduit of local rural economic development. However, the productivity of smallholders is relatively low, with only around 1-3 tonnes of CPO/ha/year. Their operational activities are dominated by family-run businesses with limited or no application of technology. The limited utilization and exposure to technologies are the challenges faced by smallholders to improve their productivity.

Meanwhile, the large oil palm plantations have incorporated the technologies to their business activity. Automation in harvesting, weed control, utilization of data to facilitate the harvesting and fertilizer application as well as transportation are some of the technologies used by the large oil palm plantation. They understand that, with limited source of land for new cultivation and high dependency on manual labour, the key to increase productivity is by utilizing technologies.

The approaches and technologies used by large oil palm plantations to enhance their productivity and performance can and should be emulated by the smallholders. It is important to review the technologies that can be implemented by the smallholders to enhance their operational activity. However, since smallholders are very diverse, not all technologies can be adopted by them. Therefore, the different categories of smallholder must be taken into consideration when studying the available technologies for adoption and adaptation.

## **B. PROBLEM STATEMENT**

The majority of smallholders in Indonesia and Malaysia have limited access to technologies to support their operational activities. In contrast, large oil palm plantations have the added advantage due to automation and incorporation of technologies to support their business operation. Hence, it is important to learn from the large oil palm company on application of the technologies on managing the plantation, to identify the suitable technologies that can be adopted and adapted for use by smallholders.

## **C. OBJECTIVES**

This study is expected to provide a comprehensive identification of technologies used by large oil palm plantations that can be adopted and adapted by the smallholders to enable better performance in their operational activity to increase their productivity. The objective of the study includes the method to transfer the technologies for adoption to suit the smallholders.

## **D. EXPECTED BENEFITS**

This study is expected to come up with recommendations of technologies that can be used by the smallholders to increase their productivity and efficiency. The recommendation should be tailored to the needs of different types of smallholders in Indonesia and Malaysia as well as recommendation on its implementation.

## **E. SCOPE OF WORK**

The study is a desktop study where the implementer should come up with complete literature review on related topics. However, there will be an opportunity for conducting interview, focus group discussion (FGD) and other data collection methods to garner deeper understanding on smallholders' context and feasibility to adopt and adapt the technologies. The technologies to be recommended should cover financial capacities, traceability, and productivity enhancement. Implementer(s) will develop their study framework based on agreed TOR.

## **F. OUTPUT**

1. Comprehensive literature review on utilization of technologies by large oil palm

- plantations, which can be adopted and adapted to the smallholders.
2. To provide recommendations on how to adopt and adapt suitable technologies from large oil palm plantations to different categories of smallholders.
  3. To share the study result/ findings to smallholders through the relevant stakeholders.
  4. Dissemination of the findings of the study subjected to the recommendation and approval from the Council of Palm Oil Producing Countries (CPOPC).

#### **G. PROJECT DURATION AND TIMELINE**

The study is expected to commence in 2023. The final report would be ready within six months of the study being conducted. An interim report is to be submitted to the Secretariat within three months of the study.

## **2. A STUDY ON CONTAMINANTS IN PALM OIL**

### **A. BACKGROUND**

Contamination is one of the many possible risks during food processing. In certain cases, a contaminant would form under certain process to reach the desired product. In others, the source of the contamination comes from contact with certain items, often one that is used to contain or to process the product. The level of danger that each contaminant brings to human health varies due to the frequency of the exposure, the amount ingested, the physical situation of the person, and the route of exposure<sup>1</sup>.

While not all contaminants are harmful, and some does not cause any effect to human health when consumed under certain doses. Environment, packaging methods, processing, or transport are possible causes for contaminations.

There is a risk of contamination to any food products, vegetable oils included. Some of the examples of these unwanted chemicals that could be found inside the commodities are 3-Monochloropropane-1,2-diol Esters and Glycidyl Esters or 3-MCPDE and GE, and mineral oils, namely Mineral Oil Saturated Hydrocarbons (MOSH) and Mineral Oil Aromatic Hydrocarbons (MOAH).

The vegetable oil industry as a whole has the responsibility to make sure that their products are safe for consumption. Having a good understanding of the contaminants is crucial to ensure the well-being of their consumers. While these contaminants are all different in nature, it is important to avoid the exposure of palm oil to these foreign matters altogether. To achieve that, an identification of the process that might alter certain compounds and cause for unwanted contamination is needed.

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<sup>1</sup> <https://www.hindawi.com/journals/jt/2019/2345283/>

## **B. PROBLEM STATEMENT**

The existence of contaminants in palm oil products and the potential health problems caused by it has exacerbated the negative image of palm oil. CPOPC, whose members represent more than 80% of the world's production of palm oil, has an important role to ensure that its product is safe for consumption. Hence the study on contaminants, how to mitigate and reduce their amount in palm oil products should be done.

## **C. OBJECTIVES**

This will be a desktop study on 3-MCPDE, GE, MOSH, and MOAH in palm oil. The objectives of the study are:

1. To provide complete literature review on the possible source of contamination of 3-MCPDE, GE, MOSH, and MOAH in palm oil products.
2. To provide complete literature review on the health risk data of 3-MCPDE, GE, MOSH, and MOAH.
3. To assess and recommend the most viable and available technologies for commercial mitigation on 3-MCPDE, GE, MOSH, and MOAH in palm oil.

## **D. EXPECTED BENEFIT**

This study is expected to create balance and common narrative on 3-MCPDE, GE, MOSH, and MOAH on the mitigation and reduction of contaminants in palm oil products.

## **E. SCOPE OF WORK**

This study will be in the form of desktop study, where implementer(s) will conduct a comprehensive literature review related to 3-MCPDE, GE, MOSH, and MOAH in palm oil products.

## **F. OUTPUT**

1. Data on the sources of the contamination of 3-MCPDE, GE, MOSH, and MOAH in the palm oil products.
2. Data on the possible health risks of 3-MCPDE, GE, MOSH, and MOAH.
3. Recommendations on how to mitigate the 3-MCPDE, GE, MOSH, and MOAH in palm oil (including to identify and develop alternatives to minimize the formation and/or contamination).
4. Dissemination of the findings of the study subjected to the recommendation and approval from the Council of Palm Oil Producing Countries (CPOPC).

## **G. PROJECT DURATION AND TIMELINE**

The study is expected to commence in 2023. The final report would be ready within six months of the study being conducted. An interim report is to be submitted to the Secretariat within three months of the study.

### **3. A SYNTHESIS STUDY OF CARBON SEQUESTER POTENTIAL OF OIL PALM PLANTATIONS**

#### **A. BACKGROUND**

There is an urgent need to reduce global greenhouse gas (GHG) emission to address the global concerns of global warming and climate change. United Nations scientists have indicated that the world has to cut GHG emissions to reach net zero by 2050. Net zero means cutting GHG emission to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere.

Many extensive research has been conducted on the carbon sequestration potential of oil palm plantation. Oil palm as tree carries out photosynthesis, which absorb the CO<sub>2</sub> and release O<sub>2</sub>. Hence oil palm has carbon sequestration potential with large range of value based on various variables including among others, soil types, biomass calculation and emission factors. In view of these, there is continued debate on the carbon sequestration potential of oil palm plantations and its impacts on the environment.

Thus, it is important to have scientific evidence on the sequestration potential of oil palm plantations to support the claim that cultivation of oil palm plantations contribute to reduction of carbon emission. It is necessary to establish an average value of carbon sequestration potential of oil palm plantation based on scientific evidence to counter the negative allegations against palm oil as carbon source and to compare the carbon sequestration of oil palm vis-à-vis major vegetable oil crops namely: soybean, rapeseed and sunflower.

#### **B. PROBLEM STATEMENT**

Extensive research has been conducted on the carbon sequestration potential of oil palm plantation. However, the findings are dependent on various variables including among others, soil types, biomass calculation and emission factors. In view of these, there is continued debate on the carbon sequestration potential of oil palm plantations and its impacts on the environment. Thus, it is important to have scientific evidence on the sequestration potential of oil palm plantations to support the claim that cultivation of oil palm plantations contribute to reduction of carbon emission.

### **C. OBJECTIVE**

The objectives of the study are to establish an average value of carbon sequestration potential of oil palm plantation based on scientific evidence to counter the negative allegations against palm oil as carbon source and to compare the carbon sequestration of oil palm vis-à-vis major vegetable oil crops namely soybean, rapeseed and sunflower.

### **D. EXPECTED BENEFIT**

A synthesis report of the carbon sequestration potential of oil palm plantations and the comparison with carbon sequestration potential of other major vegetable oil crops will provide the scientific evidence that demonstrate the oil palm cultivations contribute to reduction of carbon emission.

### **E. SCOPE OF WORK**

The scope of work covers comprehensive and extensive review and assessment of available research findings as well as to propose and recommend an average value of carbon sequestration potential of oil palm plantations and the comparison with other major vegetable oil crops namely rapeseed, soybean and sunflower.

### **F. OUTPUTS**

The expected outputs are as follows:

1. A synthesis report of the comprehensive and extensive review and assessment of available research findings of carbon sequestration potential of oil palm plantation and major vegetable oil crops namely rapeseed, soybean and sunflower.
2. Recommendation on average value of carbon sequestration potential of oil palm plantation and major vegetable oil crops namely rapeseed, soybean and sunflower.
3. Dissemination of the findings of the study subjected to the recommendation and approval from the Council of Palm Oil Producing Countries (CPOPC).

### **G. PROJECT DURATION AND TIMELINE**

The study is expected to commence in 2023. The final report would be ready within six months of the study being conducted. An interim report is to be submitted to the Secretariat within three months of the study.