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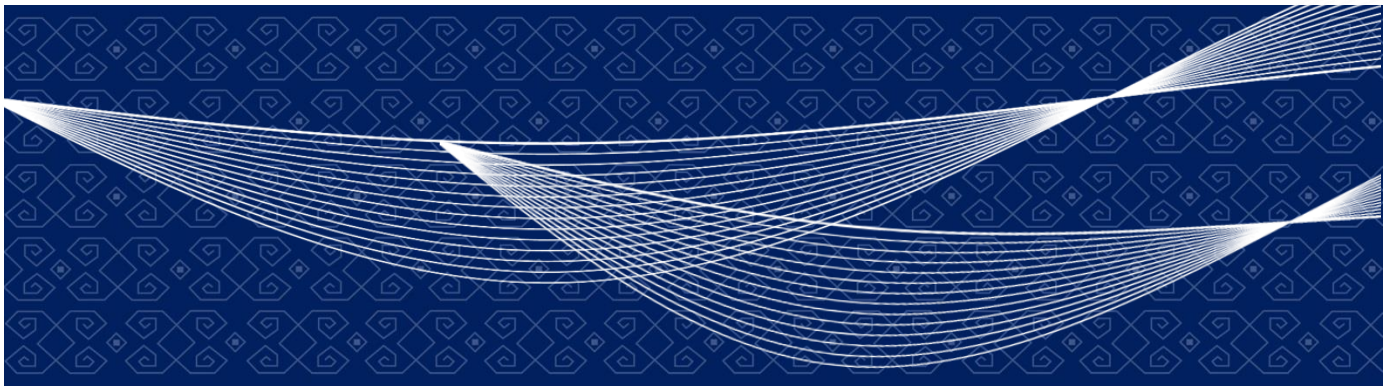

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WORKING PAPER

ISLAMIC MODES OF FINANCING FOR AGRICULTURE: A SUPPLY AND DEMAND SIDES APPROACH

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Abstract

Agriculture has not yet impressed the formal financial institutions as the focal distribution of funds. In the meantime, agriculture has survived the pandemic and has become one of the sectors contributing to positive national economic growth. Unlike its conventional counterparty, who merely acts as a lender or creditor, the Islamic financial institutions presumably grab the opportunity to be farmers' partners, beyond being simply the creditor, due to regulation advantage. Therefore, this research attempts to propose practical models of Islamic modes of financing for the agricultural sector. We conduct qualitative and quantitative approaches from both supply and demand sides. We gathered data from the literature, focus group discussions, questionnaires through surveys and in-depth interviews. A total of 51 works of literature, ten experts from the supply side, seven experts from the demand side, 463 microscale farmer respondents, and six experts for in-depth judgment have been studied, interviewed, and surveyed for being analyzed using content analysis, cross-tabulation, and regression per agricultural subsector of food crops, horticulture, plantation (estate crops), fisheries, livestock, and forestry. The result emphasizes that the off-takers take a strategic role as the market guarantor. Each sector is proven to have a significantly different nature of Islamic institution selection, including social and commercial institutions, the nature of Islamic financing modes, and the financial need-stage in production. *Salam*, or forward transaction, is expected to prom Islamic financial institutions distributing their funds to farmers. We recommend further supportive regulation to attract the financial institution.

Keywords: agriculture, Islamic financing, off-taker, *salam*, supply-demand side

JEL Classifications: D64, G21, G23, O13, Q14

1. Introduction

1.1 Background

Agriculture is one of the strategic sectors and contributes significantly to the Indonesian economy. In addition to being a supplier of food needs for the community and raw materials for industry, the agricultural sector also plays a vital role in reducing the unemployment rate. Based on the classification of the working population according to the main occupation, the agricultural sector is the sector that absorbs the most labor with a percentage of 29.76 percent. In addition, the agricultural sector also provides the second-largest contribution after the manufacturing industry for Gross Domestic Product (GDP) in 2020 (BPS, 2020). The contribution of the agricultural sector to GDP also continues to increase. At least from 2014 to 2020, the value of GDP at constant prices in the agricultural sector continued to experience favorable growth, with a growth rate of 22.05 percent.

The policy of limiting the activity and mobility of people worldwide due to the COVID-19 pandemic impacts the world economy, which is experiencing a contraction, including the Indonesian economy. Indonesia's economic growth began to decline in the second quarter of 2020, which was reflected in a decline in the total GDP of 5.32 percent (YoY) and continued in the third quarter with a decrease of 3.49 percent (YoY), and in the end, made Indonesia officially experience a decline. Economic recession after 22 years since the economic slowdown in 1998. In the fourth quarter of 2020, Indonesia's economic growth was also recorded at minus 2.19 percent.

Nevertheless, the agricultural sector is known as a sector that has a good resilience to the crisis. In 1998, when the Indonesian economy grew by -13.68 percent, the agricultural sector became one of the reliable sectors to support the Indonesian economy and grew positively by 0.18 percent. A similar thing happened in 2020. Amid economic pressure due to the Covid-19 pandemic, the agricultural sector grew by 1.85 percent throughout 2020. Although the growth was not as significant as growth in 2019, which was able to reach 3.76 percent, the development of the agricultural sector during 2020 has exceeded the expectations of business actors. During the economic crisis and pandemic, the agricultural sector can become a safety because food is a priority need that must be fulfilled so that agricultural activities must continue.

The prominent role of the agricultural sector in the Indonesian economy makes this sector necessary to continue to be developed. The availability of agricultural commodities is targeted to maintain national food security so that agriculture also has a role in regulating the inflation rate. Some of the primary entities contributing to inflation in Indonesia are volatile foods originating from the agricultural sector, including rice, red chilies, shallots, to beef and chicken. Price fluctuations in volatile foods can be caused by production constraints, weak farmer institutions, inefficiency in market structures, and government policies. Fluctuating commodity prices can also impact farmers' interest in producing, ultimately can encourage increased imports of agricultural commodities that have high competitiveness compared to local items. The high number of imports will impact the balance of payments deficit and boost inflation due to the exchange rate.

Farmers who are producers of farming activities are the community group that is most vulnerable to poverty. In addition, the gerontocracy phenomenon that occurs in the agricultural sector is also one of the problems that need to be resolved. Some people still rely on elders to lead and govern rather than people who have the actual leadership capacity. Whereas in the era of digitalization, innovation often comes from the younger generation, especially millennials who have entered the productive age of Gen-Z who are preparing to enter their productive age. If this problem continues, Indonesia will experience a crisis of agricultural labor in the youth group. Millennial farmers then set up their communities to share competencies and knowledge.

Financial support is needed to improve the welfare of farmers and the performance of the agricultural sector. Smallholders dominate Indonesian farmers with minimal asset ownership and far from sufficient to meet household needs and farm production. Additional capital through financing/credit is expected to increase farmer productivity so that farmers' income will also increase due to advanced agricultural products. However, the characteristics of agricultural products that tend to be high risk make it difficult for farmers to access capital assistance in the form of financing/credit, especially those from formal financial institutions.

Although formal financial institutions are available and scattered in various rural areas, it does not necessarily make it easy for farmers to access them. The limited access of farmers to formal sources of financing often occurs in administrative procedures and collateral. The characteristics of formal sources of financing that are inflexible and the application process that takes a long time also make this source of financing less competitive with informal financing sources such as middlemen, moneylenders to mobile banks that can provide capital assistance in a short time and without collateral, only with trust. As a result of this phenomenon, the welfare of farmers has also deteriorated because, in addition to having to pay high-interest rates, farmers often have to be willing to sell their farm products at low prices.

The government has also issued various policies and credit programs with multiple schemes to help farmers. Starting from the Rural Agribusiness Development (PUAP) program (Ministry of Agriculture 2011; Budianto et al. 2016; Burhansyah 2016), Community Direct Loan Assistance (BPLM) (Basuno and Suhaeti 2007; Kutsiyah et al. 2016), People's Business Credit (KUR)) (Lubis and Rachmina 2011; Wahyuni et al. 2020), and other programs. However, the facts show that there are still shortcomings and ineffective practices of existing Government programs. Several characteristics exist in the agricultural financing/credit model that are the factors causing the ineffectiveness.

The first characteristic is that the existing agricultural financing/credit is based on a fixed interest rate and requires farmers to repay all borrowed funds when they fall due. Farming activities have a high risk, either due to price fluctuations or production failures. Second, there is a gap between the debtor farmer business sector in the real sector and the formal financial sources as creditors engaged in the financial industry, resulting in the consequence that the risk of business failure will only be borne by the debtor, while creditors will still benefit from the interest rates that have been set at the beginning. The last characteristic is the agricultural financing calculation system which is integrated with non-agricultural financing. This characteristic can result in overestimation, and if it continues to be implemented, it will impact the lack of agricultural financing/credit support following the number of needs.

Agricultural capital itself has unique characteristics that are influenced by various factors. Starting from the type of commodity (Hartoyo and Aniri 2010; Suayb Gundogdu 2010; Ador 2014; Fuad et al. 2015; Rafia 2017; Asnawi et al. 2018; Appiah-Twumasi et al. 2020), the length of time farming (Amuda et al. 2014)), to the socio-economic conditions of farmers (Kakisina 2011; Amuda et al. 2014; Khan 2017; Uduji et al. 2019; Saripudin et al. 2020). Therefore, the financial industry and the farmers need a financing model that can accommodate the characteristics and needs of the agricultural sector. Agricultural financing with the sharia compliance model can be alternative financing. Islamic financing does not recognize any addition to the number of funds borrowed outside of the principal, also because Islamic financing focuses on *maslahah* and does not favor one party, be it creditors or debtors. In addition, the profit-sharing system in the Islamic financing model is considered suitable to answer the enormous risks in farming.

However, policy research related to the Islamic financing model for the agricultural sector is still limited. The study of existing financing models is generally technical and still discusses performance at the industry level using a case study approach. Therefore, research on the Islamic financing model for the agricultural sector is expected to produce policy

recommendations that can encourage the activeness of the Islamic finance sector in facilitating capital assistance for the agricultural sector.

1.2 Objectives

The research objectives include:

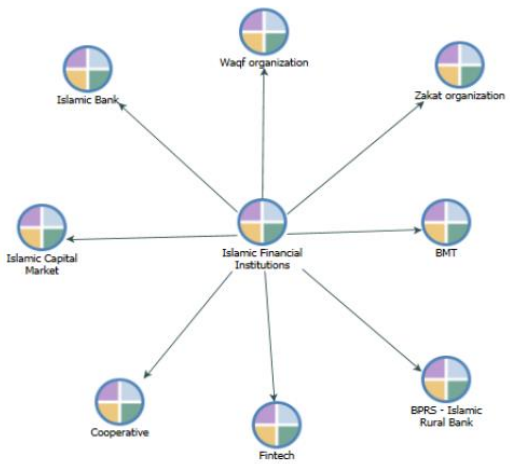
1. To obtain an overview of Islamic financing models for the agricultural sector carried out by the Indonesian Islamic financial sector.
2. To identify the ideal Islamic financing model for the agricultural sector and of particular interest to Islamic banking/finance players.
3. To recommend Islamic financing models ideal for the agricultural sector and are of particular interest to Islamic banking/finance players.

2. Literature Reviews

2.1 Theories

The nature of Islamic finance allows Islamic financial institutions, both banks, and non-bank institutions, to exchange money for products. The regulations allow the financial institution to possess a consequence, become buyer and seller, the owner of assets rented by tenants, and agent of services to collect fees (Financial Services Authority, or *Otoritas Jasa Keuangan*, abbreviated as OJK, 2014). Unlike its conventional counterparty, Islamic financial institutions are not allowed to exchange money for money, and the money must be transacted with products, either goods or services. This condition is supposed to be the opportunity for Islamic financial institutions to deal significantly with the agricultural sector.

In general, Islamic financial institutions are divided into social and commercial institutions. According to literature, the Islamic financial institution that can support the agricultural sector includes *baitul maal wa tamwil* (BMT), Islamic rural bank (*Bank Pembiayaan Rakyat Syariah*, abbreviated as RURAL BANKS), fintech, cooperative, Islamic capital market, Islamic bank, *waqf* organization, and zakat institution (vide Figure 1).



Source: Author

Figure 1 Islamic financial institution for the agricultural sector

Islamic social financial institutions that can finance the agricultural sector, like waqf and zakat organizations, can support the Islamic commercial financial institutions or the leading actor that assures the agricultural products market. Nonetheless, these two have their unique role as a social institution. *Waqf* organization's role is associated with both social and commercial purposes, as it offers endowment funds that can be utilized perpetually. Yet, it provides an entrepreneurial role for productive activities and empowers society, like cultivating *waqf* land (Effendi & Maulida, 2021). As for the zakat institution, its function is prone to provide social activities in the short term and aims to escalate the transformation of the receivers to become the donors, like supervising the farmers to become more empowered and independent (Maisaroh & Herianingrum, 2019).

Islamic commercial financial institutions aim to profit immediately from their financing partners to distribute the profit to their deposits customers. Therefore, the financing scheme for agriculture is dominated by a sale-purchase agreement (*murabahah* and *salam*) followed by an investment agreement (*mudarabah* and *musharaka*). Meanwhile, most farmers in the agricultural sector are microscale farmers who depend on the production cycle, have limited collateral, and face a high-risk production profile if not supported by innovation and technology application. Therefore, the channeling and executing schemes are expected to become the most effective way in the current situation (OJK, 2016). Collaborating with a smaller financial institution is the gateway to reach the farmers. A special agricultural vehicle can be a solution for farmers to ensure the market of agricultural products. They become the intermediary between the farmer and the financial institution (Jazil, 2019; CIBEST, 2015).

From the demand side, agriculture has a unique business cycle as per the subsector. Around 100 million at the bottom of the economic pyramid Indonesian people work in the broad spectrum of agriculture (Ministry of Agriculture, 2018). The subsectors covered are the food crops (paddy and secondary crops), horticultural crops, plantation (estate crops), livestock, forestry (forestry cultivation, captive breeding of wild plants/animals, collecting forest products, and capture of wildlife), fisheries (aquaculture and fish capture), agricultural services and hunting (Statistics Indonesia, 2020). The plantation (estate crops) contributes the most considerable portion to the national economy, i.e., 3.63 percent. The second-largest contribution comes from the food crops subsector, i.e., 3.07 percent. Meanwhile, horticultural crops, livestock, fisheries, and forestry contribute 1.62 percent, 1.69 percent, 2.80 percent, and 0.70 percent, respectively.

2.2 Previous Studies

Muqorobin dan Agustiyani (2017) found that *waqf* assets managed by *nazir* (*waqf* managers) are directed to the agricultural sector in the form of agricultural land, which will be governed by the community using a *mukhabarah* contract. The profit generated is divided based on an agreement, for example, 60 percent for land cultivators and 40 percent for the Indonesian *Waqf* Board or other *waqf* institutions. BWI will manage the donation for the needs and benefits of the community, both in the health, education, social and other sectors.

In the same Islamic social contract, Baskoro (2017) emphasized that the distribution of zakat funds can not only be done with a consumptive pattern but can also be provided with a productive and sustainable scheme, namely through *qardl hasan* financing where the recipient

mustahik is only asked to return the number of funds he received based on an agreed agreement. The refund can then be used or given to other parties who also need it. Financing channeled by Islamic Financial Institutions (IFIs) can assist farmers in using zakat funds through using other contracts other than *qard* such as *mudaraba* or *musharaka* contracts.

The agricultural sector in which the goods are available (ready stock) and have a long term of more than six months or long-term investments can carry an *ijara* contract. At the end of the lease term, the bank can resell it to the farmer. At the beginning of the agreement, the involved parties must agree on the rental price and selling price, including the installments. Banks will benefit from leasing these goods to farmers (Gumilang, 2017).

Bai' al-istisna (purchase by order or manufactured), also known as *istisna* receivables, is a facility for distributing funds to procure investment goods based on rankings. Bai' al-istishna transaction is a contract between buyer and the maker of the goods, where the maker receives an order from the buyer. Both parties agree on the price and payment system, whether done in cash, through installments, or deferred in the future (Ashari and Saptana, 2005).

Kafala in Islamic banking activities is used as a banking service to guarantee the activities or businesses submitted by customers. Guarantee in the form of kafala can be done with the property guarantee model (*kafala bi al-mal*) and person/institution guarantee (*kafala bi al-nafs*). Financially or institutionally, the bank guarantees the party applying for the guarantee service (Ali al-Khafif, 2000 in Azani and Basri, 2021).

The practice of *mugarasah* contracts can be seen, for example, in the application of *mugarasah* Sukuk where this Sukuk are issued in the context of financing the planting and maintenance fees so that investors are entitled to land and produce. Two types of *mugarasah* Sukuk can be issued. Namely, Sukuk issued by landowners or Sukuk issued by land tenants. If the landowner (landowner or land beneficial owner) issues the Sukuk, the Sukuk buyer acts as the cultivator under the Mugharasah contract. The funds from the issuance of the Sukuk are funds for the costs of planting and maintaining plants. If land cultivators issue the Sukuk, the buyer of the Sukuk acts as the owner of the land, where funds from the issuance of Sukuk are used for planting crops. The Sukuk holder is entitled to a share of the plant and land per the agreement (Setyaningsih and Jayaprawira, 2020).

Mukabara is a form of cooperation between sharecroppers and landowners, distributing results according to the agreement between the two parties, while the seeds come from smallholders. The law of the *mukabara* contract is the same as that of the *muzara'ah* contract, which is *mubah* (allowed). The *mukabara* contract is nearly the same as *muzara'ah*, and the difference is only on procurement of planting seeds. The seed in *muzara'ah* comes from the landowner, while the seed *mukabara* comes from the sharecropper (Wahyuningrum & Darwanto: 2020).

Musaqa is a collaboration between the garden owner and the sharecropper, distributing results according to the agreement between the two parties. Cooperation in the form of *musaqa* is different from paying gardeners to take care of their plants because, in *musaqa*, the results do not necessarily depend on the yields of the harvest, while the profits received by gardeners are wages that have a definite amount (Syariffudin, 2003). The object of *musaqah* is a tree that can bear fruit such as grapes, guava, dates, and others. The law of *musaqah* is permissible or permissible. (Wahyuningrum & Darwanto, 2020).

Under the *musaqah* law, farmers are responsible for the land and plants by watering and maintaining them. Cultivators are rewarded for their hard work by getting a certain percentage of their harvest (Antonio, 2001). The *musaqah* contract is not the same as garden workers who are paid money from caring for the plants, but the rewards they receive from the results of the *musaqah* contract are not the same as garden workers who are paid money from taking care of the plants, but the rewards they receive from the results (Nasution, 2020).
The practice of financing with musharaka contracts in agriculture can be done, for example, purchasing fertilizers, cultivating rice fields, managing and others. Farmers can cultivate crops smoothly because costs do not hinder them. (Maskur, 2019).

Muzara'ah is a collaboration between landowners and sharecroppers. The seeds are from the landowner, and both parties agree to divide the harvest according to the agreement (Emily, 2019). According to some *muzara'ah fiqh* scholars, the law is permissible (permissible) because there is a principle of mutual help in it; there is even a hadith which says that whoever owns the land, the land must be planted if he does not want it, it is given to his brother. (Wahyuningrum & Darwanto, 2020)

The agricultural cooperation system has very high social and economic benefits if the practice of *muzara'ah* can be realized under existing provisions, namely the growth of an attitude of mutual help in which the landowner and the cultivators benefit from each other accompanied by a sense of justice and balance (Sahrani and Abdullah: 2002). Of course, this can reduce unemployment, increase domestic agricultural production, and encourage real sector development that supports macroeconomic growth (Ngasifudin, 2016).
Ar Rahn (mortgage) holds one of the borrower's properties as collateral for the loan he received. The goods must have economic value, and the party holding them obtains a guarantee to take back all or part of their receivables (Sayyid Sabiq in Antonio, 2001).

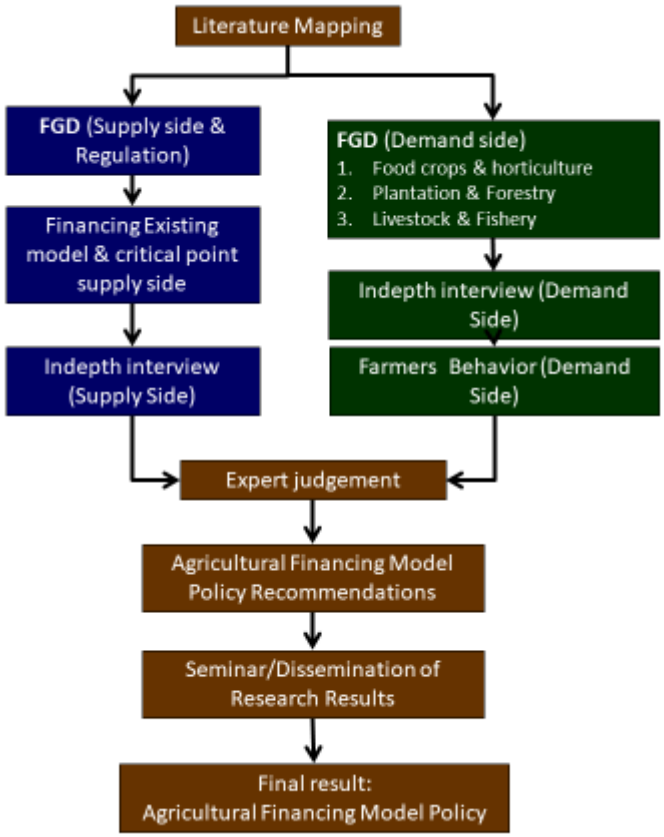
Agricultural financing using *wakala* contracts implement a combination of two contracts at once, namely the salam contract and the wakala contract (uqud murakkabah). In this case, the customer who contacts the bank is a customer with a profession as a farmer/producer. So, in this case, the bank is the buyer if the bank agrees to finance it. However, the purpose of the bank in buying the *salam* asset is not to be used as inventory, so the bank resells the *salam* asset with the *wakala* system, which is to delegate power over the *salam* asset for resale, the person receiving the power, in this case, is the *bai salam* customer concerned (Ningsih, 2020).

Previous studies do not provide the practicality of their proposed modes of financing. Furthermore, the problems have still occurred even though the banking industry has implemented the financing model. This research attempts to fill the gap by providing practical advantages models using the supply and demand sides approach. Therefore, this study offers the perspective of the Islamic financial institution and from the farmers.

2.3 Conceptual Framework

The conceptual framework of this research is shown in Figure 2. The literature is the basis of collecting primary research data. Focus groups of discussions from both supply and demand sides are conducted following the term of references based on the content analysis of the literature so that the participants structurally deliver their perspectives and ideas. Survey to

microscale farmers is expected to enrich the study of the demand-side view. Finally, the proposed model is judged by experts from the Islamic financial institutions before it is disseminated through seminars, resulting in the output of policy recommendations for practitioners.



Source: Author

Figure 2 Conceptual framework of Islamic modes of financing for agriculture from a supply-demand side approach.

3. Methodology

This study embraces a qualitative and quantitative approach to achieve the objectives. This study presents a qualitative approach using primary and secondary data analyzed through content analysis and descriptive elaboration. Meanwhile, we deliver a quantitative approach by primary data that is interpreted by cross-tabulation and regression analyses.

3.1 Source of Data and Data Collection

A total of 51 works of literature, ten experts from the supply side, seven experts from the demand side, this research gathered 463 microscale farmer respondents and six experts for in-depth judgment through focus group discussions, questionnaires, and in-depth interviews.

Table 1 Experts from a supply-side perspective

1	Iwan Rudiyana	LAZ MANDIRI
2	Bobby Porman Manullang	FORUM WAKAF PRODUKTIF
3	Tatiek Kancaniati	BAZNAS
4	Hanawijaya	UUS BANK JATENG
5	Deddy Nofendy	BANK ACEH
6	Noor Aziz	BAZNAS MICROFINANCE
7	Cahyo Kartiko	ASBISINDO
8	Lutfi Adhiansyah	FINTECH
9	Muhamad Abduh Khalid Mawardi	BPRS AMANAH UMMAH
10	Dr. Irfan Syauqi Beik	IPB UNIVERSITY

Source: Author

Table 1 depicts the experts as a data source from a supply-side perspective. The speakers consist of practitioners who have dealt with the agricultural sector.

Table 2 Experts from a demand-side perspective

1	Dr. Feryanto, MSi	IPB University
2	Dr. Ir. Rachmat Pambudy, MS	IPB University; Pengusaha Peternakan
3	Dr Ir Anton Apriyantono	IPB University; ketua Dewan Kopi
4	Ir Nursyamsu Mahyuddin MS	Ketua Umum Indo-Eximpro
5	Syahruddin, MSc.Fin	ICAST UNIDA GONTOR
6	drh Ajat Sudrajat	BAZNAS
7	Deden Kuswanda	BAZNAS

Source: Author

Table 2 represents the experts as a data source from a demand-side perspective. The speakers consist of academicians and practitioners who have dealt with or conducted farmers' research in various agricultural subsectors, including food crops, horticulture, livestock, fisheries, plantation (estate crops), and forestry.

A total of 463 microscale farmers were selected based on their domicile and purposively chosen through convenience sampling and snowballing based on the Islamic financial institutions' recommendations and the field farmers' references. The farmers are not necessarily the institutions' customers. The number of samples is based on the general rule of the Slovin equation for the 5 percent error term, and the samples must be at least 385. We find pretty ample references from snowballing farmers' samples. In the beginning, the collected questionnaires have reached 500. However, after being filtered, the sample has been shrunk to become 463.

Six experts were interviewed separately consisting of *Pak* Anton Apriyantono (Minister of Agriculture for the period 2004-2009 and Chairman of the Indonesian Coffee Council), *Pak* Mat Syukur (Professor, Researcher in the Ministry of Agriculture), *Pak* Nursyamsu (Horticulture Entrepreneur), *Pak* Ajat Sudarjat (veterinarian and Head of the Institute for Community Economic Empowerment). (LPEM) BAZNAS), *Pak* Rokhmin Dahuri (Minister of Marine Affairs and Fisheries 2001-2004), and *Pak* Soni Trison (Lecturer of the Faculty of Forestry and Environment, IPB University).

3.2 Data Analysis

Collected data are analyzed by employing content analysis for the 51 agricultural financing literature. After gathering the result, the main finding is carried out for the term of references of the FGDs, in-depth interviews, and the questions in the questionnaire. The content analysis utilizes NVIVO software to display the coding.

The cross-tabulation analysis is employed to analyze data from verified questionnaires, and SPSS software is utilized as the tool. Meanwhile, regression analysis tests whether the data are significantly applied for all agricultural subsectors based on Islamic financial institutions, the contracts, and the financial need-critical point in production.

The regression analysis used the software STATA to run the data gathered from the questionnaire. The data is coded and categorized accordingly. A robust test also is presented to ensure the accountability and validity of the models.

3.3 Methods

3.3.1 Content Analysis

Content analysis is employed to elaborate the 51 literature and transcribed text from FGDs and in-depth interviews.

3.3.2 Cross-tabulation Analysis

The cross-tabulation analysis identifies the farmers' behavior per subsector of agriculture. The data is analyzed based on the Islamic financial institution (IFI), the contract, and the financial need-critical point in the agricultural production process.

3.3.3 Regression Analysis

Regression analysis is used to test whether each agricultural subsector significantly affects the IFI, the contract, and the financial need-critical point.

$$Y_1 = \beta_0 + \beta_1\, AGE + \beta_2\, GENDER + \beta_3 EDU + \beta_4 INCOME + \beta_5 CAP + \beta_6\, VOL + \beta_7\, OCCUP + \beta_8\, LAND + \beta_9\, COOP + \beta_{10}\, DOM + \beta_{11}\, SUB + \varepsilon$$

Equation 1

Notes:

Y_1 : Islamic financial institution (category)
β_0 : Constant

β_n : Coefficient
AGE : Age
GENDER : Gender
EDU : Education attainment
INCOME : Income per month
CAP : Capital per business cycle
VOL : Selling volume
OCCUP : Occupation
LAND : Land status
COOP : Cooperation membership
DOM : Domicile
SUB : Agricultural subsector
ε : Error term

$$Y_2 = \beta_0 + \beta_1 AGE + \beta_2 GENDER + \beta_3 EDU + \beta_4 INCOME + \beta_5 CAP + \beta_6 VOL + \beta_7 OCCUP + \beta_8 LAND + \beta_9 COOP + \beta_{10} DOM + \beta_{11} SUB + \varepsilon$$

Equation 2

Notes:

Y_2 : Financing contract (category)
β_0 : Constant
β_n : Coefficient
AGE : Age
GENDER : Gender
EDU : Education attainment
INCOME : Income per month
CAP : Capital per business cycle
VOL : Selling volume
OCCUP : Occupation
LAND : Land status
COOP : Cooperation membership
DOM : Domicile
SUB : Agricultural subsector
ε : Error term

$$Y_3 = \beta_0 + \beta_1\, INPUT + \beta_2\, CULTIVATION + \beta_3 HARVEST + \beta_4 POSTHARVEST + \varepsilon$$

Equation 3

Notes:

Y_3	:	Nominal of financing
β_0	:	Constant
β_n	:	Coefficient
INPUT	:	Preparation of production (binary)
CULTIVATION	:	Cultivation process
HARVEST	:	Harvest stage
POSTHARVEST	:	Postharvest stage
ε	:	Error term

3.4 Selected variables

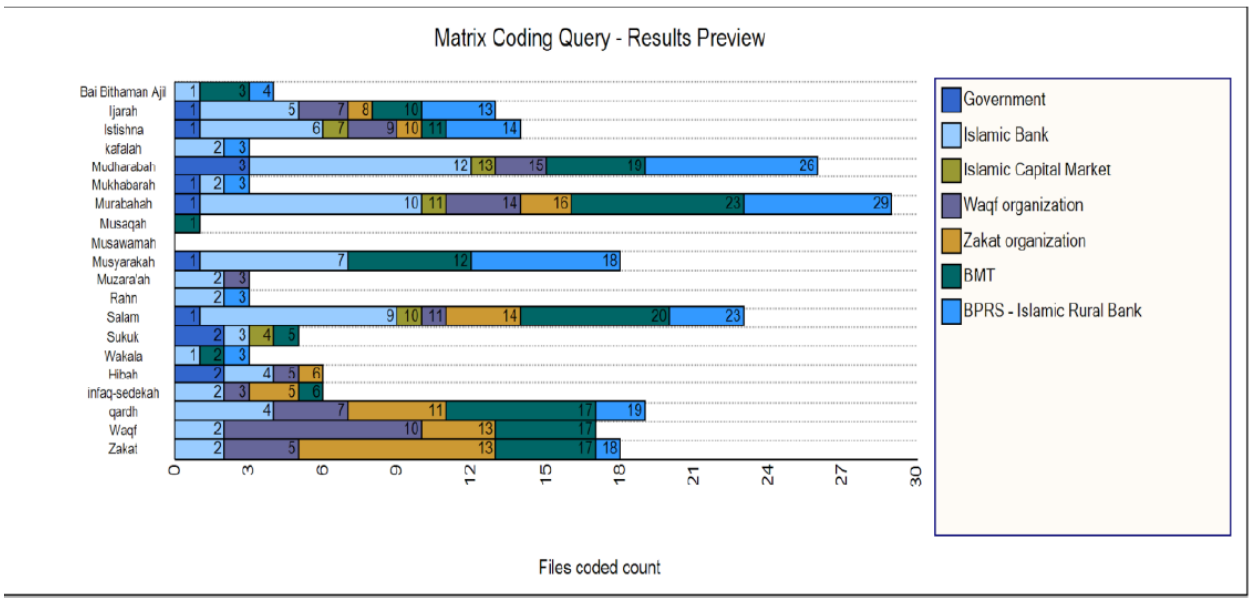
Variable	Definition
Islamic financial institution	From where did the respondent get their financing: Cooperation, *amil* zakat, BMT, Islamic banks, Islamic rural banks, others
Financing contract	What contract does the respondent deal with their financier: zakat, charity, *murabaha, wakala, ijara, hibah, waqf, mudaraba, musaqa*, others
Nominal of financing	How much did the respondent get the financing
Age	How old were the respondent when the survey was done
Gender	What is the gender of the respondent: male (1) or female (0)
Education attainment	At what level the respondent attain their education
Income per month	How much the respondent earn their income per month
Capital per business cycle	How much money does the respondent need for financing per cycle of production
Selling volume	How many the respondent sell their products
Occupation	What is the respondent's occupation regarding agriculture? Is farmer their main occupation or side-job
Land status	Is the land the respondent cultivated/utilized is their land or other's
Cooperation membership	Do the respondent join cooperation membership
Domicile	Where the respondent is currently settled: in Java Island or Outside Java Island
Agricultural subsector	Which agricultural subsector that respondent being involved: plantation, food crops, horticulture crops, livestock, fisheries, or forestry (categorical)
Preparation of production	- Land supply - Provision of basic fertilizer - Preparation of seeds - Provision of pesticides/fungicides - Provision of machinery (tractors)

Cultivation process	- Planting tools/spray - Provision of fertilizers/medicines - Intensive irrigation/irrigation
Harvest stage	Marketing
Postharvest stage	- Provision of postharvest machinery and processing - Added value product

4. Results and Discussion

4.1 Overview of Islamic Financing Models for The Agricultural Sector

Based on the coding matrix based on existing contracts and IFIs, non-profit IFIs, the dominant contracts are *qard*, zakat, and *waqf*. Meanwhile, in profit IFIs, the prevalent contracts are *murabaha*, *mudaraba*, and *salam*. The numbers in the figure represent the number of references coded for different nodes and cases. This amount can be changed depending on the appropriate literature taken by the researcher. However, the facts on the ground do not seem much different. For example, the murabahah contract is recognized by many researchers as the most dominating contract in various IFIs, especially in Islamic banks, BMTs, and rural banks.



Source: Author

Figure 3 Matrix coding of contracts in non-profit and for-profit Islamic Financial Institutions

The agricultural sector consists of six sub-sectors: food crops, horticulture, plantations, fisheries, and forestry. In this study, the forestry sub-sector was not discussed further due to the limitations of previously available research. Meanwhile, the horticulture sub-sector is combined with the food crops sub-sector based on their similarities in Islamic financing.

Based on the literature study, there are variations in the types of contracts used in the Islamic financing model based on the agricultural sub-sector. However, in general, at least four types of contracts dominate the entire sub-sector, namely 1) *mudaraba*, 2) *musharaka*, 3) *murabaha*,

and 4) greetings. When viewed from the type of contract based on its orientation, the four contracts are profit-oriented types of contracts.

	A : 1 Crops and Horticulture	B : 2 Plantations	C : 3 Livestock	D : 4 Fisheries	E : 5 Forestry
1 : Bai Bithaman Ajil	0	0	0	0	0
2 : Ijara	3	2	4	8	2
3 : Istishna'	3	3	4	7	2
4 : Kafalah	0	0	0	1	0
5 : Mudharaba	14	15	11	12	10
6 : Mugharasa	0	0	0	0	0
7 : Mukhabara	0	0	2	0	0
8 : Murabaha	8	6	10	10	4
9 : Musaqa	1	1	0	0	0
10 : Musawama	0	0	0	0	0
11 : Musyaraka	12	13	10	9	8
12 : Muzara'a	1	2	1	0	0
13 : Rahn	0	0	0	0	0
14 : Salam	11	11	8	13	6
15 : Sukuk	4	4	4	7	4
16 : Wakala	0	0	1	0	0
17 : Hibah	3	3	3	4	3
18 : Infaq-Sadaqa	2	2	2	2	2
19 : Qardh	4	4	5	13	4
20 : Waqf	5	8	6	6	4
21 : Zakat	5	5	5	6	4

Source: Author

Figure 4 Mapping of Islamic financing in the agricultural subsector

Based on Figure 4, all non-profit contracts can be applied in all sub-sectors of agriculture. However, not all profit contracts can be used in all sub-sectors of agriculture, such as *muzara'ah* contracts. The fisheries sub-sector cannot apply m*uzara'ah* contracts involving elements of land ownership, especially capture fisheries on the high seas.

4. 2 Characteristics of the Ideal Islamic Financing Model for The Agricultural Sector

In the context of financing, social IFIs have played a significant role in encouraging the agricultural sector in a broad sense, starting from the sub-sectors of food crops, horticulture, plantations, fisheries, livestock to forestry. If the problem is natural factors such as weather/climate or pests/diseases, why are social IFIs very enthusiastic about channeling their financing to the agricultural sector?

The context, as mentioned earlier, shows that the problem is not only the agricultural sector, but it lies in the commercial IFIs itself (supply side), without denying the problems within the agricultural sector itself. The lack of interest in commercial IFIs in the agricultural sector is inseparable from the limitations of the existing commercial IFIs which makes it less likely to play a prominent role in the agricultural sector.

Based on the results of the FGD, this research tries to divide the problem of this commercial worksheet into two, namely internal problems and external problems. Internal problems are problems that come from the commercial IFIs themselves. Meanwhile, external problems are problems that come from outside the commercial IFIs and affect the business model of the commercial IFIs, thus making it unable to play much of a role in financing the agricultural sector.

Source: Author

Figure 5 Problems in Commercial IFIs Providing Financing to the Agricultural Sector

The internal problem of IFIs lies in the human resources of commercial IFIs who see that the agricultural sector is complicated. Human resource is inseparable from the existing commercial IFIs business model. Commercial IFIs such as Islamic banks or rural banks are IFIs that focus on the financial sector, not the real sector. The task of IFIs is to raise funds (funding) and channel funds (landing). Commercial IFIs are not too concerned with the business they finance. What is a concern is how the money disbursed can be returned on time along with the margin.

Commercial IFIs such as Islamic banks are only concerned with documents rather than the real sector they finance. This commercial IFIs business model has been running for a long time, perhaps since establishing the first Islamic bank in Indonesia. Accustomed to only working in the financial sector for a long time, it has become difficult for commercial IFIs to be directly involved in the real sector. Entering the agricultural sector is a difficult thing for commercial IFIs.

In addition to the issue of IFIs human resources, the problem that makes commercial IFIs not interested in financing the agricultural sector is the regulation that has not supported IFIs to play a more significant role in the agricultural sector itself.

There are many external problems in the agricultural sector. Among them are natural factors, erratic prices, the presence of middlemen/moneylenders or mafia. There are at least two reasons. First, the obligation of banks to return third-party funds (deposits funds) along with the yield, which distinguishes commercial IFIs from social IFIs. In social IFIs, the funds raised do not need to be returned to the donors because they are unidirectional (*tabarru'*). The condition makes social IFIs brave and even very enthusiastic to go directly to the agricultural sector.

Second, regulations that do not support IFIs go directly to the agricultural sector. Sharia bank regulations refer to the same laws as conventional banks. The law positions Islamic banks like conventional banks as mere financial institutions and Islamic banks have not been allowed to play a direct role in the real sector.

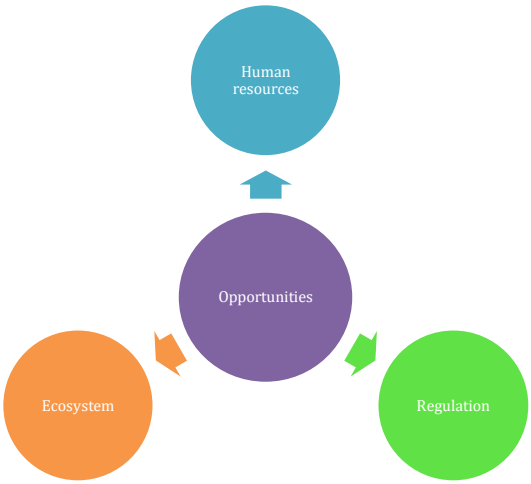
These problems cause commercial IFIs always to use *murabaha* contracts in the distribution of their financing. *Murabaha* agreements based on buying and selling have become "world sweep contracts" in commercial IFIs such as Islamic banks, RURAL BANKS, and BMTs.

Salam contract, which is considered as a mainstay contract for agricultural financing, becomes difficult to implement. Salam contract is ideal for the agricultural sector because it can provide offtake guarantees for agricultural products. However, due to the inadequate mindset of IFIs human resources, coupled with unsupportive regulations, the *salam* contract has become unpopular.

In addition, the applicable regulations are also not compatible with agricultural businesses in terms of loan repayment. The best installment method for farmers is *yarnen*, which pays after harvest. But *yarnen* cannot be applied widely because the existing regulations do not support it.

This paper tries to identify the supply-side and demand-side of agriculture to formulate a financing model. Therefore, this research attempts to identify the formulation of the Islamic financing model for the agricultural sector with a supply-side and demand-side approach, including farmer behavior.

At least three solutions are needed for commercial IFIs interested in financing the agricultural sector. First, increasing human resources for commercial IFIs in agriculture. Second, the adjustment of applicable regulations. Third, build an agricultural business ecosystem.



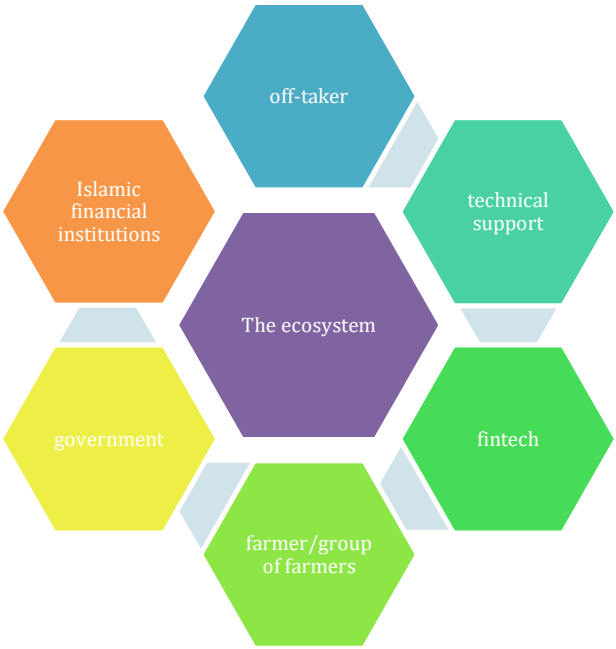
Source: Author

Figure 6 Solutions to Increase the Role of Commercial IFIs in the Agricultural Sector

Improving the quality and quantity of commercial IFIs' human resources is very important. The mindset of commercial IFIs HR that considers the agricultural sector to be complex needs to be changed. Increasing the role of commercial IFIs human resources from just being a "creditor" needs to be changed to becoming a farmer partner. If you want to go directly to the agricultural sector, there must be an increase in the competence of commercial IFIs human resources in the agricultural sub-sector to be financed. Adjusting applicable regulations is crucial so commercial IFIs can play a different role in the real sector, including the agricultural sector.

Islamic banks cannot be equated with conventional banks in that their scope is limited to financial function. Islamic banks need to be given leeway to play a different role in the real

sector. The advancement of the agricultural sector depends not only on IFIs and farmers but also on other parties. Building an agricultural business ecosystem is a must.
Previously, it was necessary to identify bank-able and non-bank-able farmers. Later, bank-able farmers are financed by commercial IFIs with commercial contracts such as *murabaha* or *salam*, while social IFIs finance non-bankable farmers with social agreements such as zakat, *infaq*, *waqf*, grants, or CSR.



Source: Author

Figure 7 Agricultural Financing Ecosystem

Among the stakeholders who need to be involved in agricultural financing. First is the off-taker. Offtakers are very important because they guarantee that they will purchase farmers' products, and Offtaker must exist before production. Currently, what happens a lot is that farmers plant before they know who the off-taker is. Finally, farmers' products are bought by middlemen at low prices. The situation depicts why the *salam* contract is essential because it provides market certainty.

The second is the technical aspect. Contractors, supporting human resources, and technology are essential parties that ensure product quality and quantity. The third is fintech. Fintech can play a role from two sides, channeling, and crowdfunding. In channeling, fintech can cooperate with other IFIs in distributing financing. While in crowdfunding, fintech can collect public funds, both commercial funds and social funds such as cash waqf, to channel them to farmers.

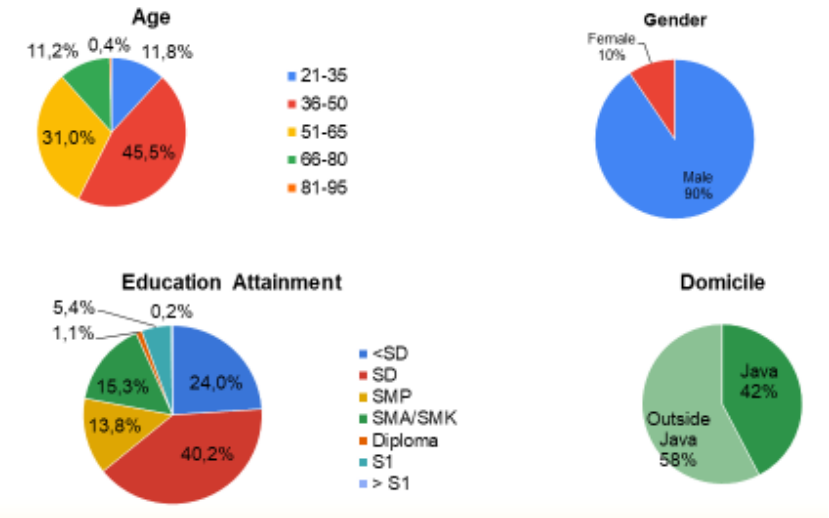
Furthermore, fintech can also play a role as an off-taker of farmers' products. Fourth are farmers/farmer groups: *maqasid sharia*, education/*da'wah*. In addition to IFIs human resources, farmers' human resources also need to be continuously improved so that the products produced are of higher quality.

Fifth is the government. The government can act as a provider of insurance, incentives, extension workers, and subsidies. The government can also make a policy to establish a particular bank for agriculture. Sixth is company. Companies, both state-owned and private, can play a role following their respective capacities. Fertilizer and seed companies can become suppliers of fertilizers and seeds. Insurance companies can provide guarantees: Jasindo. Telecommunications companies like Telkom can support agricultural IoT.

The agricultural sector in Indonesia has exceptional dynamics compared to other economic sectors, even when compared to the agricultural sector in other countries. Therefore, in agricultural financing, it is necessary to understand the characteristics of farmers in each sub-sector as business actors in agricultural activities. In general, according to the scale of their business, farmers can be classified into large, medium, and small scale farmers. Statistically, the size of the scale of the farmer's business is different in each sub-sector. In the food crops, horticulture, and plantation sub-sectors, it refers to the total area of land owned and managed by farmers, while in the livestock sub-sector, it refers to the number of livestock owned. As for the capture fisheries sub-sector, the classification of fishers refers to the fishing capacity according to the type of vessel owned, and in the aquaculture sub-sector, the variety of farmers refers to the area of cultivated land.

Statistically, the picture of farmers in Indonesia in various sub-sectors is dominated by small-scale farmers. According to data from the Central Statistics Agency in 2018, 20,755,762 farmer households controlled less than one hectare of land. Of this number, smallholders, namely farmers with ownership of land fewer than 0.5 hectares, reached 16,257,430 farmer households. This very small land tenure is mainly found in the food crops and horticulture sub-sectors. In the livestock sub-sector, the average ownership of sheep/goat commodities, for example, only ranges from 3 to 10 sheep per farmer. As for the plantation sub-sector, the classification consists of people's plantations and commercial plantations managed by private companies and state-owned enterprises. In addition, in the plantation sub-sector, it can also be identified that there is a pattern of partnership between plantations.

The scale of farmers' businesses in Indonesia, mostly very small, is also characterized by a low level of education and a relatively old age. Agricultural production/cultivation activities are generally seasonal, such as for food crops and horticulture commodities. The plantation commodities typically have a reasonably long duration, where there is a period before producing and after producing. With a very small scale of business and the characteristics of agricultural production that tend to be seasonal, farmers tend to have a reasonably weak bargaining position in the trading system. Farmers tend to be price takers in the price determination process, so it is not uncommon for farmers to experience losses during the harvest season when prices fall due to oversupply. As a result, farmers often have difficulty in providing capital for production activities for the next season. Therefore, with a situation like this, anticipate farmers tend to sell their agricultural products to middlemen. In addition to being an off-taker or intermediary for selling agricultural products, the middleman's role also provides financing assistance for other production activities quickly and without collateral. In general, farmers and middlemen have a close emotional relationship, so that it is not uncommon for middlemen to also play a role in other household economies. Middlemen also offer flexibility in assisting farmers, so they can help when farmers need urgent funding sources.



Source: Author

Figure 8 Age, gender, educational attainment, and domicile of respondent

Most of the respondents are male, are in the productive age of 30-50 years, have last education graduated from Elementary School (SD), and are domiciled outside Java. These characteristics follow the characteristics of national farmers except for domicile. When viewed from the agricultural sector, Java Island is the most fertile area, which requires land, considering the features of the land on this island. However, agriculture in this study is not limited to land agriculture but also aquatic agriculture and animal husbandry. If you look at the potential for marine agriculture, then areas outside Java should dominate (Figure 8).

4.2.1 Plantation (estate crops)

The plantation sector dominates the agricultural sector in which the respondents of this study are involved. Plantation farmers in this study revealed the financing needs for their business from business behavior based on the procurement of production inputs (upstream) 25 percent, cultivation process (process) 33 percent, harvest 26 percent, and postharvest 16 percent (downstream).

According to farmers, agricultural financing for the Plantation Sector is much needed in the cultivation process or the production process of plantation products. Based on an in-depth interview with *Pak* Anton Apriantono, the most needed cultivation process is mentoring, even from planning to postharvest. The second critical point, according to farmers, is that financing is needed at harvest. As stated by *Pak* Rokhmin Dahuri, farmers should think about the concept of the value-added economic value of agricultural products to enjoy higher incomes than relying solely on selling unprocessed raw crops. The third is the procurement of production inputs. Plantations require quality planting equipment and raw materials to produce quality products, such as procurement of administrative applications accompanied by periodic assistance (results of in-depth interviews with *Pak* Nursyamsu and *Pak* Anton Apriantono). Finally, postharvest requires financing to add value to the resulting product.

Most plantation farmers in this study choose to finance their agricultural businesses with internal financing or do not require capital. Second, they get funding from *amil* zakat institutions, then conventional commercial banks, government grants, and cooperatives are in

the following order. Although more than half (52 percent) of the plantation farmers in this study have become cooperatives, in reality, they still do not consider cooperatives to be at least half of the sources of agricultural financing.

These results indicate that in this sector, farmers still think they do not need financing. It could be that farmers need more investment than working capital which this study tends to raise. Investment for the plantation sector can be in the procurement of administrative applications and the effectiveness of the mentoring function (results of an in-depth interview with *Pak* Anton Apriantono).

4.2.2 Food crops

This sector occupies the second position after plantations that farmer respondents in this study cultivate, which is in line with nationally the most widely cultivated sector by Indonesian farmers. Like plantation farmers, food crop farmers need financing for the cultivation process (31 percent) and then for production inputs (26 percent). In contrast to the Plantation Sector, food crop farmers do not pay more attention to the needs at harvest and postharvest than in the previous stages. This farmer's behavior shows that Indonesian food crop farmers still need education related to adding value-added to the economic value of agricultural products. This behavior can also be a concern for Islamic banking in fostering farmers.

A third of food crop farmers choose not to get agricultural business financing at this time, and this percentage is higher than in the Plantation Sector. Choices for other financial institutions currently choosing food crop farmers are cooperatives, private finance, families, and commercial banks. The results of the in-depth interview with *Pak* Ajat Sudarjat stated that farmer groups who are closely related to cooperatives would tend to choose cooperatives as a source of financing. This study shows that the respondents of food crop farmers already have a solid farmer group that cooperates with cooperatives. The results of farmer behavior also show that although farmers who obtain financing from cooperatives agree that they will apply for Islamic financing for their agricultural businesses, half of them still choose cooperatives as a source of financing.

4.2.3 Horticulture crops

Horticulture is the third sector engaged in by the respondents of this study, even though the agricultural sector is currently popular during the COVID-19 pandemic, which has limited space for movement. The popularity of horticulture is more prevalent in urban areas, while the majority of the respondents in this study are in rural areas outside Java. Hydroponic and aquaponic farming technology in horticulture is a solution for farmers with limited land or narrow yard. Farmers can open up business opportunities with adequate sources of income (Arsyianti et al., 2021).

The need for financing for horticultural farmers in this study was during the cultivation process. The popularity of hydroponic and aquaponic cultivation technology can be a trigger for today's needs. The second position is when farmers need to procure production inputs. The results of the in-depth interview with *Pak* Nursyamsu show that farmers need not only working capital but also investment in the procurement of business infrastructure. Seventy respondents of horticultural farmers are prominent farmers or make the profession of farmers their primary

source of income. Fifty-four percent of their land, only 28 percent do not use land belonging to others. Meanwhile, 18 percent own land while borrowing other people's land. Horticultural business development should also pay attention to the value-added of the economic value of agricultural products. However, only 43 percent of farmers pay attention to this need during harvest and postharvest.

Pak Nursyamsu also supports the *Merdeka Belajar Kampus Merdeka* (MBKM) program, which initiates students to collaborate with industry in the field. Students can become extension workers, coaches, and mentors for farmers to help make their businesses successful. The MBKM program needs to be implemented massively for the agricultural sector. Students can directly experience agricultural practices in the field, and farmers also get knowledge and guidance to help their business succeed.

As many as 60 percent of horticultural farmers are members of certain farmer groups. The involvement of their farmer groups is also reflected in the source of business financing, more than a quarter of which comes from cooperatives, after conventional commercial banks, which are the highest source of financing. External sources of financing more dominate horticultural agriculture than without financing, personal or close relatives. This condition shows that at the current position, the horticultural sector has received branding in financial institutions. IFIs need to pay attention to this and start working on the horticultural market.

4.2.4 Livestock

Farmers in the livestock sector are the group with the most significant number of members of farmer groups, reaching 68 percent of the total farmer farmers. The results of cross-tabulation of farmers and breeders with sources of financing show that, like the Horticulture Sector, cooperatives are the second-largest source of financing after conventional commercial banks. A total of 68.1 percent of breeder farmers obtained external commercial financing sources (conventional commercial banks, cooperatives, BMTs, and finance companies), 19 percent from external social (*amil* zakat institutions and government grants), the rest did not need funds or from personal funds. The dominance of external financing sources can also consider IFIs to target breeder farmers as cooperation partners, accompanied by comparative studies with conventional commercial banks and cooperatives that have built markets and are close to them.

Farmers believe the tipping point of the Livestock Sector to be mainly in the livestock cultivation process. However, the results of an in-depth interview with *Pak* Ajat Sudarjat showed that breeders need funding for the procurement of cages before livestock processing. *Pak* Ajat revealed that the facts on the ground show two large groups of farmers, namely plasma and core partners. Plasma farmers provide cages, workers, and pen equipment. Meanwhile, the core partner farmers provide day-old chickens, medicines, and the market for livestock products. The limited ownership of capital has led to most farmers becoming plasma farmers (approximately 90 percent) and partnering with core partners (roughly 10 percent). IFIs can fully assist farmers in the procurement process, but farmers need off-takers who become guarantors in the cultivation process. In this case, it could be the core partner farmers who become off-takers, but the essence of helping to develop plasma farmers also needs to be supported and paid attention to by the IFIs.

4.2.5 Fisheries

The critical point of the Fisheries Sector for financing needs is similar to that of the Horticulture Sector. Only 43 percent pay attention to agricultural products to provide value-added economic value. Pak Rokhmin Dahuri also emphasized that fishery farmers need to increase the value of their agricultural products by being briefed on the importance of added value to increase their income, rather than relying solely on the export of fishery raw materials. Indonesian fishery products are the world's leading products; farmers need to be aware of their positioning in the world's eyes to pay attention to agricultural products seriously. Fish farmers still consider the aquaculture process to be a critical stage that requires external financing.

Fisheries farmers rely more on internal or external sources of social financing. Only 13.7 percent took commercial external financing sources (cooperatives and conventional commercial banks), and this sector is still not widely worked on by the IFIs. Moreover, only 23 percent of respondents are members of farmer groups, indicating that there are still many fishery farmers who do not yet have a community as a means of increasing their business network. Commercial financial institutions need certainty about the characteristics of customers who can be trusted and can become partners in advancing the business. Farmer groups are believed to be the mainstay of guaranteeing the characteristics of fishery farmers.
The results of in-depth interviews with *Pak* Rokhmin Dahuri also show that fishery farmers need to upgrade their sociological understanding. The potential for capturing fisheries outside Java is tremendous, and the transmigration of fishery farmers is required to understand the distribution of fishing areas. Consequently, especially the government, it is necessary to pay attention to the need for assistance from fishery farmers on the island of Java, not providing small capacity fishing boats but educating fishing areas. The provision of modern fishing boats with a more wide-ranging fishing capacity and reach needs to be provided for fishing areas outside Java.

4.2.6 Forestry

Currently, the Forestry Sector is still in the lowest position in the agricultural sector, which is involved in research respondents and farmers at the national level. The potential of forestry farmers is vast, and forestry farmers need to be educated regarding forestry agricultural products, which are currently dominated by timber forest products. Forestry agriculture consists of timber forest and intermediary agriculture that can be empowered in forest areas, such as agroforestry.

Respondents believe that the financing needs for forestry agriculture are in the cultivation process. In this sector, respondents understand that harvest and postharvest yields require the most funding. At this time, farmers who rely on wood products certainly need a variety of supporting equipment that can help the harvest process and postharvest such as marketing and processing wood forest products.

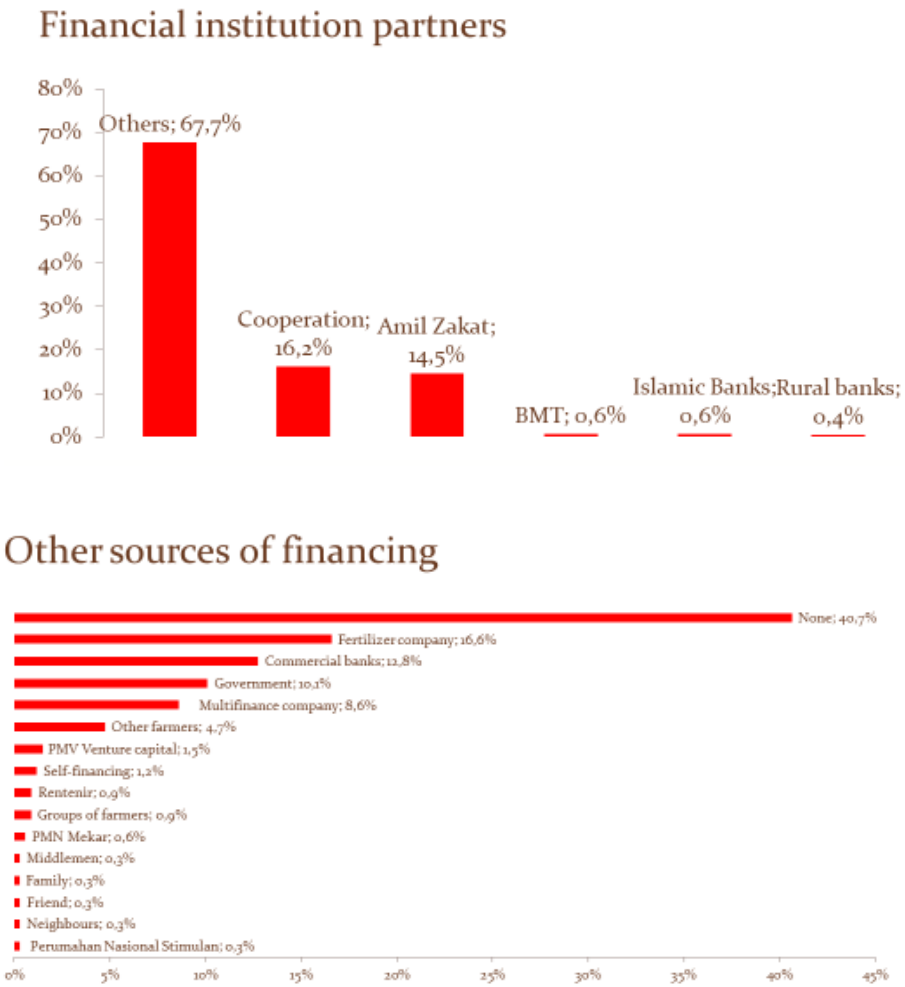
However, forest farmers need to understand that the forestry sector does not only include timber forests. Farmers can use the land and harvest waiting period to produce other agricultural products. The results of in-depth interviews also confirm this. Including forestry, farmers can get additional income from the tourism sector through the concept of ecotourism.

Forestry farmers still rely on internal and external social financing sources (*amil* zakat institutions). The rest, 42.9 percent of them rely on external commercial sources (cooperatives and middlemen/lenders). Only 14 percent of forestry farmers are members of farmer groups. Fifty-seven percent of forestry farmer respondents rely on this profession as their primary source of income. Fifty-seven percent of them also cultivate forestry that is not on their land. Only 29 percent have their land to grow.

The immense potential of the non-timber forest should be a concern for IFIs not only for financing distribution but also for educating forestry farmers. They need to be strengthened in the guidance and extension of agricultural forestry products that cover cross-sectoral. This research expects forest farmers to realize the potential of non-timber forest across sectors.

4.3 Islamic Financing Models Recommendation

Respondents mainly attained financing from non-Islamic financial institutions, including conventional commercial banks, government, family, friends, neighbors, multifinance companies, and middlemen. However, most of them applied to none of them, and instead, they financed their business with their funds (Figure 9).



Source: Author

Figure 9 Source of financing

As for regression analysis, each subsector is proven to have a significantly different effect on IFIs. The notion implies that plantation, food crops, horticulture crops, livestock, fisheries, or forestry contribute additionally to IFIs. The business cycle of each subsector is exceptional. For example, horticulture serves the shortest production period among others, thus banks or other formal institutions eager to finance this subsector, relative to other sectors. Meanwhile, livestock has been involved in a predetermined standard system that has been rooted for years, ensuring the financial institution is their partner. All other variables are proven to have significant effects on IFIs selection. Only the respondent's capital, occupation, and domicile are not established to influence Islamic financial institution selection significantly. The older respondent shows a significant contribution to IFIs selection. Male respondent contributes significantly towards IFIs selection. Higher attainment in education also offers a substantial effect on IFIs. Income also implies important implications towards IFIs selection. Selling volume significantly affects toward IFIs selection. The ownership status of cultivated land, as well as cooperation membership, greatly influence IFIs selection. The condition forces IFIs to have a more effective strategy to grab this segment to become more attentive.

Table 3 Determinant of Islamic financial institution selection

Variable	Coef.	Robust std. err.	p-value
Constant	3.855	0.597	0.000***
AGE	0.210	0.121	0.083***
GENDER	1.143	0.315	0.000***
EDU	0.240	0.078	0.002***
INCOME	-0.209	0.101	0.038**
CAP	0.084	0.137	0.540
VOL	0.339	0.091	0.000***
OCCUP	-0.303	0.241	0.211
LAND	-0.328	0.184	0.075*
COOP	-2.516	0.256	0.000***
DOM	0.317	0.225	0.160
SUB	-0.450	0.093	0.000***

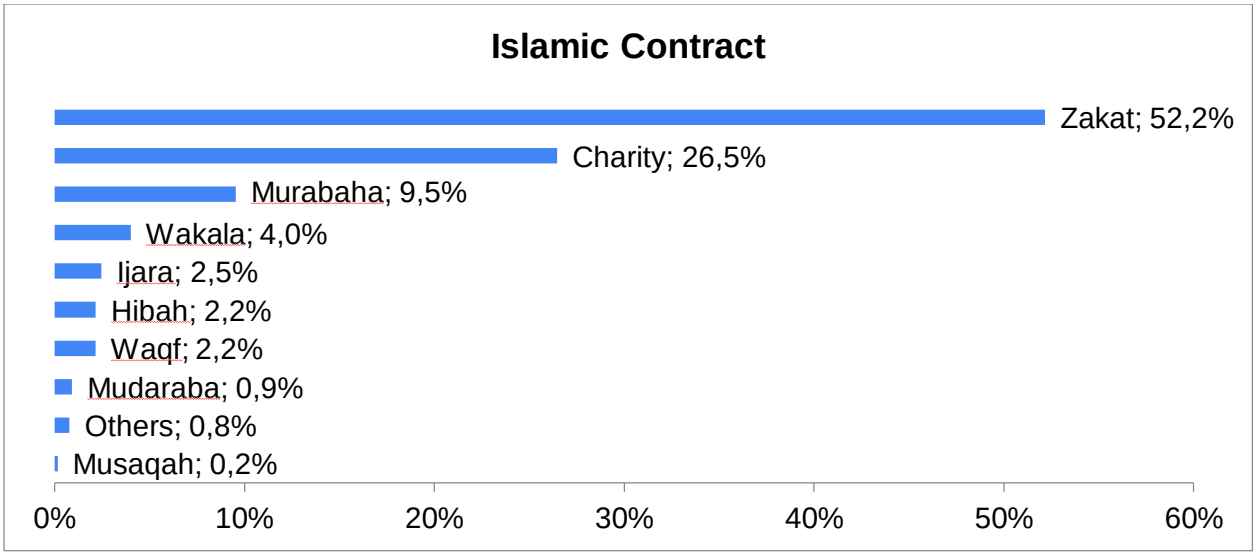
```
Linear regression                               Number of obs =     463
                                                F( 11,   451) =   31.81
                                                Prob > F      =  0.0000
                                                R-squared     =  0.2979
                                                Root MSE      =  1.7976
```

Source: Authors' calculation

Notes: ***significant at 99 percent confidence level, **significant at 95 percent confidence level, *significant at 90 percent confident level

At the existing ambiance in agriculture, a social contract has dominated the market. The majority of respondents use zakat and charity contracts for their financing scheme with IFIs (Figure 10). It is followed by *murabaha*, the most popular contract in the Islamic financial industry, the sale-purchase agreement. *Salam* has not familiarized itself with the farmers.

Although the farmers presumably have practiced salam with the middlemen, they do not know what kind of contract involves future product delivery. The difference is some middlemen presumptuously offer unfair prices to the farmers. This Islamization of their contract presents the prioritized solution in this matter.



Source: Author

Figure 10 Islamic contract for agriculture

Age, education attainment, occupation, and land ownership are not proven to affect this model significantly. However, the subsector is almost proven to substantially affect Islamic agricultural financing contracts by only a 0.1 percent error term gap (which means at 89.9 percent confident level). Gender, income, capital, selling volume, cooperation membership, and domicile significantly contribute to Islamic contracts. The result is presented in Table 4.

Table 4 Determinant of Islamic contract

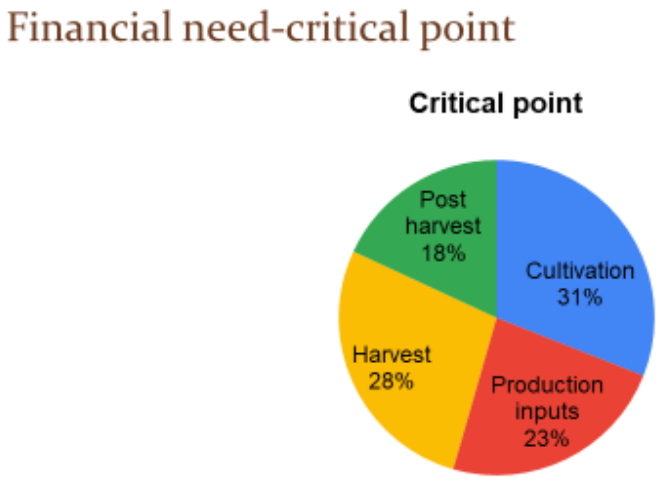
Variable	Coef.	Robust std. err.	p-value
Constant	4.307	0.932	0.000***
AGE	0.117	0.191	0.540
GENDER	-1.436	0.563	0.011**
EDU	0.054	0.136	0.690
INCOME	-0.672	0.180	0.000***
CAP	0.540	0.250	0.031**
VOL	0.332	0.172	0.054*
OCCUP	-0.235	0.441	0.596
LAND	0.430	0.343	0.211
COOP	3.673	0.572	0.000***
DOM	1.306	0.414	0.002***
SUB	-0.238	0.145	0.101

```
Linear regression                               Number of obs =     463
                                                F( 11,   451) =   11.47
                                                Prob > F      =  0.0000
                                                R-squared     =  0.3413
                                                Root MSE      =  3.0368
```

Source: Authors' calculation

Notes: ***significant at 99 percent confidence level, **significant at 95 percent confidence level, *significant at 90 percent confident level

All subsectors in agriculture are the majority in need of financing at cultivation and preparation for production (input), i.e., 54 percent. Meanwhile, harvest and postharvest stages are acknowledged to have less financing (vide Figure 11).



Source: Author

Figure 11 Critical point of financial aid in agriculture

Harvest and postharvest stages are proven to have a significant effect on the amount of financing. Meanwhile, the preparation of production (input) and cultivation are not proven to affect financing significantly. The figures imply that farmers' critical point for financing is in the marketing stage and adding values for their products, rather than during the production process. The model should allow a marketing approach rather than a selling approach that only depends on what products they have been cultivated. All subsectors are indifferently in need of financing at the beginning of production.

Table 5 Critical point of financial aid in agriculture towards the amount of financing

Variable	Coef.	Robust std. err.	p-value
Constant	1.281	0.085	0.000***
INPUT	0.084	0.079	0.285
CULTIVATION	0.044	0.074	0.557
HARVEST	-0.249	0.080	0.002***
POSTHARVEST	0.209	0.081	0.010***

```
Linear regression                               Number of obs =     462
                                                F(  4,   457) =    3.70
                                                Prob > F      =  0.0056
                                                R-squared     =  0.0280
                                                Root MSE      =  .74016
```

Source: Authors' calculation

Notes: ***significant at 99 percent confidence level, **significant at 95 percent confidence level, *significant at 90 percent confident level

Based on the identification of the supply side and demand side and previous CIBEST research, the following is an initial identification of the formulation of the role of IFIs and other stakeholders in the Islamic financing scheme for the agricultural sector.

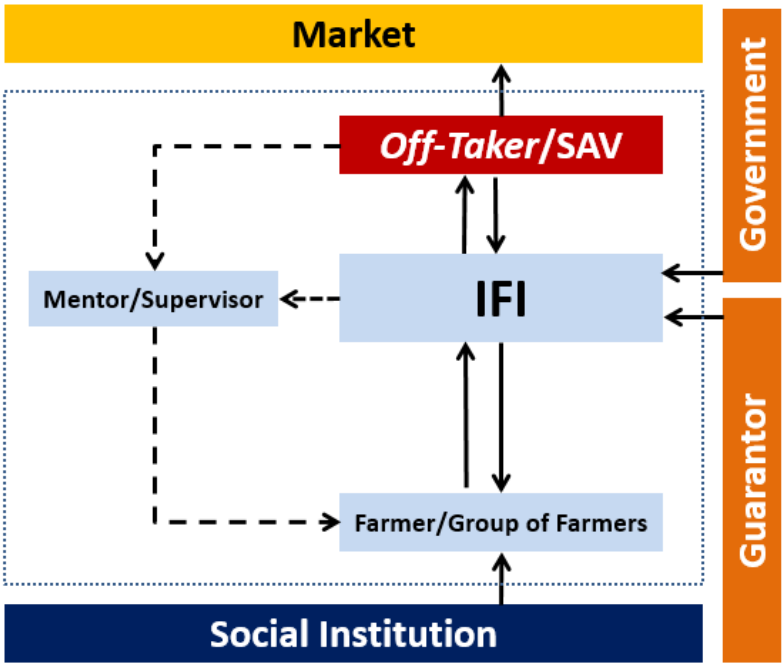
Table 6 Modes of financing for agriculture

	Farmer/Groups of Farmers	**Fintech**	**Technical Support**	**Off-taker/ Corporate/ special agricultural vehicle (SAV)**	**IFIs**	**Government**
Food crops	Unbankable - administrative		Supervision 1) business process, 2) fertilizer, 3) milling, 4) capital	Middlemen, seed, and fertilizer supplier	social	Tax incentives, Sessions of training and education, political will towards agriculture
Plantation (Estate crops)	-Unbankable – administrative -Community plantation -Commercial plantation		Supervision	Middlemen, external party, pick-up approach	social	
Horticulture crops	Bankable – commercial banking, micro-bankable - cooperation	High-risk, newcomer, millennial, middlemen custome	Fintech and off-taker/local middlemen integration, internship program of MBKM	Middlemen (emotional), ensemble the top customer, risk-taker	Commercial banks, cooperation	

		r leftover				
Livestock	- Plasma - Sole partner		Plasma supervision to become a sole partner	External party, social	cooperation	
Fisheries	Unbankable – non-groups of farmers		Large-scale ship support, supervision, transmigration to the outside of Java Island	Fish auction	social	The regulation about transmigration and potential assessment outside Java Island
Forestry	Unbankable – product innovation		Psychological support for farmers to encourage production in agroforestry, ecotourism, and other potential forestry products, not only woods.	Middlemen, lumber company	social	Social forestry

Source: Author

In general, the agricultural financing model is shown in Figure 12.



Source: Author

Figure 12 Islamic Financing Model for Agriculture Sector in General

The generally recommended contract is the *salam* contract. Parallel greetings provide space for farmers to be assisted by off-takers in obtaining markets, including IFIs. Practices in the field that IFIs face when dealing directly with farmers in general in all sectors are administrative reporting, product availability assurance, and government regulatory support, which does not provide incentives for IFIs to provide financing to farmers.

The marketing approach, namely ensuring market availability, is considered the most appropriate method for financing the agricultural sector than the selling approach, which is selling what is available. Therefore, the agricultural financing system needs to be supported by stakeholders and carry out its role effectively in the field. The following is an explanation of Figure 12.

1. Islamic financial institutions (IFIs) are expected to support the agricultural sector and pay attention to farmers with various components: off-takers/SAVs, technical institutions, guarantee institutions, and the government. Off-taker/SAV guarantees product availability for IFIs as has been practiced so far in the field. If IFIs provide direct financing to farmers, they must invest in technical institutions that will guide, foster, and provide counseling to farmers. IFIs acts like an entrepreneur investor who runs and oversees his business to be successful. The guarantor institution can be an insurance company or a special guarantee company. The government provides incentive regulations to encourage IFIs to provide financing to the agricultural sector.
2. Off-taker/SAV is currently the most strategic institution for farmers. Unbankable farmers are very dependent on off-takers/SAVs who have capital, funds, and agricultural materials. Off-takers/SAVs can help IFIs ensure the availability of goods and provide market certainty for farmers. Off-takers/SAV can also offer guidance and counseling for farmers because of the relatively built emotional closeness. When

transacting with farmers/groups of farmers and IFIs, off-takers/SAVs need to have an Islamic contract. The recommended contract is *salam*.

3. Many farmers/Groups of farmers are still unbankable. Only horticultural farmers and breeders have bankable potential. Farmers/groups of farmers still need guidance and counseling to produce quality agricultural products that are competitive from technical institutions. Farmers/groups of farmers need market certainty so that the business cycle runs smoothly and that the marketing approach is more appropriate to be practiced. If the market has been obtained, the price can be estimated, and farmers and buyers of agricultural products get a win-win solution.
4. Technical institutions consist of human resources (HR) who can help make the agricultural business process successful. The function of technical institutions is to provide counseling and guidance to prepare inputs, cultivate and prepare harvests to have more added value. The human resources of technical institutions also assist in the preparation of the necessary administrative completeness. Human resources can be recruited directly by IFIs for their investment in farming or under the guidance of an off-taker/SAV or students participating in the Merdeka Learning Independent Campus (MBKM) internship program empowered by both universities and industry.
5. Fintech is a medium for utilizing technology which is expected to be able to expand inclusiveness among farmers. Fintech is a unique financing company or is also a marketplace that ensures market availability for farmers. Currently, off-takers/SAVs and fintech are still operating separately, even though these off-takers/SAVs have experienced so that they dominate the market more and can work with top-ranking farmers because of their emotional closeness. As a result, fintech is exposed to the risks and challenges of getting 'leftover' farmers from off-takers/SAVs. This model seeks to integrate fintech and off-taker/SAV because both should work together and benefit each other. Fintech masters technology and can provide a market for off-takers/SAVs. Off-takers/SAVs can also help fintech to approach high-ranked farmers/groups of farmers.
6. The government, as a policymaker, should provide incentives to revive the agricultural sector. The Ministry of Finance can provide policies related to tax incentives for financing the agricultural sector. Bank Indonesia and the Financial Services Authority can establish non-performing-financing (NPF) policies specifically for the agricultural sector, which naturally produces seasonal products, including how the *yarnen* (pay at harvest) system can be accommodated. The Ministry of Education and Culture and the National Committee for Islamic Economy and Finance can encourage the practice of the MBKM internship program for the agricultural sector, especially for micro farmers.

Supporting stakeholders colored in orange in Figure 8 indicate that these stakeholders are highly recommended to be available in the system considering the marketing approach suggested by this study. Markets play an essential role for farmers as users of agricultural products, and the availability of this market can determine prices to prevent losses for farmers. In the end, the market was able to convince IFIs to provide financing for farmers.

The guarantee institution is a separate entity that can guarantee or back up Islamic financing from IFIs for farmers. Guarantee institutions can be in the form of insurance products, guarantee companies, social Islamic financial institutions, or guarantee companies that provide agricultural materials, including seeds and fertilizers. Guarantee institutions are expected to provide relative security for the distribution of Islamic financing for agriculture.

5. Conclusion

The agricultural sector can be prearranged Islamic financing from financial institutions but needs to be supported by stakeholders who effectively carry out their respective roles. The Islamic financing model needs to involve all relevant parties so that Islamic financial institutions, both commercial and social, are interested in distributing Islamic financing for the agricultural sector. The recommended financing contract for the agricultural sector, in general, is a *salam* contract because the production characteristics of the agricultural sector are dominated by seasonal periods.

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