Need Assessment of Traceability System for Agricultural Product Exporter

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Conducted by Sub-Component 2.2 SAAMBAT Project

Table of Contents

List of Abbreviations

AC	Agricultural Cooperatives
ASEAN	Association of South East Asia Nations
CEO	Chief Executive Officer
CO	Certificate of Origin
EU	The European Union Countries
FAO	Food and Agriculture Organization of the United Nations
FTA	Free Trade Agreement
GDA	General Directorate of Agriculture
GDP	Gross Domestic Product
ha	Hectare
HACCP	Hazard Analysis Critical Control Point
IFOAM	The International Federation for Organic Agriculture Movements
INGO	International Non-Governmental Organization
ISO	International Standardization Organization
JAS	Japanese Agricultural Standard
JMAFF	Japanese Ministry of Agriculture, Forestry, and Fisheries
GHP	Good Hygienic Practices
GMP	Good Manufacturing Practices
MAFF	Ministry of Agriculture, Forestry, and Fisheries
MT	Metric Tons
MoC	Ministry of Commerce
PDAFF	Provincial Department of Agriculture, Forestry, and Fisheries
PGS	Participatory Guarantee System
QR Code	Quick Read Code
RFID	Radio Frequency Identification Devices
SAAMBAT	Sustainable Assets for Agriculture Market, Business and Trade
SC 2.2	Sub-Component 2.2 of SAAMBAT project
SMEs	Small and Medium Enterprises
SPS	Sanitary and Phytosanitary
USAID	United State Agency for International Development
USDA NOP	United State Department of Agriculture National Organic Program
WSN	Wireless Sensor Network

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1. Introduction

Information and Communication Technology is increasingly applied to agriculture value chain to overcome fragmented and miscommunication barriers. By adopting this technology, Sub-Component 2.2 of SAAMBAT project or SC 2.2 is mandatory to develop 5 digital key applications, one of which is the dynamic traceability system application for agricultural products. Additionally, the development of the traceability system is to assist private sector who wishes to export agricultural products to overseas markets that are required to comply with importing policy by developed countries such as the US, the EU, Japan, China, Australia, and New Zealand on food safety which include HACCP, GMP, GHP, and Sanitary and Phytosanitary certificate. To ensure food safety it is necessary to have the traceability system in-place to track and trace agricultural products at any value chain stages, improve product quality control, reduce incident of food poisoning risk, authenticate ethical credential, country of origin, produce provenance, and ultimately build consumer trust and satisfaction. Traceability system allows an early detection of food-borne disease in the value chain to avoid illness proliferation. The study of traceability system for agricultural product export will complement the need assessment for the traceability system for vegetable value chain. Likewise, it will assess whether the sustainability of the digital traceability system application will be continuously utilized when the project is phased out. It is hoped that the result from the study will provide a concrete evidence of demand side from relevant institutions ranging from agricultural products supporting for export institution to exporters and to elaborate whether the dynamic traceability system should be developed.

2. Objectives of Study

This study seeks (1) to understand the need of the traceability system for agricultural producer groups, cooperatives, associations, and exporters, (2) to identify the preferred standardization and certifying body in the country, and (3) to confirm the utilization as well as a willingness to co-finance the system when it is developed by SC 2.2.

3. Scope of Study

This is a complementary study to the traceability system for vegetables to confirm that SC 2.2 should develop a dynamic system which is applicable for any type of agricultural products. This study specifically focuses on the demand side of the traceability system for agricultural export crops such as pepper, cashew nut, mango, and Pailin longan. In addition, various actors who provide technical assistance and facilitation to small & medium size enterprises of International Non-Governmental Organisations (SMEs-INGOs), agricultural cooperatives, chemical-free and organic wholesaler & retail shops, and exporter companies were also picked for an interview.

4. Limitations

Due to limited resources, time constraint, lacking data of agricultural product exporters, and a bureaucracy requirement of an official letter of request of some exporters who would cooperate and

allow for an interview, only selected number of each of the following potential agricultural product exporters (cashew nut, longan, mango, and pepper), INGO, chemical-free/organic wholesalers & retail shops, agricultural cooperatives, and certifying body were chosen. Banana export companies were excluded due to their contacts could not be reached. In addition, milled rice exporters were also ruled out in this study because the team used to meet with AMRU RICE CEO, Oknha Song Sarann who is currently a Cambodia Rice Federation President, keeps insisting that the traceability system should have already been established as it plays a significant role in facilitating agricultural products export to overseas markets.

5. Literature Review

There are 3 main sectors that drive Cambodia economy. They are industry, service, and agriculture. Agriculture sector contributes 20.17% to the total GDP in 2019 (World Bank, 2020). Agriculture sector divides into 5 sub-sectors such as rubber, animal production (including poultry and egg), forestry (wildlife raising and swift bird nest), fisheries (freshwater fish, marine fish, and aquaculture), and crop production (selected major exporting crops including milled rice, paddy rice, cassava, mango, cashew nut, longan, pepper, and cavendish banana).

Table 1: Agriculture sub-sectors production area and worth in value for exporting quantity (Compiled and consolidated by Author)

Type of productions	Total production quantity (MT)	The total value of the total production (million USD)	Exporting worth of value (million USD)
Livestock and poultry (including egg)	258,257	$ 1,827.20	$ 61.31
Fisheries	936,300	$ 1,872.60	$ 8.33
Forestry product	30,926	$ 86.96	$ 44.09
Rubber	350,000	$ 482.76	$ 459.00
7 major exporting crops	24,415,172	$ 2,323.19	$ 2,170.00

Source: Veng, Sakhon. (2021, January 04). Total value of agricultural products and agricultural export sub-sectors of animal production, fishery products, forestry products, rubber products, and crop

production achieved in 2020. *Sakhon Veng, Minister of the Mistry of Agriculture, Forestry, and Fisheries*. https://www.facebook.com/vengsakhon

Among the 5 agricultural sub-sectors, the major exporting crops stand at the top of the table in all 3 units including the total production quantity, total value of the total production, and exporting worth of value which accounts for 24,415,172 MT; $ 2.32 billion; and $ 2.17 billion respectively. In terms of the total production quantity, the second place is freshwater and marine fish ahead of rubber, livestock, and forestry products with the total quantity of 936,300 MT; 350,000 MT; 258,257 MT; and 30,926 MT respectively. Likewise, when it comes to worth of the total production freshwater and marine fish remains sitting at second spot follows by livestock, rubber, and forestry products at $ 1,873.6 million; $ 1,827.19 million; $ 482.76 million; and $ 86.96 million respectively. However, the result has changed when it comes to exporting worth in value. The first runner up is rubber chases after by the second runner up which is livestock, the fourth place which is forestry products, and the last spot in table 1 above which is freshwater and marine fish with a value of $ 459 million, $ 61.30 million, $ 44.09 million, and $ 8.33 million respectively (table 1).

Prior to these agricultural products being allowed to export to overseas markets as well as to comply with intended importing countries, it is necessary to get a sanitary and phytosanitary certificate and a certificate of origin from the department of plant protection, sanitary, and phytosanitary of the General Directorate of Agriculture (GDA) of MAFF and General Department of Trade Service of Ministry of Commerce (MoC). This measure is to assure that there would be no transmission of quarantine pests and/or economically devastating pests from one country to another in order to protect one's country agricultural production and biodiversity without setting up unnecessary barrier to trade and transport (FAO, 2020). The certificate of origin is to certify that the products are locally produced or obtained using local raw materials (MoC, 2021).

This section collects and collates secondary data on major exporting agricultural products to overseas markets and the rules and regulations to be complied with intended importing countries.

➢ Major exporting agricultural products in 2020

5 major agricultural commodities that have been produced and exported to overseas markets were consolidated and compiled as illustrated in Table 2 (Veng, S. 2021).

Table 2: Commodity production areas, productivity, exporting volume, and worth in value in 2020 (Author's compilation based on information retrieving from an official Facebook page of Minister of MAFF)

Commodity	Production areas (ha)	Harvesting areas (ha)	Productivity (MT)	Average yield (MT/ha)	Exporting Quantity in 2020 (MT)	The total value of the total productivity (in million USD)
Cavendish Banana	15,945	14,270	478,350	33.52	333,143	$ 434.35
Cashew nut	258,984	162,294	242,324	1.49	230,981	$ 481.48
Mango	131,890	93,099	1,748,624	18.78	947,628	$ 571.86
Pepper	7,239	6,092	18,242	2.99	5,079	$ 42.50
Longan	14,500	11,599	196,712	16.96	102,280	$ 155.82

Source: Veng, Sakhon. (2021, January 02). The total agricultural production yield and overseas export quantity initial result in December 2020. *Sakhon Veng, Minister of the Mistry of Agriculture, Forestry, and Fisheries*. https://www.facebook.com/vengsakhon

Out of the 5 agricultural commodities, cashew nut and mango contain the biggest production areas follows by cavendish banana and longan with the cultivated areas of 258,984 ha; 131,890 ha; 15,945 ha; and 12,500 ha respectively. Mango provides the highest yield that accounts for 1,748,624 MT/ha follows by banana, cashew nut, longan, and pepper. However, banana offers the highest average yield chases after by mango, longan, and pepper with amount of 33.52 MT/ha; 18.78 MT/ha; 16.96 MT/ha; and 2.99 MT/ha respectively. Cashew nut sees the lowest on average yield among the 5 commodities at 1.49 MT/ha. Mango stands at the top in terms of exporting quantity comes after by banana, cashew nut, longan, and pepper with the volume of 947,628 MT; 333,143 MT; 230,981 MT; 102,280 MT; and 5,079 MT respectively. In terms of the selling price of the total yield, mango is the leading commodity goes after by cashew nut, banana, longan, and pepper with a total worth of money of $ 571.86 million; $ 481.48 million; $ 434.35 million; $ 155.82 million; and $ 42.50 million respectively.

➢ Overseas market importing regulatory requirements

According to the Khmer Times online news (2020) reported that most of Cambodian agricultural products were exported mainly to China, the EU, ASEAN, Hong Kong, Taiwan, Australia, New Zealand, and the US with the total quantity of more than 3 million MT (Chan, 2020). When exporting agricultural products to these countries there are some criteria required to comply with including

sanitary and phytosanitary certificate, and food safety and quality assurance certificate which encompasses the traceability system. In addition, amid growing concerns of consumer over food safety and health consciousness, importing countries have strictly imposed the law on importing agricultural and food products to their countries (UNESCAP, n.d.).

The member states of the ASEAN have signed several Free Trade Agreements (FTA) either bilateral or regional with various countries such as Australia, New Zealand, China, Hong Kong, Japan, South Korea, and India. This agreement removes the import & export tariff barriers of all ASEAN nations to freely trade with its signed counterpart countries (Association of Southeast Asian Nations, n.d.). This means that Cambodian agricultural products export to endorsed counterpart nations are tariff barriers free. However, there are 2 types of required documents including preferential tariff **certificate of origin (CO)** to be issued by the Ministry of Commerce and **sanitary and phytosanitary certificate (SPS)** which is attested by the GDA of MAFF. The former letter is an official document that certifies the products originated, wholly obtained, produced, or manufactured in a country whereas the latter certificate is to assure the food safety and to prevent entry, establishment of or spread of harmful pests and diseases (MoC, 2021; GDA, 2017).

Looking at regulatory policy of importing agricultural products to the developed countries such as the EU and the US, trading agricultural products in those country markets must comply with food safety legislation to assure the food products are safe for consumption and of high quality. Thus, each company along the supply chain must adopt an internal traceability system and share the data with concerning regulatory institutions. This is to ensure product quality and public safety are under control which results in putting pressure on traceability requirements in the food supply chain to become more and more strict (Mainetti *et al*., 2013).

This section will explain some of the selected internationally recognized certification and accreditation bodies for exporting agricultural products to the globe. They are CODEX Alimentarius, International Food and Organic Agriculture Movement (IFOAM–Organic International), and International Organization for Standardization.

- CODEX Alimentarius is an international food standard which produces guidelines and codes of practices that contribute to the safety, quality, and fairness of the international food trade. It protects consumer's health and assures the safety and quality of food products which follow the standardized ordered specification set by this institution. It is established and under the oversight of FAO and WHO (CODEX Alimentarius, 2021).
- IFOAM – Organics International work focuses on bringing true sustainability to agriculture across the world. They promote adoption of organic agriculture and similar approach whether certified or non-certified toward best practices by integrating organic principles and methods for agricultural operations to become more sustainable (IFOAM, 2020). Standards and certification that this institution offers including the organic guarantee system which demarcate the line between what is organic and what is not, participatory guarantee system (PGS) is a "locally focused quality assurance system or organic guarantee systems that certify producer based on active participation of stakeholders and are built on a foundation of trust, social networks, and knowledge exchange.", and internal control systems (ICS) for group certification

which facilitate organic smallholders to access to third-party certification and organic market (IFOAM – Organics International, n.d.)

- International Organization for Standardization develops internationally recognized standards. It is an independent non-governmental organization which envisions a collective action bringing experts of the member countries to share knowledge and develop voluntary, consensus-based, market-relevant international standards that support innovation and provide solutions to global challenges. It allows the best practices of making products fit and work well with each other, identifying safety-related issues of products, and sharing ideas and solutions to the member countries (ISO, n.d.).

These international organizations do not issue any certifying products to their member states, however, with the consent from the state members, they are mandatory to authorize an official inspection system and official certification systems to the state member government or eligible independent body to be a registered certifying body which complies with specific pre-defined requirement criteria (FAO, n.d.; FAO, 1995; ISO, n.d.). For instance, ISO 9001 or ISO 14001, must be certified by an independent body with written assurance, which is a provisional certificate, that the product, service, or system complying with specific requirements (ISO, n.d.).

However, developed countries like the EU, Japan, and the USA have customized these regulations to be aligned with their country standard requirements such as EU Organic Regulation – EC 834/2007, Japanese Agricultural Standards-JAS, and the United State of Department of Agriculture National Organic Program (USDA-NOP) respectively.

- JAS is established by the Japanese Ministry of Agriculture, Forestry, and Fisheries-JMAFF which is in charge of issuing Japanese National Standard in the field of agriculture, forestry, fisheries, and food industry (JMAFF, n.d.). In 2003, the Japanese government enacted the food safety law with an objective to promote the measure concerning food safety. One of the measures in the food sanitation law was the introduction of "Food Traceability Systems". A month later, JMAFF announced a new Japan Agricultural Standards (JAS) program of imported beef (Clemens, R. 2003). To be able to use the JAS sticker on imported products as "Organic" importing companies are required to be certified by Accredited Japanese Certifying Bodies or unless the overseas manufacturers are certified by organic JAS certification bodies. To acquire the JAS organic logo, firms or manufacturers must apply for this certificate through registered certifying bodies. JMAFF accepts the applications of intended register certifying bodies and conducts assessment based on the standards specified by JAS law. The registered certifying agents open for certification application from agricultural production firms and processed food manufacturers then award the certification after conducting assessments based on technical criteria for certification. After issuing organic certifying products, the inspection institution will annually check the firms whether they comply with JAS technical requirement criteria (JMAFF, 2015).
- In the EU, EU directive 178/2002 came into effect in early 2005 which is mandatory for all foods and feeds sold within the EU countries must apply traceability system (Fonlinas, *et al.*, 2006). Having had the EU Organic Regulation sticker on locally produced or imported products allows the free flow of these products with the EU member states. To obtain the EU Organic Regulation – EC 834/2007, commercial firms, importing companies, and the farmers of the EU member nations must apply for this certificate through registered certifying institutions. A

process of applying for the EU Organic Regulation – EC 834/2007 of ECOCERT, which is one of certifying bodies, is exemplified. First, firm or farmer is required to file an application then it will be reviewed by ECOCERT. Next, the formal certification contract comes into effect after the body has agreed to accept the application. Then, an initial evaluation of both recorded paperwork and onsite inspection kicks off. Later, the final review by the certifying body committee and certification decision is made whether the firm or farmer complies with and meets the required criteria to be certified as organic or not. After granting the EU Organic Certificate, the surveillance of the operation takes place which the final step of the application process where it will annually check the firm or farmland at least once (ECOCERT, 2020).

- USDA NOP is the federal regulatory entity that oversees the development and enforcement of rules and regulations for all organic agricultural products trafficking in the US territory (USDA AMS, n.d.). To acquire this certification, there are 5 steps to follow. Firstly, the firm is required to develop its organic system plan and implements this developed organic system then request for a certifying agent to inspect the system. Later, allow the agent to review the inspection report. If the operation complies with the rules the certifying agent will issue organic certificate listing products that can be sold as organic on the US territory and its accredited counterpart countries (McEvoy, 2020).

Traceability is the ability to follow the movement of a food through specified stage of production, processing, and distribution (CAC, 2005) or is the ability to capture, store, and transmit sufficient information about products or substances at all stages in the food supply chain so that the products can be checked for safety and quality through trace upward and track downward activity at any time (Bosna & Gebresenbet, 2013). When the traceability system is applied to an integrated food supply chain in a coordinated and rapidly responsive manner will achieve a reduction of foodborne diseases (Zhang, R. & Bhatt, T. 2014).

➢ Type of the traceability systems

In the food supply chain when applying a traceability system, it is required all involved actors link the free flow of products in exchange for an interoperability of recorded information across the whole supply chain. All actors in the chain must have an agreement on product identification to ensure that the products are traceable within each stage. These implementing activities are to assure transparency and continuity of information exchanges across the chain (UN Global Impact, 2014). An effective traceability system requires a control process of external and internal traceability.

➢ External traceability system

All traceable products must have a unique product identification number and batch or lot number. The recorded information within each chain/stage must be interoperable shared between distributed channel participants. This is to ensure that each traceability partner should be able to identify the direct source and direct recipient of traceable products as they pertain to their process.

External traceability interacts with two of product tracings namely tracing back, enables actors in the food supply chain to identify the immediate supplier, and tracking forward, facilitates actors to distinguish an immediate subsequence recipient (Aung, M. M. & Chang, Y., 2014).

➢ Internal traceability system

Processes must be maintained within an organization to link identities of raw materials to those of the finished goods. When one material is combined with others, and processed, reconfigured, or repacked, the new product must have its own Unique Product Identifier. The linkage must be maintained between this new product and its original material inputs (such as batters, breading, seasonings, marinades, salt, packaging materials, and many other inputs) to maintain traceability. A label showing the Lot Number of the traceable input item should remain on the packaging until that entire traceable item is depleted. This principle applies even when the traceable item is part of a larger packaging hierarchy (such as cases, pallets, or shipment containers) (Zhang & Bhatt, 2014 b).

➢ Technical instruments for traceability

Aung and Chang (2014) signified that there are 4 types of technical instruments for traceability that are usually used on food products. They are:

1. Alphanumeric code is a combination code contains alphabetical letters, mathematic symbols, numbers, and punctuation marks which is easily readable by computer program.
2. Barcode or QR code is a printed label that encodes a series of parallel bars or lines of varying width, spaces, squares, and dots which is readable by optical machine.
3. RFID is the technology that applies radio frequency to read and capture data stored on a tag attached to the objects.
4. Wireless Sensor Network (WSN) is a system designed to remotely collect, monitor, control, and transmit data of the surrounding environment through interconnected sensor nodes.

6. Methodology

To capture the intended respondents' perceptions, purposive sampling is applied in this study. The interviewees are purposively and carefully selected based on their knowledge of the subject and their several experiences as agricultural producer groups, agricultural cooperatives, chemical-free wholesaler or organic retail shops, agricultural product exporting firms, agricultural food manufacturers, and INGO whose works supporting export of agricultural products. These institutions are well-aware of exporting policy requirements.

The interview was conducted in 3 communication ways including a phone call, virtual interview, and a physical meeting interview.

Potential major agricultural product exporters, AC, an association, a private company, and certified institutes were interviewed. A total of 16 interviewees were surveyed which is summarized in table 3:

Table 3: List of interviewed agricultural product exporters and relevant institutions.

No	Name of Institution	Type of Institution
1	Angkor Harvest Company	Mango exporter
2	Kirirom Mango Farm	
3	Kingdom Fruits International Firm	

4	Kampot Pepper Association	Pepper Agricultural Cooperative
5	Samlot Khmer Organic Pepper	
6	Pailin Longan Production	Longan Agricultural Cooperative
7	Pailin Longan Product Agricultural Cooperative	
8	Chey Sambo Enterprise	Cashew Nut Agricultural Cooperative
9	Cashew Nut Association of Kampong Thom	
10	Yamato Green Co Ltd.	Chemical-free/organic wholesaler & retail shop
11	Khmer Organic Cooperative	
12	Agri On Co Ltd.	
13	International Volunteer of Yamagata	INGO
14	Cambodia Pepper Spices Federation	Supporting Agricultural Cooperative
15	Cambodia Agricultural Cooperative Alliances	Constitutional Agricultural Cooperative
16	Cambodia Food Manufacturer Association	Food Manufacturing Association
Total Number of Interviewees		**16**

The traceability system for agricultural export product questionnaire was developed as attached in Appendix 1. They are designed using a semi-structured interview with an open-ended questionnaire. The questionnaire is used to guide the interview and the interviewer is flexible to ask further questions if the guided questions are not applicable to the context. As this study is not intended to collect quantitative number but rather to get the opinion and perception of the subject matter, the finding will be analyzed based on the content analysis which is a method application of the qualitative analysis.

7. Results of the study

The primary purpose of this study to elaborate on whether the traceability system should be developed. Respondents' experience and feedback added insights to the study. By listening, paper-recording, and analyzing the experience shared by purposively chosen institutions, valuable information was obtained on the demand of the traceability system.

According to the observation through content analysis, the study found that all respondents are well-aware of and understand the importance of the traceability system which is a value-added to agricultural products export to overseas markets especially the US and EU countries. These overseas markets mandate all agricultural and food product importers must adhere to food safety policy which requires a traceability system to tackle food-borne disease proliferation in their territories which in turn protect consumers and public health.

It also reveals an answer to the second objective of identifying the preferred standardization and certifying body in the country, the study shows that it is dependent on the type of agricultural crops they cultivate and overseas markets that they export to e.g., pepper grower needs organic certificate by ECOCERT to export it to the EU market. However, if the exporting firms wish to export to the US they must acquire USDA organic standard. This strict standard of regulation applies to other crops as

well. Mango, Pailin longan, and cashew nut exporters require Certificate of Origin and Sanitary and Phytosanitary certificate which they mainly export these products to the ASEAN and FTA countries.

Finally, the study discovered the third objective of confirming the utilization as well as a willingness to co-finance the system when it is developed by SC 2.2 that all respondents are thrilled to apply traceability system to their agricultural production chain and most agricultural product exporters are willing to co-finance if this is a regulation requirement from overseas markets. However, agricultural cooperatives are hesitant and necessitate to have in-depth discussions with their committee members first prior to making any further decision on the co-investment. All interviewed AC leaders also mentioned that if the members saw the potential benefits of the system such as contract ordering from overseas markets, premium price offered, and sustainable purchasing contract was made between producer groups and buyers then the member would surely co-invest in the traceability system. A tenacious commitment from Cambodia Food Manufacturer Association and Cambodia Agricultural Cooperative Alliances in disseminating and encouraging the application of the system to its 35 food manufacturing members and over 1,200 AC members respectively.

Kirirom Mango Farm Sale Manager shared their experience of the manual traceability system as they have to record all of the relevant data on paperwork and excel sheet. This manual causes difficulty when they want to find out the source of mango farms which take them at least 4 weeks to trace back all of those stacked up information. Having a traceability system in place would help to ease the pressure in search for relevant data that they have stored.

The Kingdom Fruit International company who exports several agricultural products to overseas markets welcomed the idea of developing a digital traceability system, they will utilize the system for their internal food safety control measures and in case if their importing countries require the traceability system to prove their products are safe then they will instantly present the system to their partnering markets. Additionally, they are also willing to co-invest if project could optimize the system that meets their requirements and if they would have decent control over the direction of the system.

Agri On Co Ltd which is a wholesaler of fruit and vegetable products is undertaken developing its own traceability system with assistance from their partnering company in Singapore. SC 2.2 hopes to convince and integrate the traceability system developed by Agri On Co Ltd onto Khmer Agriculture Suite Core Platform.

8. Recommendations and Conclusion

The results show that there is a strong demand from the digital traceability system application from all interviewed organizations as well as their willingness to co-invest in the system.

Due to concrete evidence on robust demand from interviewed entities, it is recommended that customizable traceability system application should be developed that could be used with all kinds of agricultural crops.

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Appendix 1: List of questions for traceability system for agricultural product exporter

A. Company profile

1. Interview Date: _____, Location: _____
2. Interviewee name: _____Phone number: _____
3. Which groups do you belong to?
   ☐ a. Ag Product Exporter ☐ b. Producer ☐ c. Other (_____)
4. Company name: _____
5. Address: _____
6. Date of establishment: _____
7. Which crops do you produce or export?
   ☐ a. Mango ☐ b. Banana ☐ c. Cashew nut ☐ d. Longan ☐ d. Pepper ☐ e. Other (___)
8. Type of company
   ☐ a. A Local firm ☐ b. International firm
9. What is your production volume per annum (metric tons)? _____
10. What is your exporting capacity per annum (metric tons)? _____
11. What is the export frequency?
    ☐ a. A year-round ☐ b. Seasonal ☐ c. Other (_____)
12. Which countries do you mainly export to? _____
13. Which of the following post-harvest practices do you apply?
    ☐ a. Cleaning ☐ b. Grading ☐ c. Packing ☐ d. Weighing
    ☐ e. Labelling ☐ f. Transporting ☐ g. Storing/cool storage ☐ h. All of above

B. Recording information

14. What information do you record (planting, pesticide application, harvest date?) how do you record? _____
    _____
15. Do you encounter any challenges when recording these information?
    ☐ a. Yes. Why? _____
    ☐ b. No. Why not? _____
16. What are the purposes for recording the above information?
    _____

C. Crop standard and certification institution

17. What type of crop standard does the company comply with?
    ☐ a. Organic ☐ b. Chemical-free ☐ c. CAMGAP ☐d. Other (_____)
18. Which certifications do your firm possess?
    ☐ a. CAMGAP ☐ b. GI ☐ c. Organic ☐d. Other (_____)
19. Which institutions certify your agricultural product/s for export?
    ☐ a. GDA/MAFF ☐ b. ECOCERT ☐ c. COrAA
    ☐ d. USDA Organic ☐ e. JAS ☐ e. Other (_____)
20. What are the procedures of applying for product certification? How long does it take?
    _____

_____

21. What are the compliant criteria?

_____

_____

22. How long will the certification last? _____

D. Products complaint

23. Have you ever got any complaint from buyer/business partner on?

☐ a. Produce quality ☐ b. Chemical residue☐ c. Microbial contamination☐ d. Other (____)

Why? _____

Why not? _____

24. If you have ever got a complaint, how do you deal with such complaint? (Recall products back?)

_____

_____

E. Product traceability system information

25. Do you have any traceability system in-place? (If No, Skip the Question 27)

☐ a. Yes. Why? _____

☐ b. No. Why not? _____

26. To what extend do you think that the traceability system is important?

☐ a. Very important ☐ b. Important ☐ c. Not important ☐ d. Other (_____)

27. If you do have a traceability system in-place, which companies do you collaborate with, where are they from, and what is a rough fee-charge per annum?

_____

_____

28. If the traceability system is available, would you be interested in applying it?

☐ a. Yes. Why_____

☐ b. No. Why not? _____

29. Which of the following traceability system technologies would you prefer to apply?

☐ a. Barcode ☐ b. QR code ☐ c. RFID

30. If you operate the traceability system, are you willing to share the data?

☐ a. Yes. Why_____

☐ b. No. Why not? _____

31. Are you willing to invest or co-invest in setting up a system? (Printing barcode, barcode scanner)

☐ a. Yes. Why_____

☐ b. No. Why not? _____

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