

Institutional Analysis of *Shariah*-compliant Agribusiness

A Technography of A Mushroom Business
in Cisarua Sub-district, West Bandung
Regency, Indonesia

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Indonesia

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Abstract

Cisarua sub-district in West Bandung Regency, Indonesia was famous of its mushroom production since 1980. However, mushroom farming in Cisarua encompasses diverse constraints imposed by different institutional prescriptions. In particular, some of the Islamic prescriptions contradict the general economic system and local practices. RumaJamuR, with its embedded *shariah* or Islamic principles, has been operating in Cisarua since 2004. This study explores the operational practices of RumaJamuR as a *shariah*-compliant agribusiness in the midst of a conflicting institutional environment. To investigate operational practices, I do not follow the management literature which conceptualise business as an organisation per sé, but follow the sociology of technology. Thus, I mainly use the concept of operational sequences proposed by Lemmonier (1992). Douglas' conceptualisation on institutional ordering also provides a promising lens for viewing hybrid institutional environment in which RumaJamuR operates. The use of technography in this study has helped me in understanding RumaJamuR business operation, whose results are very useful in portraying both the technical and social aspects of RumaJamuR business operations. It is found that embedded *shariah* principles could lead to effective business operation of an institutionally-adept enterprise like RumaJamuR. The interplay of conformity to *shariah* and ability to respond to the competing institutional demands (both internal and external) has shown how RumaJamuR operates in a hybrid institutional environment.

Keywords: *shariah*, agribusiness, operational practices, business operation, institutions

Table of Contents

Chapter 1	1
1.1. Problem Statement	1
1.2. Context	2
Chapter 2	5
2.1. Theoretical Framework	5
2.1.1. Operational Practice and Sequences	5
2.1.2. Conceptualising Institution: Douglas' Institutional Ordering	6
2.2 Research Questions	8
2.3. Research Field Site	9
2.4. Methodology	11
2.4.1. Technographic Research Design	11
2.4.2. Data Collection Methods	12
2.4.3. Data Analysis	15
Chapter 3	16
3.1. Initiation, Mission, and Development	16
3.2. Operational Practices	18
3.2.1. F0 Production	20
3.2.2. F1 Production	21
3.2.3. F2 Production	22
3.2.4. F3 Production	23
3.2.5. Incubation Process	25
3.2.6. Growing Process	25
3.2.7. Pest and Disease Control	26
3.2.8. Harvesting and Post-harvest Handling	26
3.2.9. Mushroom Processing	27
3.2.10. Recycle	28
3.2.11. Agrotourism (Training/Educational Activities)	30
Chapter 4	32
4.1. Financial Aspects	32
4.1.1. Transparency and Reliable Source of Funding	32
4.1.2. Just and Fair Trading Arrangement	35
4.1.3. Avoiding Scams Element	37
4.2. Structured Interactions	38

4.2.1. Workplace Culture	38
4.2.2. Permanent Employment System and Worker Welfare	39
Chapter 5	42
5.1. RumaJamuR Informal Relationship.....	42
5.2. RumaJamuR Formal and Collaborative Relationship.....	44
5.3. MAJI and Individualist Mushroom Farmers in Cisarua	46
5.4. Initiation of PATIMURA	47
Chapter 6	49
6.1. Discussion.....	49
6.2. Conclusion	54
6.3. Limitations and Recommendations for Future Research.....	55
References	56
Appendices	59
Appendix 1. <i>Shariah</i> -compliant Agribusiness.....	59
Appendix 2. RumaJamuR <i>Shariah</i> Funding Contract Template	62
Appendix 3. RumaJamuR <i>Shariah</i> Funding Scheme	65

List of Tables

Table 1. Elements of operational sequences, adopted from Centre National de la Recherche Scientifique (CNRS), 1977 in Lemmonier, 1992.	6
Table 2. Job division in RumaJamuR	13
Table 3. List of Informants	14
Table 4. Comparison of Different types of Grains based on RumaJamuR experience.....	21
Table 5.Criteria for classification as a <i>shariah</i> -compliant agribusiness	60

List of Figures

Figure 1. Grid-group institutional map (Richards, 2017; Bulte <i>et al.</i> , 2018).....	8
Figure 2. Theoretical framework of this research	9
Figure 3. Map of Cisarua sub-district (bandungbaratkab.go.id/)	10
Figure 4. Integrated Mushroom Farming System in RumaJamuR	19
Figure 5. The operational sequence of mushroom cultivation in RumaJamuR	19
Figure 6. F0 Production	20
Figure 7. F1 Production	22
Figure 8. F2 Production	23
Figure 9. F3 Production	24
Figure 10. Growing Process.....	25
Figure 11. Pest and Disease Control	26
Figure 12. Harvesting and Post-harvest Handling	27
Figure 13. Mushroom Processing	27
Figure 14. Recycle	29
Figure 15. Agrotourism.....	30
Figure 16. RumaJamuR owner is delivering the training (source: organikganesha.com)	46

Glossary

BP3K	: <i>Balai Penyuluhan Pertanian, Perikanan, dan Kehutanan</i> (Extension Centre of Agriculture, Fisheries, and Forestry)
BPS	: <i>Badan Pusat Statistik</i> (Central Bureau of Statistics)
F0	: Filial 0
F1	: Filial 1
F2	: Filial 2
F3	: Filial 3
KUD	: <i>Koperasi Unit Desa</i> (Village Unit Cooperative)
LM3	: <i>Lembaga Mandiri Mengakar di Masyarakat</i> (Independent and Rooted Institution in the Community)
MAJI	: <i>Masyarakat Agribisnis Jamur Indonesia</i> (Association of Mushroom Agribusiness Society Indonesia)
PATIMURA	: <i>Paguyuban Petani Jamur Cisarua</i> (Mushroom Farmers Group in Cisarua)
ROI	: Return of Investment
SOP	: Standard Operational Procedure

Chapter 1

Introduction

In this chapter, the reason for an institutional analysis of *shariah*¹-compliant agribusinesses is explained. First, I elaborate on the current issue that is being experienced by a *shariah*-compliant agribusiness in Indonesia, particularly a mushroom agribusiness in Cisarua, West Bandung Regency, Indonesia. Then, the second sub-chapter presents the context of this research.

1.1. Problem Statement

Experiencing Hybrid Institutional Environment for *Shariah*-compliant Agribusiness

The flourishing *shariah*-compliant agribusiness is a relatively nascent phenomenon in Indonesia. By definition, *shariah*-compliant agribusiness implies a business of agricultural production that works in accordance to *shariah* principles. According to Ab Aziz (2013), a *shariah* agribusiness has an embedded Islamic management system model which contains work ethics and moral values. Being the largest Muslim country, agribusiness in Indonesia has been operating in an environment with immense diversity of regularised social interactions in markets, hierarchies, and local practices. Scott (2014) views that this pluralistic, conflicted environment poses a major challenge for organisations to operate. He also points out that conflicts were seen because there are diverse constraints imposed by different economic, political, or religious prescriptions. For instance, some of the Islamic prescriptions contradict the general economic system and local practices, or even the trading and financing arrangements ([Appendix 1](#)). This situation has been a challenge for *shariah*-compliant agribusiness in Indonesia.

In response to the above explanation, a good understanding of institutions is needed. Moreover, the issue here is not only about multiple institutions and their plurality of rules. It is also difficult to define and consequently study institutions. Ostrom (2009) broadly defines that institutions are the prescriptions that humans use to organise all forms of repetitive and structured interactions at all scales. In a recent overview work, Mary Douglas' notion of an institution is defined as a pattern of performing operations exhibiting a common style (Richards, 2017). Akullo *et al.* (2017), suggest a performative notion of institutions, which focuses on patterned operational practices of a particular society or group in society. They define institutions as patterns of performing operations. Within and between societies, different groups may have developed different patterns that function as interpretive filters for how to deal with particular situations and phenomena. Each society therefore is by default a hybrid institutional environment.

In capitalist economies, business firms particularly exert enormous power over the organisation and mobilisation of economic resources. They create hierarchical frameworks to use direct coercive and regulatory authority over their paid personnel but also form alliances, enter into networks, negotiate contracts, and design and redesign a variety of governance

¹ *Shariah* refers to legislative framework that regulates all aspects of life for Muslims. *Sharia* is derived directly from four main sources: 1) The Holy Qur'an, which is the Holy book that contains the words of Allah "God". 2) *Sunna*, which refers to *Hadith* "sayings", actions, of Prophet Muhammad as the "Messenger of Allah". 3) *Ijma*, which refers to the consensus of all Muslim scholars on a specific issue. 4) *Qiyas*, means "analogy" for the issues that were not explicitly mentioned either in the Qur'an or in the *Sunna* and hence in this case it is declared by qualified scholars who evaluate a measurement through studying rules applied for similar issues (Biancone and Radwan, 2014).

frameworks to oversee their enterprise (Child 2005; Scott 2014). Besides, Williamson (1981) viewed that even with a single organisation, there might be a clash of institutional values, for instance, between a hierarchically organised production division and a sales division ruled by individualist values. He further described, where manufacturing business, organised internally as hierarchies, meet the market, some means is needed to assess and address the obstacles generated by the shift of institutional ordering into the realm of individualistic competition.

Therefore, this research attempts to investigate the operational practices of *shariah*-compliant agribusiness in the midst of a conflicting institutional environment. Within an organisation, there tend to be differentiation on three layers: the *technical*, concerned with production activities; the *managerial*, concerned with coordination activities, procurement of resources, and disposal of products; and the *institutional*, concerned with relating the organisation to the norms and conventions of the community and society (Parsons, 1953; Scott, 2014). In this research, the attention is not only paid to the technical aspects, but also to the social aspects within the operational practices of a *shariah*-compliant agribusiness. Because in various stage of doing business, an entrepreneur also interacts with diverse stakeholders which embedded in a heterogeneous and wider relational system (Scott, 2014). Therefore, the social interactions between *shariah*-compliant agribusiness and related stakeholders are also needed to be analysed.

In order to study the above-mentioned processes, technography is used in this research as an interdisciplinary methodological approach for the integrative study of social-technical configurations (Jansen and Vellema, 2011). Technography enables detailed description of the process of making focuses on a group of actors and their practices and organisation around a group-task (Almekinders, 2011). Thus, by using technography, both the technical and social aspects are not studied separately. One of my scientific concerns of this research is to deepen the understanding of *shariah*-compliant agribusiness. There have been many studies about *shariah*-compliant finance and business in Indonesia, but particular research on operational differences between *shariah*-compliant and conventional agribusiness is relatively still scarce. Therefore, I will cover this concern in the last part of this chapter by introducing a case study of a *shariah*-compliant mushroom enterprise in Cisarua, Indonesia, namely RumaJamuR.

1.2. Context

Shariah and its Influences on Agribusinesses in Indonesia

The words '*shariah*' or 'Islamic laws' refer to religious regulations governing the lives of Muslims. *Shariah* aims at achieving society's wellbeing as defined by *maslahah* or public interest (Febianto, 2011). In *shariah*, Islamic jurisprudence (*fiqh*) determines what is required, prohibited, encouraged, discouraged, or just permissible (Saleem, 2010). As the world's most populous Muslim country, Islamic jurisprudence blended with politics and legal practices in Indonesia. *Shariah*-based law has been given legal and institutional spaces in the country's constitutional system (Otto, 2010). Aceh is one province who is granted a special autonomy to make its own *shariah*-based regional regulations (*Perda Syariah*). Importantly, Islamic jurisprudence also applies to issues such as property, money, employment, taxes, sales, etc. Therefore, there is an Islamic commercial jurisprudence which entails the rules of financial transaction and other economic activity in a *shariah* compliant manner. Consequently, the role of Islamic commercial jurisprudence also influences Indonesian economy and its society social practices.

Shariah permits all kinds of transactions except for *riba* (interests), *maysir* (gambling), and *gharar* (uncertainty), thus, as alternatives, Islam permits profit and loss sharing for financing activities (Febianto, 2011). *Shariah*-compliant finance has emerged as an alternative financing In Indonesia. According to Antonio (2011), *shariah*-compliant finance emphasises the partnership style of financing, which could be useful in improving access to finance for the poor and small business. Moreover, Ashari and Saptana (2005) propose that *shariah* schemes fund can be chosen as the alternative financing model for supporting agricultural development. The *shariah* schemes fund that is commonly used for agribusiness is *Mudarabah*. There are two parties involved in this scheme; the financier, who provides all the money and the entrepreneur who uses his or her skill to invest the money in an attractive business. When a profit is realised, it is shared between the financier and the entrepreneur according to a predetermined ratio. Profit sharing rates must be determined only as a percentage of the profit and not as a lump sum payment. Meanwhile in the case of a loss, providing it has incurred in the normal process of business and not due to neglect or misconduct by the entrepreneur, the financier loses all his or her money, while the entrepreneur merely loses his or her time and effort (Khan, 2008).

At the moment, there have been many studies about *shariah* principles and its influences on businesses. Febianto (2011) argue that the current state of business under unbridled capitalism in the majority of cases in the Muslim world remains far from the Islamic ideal. He further defined *shariah* or Islamic business as all kinds of business activities that cannot limit the ownership of goods or services including the profits, but can be limited in terms of the way it is acquired and the way it is used (according to the Islamic law). However, Maman *et al.* (2017) contend that the principles of Islam do not regulate the technical issues related to the way of cultivation, primary production, yield processing, nor the way to increase quality and quantity of products. In respond to that, I summarised the widely discussed literature on Islamic ethics and Islamic financing that could help us build the general idea of what comprises a *shariah*-compliant agribusiness (see [Appendix 1](#)).

Mushroom Agribusiness in Cisarua, Indonesia

In Indonesia, diverse *shariah* schemes fund many projects such as in annual crops plantation, dairy farms, poultry farms, fisheries, and also horticulture (Adjie, 2012). Reciprocally, there is rapidly expanding upper middle class in this country, as increased awareness about the nutritional benefits of fresh fruit and vegetables becomes entrenched in everyday eating habit (Global Business Guide Indonesia, 2014). An important horticultural commodity in this context is mushroom. Mushroom is considered a fast yielding and nutritious source of food. According to USITC (2010), cultivated mushroom satisfies the needs of health-conscious consumers and are a desirable food, especially for vegetarian. In Indonesia, mushroom has been an emerging agribusiness. The reason for fast spread of the agribusiness could be attributed to better taste, short production period, easy and simple cultivation method, higher profitability and potentiality of the enterprise to provide gainful employment (Pradhan and Nayak, 2014). Therefore, in this research, I took a mushroom agribusiness funded by a *shariah* scheme to be the case of a *shariah*-compliant agribusiness which has been operating in a hybrid institutional environment.

Cisarua sub-district in West Bandung Regency, Indonesia was famous of its mushroom production. Mushroom farming has been developed in Cisarua since 1980 (Zuhdi *et al.*, 2015). In the last five years, there has been a decline in production that causes decreasing number of

mushroom farmers group, from 17 groups with 700 farmers yielded 15 tons per day, currently production capacity is only 5 tons per day (Zuhdi *et al.*, 2015). In relation to that, Zuhdi *et al.* (2015) also show that the constraints found are lack of knowledge about effective mushroom cultivation and the absence of collective agreement of a standard operational procedure among the mushroom farmers. In addition, a study about financial viability of mushroom growers in Cisarua by Sinaga and Gallena (2015) showed that the hindrance for mushroom farming in Cisarua are the unpredictable weather, invasive pest and disease, mismanagement by the casual workers, unfavourable intermediaries, lack of financial capital, and the absence of governmental support.

This research started from my personal curiosity towards RumaJamuR, a viable mushroom business which is known for its strategy on using a *Mudarabah* funding scheme. The case of mushroom farming in Cisarua provides an interesting opportunity on how a *shariah*-compliant mushroom agribusiness operates in a hybrid institutional environment. The problem with mushroom farming in Cisarua encompasses diverse constraints imposed by different institutional prescriptions. In particular, such as the contradicting religious prescription to the economic system and to the changing community shared values. RumaJamuR, with its embedded *shariah* principles, has been operating in an environment in which conflicting demands are made upon them. For instance, in trading and financing negotiation where RumaJamuR hierarchical values need to accommodate individualistic interests of other stakeholders that do not fit with *shariah* principles.

To understand how RumaJamuR operates in a hybrid institutional environment, some theoretical perspectives used for the analysis. In this regard, I believe Douglas' conceptualisation on institutional ordering provides the most promising lens for viewing hybrid institutional environment in which RumaJamuR operates. Because as Selznick argue, the individual organisation's environment is politically and ideologically heterogeneous. Some theories on operational practices also provide necessary insights about how to do a business as explained in Chapter 2.

Chapter 2

Theory and Methodology

In this chapter, firstly I provide the theoretical framework used in this research. The subsequent sub-chapter explains the methodological aspects of the research. As this research designed as a technographic study, I attempt to elaborate why technography fit to the context, and how technography helped me to connect the theory and data collection procedures.

2.1. Theoretical Framework

The theoretical framework used in this research conceptualises operational practices and institutions. The first framework (2.1.1.) provides an understanding in analysing operational practices of a *shariah*-compliant agribusiness in a hybrid institutional environment. As RumaJamuR operates in an environment where there are competing institutional demands, businesses or organisations substantially have diverse understanding on how to organise society and/or doing business. Therefore, to understand how RumaJamuR operates in such an environment, we need to have an elaborated conceptualisation of institutions. The second component of my framework (2.1.2) explains that. Thereupon, we could analyse what are the conflicts between differently configured social ordering in the mushroom agribusinesses in Cisarua and how RumaJamuR operates.

2.1.1. Operational Practice and Sequences

From the general management literature, operational practices imply the methods of operating a business or providing a service. This conceptualisation includes the daily practices that a business carried out in order to achieve its goals. To enrich our understanding related to operational practice, there is a wealth of literature also on operational performance. The categories of leadership, management of people and customer focus were the strongest significant predictors of operational performance (Samson and Terziovski, 1999). From a study of operational practices of U.S. small and medium-sized enterprises in Europe (Prater and Ghosh, 2005) operational practices involve:

1. Cash flow (or financial, in general) management
2. Procurement and production
3. Costumer (or market) acquisition
4. Quality control
5. Human resources management
6. Environmental management
7. Relations and coordination (with related stakeholders e.g. suppliers, distributors, etc.)

To be able to look at how RumaJamuR operates in a hybrid institutional environment, specific phenomenon or processes that I investigated on this research is the operational practices and sequences. As the concept of operational practices explained in the preceding paragraph, I used the concept of operational sequences proposed by Lemmonier (1992). In this research, I do not follow the management literature which conceptualise business as an organisation per sé, but follow the sociology of technology. In studying technology, the anthropological approach looks at business as a socio-technical organisation. Sigaut (1994, p.434) explains that in studying technology, identifying an operation or ‘making’ means locating it in both its physical and social aspects. In his writing of description and analysis of

technical phenomena, Lemmonier defined operational sequence as a series of operations involved in any transformation of matter by human beings. He also stated that the sociological information regarding the actors and context of the technical process taking place also needed to be recorded on the spot. The different elements of this concept are presented in Table 2.

Table 1. Elements of operational sequences, adopted from Centre National de la Recherche Scientifique (CNRS), 1977 in Lemmonier, 1992.

Elements of Operational sequences	Operationalisation
The action	The place, date, time, duration, and location of the action The division of the process into steps
The materials and tools	The matter being worked and its successive states The tools successively used and the movements made while using these tools
The people	The people acting and number of people involved The selection of actors involved (or excluded) from the action The people responses to unpredictable and shifting condition
The social relations	The structure and culture shaped The coordination of the different knowledge bearers The construction of rules and routines

As growing mushrooms implies a sequence of operations that transforms mushroom spawns into different kind of products, this research collected empirical evidence on what operational practices and sequence take place in RumaJamuR in order to deal with the hybrid institutional environment. As summarised in Table 1, this research investigated the elements of operational sequences (the action, the materials and tools, the people, the social relations) in RumaJamuR operational practices (financial management, procurement and production, customer/market acquisition, quality control, human resources management, environmental management, and relations and coordination with related stakeholders).

2.1.2. Conceptualising Institution: Douglas' Institutional Ordering

Institutional theory is among the most vibrant and rapidly growing areas in the social sciences (Scott, 2014). However, the existing literature on institutional theory is a jungle of conflicting assumptions. There has been many different ways in which economists, anthropologists, and other social scientists approach the analysis of institution. Scholars, between and even within disciplines, exert different definitions to deliver the same meaning on understanding institutions and institutional process. Despite the varying institutional thought, I believe institutional theory provides the most promising lens for studying diverse institutional environment.

Bulte *et al.* (2018), in their splendid work on researching empirical application of institutions in the context of agrarian development in West Africa, reveal that economics literature on institutions is still poor in theoretical integration. There is a lack of agreement on where institutions come from, where they are going, and consequently a lack of consensus on

what institutions actually are. The Nobel laureate Douglass North (1991, p. 97) gave a useful starting point by defining institutions as the “humanly devised constraints that structure human interactions”. They are made up of formal constraints (rules, laws, constitutions), and informal constraints (norms of behaviour, convention, and self-imposed codes of conducts), and their enforcement characteristics. Therefore, institutions are the “rules of the games”. A broader perspective on institutions is introduced by Greif in his 2006 paper. He defines institutions as a system of social factors that conjointly generates a regularity of behaviour. In other words, institutions are not simply rules of the game, they are equilibrium outcomes of the games itself. The social factors according to Greif’s view include rules, beliefs, norms, and organisations. Whenever behaviour is governed by expectations about the response of peers, and if these expectations are confirmed by the actual behaviour of others, then such behaviour may be seen as governed by an institution (Greif, 2006).

In this research, I decide to use Douglas’ analytical approach to investigate the hybrid institutional environment in Cisarua mushroom farming where different institutions come together and interact. A major anthropologist, Mary Douglas, developed a useful scheme to analyse institutions in terms of four principles of social ordering (Figure 1). The grid-group diagram has four basic organisational propensities. It represents underlying polarities or tendencies that shape human interaction. Douglas retains Durkheim’s two basic dimensions of social ordering and introduces four modes of institutional ordering: “individualistic”, “hierarchical”, “enclave”, “isolate”. Bulte *et al.* (2018) suggest that in all social formations, the four orderings co-exist and interact. The paramount point about the grid-group diagram is the attention to the importance of interactional effects between differently configured institutional orders. The following are the most significant points I summarised from Bulte *et al.* (2018) explanation on this tool:

- ❖ Each social ordering generates rules and expectations about the behaviour of others. These rules are, at times, informal and sometimes codified and gain formal status. As consequence, agents have to be aware of how these orderings interact, and where to respect institutional boundaries. If differences are respected, different orderings co-exist in a cooperative manner. This situation is illustrated with the inner square of arrows in Figure 1.
- ❖ Mistrust and conflict emerge when agents within one ordering fail to comprehend the rules and assumptions respected by agents under other orderings. If this situation happens, different orderings tend to become more extreme and uncooperative, as depicted with the outward bold arrows in Figure 1.

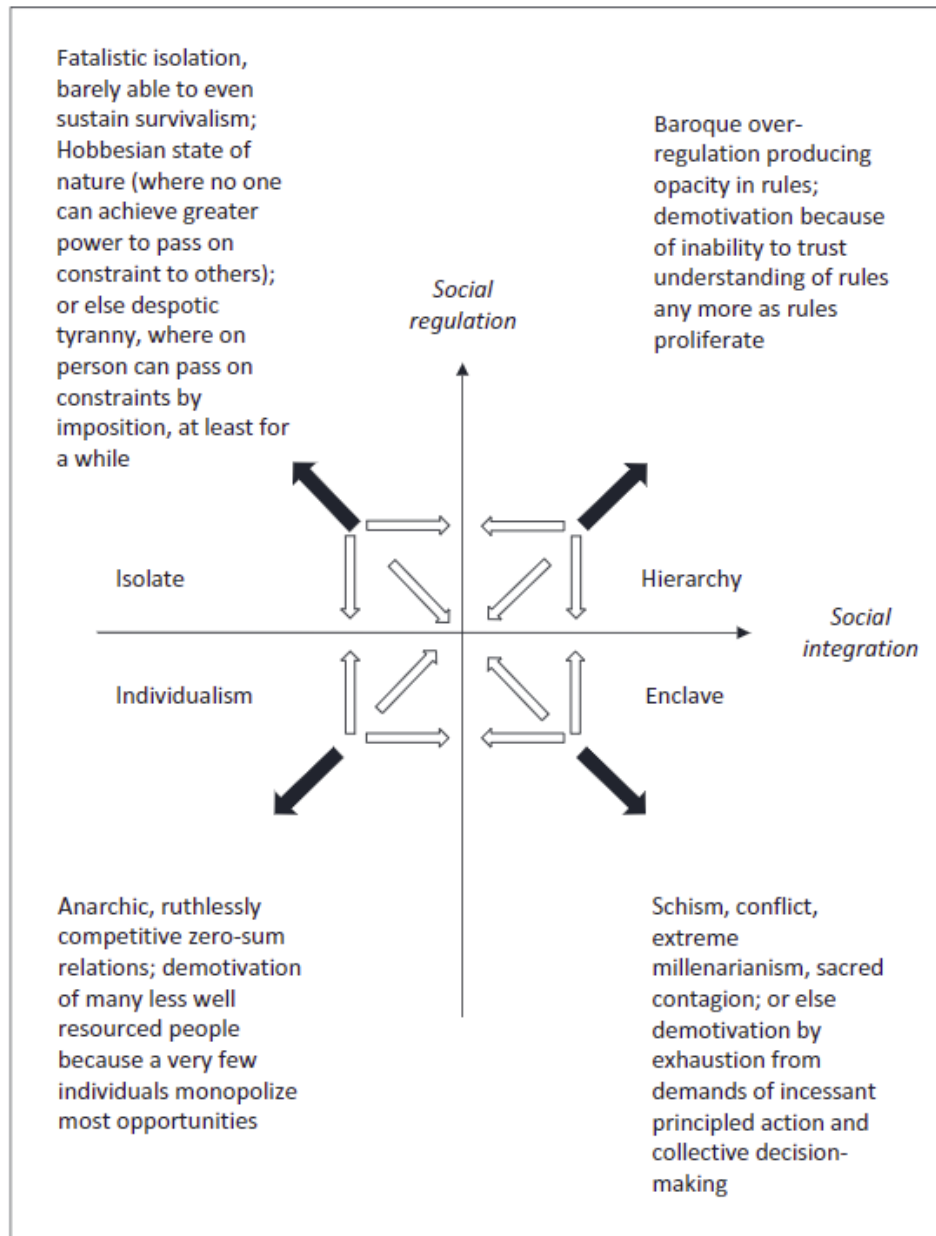


Figure 1. Grid-group institutional map (Richards, 2017; Bulte *et al.*, 2018)

2.2 Research Questions

In this research, the main objective is to investigate how a *shariah*-compliant agribusiness deals with competing institutional demands that emerge from different social orderings. As illustrated in Figure 2, in Cisarua mushroom agribusiness context, *shariah* encompasses many principles of social ordering, and therefore could be located relatively to the right in the diagram (this includes mainly hierarchical and enclave ordering). Besides, business operations are commonly based on market principles that are more individualistic. Hence, business operation could be located relatively to the left in the diagram (Figure 2). Accordingly, the theory predicts that *shariah* and business operation may contradict and this research attempted to find out if that was the case by following RumaJamuR operations.

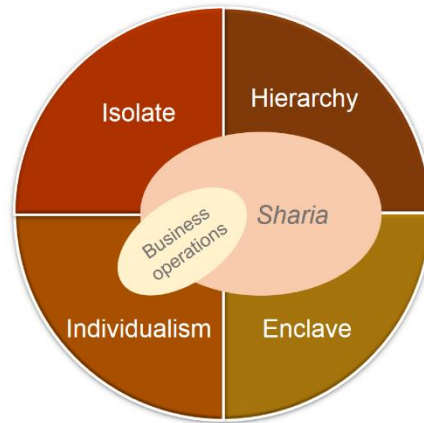


Figure 2. Theoretical framework of this research

This study is also expected to contribute to enrich the scarce literature of *shariah*-compliant agribusiness by looking at both technical and social aspects of the business operation. To achieve these objectives, I proposed a main research question “How does RumaJamuR operate in a hybrid institutional environment?”. Subsequently, in order to answer this question and to sharpening the focus of data collection and analysis, the following specific research questions are formulated:

1. What are the operational practices in RumaJamuR and who are involved?
2. How do these operational practices emerge and what motivates the actors involved in doing so?
3. What are the *shariah* principles that embedded in RumaJamuR operational practices and how do these *shariah* principles influence the capacities of RumaJamuR to execute operational practices?

2.3. Research Field Site

The research took place in Cisarua sub-district, West Bandung Regency, West Java province, Indonesia (Figure 3). This sub-district consists of eight villages which are Jambudipa, Padaasih, Kertawangi, Tugumukti, Pasirhalang, Pasirlangu, Cipada, and Sadangmekar. Cisarua is geographically located on 108°39'17"-109°27'15" east longitude and 7°15'05"-7°37'10 south latitude. According to BPS Kabupaten Bandung Barat (2017), the total number of population in Cisarua sub-district is 74.884. There are 20.908 people who are working in the agricultural sector. With abundance of natural resources and climate suitability, this sub-district generally has the potential in agriculture, livestock, fisheries, and forestry.

In terms of the social aspect, a number of different religions are practiced in Cisarua. According to BPS Kabupaten Bandung Barat (2018), there are 74.818 Muslims, 53 Protestants, 10 Catholics, and 3 Hindus. Consequently, there are 99 mosques, 219 *musholla* (smaller mosques), 1 protestant church, and 1 vihara operating in Cisarua. The collective influence of the diverse religions on the sub-district's political, economic, and cultural life is significant. Even though the majority of the inhabitants are Muslim, *shariah* principle seemed to be not inherently reflected in the daily life of the people in Cisarua. There are some social issues within Cisarua that become the concerns for Association of Mushroom Agribusiness Society Indonesia (MAJI) and Extension Centre of Agriculture, Fisheries, and Forestry (BP3K). Based on personal communication with the head of MAJI, there is burgeoning number of

moneylenders or ‘loan sharks’ who target smallholder farmers and traders in Cisarua local market. Those loan sharks usually charged smallholder farmers with outrageous interest rates, in which, this practice does not comply with *shariah*. The coordinator of BP3K also stressed that there is strong competition and individualism between mushroom farmers. Several incidences of thefts are also reported by some small scale mushroom farmers in the sub-district.

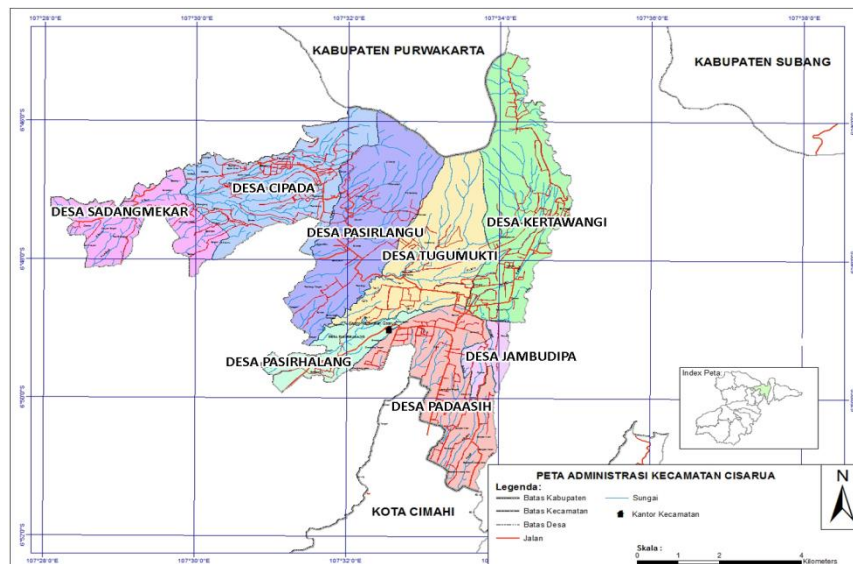


Figure 3. Map of Cisarua sub-district (bandungbaratkab.go.id/)

Interestingly, from the census conducted in 2013, there were five *Lembaga Mandiri Mengakar di Masyarakat* (LM3) or “Independent and Rooted Institution in the Community” in Cisarua. According to Zakariah (2016), LM3 was one of the agricultural development strategies pioneered by the government in 1991, as an effort to alleviate poverty and unemployment in rural areas. LM3 was intended to function as a local cooperative by utilising the religious institutions such as boarding schools, parishes, seminaries, monasteries. In the other words, LM3 was expected to be a centre of agribusiness which directly develop and simulate agribusiness around the area of religious institutions. In Cisarua, all of the LM3 were established within Islamic boarding schools and they were all operating in mushroom agribusiness since 2008-2010. However, in Cisarua, there is no LM3 operating in mushroom cultivation anymore due to the low margin in the mushroom trading and the increasing price for raw materials for mushroom production (BP3K, personal communication).

Mushroom farming in Cisarua

In general, West Java province occupied the first rank of mushroom production with a total production of 25,194,471 kg or about 67% of national mushroom production in 2014 (Febrianda and Tokuda, 2018). Cisarua, is considered as one of the central areas for mushroom production. In Indonesia, the cultivation of oyster mushrooms began to pioneered and introduced to farmers, particularly in Cisarua, Lembang, West Java in 1988. At that time, there are only few farmers and entrepreneurs of oyster mushrooms. Around 1995, farmers in Cisarua, which originally ornamental plants farmers, poultry and dairy farmers began to plant mushroom in household scale. According to BP3K (2013), the main source of incomes of the inhabitants in Cisarua is horticulture farming. But many people in Cisarua are now landless labourers. A majority of lands in Cisarua are owned by Chinese-Indonesians from big cities such as

Bandung, Jakarta, and Surabaya. Furthermore, there is only one financial institution in Cisarua named *Koperasi Unit Desa* (KUD) or village unit cooperative. This cooperative has 300 members and 6 farm shops that sell agricultural production inputs such as horticultural seeds, fertilizers, pesticides, farming utensils, and so on (BP3K, 2013).

After reading of previous studies about mushroom farming in Cisarua, I looked for information in the internet whether there is any mushroom agribusiness which is *shariah*-compliant. Fortunately, I found RumaJamuR website (organikganesa.com) and also some articles from local to national news portal featuring RumaJamuR as a success story of mushroom business and highlighting its *shariah* funding scheme. RumaJamuR is a relatively small scale enterprise but considered a viable mushroom business in Cisarua sub-district. This mushroom business became *shariah*-compliant because it has been funded by *Mudarabah* contract ([Appendix 2](#)). In the midst of the challenge in dealing with competing institutional demand, RumaJamuR initiated an integrated mushroom farming system that includes organic mushroom spawn production, mushroom baglog production, fresh mushroom cultivation, mushroom-based culinary production, compost and feed production from used baglog, and also mushroom agrotourism (Organik Ganesha, 2018). I conducted my technographic study in this small enterprise for around two months. I attempted to immerse myself within the daily practices of other five permanent workers. The interaction of RumaJamuR with many different actors offers a useful opportunity to analyse *shariah* agribusiness within different social orderings.

2.4. Methodology

2.4.1. Technographic Research Design

In this research, how RumaJamuR deals with a hybrid institutional environment is not a linear result of single mushroom agronomic measures but also co-determined by specific labour processes embedded in the social relations, and influenced by the Islamic business ethics. Therefore, capturing these multiple determinations requires an integrated methodology that combines natural, technological, and social processes. For that reason, this research developed using a technographic design. Technography is an interdisciplinary methodology for the detailed study of the use of skills, tools, knowledge and techniques in everyday life (Jansen and Vellema, 2011). Furthermore, technography contributes to the large body of literature, particularly in assessing the importance of institutional failures in explaining agrarian conflicts (Richards, 2005; Jansen and Vellema, 2011) also in studying how sets of rules order social actions and practices (Pinch, 2008; Jansen and Vellema, 2011).

In the case study of technological change in asparagus farming in the Philippines, Jansen and Vellema (2011) propose that the contribution of technography highlights how group of actors use, construct, or transform sets of rules in the process of making. In a similar vein, Lemmonier (1992) proposed that technographic work requires investigation on operational sequences. This shows that technography links to the theory used in this research. Besides, in describing socio-technical configurations, technography needs to be complemented with more substantial social theory, for instance, substantive explanatory of society x material interaction (Jansen and Vellema, 2011). Whereas in this research, Douglas' institutional ordering provides substantive explanation of polarities that shapes human interaction. Equally important, there are three dimensions of technography that helped me answering the proposed research questions,

they are *making*, *distributed cognition*, and *construction of rule* as explained in the following paragraph.

The *making* encompasses important aspects of performance, where in this research I attempted to study the action, skills and knowledge that underlie RumaJamuR operational practices. These are some elements of operational sequences as suggested by Lemmonier (1992). The second dimension is *distributed cognition* that includes division and co-ordination of tasks between different knowledge bearers. This is also an important aspect to see how RumaJamur is organised internally, how people are selected or excluded from the action as suggested by Lemmonier (1992). Last but not least, is the *construction of rules*. A technography explores the roles of rules, protocols, routines, and rituals within the unit of analysis as these affect the technology use and innovation (Jansen and Vellema, 2011). These aspects are fundamental especially in linking how *shariah* principles that embedded in RumaJamuR function as interpretive filters in facing the adversity and challenges related to different values and market arrangements.

2.4.2. Data Collection Methods

The methods of data collection in this research were observation, interviews, and analysis of secondary data. Each of the selected methods is explained in the following subsections.

1. Observation

This research involved participant observation in the daily operational practices of RumaJamuR. Getting involved directly in the farming, processing, until marketing of the mushroom gave insights at how the social and technological processes take place. I managed to observe the behaviour, mundane everyday activities, and social interactions in RumaJamuR. Informal conversation with the workers, farm manager, and the owner of RumaJamuR also provided very important insights. According to Bernard (2011), this type of observation will enable the researcher to reduce the problem of reactivity, help to ask sensible questions, gain intuitive understanding about what is going on, and to gain real understanding of how institutions and/or organisations work. The observations are recorded by taking pictures and videos with prior informed consent. In describing the material aspects of a physical action on the material world, Lemmonier (1992) suggested to watch, write, take pictures, and not the time without interrupting the people at work. He further mentioned that a technographer should snap a sequence of photos covering the full range of movements involved.

During two months of fieldwork, I followed the daily practices of RumaJamuR from Monday until Friday (07.00 - 15.00). In the daily tasks of mushroom enterprise, all the five mushroom workers have the so-called 'know-how' which is often difficult to transfer by verbal instruction and is more easily detected through observation (Jansen and Vellema, 2011). Therefore, some attempts were made to guide the workers in RumaJamuR towards descriptive verbalisation of the lived experience of operational practices. Moreover, making field notes is important as Emerson *et al.* (1995) argue that experiences and observations can be described by the researcher when participating in an intense and involved manner. During the fieldwork, I managed to become a participating observer at both women and men tasks. Division of labour was very clear from the first moment I arrived at the farm.

Table 2. Job division in RumaJamuR

Men tasks	Women tasks
Baglog production <ul style="list-style-type: none"> • Substrate preparation <ul style="list-style-type: none"> ○ Mixing substrate ○ Filling baglog ○ Pasteurising baglog • Cooling down baglog 	Spawn production <ul style="list-style-type: none"> • F0 production • F1 production • F2 production • Sorting contaminated spawn
Mushroom Cultivation <ul style="list-style-type: none"> • Maintenance <ul style="list-style-type: none"> ○ Sorting contaminated baglog in the incubation huts ○ Transferring baglog from incubation huts to growing huts ○ Cleaning the growing house ○ Opening the baglog ○ Watering ○ Pests and disease control • Harvesting and post-harvest handling 	Mushroom Cultivation <ul style="list-style-type: none"> • F3 production
	Mushroom Processing <ul style="list-style-type: none"> • Making mushroom culinary products • Making mushroom educational products
Recycle (contaminated F1, F2, F3, and making vermicompost)	
Agrotourism (training/educational activities)	

Nonetheless, the participant observation and interviews were an intertwined process, by looking at the situation and availability of the people in RumaJamuR. Not only conducting participant observation, in order to understand the big picture of mushroom value chain, I also became a complete observer to collect data on 1) the price of oyster mushroom in a local market and two retail stores; 2) the innovative mushroom-based culinary products on local shops in Cisarua. This observation has enabled me to see what is exactly happening and who are involved along the mushroom value chain in Cisarua.

2. Interview

The interviews are carried out in-depth with all actors involved in the patterned operational practices of RumaJamuR, including the female and male workers, the farm manager, and the owner (see Table 3). The interviews were done in semi-structured way, so it was largely under control. Bernard (2011) describe that semi-structured interview is based on the use of an interview guide that includes a written list of questions and topics that need to be covered in a particular order. This way of interviewing has been selected because its advantage concerning the already determined focused topics. The interviews were not recorded in audio format due to informants' reluctance but written notes were taken. Without having to hold an audio recorder, both the informant and I felt more comfortable as if the conversation just happened naturally. However, informal conversation also played a great contribution during the fieldwork. By trying to have more informal conversation as much as I could, I was able to dig deeper information that the informants were not comfortable to tell at the very first place. It is also one of my concern to consider the informant particular way of living, of perceiving, of making sense of his/her situations to take into account his/her world.

In order to understand the competing institutional demand, I conducted formal and scheduled interviews with the coordinator of extension centre (BP3K) in Cisarua, the head of Association of Mushroom Agribusiness Society Indonesia (MAJI), the assistant store leader of a supermarket, and the *shariah* financier. These interview participants were

selected purposively. This form of sampling represented the key informants as well as to serve as the triangulation of data sources. In addition, I also managed to have informal interviews with other important actors by using snowball sampling method, which consists of some other mushroom farmers/entrepreneurs in Cisarua, traders in the market, the middlemen, the research collaborators, and the plastic waste pickers.

Table 3. List of Informants

Informants	Number of informants	Collected Data
The actors in RumaJamuR		
The owner of RumaJamuR	1	The detailed information about the initiation of the mushroom farm, the strong motivation behind implementing <i>shariah</i> values in the financing scheme and operational practices
The field manager of RumaJamuR	1	How operational tasks are performed in RumaJamuR <ul style="list-style-type: none">• The task divisions among workers (how tasks are divided)• The bodily practices (what an actor does, the knowledge which is mobilised during his/her activity, what drives the actors to act as he/she does at the very moment of acting)• Technical aspects of the process (tools and materials used, the way they are used)• Flow of communication between actors in RumaJamuR
The mushroom culinary manager	1	
The workers	5	
Relevant stakeholders in the “hybrid institutional environment”		
Other mushroom entrepreneurs in Cisarua	4	Socio-economic condition of the farmers, the challenges of mushroom agribusiness
The Head of Mushroom Agribusiness Society Indonesia (MAJI)	1	Information about the role, structure, initiation, and activities of MAJI, perceived experiences in solving the mushroom farmers challenges
The Coordinator of Extension Centre of Agriculture, Fisheries, and Forestry, Cisarua (BP3K)	1	Socio-economic condition in Cisarua and perceived experiences about solving the farmers financing problem
Traders in the market	3	Information about the changing price of mushroom from the central market into end-consumers
Assistant store leader of a supermarket	1	Information about the mushroom value chain from retail practices
Intermediaries/middlemen	2	Information about the mushroom value chain in Cisarua and West Java in general
The <i>shariah</i> financier/credit provider	1	Information about the engagement of credit providers in the business, the perceived experiences following <i>shariah</i> investment contracts, aspiration about future improvement of the business
Research collaborators (Griin.id & a BSc Student)	2	Information about the value of mushroom commodity and opportunities for further mushroom agribusiness development
Plastic waste picker	1	Information about the value of plastic waste from mushroom farms, the story of past flood disaster in Cimahi, the livelihood of marginalised people in villages
Total	24 informants	

3. Secondary Data

This research employed analysis of secondary data in order to have a triangulation in the data collection methods. Any official documents from RumaJamuR are used only after the permission has been granted. The secondary data used in this research are:

- RumaJamuR contracts with financier ([Appendix 2](#))
- General data from *Balai Penyuluhan Pertanian, Perikanan, dan Kehutanan*, Cisarua (BP3K) or Extension Centre of Agriculture, Fisheries, and Forestry, Cisarua
- RumaJamuR media coverage

2.4.3. Data Analysis

The findings were qualitatively analysed and highlighted the technical and social practices of *shariah*-compliant agribusiness such as RumaJamuR in dealing with a hybrid institutional environment. The notes from the observation, analysis of secondary data, pictures, videos, and some informal conversation also contributed to the data analysis. Some follow up online contacts were also made with some informants in order to clarify or confirm some findings. The data was analysed qualitatively by using a mixed of deductive and inductive coding approach suggested by Bernard (2011). Ose (2016) argue that in applied social sciences, it is often necessary to take an inductive approach, whereby the researcher does not have a specific hypothesis to test. Thus, results will be based also on experiences reported by many respondents who have first-hand information about the topic of the research. The analysis was started with transferring the texts from transcribed word files into excel. In excel format, the data were categorised according to the codes that are derived from the interview guide or list of research questions. I also found emergent codes which they were concepts or actions that evolved from the data and are different from the a priori codes. By having these codes, I was able to find patterns that helped me to build the narrative or storyline of the findings.

Chapter 3

Internal Operations in RumaJamuR

In this chapter, I disentangle how RumaJamuR organised internally. This chapter comes in two subchapters, the first one discusses the profile of RumaJamuR, started from the initiation, mission, and development. The second subchapter explains the detailed operational practices in RumaJamuR as a *shariah*-compliant agribusiness operating in a hybrid institutional environment.

3.1. Initiation, Mission, and Development

The idea of starting a mushroom agribusiness emerged when the owner of RumaJamuR finished his bachelor internship on a mushroom farm in 2004 in Cisarua. From that moment, he realised that the land for agriculture is diminishing and we need alternative farming method such as vertical farming to be self-sufficient. He came up with mushroom farming due to the growing opportunities for this commodity. Not only because mushroom can be grown vertically or requires less land for cultivation, but also because the available raw materials and suitable climate condition to grow mushroom in Cisarua. In 2004, together with his three other friends and supported by a loan given by his teacher, he rented out a growing hut and some production utensils from other local farmer in Cisarua. However, the first trial did not succeed. Out of 1.000 baglog, normally farmers could get four tons of mushrooms. But at that time, the yield was only 15 kg.

Facing failure in the first trial, he found out that the spawn (F0) he bought was a bad quality. As a biology student who has been familiar in working in a laboratory, he felt challenged to produce high quality of mushroom spawn by himself. He started utilising a room of 1 x 2 meters, creating his own unsophisticated lab for tissue culture using cleaned cooking ware. With sufficient biological knowledge and persistence, his trial to produce F0 by himself succeeded. He gained confidence to restart the business. In about three years later, the business grew well. In 2007, RumaJamuR owner created a simple web page of RumaJamuR by himself where he put some articles about mushroom and his contact number for trading. One month later, he was contacted by many people who wanted to buy the mushroom spawn and some asked him to give training about mushroom cultivation. At that time, information about mushroom farming is still limited in the internet and even still today it is not very common.

Using his three years of experience in growing mushroom by himself, he worked as a consultant and trader. He was only selling fresh mushroom to local middlemen at that time. But after many people contacted him from the website, he diversified his agribusiness by also selling quality mushroom spawn (F0) at low cost (100.000 Rupiah/tube) compared to those sold by a big company in Cisarua (700.000 - 1.000.000 Rupiah/tube). In 2009 - 2010, RumaJamuR owner tried to develop some mushroom-based culinary product, together with his wife. The initial reason to create this new business unit is because there used to be a lot of rotten and unsold mushroom. RumaJamuR was very dependent on the middlemen to get their mushroom sold to the traditional market and there were few middlemen. Therefore, to optimise the business, they created new products from processed mushroom. Some innovative foods they developed are all made of mushroom, such as nugget, katsu, chips, patties for burger, *pempek* (Indonesian fish cake), *siomay* (Indonesian dumplings). In creating the suitable recipes, they modified some recipes from the internet and they tested a lot variation. The profit of selling this

value added mushroom-based products is higher (20.000-30.000 Rupiah/pcs) rather than selling the fresh mushroom (10.000 Rupiah/kg).

In the midst of the investments in new products, RumaJamuR had to experience a critical phase of the business. The investment of two billion Rupiah from many financiers got stolen by RumaJamuR's financial person. This tragedy was really the hardest part of RumaJamuR owner's business journey. Interestingly, the person who stole the money was indeed very skilful in promoting the *shariah* funding scheme to many people. He tried to exaggerate that the return of investment (ROI) for financier will be 5% on a monthly basis. He presented RumaJamuR as a successful example of *shariah* business and made RumaJamuR owner quite popular in entrepreneurial networks. During that period, the RumaJamuR owner was overwhelmed by the high production target (300.000 baglog/season) for which he had to rent other farmers' huts in Cisarua. He therefore had no time to supervise the financial management. However, the owner still was responsible despite it was not his intentional misconduct.

He almost went bankrupt and lost his motivation at that time. Despite of mourning the loss, he contemplated many things in life. Several days later, he encountered a spiritual teacher. This man was an Islamic priest from a local mosque near his home in Cimahi. The owner finally found comfort and his inner peace again. After learning deeper about Islam from this man, the owner realised that he had to focus more on Islamic principles in his life. Starting from the smallest thing, such as trying to be honest to the financiers. Since then, he tried to develop a better and transparent communication with all RumaJamuR financiers. Surprisingly, the financiers at that time were kind enough to understand what has happened. Some of them even helped him financially. However, the owner has been putting many efforts to pay back to the financiers, even until now, little by little. Fortunately, the online platform that RumaJamuR joined in was a great help. There were some new *shariah* financiers invested in RumaJamuR. Further explanation about this will be discussed in [subchapter 4.1](#).

While RumaJamuR is still trying to recover from the loss of two billion Rupiah, in the mid of June 2018, some stuff and machineries in the farm were stolen. The theft happened in the early morning while RumaJamuR was going to be filmed for a national television channel². The shooting was planned to be conducted after the lunch time, where the RumaJamuR owner would be featured for his innovative mushroom products and his business resilience in coping with the fraud of five years back. All the workers were shocked, because when they arrived at the farm, some properties were already gone, such as a freezer, a showcase cabinet, a vacuum sealer, pH meter, termohigrometer, some cutleries in the kitchen, and even cotton mattresses that are provided for the workers to take a short nap or a break. The owner was really patient. He called the police but it did not solve anything. Eventually, the film was shot at the owner's house which is located 30-40 minutes away from the farm.

“We were so panic but he (the owner) was calm! He called the police immediately but when the police came, they did not do much. They only looked around, asked some questions, and then they left. Until now, neither the thief identity nor his /her motive are revealed. We never know! It seemed like we have to ‘pay’ the police so they will carry out serious investigation” - A female worker in RumaJamuR

² organikanesha.wordpress.com/2017/06/02/kuliner-jamur-rumajamur-liputan-kompas-tv-food-story-benu-buloe/
www.youtube.com/watch?v=oiKImQRj0oY

Despite of all adversities, RumaJamuR at the moment continues to produce different kind of mushroom-based products by developing integrated mushroom farming system, business partnership, business workshops, and *shariah* entrepreneurial assistance (Organik Ganesha, 2018). The owner regularly receives invitations to give formal training on mushroom cultivation and culinary or general agribusiness training to group/communities and companies across the country. Nevertheless, RumaJamuR is also open to any individuals or any educational institutions who want to learn about mushroom cultivation for free. As a 36 years old entrepreneur, RumaJamuR owner envisions not only to continuously give social impact but also to be the centre of mushroom research and development in Indonesia in the near future.

“In here, want to share our knowledge and experience as much as possible. My personal principle is, not to be stingy with my knowledge. Despite our small scale business, I hope RumaJamuR could be the leading example for other mushroom growers” - Owner of RumaJamuR

In terms of tasks division, RumaJamuR owner acts as the financial and human resource manager at the same time. There are four workers from the local area that are employed permanently, which two workers are male and two other are female. In RumaJamuR and in other mushroom farms in Cisarua, there is a clear distinction on labour division related to gender. In the mushroom culinary unit, the owner works together with his wife in developing many innovative mushroom-based products. There used to be one staff that manage the marketing and communication, but due to some reasons, this person resigned several years ago and the position is now left unfilled. In addition, to control the daily operational practices, a farm manager is employed. This farm manager is responsible in giving supervision and guidance for the workers, arranging the trading, and managing production resources. Every year, there are always some university or vocational school students who undertake their internship in RumaJamuR. The farm manager is also responsible in dividing tasks and giving the internee basic guidance on mushroom cultivation. Last but not least, as RumaJamuR adopted *shariah*-compliant funding scheme, the financier also plays an important role. In a *shariah*-compliant finance, investment is on the basis of profit and risk sharing (Khan, 2008). Therefore, there are some situations where a decision has to be made together with the financier (see [Appendix 2](#)).

3.2. Operational Practices

The operational practices within RumaJamuR are diverse, ranging from the spawn production to diversification of mushroom-based products and utilisation of its by-product. The mushroom variety that is produced in RumaJamuR is oyster mushroom, but there are different strains such as white oyster -the most popular one-, brown oyster, and pink oyster. In addition, RumaJamuR has also been developing an integrated mushroom farming system that enables responsible and sustainable production. The integrated mushroom farming system comprises main business unit, waste utilisation unit, future business development unit, and partnership unit as depicted in Figure 4. RumaJamuR hopes that this integrated system could be developed and implemented by many other farmers, either through partnership or knowledge transfer activities such as farm visit or training of farmers. Eventually, in the midst of adversity for mushroom farmers, this integrated system is expected to be the solution in improving the farmers' welfare in Cisarua.

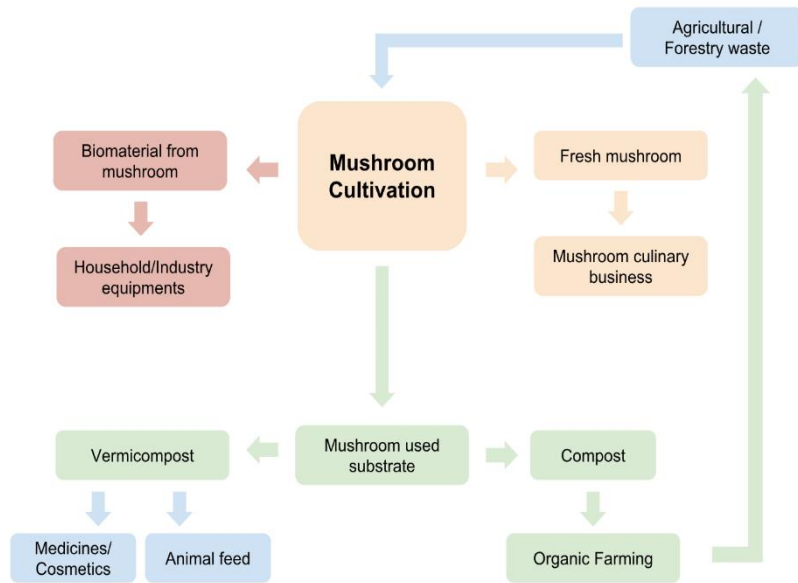


Figure 4. Integrated Mushroom Farming System in RumaJamuR

To get an overview of mushroom cultivation techniques, Figure 5 shows the operational sequence in RumaJamuR. The first stage in mushroom cultivation is to produce the mushroom tissue culture or in scientific terms called Filial 0 (F0), and what farmers understand as “seed starter”. F0 production is always carried out by the female workers under a strict supervision of the farm manager in the small laboratory of RumaJamuR. This stage is very crucial. If the workers succeed in producing F0 without a contamination, a tissue culture can be expanded to provide 2.500 fruiting baglog (F3). Starting from a mushroom tissue culture in a test tube, the mushroom mycelium can be expanded into five bottles of F1 (spawn or inoculated grain), one bottle of F1 can be used to make fifty packs of F2 (propagation of inoculated grain), and a pack of F2 can be used to make ten fruiting baglog (F3).

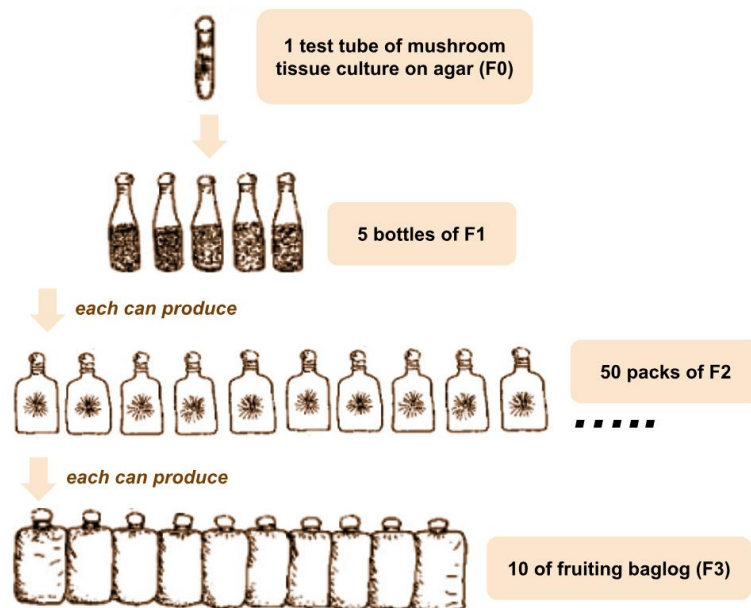


Figure 5. The operational sequence of mushroom cultivation in RumaJamuR

3.2.1. F0 Production



Figure 6. F0 Production

Before producing F0 or seed starter, the female workers prepare two important materials, which are (1) agar tubes; (2) a fresh, clean, and fleshy fruit body of mushroom. To prepare the agar media, the female workers wash and dice 200 gr of potatoes. They boil the potatoes in one litre of water to save the liquid. After 15-20 minutes, the potatoes are then discarded and they mix the potato broth with 20 gr dextrose, and 15 gr agar. The female workers pour the suspension to each test tube about $\frac{1}{3}$ full and then they plug the cotton at the top, covered with aluminium foil. The test tubes are placed in specified racks and then sterilised in the autoclave for 20 minutes at 15 PSI. Thereafter, with a mitt, female workers slant the still hot tubes against a raised surface. This process requires skills and accuracy in order to avoid the agar reaches the cotton plug, therefore the farm manager always guide the female workers. After the agar has gelled, the female workers store the finished tubes in a cool, cleaned, and dust-free area in the laboratory.

Once the agar tubes have cooled, F0 production is ready to start. To start the work, ideally, the female worker has to wear a set of safety clothes such as lab clothes, disposable face mask, and gloves. However, when the farm manager is not around, sometimes the female worker does not wear the required set of safety clothes. Thus, the farm manager often checks and reminds them not only to wear the set of safety clothes, but also to turn on the exhaust fan. The exhaust fan in the laboratory is important to improve the quality of air circulation from excess moisture, odours, and pollutants. To ensure the hygiene, the female worker also need to clean all the necessary equipment such as the laminar flow hoods, scalpel, and stainless micro spatula, by using alcohol spray and some cottons.

After turning on the laminar flow hood, a female worker light a glass alcohol lamp. Then she sterilises the scalpel blade thoroughly in the flame, then she places it on a glass can. This glass can functions as a stable place to rest the scalpel blade in the air near the flame to avoid contamination when not in used. The challenging part is to be skilful in tearing off small pieces of mushroom tissue and place it on the agar tubes. The female workers need to be able to organise the materials so when the tube is opened, it is exposed for a minimal amount of time while she inserts the piece of mushroom tissue. To prevent contamination, between each agar tube inoculation, the female worker needs to re-sterilise the scalpel blade in the flame. The newly inoculated tubes are plugged with cotton and aluminium foil, and then placed in a low light area in the laboratory. Within a week, the agar surfaces in the inoculated tubes are completely covered with mycelium.

Importantly, some skills and knowledge are prominent to carry out this F0 production. A worker has to know which part of the mushroom fruit body should be teared off for the tissue culture, how to tear it off carefully without hurting her fingers, how to conduct each steps by also maintaining the hygiene at the same time, and so on. This is one of the reasons why many

other farmers are not interested to produce their own mushroom spawn. Well in fact, with a few practice and persistence, this tissue culture technique can be successfully mastered by anyone.

“I am only a junior high school graduate, I have never experienced anything like this before. I thought it was a complicated process, but the farm manager trained me well. The owner, sometimes when he came, also corrects me if I do it wrongly”
- A female worker in RumaJamuR

Nevertheless, in each stage of mushroom cultivation, control is always needed. Especially during F0 production, periodic control is important for an early detection of contaminants. Hence, this requires adequate knowledge on detecting moulds or bacterial infection. Moulds contamination can usually be detected by its green, black, or orange spores. Meanwhile bacterial contamination is usually coloured slimy material. If any of this indication found, anybody in RumaJamuR (whether the farm manager, the male or female workers) should discard the culture and immediately clean the tubes thoroughly with hot water and disinfectant soap.

3.2.2. F1 Production

In the morning, before going on with another task, the female workers always start with boiling the grains that have been soaked overnight in a large plastic container. Sometimes different types of grains are used, including millet, wheat, and corn as explained in Table 5. However, due to some reasons, the most common grain used for mushroom cultivation in Cisarua is millet.

Table 4. Comparison of Different types of Grains based on RumaJamuR experience

Characteristics	Millet-based spawn	Wheat-based spawn	Corn-based spawn
Advantages	The texture is dense and strong, the grain is not tender if recycled. Suitable for an integrated mushroom farming system. Widely used by mushroom farmers in Cisarua, so workers used to work with millet (with confident)	Contain more nutrients for mycelium growth particularly in F1 stage. Easily broken after cooked, this will allow easier digestion by mycelium.	Widely available. Suitable for F1 production. The price is more affordable compared to other grains.
Disadvantages	Millet is not locally sourced, but imported from the USA. Therefore there could be risk in its availability.	The texture is not as dense compared to millet. After cooked, the texture easily gets soften and cracked open, thus wheat grain is not suitable for recycle. Needs longer time in boiling, so it uses more gas.	Too attracting pest (e.g. rats). So corn-based spawn has to be placed in a bottle to prevent them from rats. Using bottles mean more washing after used, and it means more water needed. This is not favourable especially during drought season. Corns are also prone to <i>Neurospora</i> sp. infection.

The soaked grain is boiled for 30-45 minutes to allow water absorption. After that, the female workers drain and dry the excess moisture by using colander and small fan. In this process, the female workers have to possess the knowledge whether the grain is ready to use or not. Ready to use grains are usually loose, dry on the outside, and swollen with water on the inside. Thereafter, the worker loads the grain into a transparent glass bottle until it fills up to $\frac{3}{4}$ of the bottle. To prevent contamination, the worker plugs the bottle with cotton and she covers it with a square plastic, and then she tightly ties it with rubber band. After that, bottles of F1 grain are ready to be sterilised in an autoclave for two hours.



Figure 7. F1 Production

Afterwards, the bottles are taken out to allow temperature decline. When the bottles reach room temperature, the female workers transfer them to the laboratory by putting them in a wheeled container. From there, the female workers open the plastic cover and cotton plug to inoculate them with a slice of culture from the test tube. One test tube of tissue culture (F0) can be used to inoculate 5 bottles of F1. After the inoculation, the female workers immediately plug the bottles with cotton, cover it with square paper, and then they tie it with rubber band. The bottles of F1 then are placed in the cleaned incubation rack in the laboratory. Within two weeks, the mycelium will fully cover the grains and it indicates that the F1 is ready to be used for F2 production. Periodic control is also need to check whether the mycelium grows well or impeded by contamination.

Since this activity has become a mundane practice, they seemed to be really natural in carrying out this task. When they finish, they need to count on how many F1 are produced and how many F0 are used on that particular day. In a day, usually two female workers in RumaJamuR can produce up to a hundred bottles of F1. They need to write the calculation on a hanging note that is put in the wall by the farm manager. However, sometimes they forget to do so or the calculation is not exactly correct because numeracy skills among workers are different. Thus, this has become a concern for the farm manager to consistently guide the female workers.

3.2.3. F2 Production

The beginning of F2 production is generally the same with F1 production. After boiling the soaked grains, the grains are drained. The female workers then load 140 gram of grain into a polypropylene plastic bag (12 x 20 cm). In RumaJamuR, they use a used coffee cup to make this process easier because based on the measurement, $\frac{3}{4}$ grain in the cup equals to 140 gram. After that, the plastic ring (with 2-3 cm diameter) is put on top of the plastic bag and the worker pulls out top of bag through the plastic neck, and then the plastic filter (square piece of plastic) is put on top of the plastic ring, and it is tied firmly with a rubber band. Then the packs of F2 are sterilised at 125°C in the autoclave for two hours. Sometimes, the sterilisation of F1 and F2 are carried out in the same time. To make sure the sterilisation

process occurs effectively, the female workers load the bottles of F1 at the bottom of the autoclaves, and from there, they put packs of F2 in the remaining space.



Figure 8. F2 Production

After the sterilisation, packs of F2 are taken until they reach room temperature. Then, the female workers transfer them to the laboratory along with F1. After finishing F1 production, the female workers loosen the spawn inside the plastic packs by compressing and twisting them firmly. Because after the sterilisation, the spawn are getting dense. According to the farm manager, mycelium prefers to absorb the spawn nutrients if the grains are loose. Moreover, the female workers also need to loosen the F1 spawn. After two weeks of inoculation, the mycelium makes the grain more closely compacted. Therefore, the female workers use stainless micro spatula to loosen the F1 spawn by moving the spatula round and round.

After loosening both the F2 and F1 spawn, the female workers open the tie and the plastic cover to inoculate the F2 spawn with F1. A bottle of F1 can be used to inoculate 50 packs of F2. After the inoculation, the female workers immediately cover the packs with square paper, tie it with rubber band, and placed them in the cleaned incubation rack in the laboratory. Within two weeks, the mycelium will fully cover the grains and it indicates that the F2 is ready to be used for F3 production. Similar to F1 production, to prevent contamination, the female workers need to do periodic control. They also need to take notes on how much F2 are produced, how many F1 used at that particular day, how many are sold (if there is any buyer), how many are contaminated but still decent for recycle, or how many are severely contaminated and have to be thrown away. Consequently, the female workers are required to be able to detect whether the contamination is too severe or not for a recycle.

“Sometimes I have doubts, because in a pack of F2, there could be multiple contaminations from green moulds, black moulds, and also oncom³. So I rely on the lamp lighting to make colour distinction. If the grains are fully covered with green moulds, I will definitely put them in the waste bin. However, if I doubt, I always ask the farm manager” – A female worker in RumaJamuR

3.2.4. F3 Production

F3 is produced by inoculating a pasteurised substrate with F2. Firstly, to prepare the substrate, the male workers thoroughly mix some materials such as sawdust, lime (CaCO₃), rice bran, and water (65%) by using a hoe. In this process, the workers used to check the pH and moisture by using pH & hygrometer to know which materials should be added more. Unfortunately, this tool was also stolen. Thus, the farm manager now always supervises this process and he relies on his intuition to detect if the mixture needs any materials addition. The

³ Oncom is the traditional *sundanese* word in Cisarua for orange moulds or in biological terms called *Neurospora* sp.

mixture then is covered with a large plastic tarpaulin in order to create an anaerobic condition for 2-3 days of fermentation. After that, the male workers fill out the plastic bag (baglog) with the mixture. In RumaJamuR, there is actually a filling machine for baglog but it can only be used with the 20 x 35 cm plastic bag. In order to achieve higher yield, RumaJamuR prefer to use a slightly bigger plastic bag (22 x 35 cm) because higher substrate mass can provide more nutrients for the mycelium.



Figure 9. F3 Production

The process of filling the baglog requires certain techniques and know-how. Filling out the plastic bag with the mixture until it reaches certain density (approximately 2 kg) and to tie it up at the end is not a simple process. However, this already becomes a common skill for people living in Cisarua. After the plastic bag is filled with substrate (now it is called baglog), the male workers transfer them into a specified cart for pasteurisation. A cart can contain up to 250 baglog. The pasteurisation takes about eight hour in 90°C by using a drum steamer powered by gas. The capacity of the drum steamer is for pasteurising 500 baglog or two carts at a time. When the pasteurisation is done, the cart is taken out. The male workers use mitts to put the still hot baglog in the incubation room one by one, in order to decrease the baglog temperature. The baglog are line up sometimes with the help of the female workers if they already finished with their work. The next day, when the baglog reach the room temperature, the female workers carry out the F3 production.

F3 production started by inoculating the pasteurised baglog with F2. The workers add F2 to the pasteurised baglog in the incubation room which is an enclosed space. This process should be done under hygienic conditions in order to prevent contamination. The workers usually use one piece of F2 for ten baglog. The first thing they do is to open the tie and add the spawn from F2 packs without measurement tool. They basically use their intuition in dividing one piece of F2 for then baglog. After the spawn is given, they put a cotton plug and then they tie it again tightly. The tie has to be positioned in such a way that could leave half part of the cotton inside the plastic, and the remaining part is outside of the plastic. The cotton works to absorb the water inside the baglog as the result of the incubation process. The workers have to repeat this process as quickly as they can to minimise the air exposure that might contains contaminating bacteria. In a day, two female workers can produce up to 500 baglog of F3.

3.2.5. Incubation Process

After the inoculation, the baglog are transferred to the incubation huts for a month. A hut is a semi-permanent building. Some specific materials are chosen for building a hut, such as using corrugated metal for the roofing (to bring heat), cement for the flooring, and woven bamboo for the wall. By these materials, they create a suitable condition for mycelium growth, which has always been the most challenging stage. Furthermore, humidity level is very important for the mycelium to colonise the substrate. Therefore, the baglog are covered with used newspapers in order to create enclosed and darkened environment. Besides, the huts are equipped with bamboo shelves to put the baglog. The shelves are separated by an aisle for the workers to carry out treatment and daily control.

During the incubation process, the mycelium will fully grow. This is can easily be indicated by looking at the baglog which will be fully covered in white. In this process, the male workers also start to distinguish the contaminated baglog (baglog partially or fully covered with green mould, brown mould, or sometimes black mould). The contaminated baglog are immediately taken away by the male workers from the incubation hut for the recycle process. There used to be thermo-hygrometer inside the incubation hut, but since it was stolen, RumaJamuR relies on manual periodic check of the baglog. For instance, when they check there is *oncom* (*Neurospora* sp.) detected, they understand that the air content in the substrate is too low. So for the next substrate preparation, they will add more water.

3.2.6. Growing Process

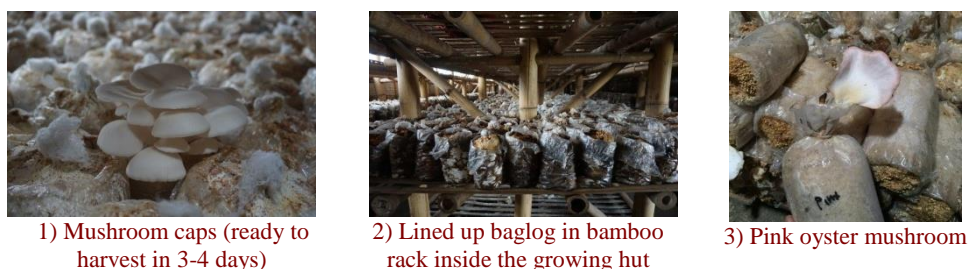


Figure 10. Growing Process

To produce mushroom fruiting bodies, the mycelium needs lower temperature. Therefore, the baglog with well grown mycelium are then transferred by the male workers into the growing huts. The growing huts are also semi-permanent building using cement for the flooring, woven bamboo for the wall, but clay tile for the roofing (to reduce heat). The temperature in the growing huts is relatively lower than in the incubation hut. Once the mycelium has grown throughout the substrate, openings are cut through the bag by the male workers. The cuts will allow fruiting bodies to develop, because oxygen is needed to grow fruiting bodies. To maintain the humidity, the male workers spray considerable amount of water to the baglog, depending on the weather. In rainy season, the male workers only do the spraying once in the afternoon. Meanwhile in dry season, the male workers do the spraying once in the morning and once in the afternoon.

The male workers do the watering by using a nozzle sprayer. This task needs knowledge on how much the water should be given. Because the watering should only form mist, not water droplets. If the baglog gets too wet, contaminating microbes are easily spread. In addition, RumaJamuR tries a simple experiment during the growing process. There are two

ways in placing baglog into the shelves. First, the most common way in Cisarua, is to place baglog vertically where the baglog hole faces up. Secondly, baglog is placed horizontally, so the baglog hole faces sideways. After a month of observation, the owner explains that both ways have their respective advantages. Baglog arranged horizontally are less exposed to the water spray. If the watering is too excessive, the water will not directly enter the baglog. The harvesting is also easier in horizontally arranged baglog. Nevertheless, this arrangement needs bigger space.

3.2.7. Pest and Disease Control

Detecting pest and diseases during the growing stage is also important. The male workers usually remove the bugs/mites and put a yellow trap. If the pest attack is high, they spray a considerable amount of bio pesticide, made of homemade garlic dilution. The advantage of using this kind of bio pesticide is the low cost, safe for the environment, and it works for killing aphids and small maggots. The male workers have to look at the pest damage and intensity to begin with. If the damage is tremendous, they usually spray the bio pesticide in the afternoon by using a nozzle spray. In here, the knowledge in identifying the pest damage and intensity is important. Therefore, the farm manager closely supervises the male workers and they often discuss what they found, what are causing factors, what needs to be done, and so on. If they could not find any solution, they always ask the owner for further directions on what to do. Throughout the cultivation period, there is no usage of chemical pesticides and/or fertilizers in RumaJamuR.

"I used to be a casual worker. I saw that many other farmers sprayed chemicals to combat pest and disease. They usually use Urea, Rezotin, and plant catalyst." - A new female worker in RumaJamuR



1) Contaminated F3



2) Rotten mushroom



3) Nozzle sprayer for biopesticide

Figure 11. Pest and Disease Control

3.2.8. Harvesting and Post-harvest Handling

Within three months of growing process, mushrooms are harvested manually by hand on daily basis. This is because not all of the mushrooms are fully mature on the same day. Therefore, to avoid spoilage, harvesting is the first work carried out by the male workers in the morning (from 07.00 - 09.00). The farm manager has trained all workers to recognise the appropriate stage and the physical criteria for harvesting. In RumaJamuR, once the edge of mushroom caps starts to flatten out and the substrate starts to dry out, it's time to harvest. After harvested, the mushroom will grow again within a week because there are still remaining inoculants inside the substrate.

In a growing hut, there are five rows in each bamboo racks. A male worker is responsible to pick the whole cluster of mushroom and put them in a wheeled plastic container per rows. After finishing the harvest in one row, the mushrooms are weighed and another male

worker is responsible to take notes of it. As RumaJamuR owner always says, note keeping is an important asset in order to track the productivity of each growing season. The notes are source of information for the monthly reports that are sent to the financiers. In a day, they can harvest up to 30 kg of mushroom from two growing huts.



Figure 12. Harvesting and Post-harvest Handling

Harvested mushrooms need to be carefully handled because mushrooms are perishable crop. To reduce the risk of damage, the harvested mushrooms kept in a basket and dried in the sun for thirty minutes (especially in rainy season, where the mushrooms are wet because the humidity is high). After that, the mushrooms are transferred to the production room. From there, the remaining substrate at the bottom of the mushroom stem is cut by using cutter or small knife. Sometimes, there are dusts from the substrate on the mushroom caps. The male workers also gently wipe them away. After the cleaning, the mushrooms are packaged in a big plastic bag that can contain five kg of mushroom. The weighing process is conducted accurately. The harvested mushrooms should be taken without delay in order to maintain the freshness. Due to unavailability of cold rooms in RumaJamuR that can be used to store the mushroom, the middlemen always come between 11.00 - 13.00 to pick up the harvest. If some harvested mushrooms are not qualified to be sold to the middlemen, the workers are free to take them home.

3.2.9. Mushroom Processing



Figure 13. Mushroom Processing

For the last couple of years, the mushroom processing is not the main business unit anymore in RumaJamuR. In this unit, the value addition of fresh mushroom are carried out by transforming them into two types of product (1) mushroom educational products, (2) mushroom culinary products. For the educational products, two years ago, the owner had the idea to develop a mushroom cup. A mushroom cup is basically a growing kit consists of mushroom spawn (F2), mixed substrate (F3), and a printed guide on how to cultivate oyster mushroom at home. This cup introduces mushroom farming in four simple steps, (1) open the cup, (2) spray the substrate, (3) watch the mycelium growth, (4) harvest the mushroom. This product is

usually sold at 20.000 rupiah per cup during organic farming community exhibition. However, the production of this growing kit is not on a daily basis anymore. At the moment, the kits are only made by order. Nonetheless, there is another mushroom entrepreneur in Cisarua who utilises this idea. He develops a commercial mushroom growing kit that sold at a supermarket and exhibitions in Bandung. Turned out, he used to learn about mushroom from RumaJamuR owner. He basically received business mentorship from RumaJamuR owner.

In terms of mushroom culinary products, there are different mushroom-based food products developed in RumaJamuR since 2009 such as nugget, katsu, chips, cookies, patties for burger, *pempek* (Indonesian fish cake), *siomay* (Indonesian dumplings). The production of these products is carried out in RumaJamuR kitchen by the culinary unit manager (the owner's wife) together with the help of the female workers. The ingredients used in the recipes are all natural-based. There are no preservatives used, as it is in line with the slogan "Good Food Good Health". The recipes have been set and shared to the female workers. So if the owner's wife is not able to come to the farm's kitchen, the female workers can do the production by themselves. The marketing of this food product was mainly online-based which relied on agents and resellers. Same as the mushroom growing kits, these food products are also merely made by order at the moment.

All of these products are registered to *Pangan Industri Rumah Tangga* (PIRT)⁴ or household food industry license and *Halal* Certification at the municipality in Cimahi. PIRT and *halal* label are considered as important elements that will enhance the sales, especially to embrace the market of Muslim consumers in Indonesia. The registration for both PIRT and *halal* label were free of charge for Cimahi residents who own micro small and medium enterprises (MSMEs) at that time. Therefore, as Cimahi resident, RumaJamuR owner took this opportunity to further develop this business unit. The most important aspect during PIRT and *halal* certification is the hygiene. The raw materials, ingredients, processing facilities, equipment, handling, and storage must meet sanitation requirement determined by the Health Department in Cimahi, and to meet some *halal* requirements determined by *Majelis Ulama Indonesia* Indonesia's top Muslim Clerical Body. Therefore, the farm manager is responsible to make the workers aware of this requirement. Thus, whenever RumaJamuR gets inspected, there would be no incompliances found.

In addition, RumaJamuR also used to have some mushroom food stalls in two university canteens in Bandung and two other small restaurants in Wonosobo and Yogyakarta. The food stalls and restaurants usually employ 2-3 employees who serve diverse mushroom-based culinary menus. The price of each portion was 15.000. Unfortunately, both of the mushroom food stalls are now closed, and two other small mushroom restaurants are now acquired by the owner's colleague. The main reason behind this decision is to stabilise the on-farm business, especially after the fraud tragedy. Therefore, RumaJamuR patterned operational practices are now basically centered at the mushroom cultivation.

3.2.10. Recycle

To achieve sustainable production, RumaJamuR explores some alternatives to optimally utilise the resources used in the mushroom cultivation. For instance, the remaining substrates from the fruiting baglog are used for compost or organic mulch materials. The compost can be used by other farmers, especially for horticulture farmers in Cisarua who have a

⁴ PIRT is a required food / beverage business license that is sold and circulated in the community to meet food safety standards or distribution permit for food products.

full year of rotating vegetable crops. The substrates are also used for vermicompost. In making vermicompost, the workers use earthworms in a pile of wooden racks. Once in two days, a little amount of water is given to moisten the substrate. From the vermicompost, the worm castings are sold to the Biofarma, a pharmaceutical company in Bandung. This vermicompost unit in RumaJamuR was initially a research led by a public university in Bandung. Unfortunately, the partnership ended after the research finished. After all, RumaJamuR hopes to continue this vermicompost unit in order to support the integration farming system idea and also as a means to diversify the income.

RumaJamuR also recycles the contaminated baglog (F3), and spawn (F1 and F2). Generally, the process of recycling contaminated F1, F2, and F3, is generally the same as the production sequences. But after years of trials and errors, the farm manager always guides the female workers to add some additional materials. For instance, in recycling contaminated baglog (F3), usually bigger amount of limes is given before fermenting the substrate. In recycling contaminated F1 and F2, the female workers have to wash the grains thoroughly under running water. In this process, the female workers have to make sure that the clumps of spores are cleaned. After washed, the grains have to be boiled again in high temperature for 15 minutes in order to kill the contaminating microbes. After that, the workers usually add more limes in order to increase the pH level. The farm manager explains that he wanted to see whether increasing the pH level would work to prevent more contamination.



1) Sorting out contaminated F1 & F2



2) Washing contaminated grains



3) Vermicompost

Figure 14. Recycle

In this process, the workers have to possess adequate knowledge in distinguishing different type of contamination. In the first place, they need to sort which contaminated spawn or baglog are decent for a recycle and which items have to be thrown away. Moreover, since mushroom cultivation use large amount of plastic bags (especially for F2 and F3/baglog), the plastic waste has always been an issue. Once in a week, there is always a local person who collect all the plastic waste from RumaJamuR for free. In a day, he can collect up to 10 kg of plastic waste. He always bring sacks to put the plastic waste inside. The sacks of plastic waste then are brought by this man to his home for a quick cleaning and then sold them to a plastic manufacturing company in Batujajar. He sells the cleaned plastics to the company for 1.500 Rupiah/kg, and 600 Rupiah/kg for the uncleaned plastics.

“There are many mushroom farmers in Cisarua and all of them use plastics. If the plastic waste is not recycled, then it will clog the river. We had experienced flood from the clogged Cimahi river! I am glad that I am allowed to collect the plastic waste in here for free. Sometimes in other farmers, I still have to pay although in a very low price.” - The plastic waste picker

“Actually we can also make profit out of the plastic waste. Other farmers are doing it. But I think we have to think correctly. They are collecting it in search of money, and we need them! So we are not polluting the environment with our plastic waste. So, instead of setting a price for the plastic waste, we want them to take it for free. As much as possible! We have no time and resources to bring the plastic waste to any recycling unit. So they help us and we help them. It is a win-win.”

- The farm manager

The preceding paragraphs show that RumaJamuR made an effort to reduce the environmental damage through integrated mushroom farming system. Even though there is still no concrete solution for the plastic waste issue other than letting them brought to the recycling manufacturer by local people, RumaJamuR owner plans to conduct a mini research on cultivating other varieties of mushroom that are believed to be able to decompose plastics. There has been many news in the internet on mushroom potentials in revolutionise the recycling process of plastics. However, this idea is still very rough and set for a long-term goal of RumaJamuR.

3.2.11. Agrotourism (Training/Educational Activities)

“We are a small enterprise. There are only five people working here, but many people from all over Indonesia come here to learn about mushroom cultivation. There are some big mushroom enterprises in Cisarua, but they are really competitive. They are not willing to share their knowledge. I heard some of them are bankrupt now!” - A female worker

To share the experience and knowledge in mushroom cultivation, RumaJamuR also has an agrotourism unit that is directly handled by the owner and his wife. They basically offer some formal workshops for groups/community. The workshop consists of detailed theoretical lessons in the training room, combined with real mushroom cultivation and processing practice in the farm for around 2-3 days. The participants get a printed module, DVD, lunch, and a certificate. The mushroom cultivation workshop costs 600.000 Rupiah per person, meanwhile mushroom cooking workshop costs 500.000 Rupiah per person. However, RumaJamuR is also open for any individuals/groups who want to have a visit in the farm for fee. Usually, if the farm visit is based on appointment, the owner directly guides the tour by explaining the general activities in RumaJamuR. For any impromptu visit, the farm manager usually gives the tour with the help of one or two workers.



1) Visitors from neighbouring village



2) RumaJamuR owner explains the life cycle of mushroom



3) High school students visits the production room

Figure 15. Agrotourism

RumaJamuR also develops “Mushroom Fun for Kids” program which is aimed to give new experiences for kindergarten or elementary school students about mushroom. In this program, children can learn all about mushroom both indoor and outdoor. The main activities of this program are harvesting mushroom, cooking mushroom, and making mushroom growing cup. The program costs 75.000 Rupiah per student. According to RumaJamuR owner, this program could be a fun way in introducing where does mushroom come from to children living in urban areas. In the program, two or three workers are usually involved in preparing the materials. Whereas the program itself will be directed by the owner or his wife.

During the data collection, there were three formal visits by two groups of Islamic boarding school students, and a small group of young farmers from the neighbouring village. All of them seemed to be really excited to know how mushrooms are grown. Some of them did not know that oyster mushroom is not grown in soils like many other crops. During these visits, RumaJamuR owner always uses an easy-to-understand language. He tried to make an impression that mushroom farming can be mastered by anyone who wants to learn and patient. In addition, he also explained that people need to change their mindset that mushroom farming does not always have to be at industrial level. Household level is also feasible for growing mushroom. He did not only give agronomical explanation but also some general insights about agribusiness.

“There are 50 students here in this visit. Sometimes the situation is not conducive because it is just too crowded! I can’t see what the man is explaining about. Above all, this visit is really inspiring. I might think to become a mushroom entrepreneur in the future.” - A 11th grader from Nurul Fikri Islamic Boarding School

From the explanation in [sub-chapters 3.2](#), it can be inferred that in RumaJamuR mundane operational practices, there has been no *haram* (not permissible in Islam) elements. The materials acquired for mushroom cultivation are checked to be *halal* (permissible in Islam). Moreover, all the mushroom-based food products also got *halal* certification by the Indonesian *Ulema* Council. Therefore, from the materials procurement, cultivation, processing, and trading, all seemed to comply with the *shariah* principles. Furthermore, looking at the other elements of operational sequences such as ‘people’ and ‘social relations’ as suggested by Lemmonier (1992), it can be inferred that the operational practices in RumaJamuR requires (1) very careful handling and periodic control (because hygiene is a crucial factor of mushroom production) and (2) cooperation among the workers and the farm manager. These operations are done in hierarchical order through operational rules as stipulated in a Standard Operational Procedure (SOP). In [sub-chapter 4.2.2](#), I will discuss how the operations affect the work culture and interactions in RumaJamuR.

Chapter 4

RumaJamuR Embedded *Shariah* Principles

In this subchapter, I provide systemic evidence on how *shariah* principles are implemented in RumaJamuR. However, there is no single standard for an enterprise to run a *shariah*-compliant business. Some attempts are also made to delineate the conflicting institutional demands. In general, there are some distinctive characters of *shariah*-compliant agribusiness identified in RumaJamuR. These characters are embedded mainly in financial aspects as described in the first sub-chapter. Meanwhile in the second sub-chapter, I discuss how the operations structure the interactions in RumaJamuR.

4.1. Financial Aspects

4.1.1. Transparency and Reliable Source of Funding

In the first stage of the business, RumaJamuR was funded by a teacher from University of Indonesia. Having learned from many ups and downs throughout the journey (the fraud led to the loss of two billion Rupiah, the theft, unfavourable margin, drought, etc.), RumaJamuR owner started to think on finding another alternative funding idea. In 2016, RumaJamuR joined an online platform⁵ which was a website consists of business projects that potential financiers would opt to fund under *shariah* principles (profit and risk sharing). Therefore, there could be multiple profit sharing arrangement such as 50%:50%, 55%:45%, and so on. However, since 2009, most of the profit sharing arrangement is 50%:50% under *mudharabah* contract. So the financing agreement is peer to peer basis. The financier has the rights to come to RumaJamuR farm in order to see the real operational activities prior to making decision on funding the agribusiness or not. This kind of farm-visit is also one of the important factors that will build trust and support a transparent relationship before the written contract ([Appendix 2](#)) is signed.

At the moment, there are seven active financiers that support RumaJamuR. Before receiving funds from a financier, RumaJamuR has developed personal criteria in selecting a financier. Even though RumaJamuR has been facing financial difficulties, the owner never sends loan application to any bank, not even to *shariah* banks that are widely developing in Indonesia. The main reason that makes RumaJamuR stick to the current *shariah* financing is to avoid *riba*. *Riba* is the Arabic word for the predetermined return on the use of the money that also can be translated as “usury”, “excess”, or “increase”. Khan (2008) emphasise that *riba* is a sin under Islamic law, because Islam does not allow gain from a financial activity unless the financial capital is also exposed to the risk of potential loss; and that interest reinforces the tendency for wealth to accumulate in the hands of the few.

“I have never been to any bank to apply for loan. Even when the fraud happened several years ago. At that time, I had to be responsible for the lost 2 billion Rupiah from all RumaJamuR financiers, but I still believe that I will find the halal way. It is clearly stated in the holy Qur’an (3:130) “O you who believe! Eat not Riba (usury) doubled and multiplied, but fear Allah that you may be successful.””
- Owner of RumaJamuR

⁵ peluangusaha.kontan.co.id/news/yuk-memetik-peluang-kemitraan-rumajamur-persentasiinvestasi.wordpress.com/investasi-jamur/

According to Khan (2008), if a small business applies to an Islamic lender for finance, the lender should, in principle, decide whether or not to support the project on the basis of a cost-benefit analysis of the scheme, not on the basis of collateral. This is in line with what RumaJamuR has been doing for years, in all of its investment scheme promotion in the internet, a cost-benefit analysis is always attached. The cost-benefit analysis of RumaJamuR *shariah* funding scheme is presented in [Appendix 3](#). By having this cost-benefit analysis, potential financiers could roughly see the basic operational cost required for one growing season. The specification of the revenue also transparently delineates how much from the income will be allocated for *zakat*, how long is the payback period, and so on.

The most important thing under this scheme is the percentage of estimated return of investment (ROI) that will be given to the financiers. A mushroom growing season takes around 100 days (approximately three months) and it can be harvested on daily basis after 60 days. Therefore, RumaJamuR gets cash profit from the fresh mushroom trading on daily basis. However, under the *shariah* scheme, RumaJamuR has to calculate the nett profit⁶ for the agreed period, for instance, in one growing season. Consequently, RumaJamuR cannot allocate monthly ROI to the financiers because the exact yield and nett profit have not been known yet. However, there are different types of financiers in RumaJamuR. Some financiers obey the contract very well and they wait for one growing season to be completed, after that they receive no matter how much the ROI for one season is. On the other hand, some financiers want a flat monthly ROI. In order to make it compliance under *shariah* law, RumaJamuR owner created a strategy by using prediction. For instance, it is agreed that in the first and second month, the financiers will get 4% of ROI. However, in the third month (end of the season), RumaJamuR owner calculate the nett profit for the whole season. For example, the percentage of nett profit for the whole season is 10%, and then these financiers will get only 2% ROI in the third month (end of the season). To be able to carry out this strategy, RumaJamuR relies on the note-keeping compiled by the farm manager so the nett profit for the whole season can be known.

Another case related to the funding is, there were some potential financiers who want a flat monthly ROI without looking at the total real income at the end of the agreed period. Some of them ask for 2% ROI, flat, in monthly basis. Even though 2% is relatively small, this is not compliant to the *shariah* principles, because the exact nett profit has to be known. To face this kind of request, RumaJamuR always firmly resists such deals. Khan (2008) argues that one of the challenges under *mudarabah* contract is indeed, the uncertainty of the profit. Therefore, it considered to be very risky and require a great deal of confidence in the financier. For RumaJamuR, this funding scheme is also challenging because they have to be responsible, rely on accurate accounts and carefully oversee the fund that are given by different financiers under different agreed periods of time. Thus, for RumaJamuR owner, it is understandable if the financiers want to check the farm periodically because indeed they both want profit, so the financiers expect improvement in the agribusiness. Besides, in some condition, a financier would ask to withdraw their fund due to some family-related issues. Therefore, as he always mentions to their workers, what needs to be built between RumaJamuR and the financiers are trust, responsibility, and transparency.

⁶ **Nett Profit** is an economic terms for the actual income. In RumaJamuR, it is the calculation from cash profit minus the amount paid for *zakat* (2.5% of the cash profit) and productive charity (17.5% of the cash profit)

“Sometimes financiers put high expectation (e.g. high percentage of ROI). But mushroom farming and agriculture in general, is very risky. Especially in changing weather like these days! We need to be aware of that. The challenge for me is to always improve the management of this business by having better control and better response to problems. Moreover, co-operative skill is also important. Sometimes a financier wants to withdraw the fund to pay for his/her children school fee or to pay the hospital fee for his/her parents.” - RumaJamuR owner

This signifies that *shariah* schemes fund requires closer social ties. To build such social ties, trust, responsibility, transparency, and communication between RumaJamuR owner/farm manager with the financiers has to be maintained. Both parties seemed to respect and learn from each other. For instance, one of the financiers was a top manager in a private company who is now retired and invested some portion of his savings to RumaJamuR. On many occasion, including during his visit to the farm, he always share his knowledge related to business or organisational management to RumaJamuR owner/farm manager. On the contrary, RumaJamuR owner also share his practical knowledge on farming and his business experience. They often have discussion in exchanging their experiences. This kind of relation also exists between RumaJamuR owner and other financiers. Although some of them do not have time to come to the farm oftenly, at least they are able to maintain communication through Whatsapp or phone calls with RumaJamuR owner.

Furthermore, to build such social ties, RumaJamuR hierarchically made a contract agreement (see [Appendix 2](#)) to accommodate the individualist’s motives of both RumaJamuR and the financier. This document needs to be signed by both parties above a *materai* or stamp of duty⁷ that signifies a legal transaction. Therefore, the written contract legally binds both parties. In the contract, all the responsibilities of both parties are clearly stated. This part of the contract is significant because the difference of *shariah* funding with a non-*shariah* could be identified explicitly. In the Islamic perspective, this kind of contract reinforces the investment based on profit and risk sharing in order to establish a just instrument of financing. If the borrower’s business (in here RumaJamuR) is unsuccessful through no fault of his/her own fault, it is unfair for the financier to consider a fixed rate of return or demand repayment; while if the financier earns very high rate of profit, it is unfair that the lender should receive only a small proportion of the profit even though she/he may well have provided the majority of the finance for the business (Khan, 2008).

The relationship between RumaJamuR owner and the financiers is also arranged in the contract. In Article 6 ([Appendix 2](#)), the calculation of cost-benefit is conducted on the 5th day of the following month. At the latest, on the 10th day of the following month, RumaJamuR owner will send a detailed monthly report to the financiers. Furthermore, RumaJamuR owner is obliged to send any update to the financiers in case of unforeseeable circumstances in the middle of the agribusiness activities. Basically, the RumaJamuR owner has the right to manage and decide the operational protocol. However, the financier also has the right to propose any recommendation to RumaJamuR owner in order to improve the ongoing agribusiness activities.

“I have been investing since 1 year ago. So far the owner is communicative and transparent. I also learned a lot from him about entrepreneurship, both

⁷ Stamp of duty is one kind of taxation or monetary tools just like post stamp or money. (Saryadi, 2016)

technically at the farm level and at the managerial level” - Mr. E, one of the financiers

The relation maintained by RumaJamuR owner with the financiers has nurtured the agribusiness. Even though the payback period in the funding scheme is two years, the financiers have the option at the end of the first year to cease or increase the funding. Some of them want to continue with slightly higher investment. This leads to a diverse and reliable source of funding for RumaJamuR. As financial capital is a vital component for running operational activities, RumaJamuR is able to achieve financial viability through *shariah* funding scheme. Furthermore, during the data collection, there are three visits from potential financiers. They are accompanied by RumaJamuR owner to take a look around the farm. I managed to be involved in the conversation where the owner unveil both the opportunities and threats/risks in mushroom agribusiness. This is in line with Elasrag (2016) who argue that when loans are given for business purposes, the lender, if he/she wants to make a legitimate gain under the *shariah*, he/she should take part in the risk.

“To join a shariah funding scheme, the lender/financier has to be aware of the principle of profit and loss sharing equity principle in Islam. He/she also has to know both the opportunities in this business, and what the risks would be. So in the future, there will be no misunderstanding” - RumaJamuR owner, after the discussion with a potential financier

In contrary, according to Sinaga and Gallena (2015), the majority of mushroom farmers in Cisarua are still constrained and often resort unorthodox form of financing or what is known as “bootstrap financing”. This bootstrap financing refer to using personal or family funds to finance a business, or foregoing income. Moreover, in some cases, farmers also have debts to loan sharks in the traditional market. The loan sharks usually charge high interests that eventually put farmers into a debt-cycle. This common practice is not allowed according to *shariah* because the existence of interests and exploitation of one party. However, many mushroom farmers prefer this practice because its flexibility compared to a formal loan in financial institutions such as bank (either *shariah* or conventional) or village unit cooperative (KUD). Having debts to middlemen or loan sharks in the market allow the farmers to have fast money, individualised terms, and possibility to roll over without collateral.

“In a traditional market, especially in the morning, the loan sharks bring their cash money and walk around to find any seller or farmers in the market who want to pay their previous loan or to ask for a new loan. They usually charge 20-30% of the interest! Just imagine, if a farmer has to pay for their daughter wedding in the coming weeks, he has no option but to get the money from the loan sharks. It is faster, even without any certificate or collateral given!” - Head of MAJI

4.1.2. Just and Fair Trading Arrangement

The presence of intermediaries/middlemen has been entrenched in Indonesian agricultural supply chains, including mushroom. Therefore, the common way for mushroom growers to sell their harvest is to sell it through intermediaries/middlemen. With the total area of 55,11 km², there is only one traditional market in Cisarua. Therefore, selling the harvest to Cisarua traditional market is very competitive. Many farmers prefer to sell it to another market outside of Cisarua. But due to lack of market information and also limited capital and manpower for transferring the harvest, many mushroom farmers in Cisarua rely on the

intermediaries/middlemen. However, the trading arrangement between mushroom farmers and the intermediaries in Cisarua are sometimes one-sided. The intermediaries have higher bargaining position in determining the price. Meanwhile the farmers have no option but to receive very low margin.

In Islam, the condition explained above is considered unethical and oppression of one party because there is no mutual consent of both parties involved. This situation is unavoidable as well for RumaJamuR. To tackle this issue, several years ago, RumaJamuR avoided selling the mushroom to the local intermediaries and chose to collaborate with a supermarket in Bandung. However, the agreement was not favourable because if there are any unsold mushrooms, they have to be taken again by RumaJamuR. This rule led to higher transportation cost for RumaJamuR, because the supermarket is located in Bandung and they lack of manpower to pick the unsold mushrooms as well. RumaJamuR owner tried to find any intermediaries who want to have a fair trading but it was difficult. The majority of the intermediaries follow the market rules and they are in the higher position to determine the price.

Eventually, three years ago, RumaJamuR established a fair trading arrangement with an intermediary who was a participant of mushroom training in RumaJamuR. This intermediary is both a mushroom grower (in smaller scale) and also a mushroom distributor in Bandung. After the training, this man executed his mushroom business by renting a hut in Pamengpek Village in Cisarua. However, in the midst of the adversity in mushroom agribusiness, he chose to be a distributor at the same time by collecting mushroom from another farmer in Cisarua, including from RumaJamuR. This man and RumaJamuR agreed to set a fair contract. A flat price has been set transparently that 1 kg of mushroom will be paid for 10.000 Rupiah, regardless of the mushroom price fluctuation in the market. In everyday basis, this man will pick up 10 kg of mushroom before the *Dhuhr* prayer (before 12.30). If RumaJamuR harvest could not meet 10 kg for him, then the price would be 9.000 Rupiah/kg. This man needs minimum 10 kg of mushroom every day because he has mushroom supply agreements with some restaurants in Bandung.

However, RumaJamuR could not rely on one trading agreement. Sometimes the harvests are abundant and they need to get sold as quickly to avoid spoilage. Therefore, RumaJamuR has no option but also to join the mainstream mushroom trading arrangement. In this second type of trading arrangement, RumaJamuR sells the remaining harvest (after 10 kg sold to the contracted intermediary as explained above), to a local middlemen by using the market pricing rule. Therefore, there is no fix price, and the price depends on the market (approximately 2.000 - 12.000 Rupiah/kg). RumaJamuR opted to accept this rules and receive whatever the price is. This local middleman usually sells the mushroom to wholesale market for 20.000 Rupiah/kg mainly to Caringin, Cibitung, Tangerang where he could get high margin.

In other mushroom farms, farmers mostly sell their harvest to middlemen with uncertain price. This middleman determines the price, exploiting the fact that many of the farmers are indebted to him in order to buy spawn or baglog. Middlemen have the time, vehicles, and social connections to access the market that the mushroom farmers do not have. Group of small scale mushroom farmers had to transform their livelihood due to this issue. Some chose to become baglog produce alone or mushroom grower alone, even some chose to process mushrooms into diverse local products such as chips, *semprong* (Indonesian egg-roll), and nuggets.

“We were groups of women mushroom farmers back then. But middlemen always give us very low price. We hardly gain profit in selling mushroom without any added value.” - A local mushroom-based local food seller

“The practice of selling mushroom to middlemen is deeply ingrained. In here mushroom farmers are very individual, there is no association. So the price determined by the second middlemen in the traditional market gate. Meanwhile in Central Java, mushroom farmers are united in an association of farmer groups, so they have higher bargaining position for pricing.” - An extension officer in Cisarua

4.1.3. Avoiding Scams Element

As price fluctuation is inevitable, during Islamic holidays in Indonesia (*Eid Al-Fitr and Eid al-Adha*), 1 kg of harvested mushroom can only be sold at 1.500 - 2.000 Rupiah/kg. In this Islamic holiday, the mushroom price is unable to compete with other protein sources like beef, lamb, and chicken, because those are the most wanted meals in the average Indonesian family diet for celebrating the feast. However, in RumaJamuR, despite of the dropped price, the farm manager and workers wage is still paid according to the agreement. This issue is discussed further in the following [subchapter 4.2.2](#). RumaJamuR owner also explains that:

“We need to possess sincerity. Despite of the price fluctuation, we are not allowed to betray the contract with our workers, to our financiers, and to other partners.” - RumaJamuR owner

On the other hand, mushroom spawn production in Cisarua used to be limited and only sold by a big enterprise in Cisarua who sell F0 with a very high price (700.000 - 1.000.000 Rupiah/culture tube). RumaJamuR owner felt that this was too expensive because actually a good quality of F0 can be produced at a house scale. As biology graduate, he understands that farmers might think producing F0 is too complicated and requires professional laboratory equipment. In fact, F0 can be produced at a low cost with moderate equipments as long as the hygieneity is ensured. He does not want to hide this fact and delude other farmers for a very expensive price of F0. For that reason, RumaJamuR chooses to sell F0 at low price. By lifting up the burden of mushroom farmers, he hopes this will contribute to the socio-economic improvement of mushroom farmers in Cisarua.

“Mushroom farming is risky. If small scale farmers get a bad quality of mushroom spawn, the yield will be very low and prone to contamination. Especially during drought season, if they face crop failures, then they will have no money anymore. Their debts will increase. That is why, a good quality of mushroom spawn is important.” - RumaJamuR owner

To maintain the quality, 1 bottle of F1 in RumaJamuR is used only for 40-50 packs of F2. In contrast, the majority of mushroom farmers in Cisarua, 1 bottle of F1 can be used for 100 packs of F2. The rationale behind this practice is to produce F2 as much as possible at a low cost. However, this practice would not result in good quality of mycelium growth. Therefore, as RumaJamuR committed to be a role model for mushroom farming, the farm manager strictly guide the female workers to produce maximum 50 packs of F2 from one bottle of F1. RumaJamuR also sells F2, therefore the owner does not want to collude the buyers by selling low quality of F2.

Lastly, In RumaJamuR *shariah* investment scheme, there are elements of social advantages offered. As stated in the funding scheme ([Appendix 2](#)), the allocation for *zakat* is 2,5% and productive charity is 17,5%. This amount will be applied to RumaJamuR actual profit before the allocation for the profit sharing is made. This 20% of total real income will then be distributed to the needy in Cisarua. The money usually given to the orphans for their educational fee, to the housewives for women empowerment activity purposes, and also to the unemployed youths for helping them to start a small business. After all, in practice, RumaJamuR owner expressed that he needs to improve the financial management. Because at the moment, he is the only one managing the finance of RumaJamuR. He is still learning on how to utilise the capital effectively while also spending 20% of the income for social purposes.

4.2. Structured Interactions

The operations (as explained in [chapter 3.2](#)), play an important role in structuring the interactions in RumaJamuR. The following sub-chapter discusses how the operations structure the workplace culture and permanent employment system that reflects embedded *shariah* principles.

4.2.1. Workplace Culture

The working culture in RumaJamuR is less strict on personal relation level (between the workers) but discipline on following the operational rules. During the break, the workers usually make jokes around, share their personal stories, talk about the newest issue in the village, and so on. However, in the middle of the work, the workers are required to fully pay attention and comply the rules (especially on hygenity rules, to come and go back on time, etc.). Even though there is no printed version of operational rules, the farm manager always communicates the dos and don'ts to the workers through direct guidance and supervision. Furthermore, RumaJamuR owner also reviews the overall production at the end of the year. This review then is used to be the input in creating a standard operational procedure (SOP).

In the implementation of the daily tasks, sometimes compliance to SOP is still an issue in RumaJamuR. There is still a need for a better SOP enforcement. There could be changes in the operational practices when the RumaJamuR workers change. For example, during the data collection, there was one female worker who decided to resign because the rumour says she opened a small shop in her house. Then, there were two new workers came. From my observation, the practices and habits of these new workers are different. They are still attached to the working culture and practices of their previous mushroom farms. This is quite problematic especially in the beginning period, because these new workers have to adapt to the SOP in RumaJamuR. For instance, the habits to keep the general hygiene (to reduce risk of contamination), as well as note-keeping (to track the production efficiency as well as for the transparent report to the financiers). This has become a challenging task for the farm manager. Therefore, constant reminders, guidance, and supervision are always needed.

“Compliance to SOP cannot be achieved in a short time. It needs time and of course my presence to build the work culture and to supervise. It is a process.”
- RumaJamuR owner

Other values that embedded in RumaJamuR work culture are the sense to help each other and honesty. Sometimes the female workers finished their tasks at 14.00, to wait until 15.00 (when they are allowed to go home), they always help the work of the male workers. If

there is any internee from vocational schools or universities, the workers teach them in carrying out the operational practices. Transparency is also important. In RumaJamuR, all workers are trained from F0 production until the processing of mushroom-based products. This does not mean that a worker needs to master all tasks, but to give a thorough picture of what kind of operational activities that RumaJamuR has. From this point, the workers are expected to be more loyal and eventually have a sense of belonging to RumaJamuR.

“The farm manager sometimes asked me to buy the production materials in the district city centre. In other farm, this usually done by the owner. They do not want their workers to know where they buy the material from or how the price of particular material is. We (workers) merely work on the given task. In here, as you see, I just came back from buying the liquified petroleum gas (LPG) and a sack of millets.” - A male worker in RumaJamuR

“I used to work in a bigger farm. In there, I was only asked to work at F2 production. That’s it. I have no idea how to produce F0 and F1 until I work here. In here at least I know the task in each production stages. I think they are afraid, if the workers know how to make F0-F2, then the workers will also produce it, then there will be no one buying the spawn from them again” - A Female worker in RumaJamuR

Honesty has been always emphasised by both RumaJamuR owner and farm manager. In daily basis, the workers have to do the note-keeping (e.g. how many spawn or baglog are produced, how many spawn or baglog are sorted out due to contamination, and so on). These notes are important as the financier might want to check it in detailed on the monthly report. The workers are asked to be honest in taking notes. To build this value, they are asked to write by themselves and the farm manager will check it. So the notes are not written by the farm manager who interrogated the workers (in bigger farm, which is how the farm manager works). Looking it from an upper level, the owner basically trusts the farm manager to manage the data from the notes, which are written by the workers. The owner also asks the farm manager and workers to give transparent information if any financiers come. Besides, everyone in RumaJamuR is trained to be hospitable to visitors who want to learn about mushroom farming.

“I have a private housing project in Karawang. Some plots are still unsold. So I am thinking to build a vertical and indoor farming there. When I looked up in the internet, I found RumaJamuR website. That’s why I am here, to learn about mushroom cultivation directly from the workers.” - A visitor from Karawang, a real estate entrepreneur

4.2.2. Permanent Employment System and Worker Welfare

There are two types of working system in mushroom farming in Cisarua, (1) casual labour, and (2) permanent employment. Casual labour in Cisarua refers to irregular employment, usually hired by the performance of specific tasks. Thus, the wage is based on the target of the tasks. This type of working system is very common within mushroom farms in Cisarua. As an illustration, the wage for one person to make one baglog is 80 Rupiah. 1 person can work 500 baglog for 3 hours in 1 farm. So he/she can get approximately 40.000 Rupiah from 1 farmer. In a day, if a person work fast enough, she/he can work up to 4 farms, so in total he/she can get approximately 160.000 Rupiah a day. Therefore, many local people in Cisarua

prefer to do the casual labour rather than being employed permanently. The advantage of using this system is the production work goes faster.

However, to work like this requires great energy and skills. The work is very repetitive with uncertain working hours. Sometimes the workers have to work really early in the morning or because he/she starts in the afternoon then he/she will finish late at night. Another disadvantage of this working system is, the workers depend on the availability of the production activities. If none farm is producing (perhaps are on the incubation stage, or harvesting stage), then the workers do not have any job. To know the availability of the production activities, usually a farmer make a phone call to someone in the village, then this people spread the information from mouth to mouth because the people live very close to each other in the village.

The working system in RumaJamuR is permanent employment. All workers start to work from 07.00 to 15.00 from Monday to Friday. The wage for RumaJamuR farm manager is 1.600.000 Rupiah/month meanwhile for the workers is 50.000 Rupiah per day and paid on weekly basis. However, to meet the production target, RumaJamuR employs some basic requirement on skills and knowledge. For instance, for the workers, it is expected that they have basic bookkeeping and numeracy skills. Whereas for the farm manager, it is expected that they he/she has skills of planning and administration, management supplies of materials, coordination and negotiation skills. In terms of knowledge, all workers employed in RumaJamuR have received training from the owner. In particular, both the farm manager and the workers have to be familiar with fungi life cycles, the importance of hygiene, and the differences of moulds contamination.

“I prefer to work here because I can go home at 15.00. It enables me to carry out some domestic works such as preparing the dinner for my family, or just to take a rest. If I do casual labour, I would have uncertain working hours. I might have to work in the early morning. Even though I earn less here, I think it is less demanding and I still have more time for my family.” - A Female worker in RumaJamuR

In RumaJamuR, the workers are respected and treated ethically. There are some facilities for the workers to pray, to rest, and to cook in the farm house. In the middle of the work, especially during the lunch time, the workers have a break for one hour. Within one hour, some workers eat their lunch, some of them pray *Dhuhr*, and some of them prefer to take a short nap in the rest room. In RumaJamuR, there is a small kitchen for the workers where they can make coffee or to cook instant noodle. Usually, the farm manager asks one of the workers to buy food from a traditional stall nearby and then they eat together while listening to *dangdut*⁸ or traditional music.

“Even though the wage in RumaJamuR is not as high as if they do casual work, at least they are treated appropriately as human, not exploited to work like a machine. In here despite of its small scale, we tried to provide space for them for praying and for having rest. Once we get higher profit, we will calculate how much wage increase should be given to them” - RumaJamuR owner

In mushroom farming, some tasks are very labour intensive. Especially for the male workers in carrying out the baglog filling and transferring them from incubation room to incubation huts, from incubation huts to growing huts. To make the tasks easier and more

⁸ *Dangdut* is a genre of Indonesian folk and traditional popular music.

efficient, RumaJamuR developed several personalised equipments. This includes specified cart for transferring baglog before and after the pasteurisation, push pull trolley, and a substrate mixer. In casual labour, male workers have to transfer the baglog from incubation hut to growing hut by putting the baglog manually in their shoulders. One baglog transferred by a male worker is paid for 50 Rupiah. Meanwhile for mixing the substrate manually, a male worker in casual labour system gets paid for 2000 Rupiah per sacks. The farm manager once told me that he provides trolleys and mixer in order to make the workers feel comfortable at work. The owner also provides some bonuses during big holidays in Islam and also when the profit is high. In national holidays, the workers also have the rights for a day-off.

Chapter 5

The Marketing Operations of RumaJamuR

In this chapter, I call the attention to how does RumaJamuR interact on the wider relational systems within which it is embedded. Most importantly, I wish to emphasise that this chapter is not avowedly RumaJamuR-centered as in the previous chapter. Therefore the highlight then is on the interactions between RumaJamuR and the related stakeholders in mushroom agribusiness. The first subchapter discusses about how RumaJamuR collaborates with other stakeholders informally. Some formal collaborative arrangements are discussed in the subsequent subchapter. In the third subchapter, I describe the status quo of MAJI and its relation to the increasing individualism among mushroom farmers in Cisarua. Lastly, the discussion about PATIMURA initiation concludes this chapter.

5.1. RumaJamuR Informal Relationship

In the operational activities, RumaJamuR interacts with different stakeholders. Each stakeholder has diverse views on how to organise society and doing businesses. Some stakeholders that RumaJamuR oftenly interact with are other mushroom entrepreneurs or hobbyists, intermediaries, extension officers, and the local people surrounding the farm.

Before 2010, there were many mushroom farmers in Cisarua. But due to the increasing competitiveness to acquire sawdust, the procurement of this particular substrate material became commercial and expensive. Sawdust used to be a waste in logs processing. As an important substrate material, mushroom farmers used to get the sawdust from timber merchants for free. But since it was commercialised, farmers now have to pay for it. As consequence, many mushroom farmers shifted to only produce baglog, or still a mushroom grower but he/she buys the baglog from other producers, some of them rent out their huts, and also chose to become a labour in other commodities. In that situation, RumaJamuR had no option but to purchase the sawdust from the local timber merchants. RumaJamuR was able to survive despite the increasing cost of production. Since many farmers shifted to only produce baglog or cultivate mushroom alone, RumaJamuR have been supplying mushroom spawn and/or baglog to many other farmers. Therefore, RumaJamuR is widely known in Cisarua. The owner is known as a relatively young farmer (compared to the most farmers in Cisarua who are middle age) who was able to sell good quality of spawn and baglog at lower cost.

Not only transaction-based relation, many local people surrounding the farm are also interacting with RumaJamuR. Every week, there is an elderly couple who manually cut the grass in RumaJamuR front yard. This elderly couple collects the grass for feeding their cows. The farm manager allows them and they often have long conversation on many topics. Unlike big mushroom enterprises, RumaJamuR is not strictly selective in who are allowed to enter the farm gate. However, this is a challenge for the farm manager to keep the security of the farm and at the same time, to maintain the “non-exclusive” image of RumaJamuR. Security issue and relationship with neighbouring people is very important these days in Cisarua. As people tend to be more individualistic, sometimes they do not care to what is happening to their neighbour farms.

“You know, one of my workers stole some harvests and a water pump in the farm. I wanted to call the police, but the another worker was threatened by this

stealing worker. He gave pressures to resolve this case peacefully. In the end, I did not make a report to the police but I managed to fire him.” - A mushroom farmer in Cipeusing Village

Therefore, the advantage of having a good relationship with the neighbouring farm is the opportunity to be alerted if the neighbouring farmers see peculiar behaviours or unknown person. In this regard, RumaJamuR farm is located in between two vegetable farms. Both the neighbouring farmers and RumaJamuR workers usually greet each other. There was a time where the neighbouring farmer brought his son to the farm and suddenly this little son had to go to a toilet. Since the neighbouring farmers and RumaJamuR workers know each other, this farmer did not hesitate to bring his son to RumaJamuR and ask whether his son could use the toilet. In another occasion, there were some young farmers working in a new start-up called Griin.id who “borrow” some area in the front yard of RumaJamuR to plant mints and marigolds. This kind of relationship is rare because according to a female worker in RumaJamuR, bigger mushroom enterprise usually set boundaries with those who do not have mutual profit-oriented interests. But since the theft tragedy last year, RumaJamuR continues to maintain good relationship with the neighbouring farms.

Another interesting interaction occurs between RumaJamuR and the contracted middlemen. This middleman comes to the farm on daily basis to pick up the harvest. However, before he left, he usually has conversation with either the farm manager or the workers in RumaJamuR. As a smaller scale mushroom farmer who used to learn about mushroom cultivation technique in RumaJamuR as well as a middleman at the same time, he seemed to know practical knowledge. Several times, he gives suggestion to the farm manager to add more limes in the substrate preparation. Based on his experiments, a good composition of lime in the substrate could prevent the green mould. He also suggests the female workers to add more F2 spawn in the F3 production because on his trials, if the F2 spawn is not predominant, the mycelium cannot compete with the contaminant microbes. This kind of communication is hardly found in any other mushroom farm. Because sharing information among mushroom practitioners has become rare in Cisarua.

On the other side, due to the absence of mushroom farmers’ association/groups, the extension centre in Cisarua could not initiate any program that could bring benefit mushroom farmers. Indonesian government is currently putting more attention to some prioritised commodities that could affect the national inflation such as chilli and shallots. According to the extension officer, mushroom is still an eminent commodity potential in Cisarua, but it requires big capital. She further illustrates that in Cisarua, the extension centre facilitates 100.0000.000 Rupiah as governmental monetary support for any horticultural commodity. For chilli, this amount of money could reach 5 hectares of cultivation by 25 farmers. But for mushroom, this could only reach 40.000 baglog, which is cultivated by only 2-3 farmers. Besides, at the moment there is no governmental regulation on spawn production (e.g. standardisation), therefore some people might take this opportunity to produce spawn on their own with very low quality.

Even though there is no program related to mushroom commodity in Cisarua, RumaJamuR managed to maintain a good relationship with the extension centre. Meanwhile in contrast, generally farmers in Cisarua here tend to overlook the extension officers because they are older and they think they have more real experiences in the field.

“Most farmers here always say, “Extension officers only know theories! But in practice, we are better”. Therefore we need a role model that is trusted by the farmers.” - An extension officer in Cisarua

Interestingly, RumaJamuR has become a place to learn mushroom or agribusiness in general for many young entrepreneurs outside Cisarua. For the past five years, RumaJamuR assisted a start-up called Mycotech who utilises mushroom as biomaterial. The product that has been developed by this start-up named Mycelium Binderless Board⁹. Unlike conventional board which uses synthetic adhesive as binder, the board that Mycotech develops uses mushroom mycelium for the natural adhesion. The founders of this start-up learned about basic mushroom cultivation from RumaJamuR owner, which from there, they found out that mycelium could strongly bind particles. Not only that, another young farmer in Cipeusing used to rent RumaJamuR huts and now he develops a mushroom growing kit called Mushome. The business idea generation was out of his own, but the practical knowledge about mushroom cultivation was counselled by RumaJamuR owner. RumaJamuR, along with the products from the “mentees”, are usually featured in local or national organic product exhibitions. RumaJamuR involvement in an organic community platform enables social network expansion where RumaJamuR owner could possibly utilise in many ways.

5.2. RumaJamuR Formal and Collaborative Relationship

RumaJamuR is easily reachable by anyone. All necessary contact information is put on the website. Most of the financiers, buyers, or training participants get the information about RumaJamuR from the website. Due to this openness, RumaJamuR has been involved in many collaborative relationships with different stakeholders such as university researchers, students, internees, and also companies.

In 2014-2015 a researcher from informatics engineering and two other researchers from economic department of Trisakti University in Jakarta developed information portal for oyster mushroom agribusiness. Zuhdi *et al.* (2015) in collaboration with RumaJamuR and the extension officers came up with www.jamur2cisarua.com which was published as a prototype of portal based management information system and a temporary domain name. This web platform was expected to facilitate multi stakeholders in oyster mushroom agribusiness system to provide and exchange information, knowledge, which is needed in excellent agribusiness operations. However, the prototype that has been made still needs to be improved particularly in its usability (Zuhdi *et al.*, 2015). The web platform development required active participation of the key stakeholders which previously granted the operation and maintenance training application.

“The idea was excellent. It was an innovative way to improve our mushroom agribusiness community. But we were lacking of human resources to maintain the platform at that time.” - RumaJamuR owner

In the past two years, some students also did their research in RumaJamuR. A student from Institut Teknologi Bandung formulated an organic pesticide to control the invasive small maggots. Maggots in oyster mushroom are relatively small larvae, white coloured with black

⁹ www.youtube.com/watch?v=6OY0-S7eoQE

www.kompas.tv/content/article/30041/video/berita-kompas-tv/start-up-ini-ciptakan-bahan-bangunan-dari-limbah-pertanian

heads and rapidly breeding in warm weather. The most common way to combat the maggots is by spraying a chemical insecticide named Orthene. However, the efficacy of the organic pesticide is still being improved and tested at the university laboratory level. Besides, as explained in [subchapter 3.2.10](#), RumaJamuR with a public university in Bandung also developed a vermicompost by utilising the used substrate. Despite of the discontinuation of the research, RumaJamuR wishes to continue the vermicompost unit to help them achieve a zero-waste mushroom production. In addition, last year a student from Maranatha Christian University also developed a prototype of mobile application for internet based-hut automation. This prototype has been developed to control the microclimate inside the growing huts.

Some bachelor and vocational school students also did their internship at RumaJamuR. Under the guidance of the farm manager, the students were involved in the daily operational practices of RumaJamuR. During the data collection, there was a bachelor student from agribusiness program of a public university in Bandung. This student has finished his internship at a bigger mushroom enterprise in Cianjur for three months but he chose to learn deeper about mushroom cultivation in RumaJamuR. RumaJamuR owner gave him opportunity to come and have discussion at the farm. In several discussions, I was also involved. They basically discussed a lot and learned from each other. This student mainly shared some insights about digital marketing that he has been studying at the university, whereas RumaJamuR owner shared his experience on his agribusiness. This kind of discussion could be a good way to gain input for both parties. According to RumaJamuR owner, he is always grateful to discuss with young students because they are more creative and technology savvy compared to his generation.

“I learned a lot from him especially on how to be resilient in doing an agribusiness. On the other side, I also shared some feedbacks for RumaJamuR digital promotion (like how to create a good branding in the social media, how to reach larger market, and so on). It was a worthwhile discussion.”
- An Agribusiness Student from Bandung

When the majority of mushroom farmers in Cisarua are sceptical to have relation with big companies, RumaJamuR utilise the opportunity to partner with some companies to expand the network. A big champignon mushroom company in East Java was collapse several years ago due to the inability to compete with a Chinese champignon company in the export trading to the United States. At the moment, this champignon company is trying to revive by doing a lot of business consultancy with many mushroom experts, and RumaJamuR owner was counted in. Even though RumaJamuR does not cultivate champignon mushroom the owner helps the champignon optimisation process by giving agronomic advices as well as in the marketing process. From this relationship, RumaJamuR owner was able to enlarge his business network. He had the opportunity to know many other mushroom commodity “players” in Indonesia.

In 2017, RumaJamuR had a partnership with PT. PJB Cirata (Indonesia hydro power plant company) to conduct mushroom cultivation training as a Corporate Social Responsibility (CSR) program. The training was given to the representative of local communities who live in Cadas Sari, Cadas Mekar, and Karoya Village. The aim of the collaboration is to introduce mushroom farming as a means to improve the social welfare of the local communities surrounding the company location in Cirata, Purwakarta, West Java. During the program, RumaJamuR owner directly delivered the training by using PowerPoint slides. Some samples of F0, F1, F2, F3 and necessary equipments were brought for practical demonstration. To

ensure the impact of this CSR program, there were some follow up coaching and monitoring done by PT. PJB Cirata staffs.



Figure 16. RumaJamuR owner is delivering the training (source: organikganesha.com)

5.3. MAJI and Individualist Mushroom Farmers in Cisarua

“In here, mushroom farmers are very individual. For instance, in Pari village, there is a big family who monopolise mushroom supply chain. A man has a big enterprise, his brother is the middlemen, his another brother is a spawn producer. This big enterprise is very competitive, they are not willing to share and they always see other mushroom farmers as competitors.” - A small scale mushroom farmer in Pameungpek Village

“I am still sceptical of joining a mushroom association. What would be the benefit? If that helps me to get better price, more advanced production facilities, or more knowledge, then that’s a good idea” - A small scale mushroom farmer in Pameungpek Village

In 1990s, mushrooms are still not widely known in Indonesia. Meanwhile MAJI or Association of Mushroom Agribusiness Society Indonesia founders saw that there are much potential for mushroom such as abundant local resources for substrate, requirement of less land area, new employment for rural people, and possibility for zero-waste practice. MAJI was established in 1998 and legally recognised by the national law. MAJI encompasses farmers groups, association of farmers groups, as well as researchers, entrepreneurs, and hobbyists. MAJI has a national and local committee across the country. The founders of MAJI aimed that MAJI could be a strategic platform for mushroom farmers, groups, scientists, hobbyists, and entrepreneurs to develop mushroom agribusiness as well as to improve the welfare of all related stakeholders in mushroom supply chains. This objective is expected to be achieved by, (1) improving human resources through training; (2) developing technology and innovation through collaboration with public universities; (3) increasing the investment through collaboration with financing institutions, (4) and doing market penetration through better post-harvest management such as packaging, quality control, distribution, storage, and so on (MAJI Charter, personal communication with MAJI Leader).

At the moment, MAJI national committee is still active in participating exhibition, workshops, seminars, doing some advocacy works to the government, and giving consultation to any parties who want to engage in mushroom agribusiness. There are also some online platform (in Facebook and Whatsapp) for mushroom farmers where they could discuss and

share anything related to mushroom cultivation, or even to trade their used production equipments. However, there is rarely any offline or face to face meeting of these farmers because the platform usually consists of many mushroom farmers from all over Indonesia.

“Yes we have whatsapp group but I personally think the discussion there is not useful. The knowledge is still unevolved. They are still talking about the same thing. We need more advanced knowledge.” - A small scale mushroom farmer in Cisarua

In the local scale such as in Cisarua, MAJI Cisarua is not active anymore because the farmers do not have interest to form farmer groups. The essence of farmers groups/association is now seemed being politicised. In the past, farmers groups existed because there was prompting desire among farmers to unite, to help each other, to build solidarity and achieve success together. At the moment, farmers groups are created merely to utilise governmental supports. Because whatever the support is, the support will only be given to groups of farmers, not individual farmers. MAJI Cisarua leader argue that, mushroom farmers in Cisarua are now tend to become a “program receiver”, because the groups/association are not harnessed to be a platform to share knowledge or discuss experiences.

“Usually farmers form a group because they need something out of it. But in here it seems like they are competing one another. Let’s compare, chili farmers need subsidised fertilizers from us that could only be given to farmers groups. Meanwhile mushroom farmers do not use fertilizers. Perhaps that is why they are not interested to form groups.” - An extension officer in Cisarua

The majority of the farmers do not trust farmers’ association/group anymore because they have been disappointed. In the past, when MAJI Cisarua is still active, there was a miscommunication when the subsidised facilities from the government (cash money, motorbike, and production machineries) are given to MAJI Cisarua for further distribution. But the farmers suspected that the facilities were used solely by the relatives of MAJI Cisarua committee members. Because at that time, the leader of MAJI Cisarua was the relative of a big mushroom enterprise. Therefore, many mushroom farmers in Cisarua are sceptical in joining farmer groups/association until now. In contrast, according to MAJI Cisarua leader, any farmers can use the facilities from government but it has to be borrowed responsibly. For instance, if using the motorbike, one need to take care of it very well and it has to be returned on time, so other farmers can also use it. In term of organisational administration, MAJI Cisarua was also not well organised back then. Therefore, MAJI Cisarua received low participation and still inactive until now.

5.4. Initiation of PATIMURA

According to the head of MAJI, there are several problems in mushroom agribusiness. The first one is actually the capital. In the past, MAJI used to apply for governmental grants and/or private investments, but the profit realisation is always low. Many factors contribute to this problem. The failure rates (both in harvesting and marketing) are basically cannot be predicted in mushroom cultivation. This is exacerbated by the price uncertainty in the market. The second problem is the availability of good quality of spawn. In 2008, BALITSA or Indonesian Vegetables Research Institute used to be the seed banks for horticultural commodities including mushroom F0 culture from Florida strain. Nonetheless, because spawn

production needs to be regenerated over time, it costs some money that the government did not allocate to. Therefore, BALITSA had to commercially sell the spawn to farmers, not giving them for free anymore. This fact was harnessed by a big mushroom enterprise at that time that produce F0 at very high price at that time.

The third is the problematic mindset of mushroom farmers in Cisarua which they only seek quality without giving attention to quality. As consequence, many mushroom farmers neglect the importance of sanitation or hygiene. The head of MAJI argue that actually both workers and farmers do not understand the SOP of growing mushroom hygienically.

“As example, in inoculation process, a worker should wear masks and follow the steps well. But they want to do the tasks fast because they need to go to other farm to gain more money. They oversimplify the hygiene by saying “No, this is our culture. This is how we do it. We have been doing this for years”. But still, you will find many contaminations! I think they basically do not understand because contamination is microscopic process. People cannot see bacteria directly. Therefore they do not realise that humans can be a carrier for bacteria, too. Such as our unwashed hands, our uncleaned clothes, and so on” – Head of MAJI

Therefore, the head of MAJI thinks that at the moment, Cisarua is not suitable anymore for mushroom cultivation because the pest and disease has become endemic. The practices which are not hygienic are seen as common practices. He further explains that the spores from contaminating bacteria like *Aspergillus* sp., and *Trichoderma* sp. have contaminated the environment in Cisarua. Most of the farmers just throw away their contaminated baglog in an open space. These habits allow air contamination by a fast spread of unfavourable microbes. Moreover, farmers nowadays pasteurise their baglog only at 80°C, meanwhile to optimally kill the unfavourable microbes, the pasteurisation has to reach minimum 120°C.

As explained above, there is a need for collective action of mushroom farmers in Cisarua. However, in the midst of increasing scepticism and individualism, it is hard to organise a better mushroom farming practice. Therefore, RumaJamuR owner took the opportunity to initiate a new farmers group in Cisarua called Paguyuban Petani Jamur Cisarua (PATIMURA). He hopes that PATIMURA could be a strategic organisation to do advocacy work to government such as utilising monetary support or even to have a more coordinated standard operational procedure in mushroom cultivation. RumaJamuR owner has gained popularity and trust from some farmers because they were interacting in the spawn and/or baglog transaction. Some farmers have been surveyed by RumaJamuR owner. But due to the lack of human resources and still, low participation of local mushroom farmers, PATIMURA initiation came to an end. In fact, despite of the failures of gaining trust from mushroom farmers in Cisarua, the leader of MAJI was supporting the notion of PATIMURA.

“I support the initiation of PATIMURA. I think there should be a new spirit for mushroom farmers in Cisarua.” –Head of MAJI

“It was difficult. Farmers are generally still sceptical about joining a farmers group. Therefore I wish RumaJamuR could be a leading example for other mushroom farmers. From there, other farmers will develop their trust and willingness to join PATIMURA” - RumaJamuR owner

Chapter 6

Discussion and Conclusion

The preceding chapters provide empirical evidence of how RumaJamuR operates internally and how does RumaJamuR interact with diverse stakeholders in a hybrid institutional environment. The discussion section highlights the most striking findings of this research as well as the scientific relevance and societal relevance of the research. In the conclusion section I will state my overall findings and answer the research questions before providing suggestions for further research.

6.1. Discussion

Individualism in Cisarua Mushroom Agribusiness

Individualism seemed to be most striking external institutional pressure for RumaJamuR in Cisarua mushroom agribusiness context. In researching institutions and agrarian development, Bulte *et al.* (2018) depict that the merits of individualist ordering are ruthlessly competitive, zero-sum relation, and demotivation of many less well people because a very few individuals monopolise most opportunities. In Cisarua, the increasing individualist ordering among mushroom farmers has been driven by the changing value and difficult economic situation. As Bulte *et al.* (2018) posit, market is a significant example of individualist institutional ordering, in which transactions are priced in terms of a monetary medium of exchange. Thus, market as institutions, and as actual sites of transactions. The following paragraph describes the example of practices that are linked to individualist ordering in Cisarua.

The mainstream mushroom price determination and market system in Cisarua has been influenced by individualist forces as described in [subchapter 4.1.2](#). The practice of mainstream loan system given by middlemen/intermediaries or loan sharks due to limited access to financial capital also prominently signifies an individualist ordering of the market context in which RumaJamuR and other mushroom producers operate. This situation results in low profit margins for many small-scale mushroom farmers in Cisarua and easily fall victim to an incessant cycle of debt. Even though these commercial loan practices do not comply *shariah* principles and are considered undesirable, it has been perceived as normal practice in Cisarua. There is no consensus on how to solve the issue but there is a widespread feeling of discomfort about it among the society in Cisarua. Within this context, RumaJamuR stands out with its *shariah* funding scheme that is complemented with a funding contract ([Appendix 2](#)) and cost-benefit analysis ([Appendix 3](#)).

Another indication of the growing individualist business climate is the selling sawdust by the timber merchants. Sawdust has been an important material for making baglog substrate. Realising the importance and mushroom farmers' heavy reliance on this commodity, timber merchants started to make money out of it by selling sawdust, where until recently anybody could just ask for free sawdust to the timber merchants. Likewise, mushroom farmers have started to sell their plastic waste. As plastic waste from F2 and F3/baglog production has become an issue for environmental degradation in Cisarua, many mushroom farmers take the opportunity to sell the plastic waste to the local plastic waste pickers. Even though the price is low, there is apparently not enough social solidarity to do this on the basis of sharing goods/resources. Here again, RumaJamuR was an exception as explained in [subchapter 3.2.10](#).

RumaJamuR Strategies in Facing Hybrid Institutional Environment

From the preceding empirical chapters, it can be inferred that there are competing institutional demands from different social orderings in the Cisarua mushroom agribusiness context. In order to be viable, any mushroom agribusinesses in Cisarua has to possess its own strategy in simultaneously dealing with diverse practices under individualist, enclave, and hierarchy orderings. According to Block and Kaartz (2008), the ability to tie together disparate institutional worlds may be a major source of organisational distinctiveness and competence. In dealing with the hybrid institutional environment, RumaJamuR adjusted its routines or capabilities to some extent. Scott (2014) argues that in order to survive, a firm must be able to reproduce and modify its routines in the face of changing situations. He suggests that routines or capabilities are made up of both the conscious and tacit knowledge and skills held by participants who carry out organisational tasks.

The empirical evidence from case studies investigated by Bulte *et al.* (2018) highlight the institutional clash and depict the process of “hybridisation”. This process implies that institutional aspects of other orderings are accommodated within a particular ordering. In Cisarua mushroom agribusiness context, RumaJamuR attempts to accommodate competing institutional orderings by adjusting its financial, managerial, and operational aspects in which *shariah* principles embedded. These institutional adjustments are reflected in both RumaJamuR internal and external arrangements. This is in line with Kraatz and Block (2008) classification on possible responses made organisations to conflicting institutional demands. One classification that is relevant to RumaJamuR response to the hybrid institutional environment is embracing a hybrid or composite model “forging a durable identity of their own, and to emerge as institutions in their own right”.

1. *Shariah*-compliant trading arrangement

In operating in the midst of competing institutional demands, RumaJamuR embraces the hybrid environment by accommodating elements of different social orderings. As Cisarua mushroom agribusiness is dominated by the increasing individualist ordering, RumaJamuR shows how this can nevertheless be combined with internalised *shariah* principles and lead to effective business management and operation. This is witnessed by its strategy to establish contractual agreements in trading. Realistically, RumaJamuR could not rely on the mainstream way of selling its produce to the intermediaries in exchange with a very low cash profit. RumaJamuR established a contractual agreement in selling the harvest to an intermediary under the consent of both parties for a transparent process in determining the price, as suggested in *shariah* principles. With this contract, both parties stipulated some conditions and rules of trade which are not one-sided. This agreement also enables a space for negotiation and coordination for both parties involved in the transaction. As Bulte *et al.* (2018) argue, some transactions are best left to markets, others are better addressed within a hierarchy.

According to Marshall and Nair (2009), the ability of individuals or a community to organise itself for trade is influenced by a number of factors including social cohesion (affected by the ethnic and religious composition of the community), the existence of other community organisations, and the presence of charismatic individuals able to motivate people to action. RumaJamuR is able to harness the knowledge within *shariah* principles and embody them in the trading arrangement. *Shariah* could also be conceptualised as a control system in this context because the trading arrangement is non-arbitrary, transparent, and fair for both parties.

This is also reflected in the second strategy in regards to the financing arrangement as explained below.

2. Shariah-compliant funding arrangement

RumaJamuR offers *shariah* funding scheme to potential financiers in a form of *mudharabah* contract ([Appendix 3](#)). RumaJamuR is able to implement the espoused Islamic finance ethics and values in the contractual agreement with the financiers. This makes the tensions manageable, source of funding reliable, and the traditional practices of loan system and bootstrap financing dismissible. The main argument to this point is because the ingrained fundamental clash of values between individualist local practices (debt with high usury to intermediaries and/or loan sharks) with the religious prescription (no usury and exploitation of one party in Islam). The *mudharabah* contract consists of rules and practices that made it possible for both parties to be equal in being exposed to profit and risk sharing. Thus, *shariah* financing scheme seemed to fit better in solving the problem of financial access in local individualist social ordering. Same as in the trading arrangement, *shariah* could be a control system which reinforces a just instrument of financing and contributes to the improved well-being of the local people through *zakat* payment.

However, both *shariah* financing scheme and local loan system from loan sharks seemed to require high social costs. Social cost in *shariah* financing scheme implies that RumaJamuR has to be able to maintain social relations with the financiers. Meanwhile for local loan system from loan sharks, social cost means the indebted farmers also have to maintain social relations with the loan sharks as they are actually living in the same community. In typical rural area like Cisarua, it is really common for farmers to ask for loans from their “richer” neighbours. Therefore, loan sharks can easily trust the farmers without having to ask for collaterals as formal financing institutions do (e.g. KUD, local banks, etc.). Apparently, RumaJamuR is able to afford such high social cost in this context, as explained in [subchapter 4.1.1](#).

3. Adjusted operational practices

The convergence of enclave with hierarchical ordering also led me to address the third strategy upheld by RumaJamuR in regards to its day to day operational practices. RumaJamuR hierarchically enforce the habits of keeping the general hygiene (to reduce the risk of contamination) as well as the habits of book-keeping and note-keeping (to track the production efficiency and for the transparent report to the financiers). These habits are widely neglected in mushroom farming in Cisarua as they mostly strive for quantity. Consistent guidance and supervision as described in [subchapter 4.2.1](#) are really important in order to make sure that the tasks accomplished by the workers comply the SOP. To deal with the local habits of overlooking a proper waste management (e.g. plastic waste from F2 and/or F3 production), another attempt in adjusting the day to day practice has also been developed in RumaJamuR such as the integrated mushroom farming system. As environmental preservation is highly advocated by *shariah*, RumaJamuR is committed to conduct a zero-waste mushroom farming and make this practice emulated by other mushroom farmers.

4. Harnessing wide network

The fourth strategy evinced by RumaJamuR reveals that the business climate for mushroom farming is not exclusively based individualistic principles. RumaJamuR is embedded in a wide network of mushroom farmers association in national scale, researchers, organic communities, emerging start-ups, and passionate individuals. RumaJamuR is able to

harness this wide network. Despite of the widespread sentiment towards MAJI, RumaJamuR regards MAJI or any farmers' group/association (including PATIMURA) as a receptacle for enhancing mutual understanding among the diverse stakeholders (from different social orderings) engaged in mushroom value chain. Bulte *et al.* (2018) confer that peaceful institutional coexistence and cooperation is possible, especially in the presence of skilled brokers, facilitating mutual understanding across the dividing lines of the group-grid diagram. Marshall and Nair (2009) also suggest that organisation between cultivators could facilitate knowledge exchange, reduce vulnerability to shocks, and increase capacity to cultivate through shared investment in equipment, helps reduce the vulnerability of individuals.

The wide network of RumaJamuR also enables multiple interactions with diverse stakeholders from different social orderings. As Bulte *et al.* (2018) argue, interactions may also change institutions, perhaps triggering a process of institutional convergence. Interaction with researchers, other mushroom farmers/hobbyists, organic community, emerging start-ups, and passionate individuals leads to information flows and shared knowledge. As inculcated *shariah* values in RumaJamuR are good manners, hospitable and mutual cooperation with other related stakeholders, sharing knowledge has become a common practice among these stakeholders. Marshall and Nair (2009) suggest that effective communication and good relationships between suppliers, growers and buyers are important to ensure effective information flows about sources or spores, substrate, other equipment, yields, crop quality etc. Thus, RumaJamuR is able to make well informed decisions on the basis of shared knowledge. The information flows also enable RumaJamuR to have the opportunity to identify any niches to be filled. For example, RumaJamuR offers healthy mushroom-based products and organic fresh mushroom in targeting the increasing niche market for organic and healthy food. In the emergence of agrotourism, RumaJamuR also harnesses the opportunity by providing some formal workshops and a program for introducing mushroom farming to kindergarten or elementary students as explained in [subchapter 3.2.11](#).

Equally important, multiple interactions and effective information flows has enabled RumaJamuR to enhance its ability to collaborate and innovate. According to Zuhdi *et al.* (2015), effective collaboration unlocks the potential of the collective knowledge and intellectual capital of the organisation and its networks of business partners, suppliers, and customers. At the core of true collaboration is the ability to share and catalogue knowledge, ideas, standards, best practices, and lessons learned and to be able to retrieve that knowledge from anywhere at any time. Those information support all the knowledge workers in making decision, policy actions, and innovation optimally. With the embedded *shariah* principles including hospitality, mutual cooperation, avoiding betrayal towards business partners, honesty, and avoiding scam elements, RumaJamuR is able to arrange both formal and collaborative relationship with related stakeholders as elaborated in [chapter 5.1](#) and [5.2](#). This phenomenon also found in Febrianda and Tokuda (2017) in a study of AAC, a mushroom enterprise in Cianjur, which shows that collaboration such as contract farming, joint farming, or other forms of collaboration, could be a positive alternative way to intensify the business performance and to escalate the scale of production of mushroom. Furthermore, they also highlighted that the strategies of AAC were capable to innovate by interacting and cooperating with external sources such as researchers from public institute, farmers, suppliers, final market and surely consumer.

This study brings empirical evidence and special input to the growing *shariah*-agribusinesses in Indonesia particularly in dealing with competing institutional demands. However, the findings could contribute to a better understanding of other agribusinesses, regardless if they are *shariah*-compliant or not. The empirical findings on RumaJamuR operational practices could universally be adopted and/or adapted by any mushroom enterprise regardless of its compliance to any religious prescriptions. Let alone, seeing that mushroom agribusiness has been growing in the country. The evidence in disparate area of Indonesia shows that the trend of mushroom farming is gradually increasing after it was pushed weekly by a collaborated party through an agricultural clinic program with the local television (Febrianda and Laili, 2016). Therefore, the strategy used by RumaJamuR can complement other studies on learning the best practices or strategies employed by a “champion” mushroom enterprise operating in a difficult context. For instance, Febrianda and Tokuda (2017) show that AAC, a leading mushroom enterprise in Cianjur, West Java, Indonesia, employs several strategies such as utilising reliable baglog technology, market’s profit and assurance, affordable capital and contract agreement. Learning the operational practices of mushroom enterprise is an urgent need in the country. Because in another study, Febrianda and Tokuda (2018) reveal that Indonesian practitioners such as farmers and sellers in the market also claimed often that local demand of Indonesian mushroom market have evolved higher than the supply, and not only higher productivity but also a higher number of mushroom farmers will be needed to fulfil the demand (Febrianda and Tokuda, 2018). This strengthen the previous study done by Nugroho (2013) which shows that despite the Indonesian society’s awareness of health benefits of mushroom has resulted in the positive progress of the commodity, its demand is not responded optimally owing to problems related to the performance of mushroom SMEs.

In terms of theory, the operational practice (Prater and Ghosh, 2005) and operational sequences (Lemmonier, 1992) were useful in helping me to understand both the technical and social practices in RumaJamuR business operation. The operational sequence suggested by Lemmonier (1992) provides a comprehensive lens in analysing the technical practices (mushroom growing) in RumaJamuR. Meanwhile operational practice posited by Prater and Ghosh (2005) helped me to also look beyond the mushroom growing. This includes the interactions, financial, and managerial aspects in RumaJamuR operational practices. Furthermore, this theory also enabled me to construe the embedded *shariah* principles in RumaJamuR operational practices who were inconspicuous. Thus, these two theoretical frameworks were fruitful for a technographic study of a *shariah*-compliant agribusiness who operates in a hybrid institutional environment. Besides, to understand the context of Cisarua mushroom agribusiness in a comprehensive manner, Douglas’ grid group ordering provides a useful analytical approach. The four modes of institutional ordering helped me to understand the underlying rules and expectations about the behaviours of diverse stakeholders who operate in different institutional orderings. Because in general, the society in Cisarua consists of several types of institutional orderings that co-exist and interact.

The empirical findings of this research could contribute to the absence of collectively agreed SOP of mushroom production in Cisarua. The technical practices and sequences of RumaJamuR that are disentangled in this study could be posited as a useful reference. The co-creation of mushroom production SOP in Cisarua could be facilitated by MAJI Cisarua or by any related parties such as the local extension officers. However, since individualism has played a great role in Cisarua mushroom agribusiness context, an effective approach to re-build trust and engage the mushroom farmers is needed. By having a collectively agreed SOP, it is expected that the economic, environmental, and social constraints could be addressed in a participatory means.

Furthermore, RumaJamuR operational practices could also be a reference to further improve the LM3 programme in Cisarua or other villages as explained in [subchapter 2.3](#). Since LM3 with mushroom production in Cisarua was only able to survive until 2010, positioning RumaJamuR as a leading local example could improve LM3 practices in Cisarua. Because as expected since its initiation in 1991, LM3 was set to be the agent of development, change, and of social control in addressing poverty and unemployment in rural area (Zakariah, 2016). Furthermore, the *mudarabah* funding scheme that RumaJamuR has been using could also be a suggestion for the KUD or village unit cooperative. With its profit and loss sharing equity principle, KUD could start to consider embracing a *shariah*-compliant funding scheme for the farmers in Cisarua. This could be a promising option for farmers to choose where to get the financial capital before the planting season starts without having to take a loan with very high interest from the middlemen or loan sharks. Moreover, rural society mostly fears to engage with banking credit because of the complicated terms on credit proposal and their poor management. Meanwhile the allocation of credit from the bank is low due to the viewpoint of the agribusiness as risky business (Ashari, 2009; Febrianda and Tokuda, 2018).

6.2. Conclusion

This research has sought to understand and subsequently deal with the issue of conflicting institutional demands in a hybrid institutional environment in which a *shariah* agribusiness operates in. In the context of mushroom agribusiness, I avowedly focus on RumaJamuR business operation, a *shariah* mushroom agribusiness in Cisarua. The research objective was to investigate how a *shariah*-compliant agribusiness operates in the midst competing institutional demands from different social orderings. This study therefore provides a deeper understanding of *shariah*-compliant agribusiness by looking at both technical and social aspects in RumaJamuR business operations.

In order to be viable, any mushroom agribusiness in Cisarua has to possess its own strategy in simultaneously dealing with a hybrid institutional environment. RumaJamuR operates in an environment in which different stakeholders enforce diverging motives, practices, and habits of organising society and/or businesses. As Cisarua mushroom agribusinesses are dominated by the increasing individualist ordering, RumaJamuR shows how embedded *shariah* principles could lead to effective business management and operation. From the analysis of empirical data, I evinced RumaJamuR attempts to accommodate competing institutional orderings by adjusting its business operation in which *shariah* principles embedded. These institutional adjustments are reflected in RumaJamuR trading and funding arrangements, operational practices, and interactions in wide network. With the help of technographic methodology, I was able to observe and actively participating in the internal operations of RumaJamuR which reflect both technical and social aspects.

The above mentioned explanation brings the discussion to its apex, in which the embedded *shariah* principles play a huge role in RumaJamuR business operation. In operating in a hybrid institutional environment, RumaJamuR conformity and commitment to *shariah* also influence its response to competing institutional demands. The espoused *shariah* values are embodied in the operational practices, financial arrangements, structured interactions, and marketing operations within RumaJamuR. In other words, a four way of institutional accommodation could lead to stable business operation. Furthermore, institutionally-adept enterprise like RumaJamuR shows its ability to simultaneously meet the expectation imposed by disparate institutional spheres in which it operates. In sum, the interplay of conformity to *shariah* and ability to respond to the competing institutional demands (both in internally and externally) has shown how RumaJamuR operates in a hybrid institutional environment.

6.3. Limitations and Recommendations for Future Research

This research adopted technographic methodology by looking at the technical and social configuration with embedded *shariah* principles in RumaJamuR business operation. In disentangling the performance, distributed cognition, and construction of rules, technography helped me to make sense of how *shariah* principles embedded in RumaJamuR actually play out in practice. As this research was avowedly investigating RumaJamuR operational practices, I was able to provide in-depth information about the chosen unit of analysis, but those are insufficient for generalising a larger population. This issue can be improved by future studies in similar enterprises to gain more empirical evidence in operational practices. Besides, further studies on operational practices of *shariah*-compliant agribusiness could also contribute to the relatively scarce literature on *shariah*-compliant agribusiness. I think there should be more empirical research employing technography in investigating business operations that comply with *shariah* and operate in a hybrid institutional environment at the same time. The opportunity to conduct such studies is widely available in many Muslim countries where there is a growing utilisation of Islamic financing scheme for agriculture sector and also an increasing awareness of “ethical business” that actually complies with *shariah* values in mundane production practices.

Technography, as proposed by Jansen and Vellema (2011), defies the dominant view that the social sciences and natural sciences should be kept separate. I agree with the statement, however, I think data collection procedures in future research related to this topic might need to give more attention to the social aspects which are usually not perceptible compared to the technical aspects. Particularly, in investigating practices related to *shariah* principles, I realised that somehow there is still an ethical dilemma. As religion is mostly perceived to be something personal, asking questions related to the *shariah* would be a big challenge for a researcher. For instance, other mushroom farmers in Cisarua that I interviewed were 3 Muslims and 1 Buddhist. As some of these Muslim farmers know that taking loan with high interest from the loan sharks is not permissible in their religion, they were hesitate to talk deeper about it because they have been relying on that practice since a long time. Therefore, to anticipate such situation, I would suggest future researchers to invest more time in having informal conversation and getting involved in the daily activities of the informants. However, as a Muslim, my own personal understanding of Islam may also influenced the analysis and discussion of this research. Therefore, to avoid such bias, triangulation of data sources and data collection methods is highly important.

Our discussion on the competing institutional demands in Cisarua yielded at least two key insights for future research; 1) choosing a wise sampling method, as I mixed purposely key actors selection and snowball sampling method, I propose future research should carry out a preliminary research to dig information as many as possible to map what are the conflicting institutional demands, which actors are involved, what are their motivation, etc. from the informants that are representative to the studied context, 2) choosing a relevant case, as I chose RumaJamuR to be the focus of the attention, I think this implies a need for future research to start with the conceptualisation of *shariah*-compliance. Because at the moment there is no single standard or certification to be “a *shariah*-compliant business” in Indonesia. Therefore, choosing a relevant case that would be able to tell a researcher about its *shariah*-compliances is important. This could be done by having a preliminary interview with the business owner or by a literature study of the chosen case before continuing to the next stage of the research. However, it is also important to note that implementation of *shariah* values in an agribusiness’ operational practices might differ one another, depending on the surrounding institutional pressures, as well as the farmers’ understanding of Islamic prescriptions.

References

- Abeng, T. (1997). Business Ethics in Islamic context: Perspectives of a Muslim business leader. *Business Ethics Quarterly*, 7, 47-54
- Ab Aziz, M.R. (2013). Shariah - Compliant Financing for Agriculture in Islamic Banking Institutions. Retrieved 4 August 2018 from [https://www.researchgate.net/publication/257748663_SHARIAH - COMPLIANT FINANCING FOR AGRICULTURE IN ISLAMIC BANKING INSTITUTIONS](https://www.researchgate.net/publication/257748663_SHARIAH_-_COMPLIANT_FINANCING_FOR_AGRICULTURE_IN_ISLAMIC_BANKING_INSTITUTIONS)
- Adjie, E. (2012). Pola Pembiayaan Syariah untuk UMKM Agribisnis. Retrieved from <https://www.kompasiana.com/adjieditya/551147188133119a36bc79c5/pola-pembiayaan-syariah-untuk-umkm-agribisnis?page=all>
- Akullo, D., Maat, H., & Wals, A.E.J. (2017). An institutional diagnostics of agricultural innovation; public-private partnerships and smallholder production in Uganda. *NJAS - Wageningen Journal of Life Sciences*, 84 (6-12),1573-5214. doi.org:10.1016/j.njas.2017.10.006
- Almekinders, C. (2011). The joint development of JM-12.7: A technographic description of the making of a bean variety. *NJAS - Wageningen Journal Of Life Sciences*, 57(3-4), 207-216. doi: 10.1016/j.njas.2010.11.007
- Antonio, M. (2011). Islamic Microfinance Initiatives to Enhance Small and Medium Enterprises in Indonesia: from historical overview to contemporary situation. *Journal Of Indonesian Islam*, 5(2), 313. doi: 10.15642/jiis.2011.5.2.313-334
- Ayub, M. (2007) *Understanding Islamic Finance*, West Sussex, John Wiley & Sons Ltd
- Baars, J. and Rutjens, J. (2016). *Finding a Suitable Biocide for Use in the Mushroom Industry - isms.biz*. Retrieved 13 February 2019 from <http://www.isms.biz/amsterdam/volume-19-part-1-article-23/>
- Badan Pusat Statistik (BPS) Kabupaten Bandung Barat. (2018). *Kabupaten Bandung Barat dalam Angka 2018 (Bandung Barat Regency im Numbers 2018)*. Retrieved from <https://bandungbaratkab.bps.go.id/publication/2018/08/16/93472f52c28b641ae982457b/kabupaten-bandung-barat-dalam-angka-2018.html>
- Badan Penyuluhan Pertanian, Perikanan, dan Kehutanan (BP3K) Cisarua. 2013. Monografi Kecamatan Cisarua.
- Bernard, H.R. (2011). *Research Methods in Anthropology: Qualitative and Quantitative Approaches*. 5th Edition.
- Biancone, P. P., & Radwan, M. (2015). Sharia Compliant “Possibility for Italian SMEs”. *EJIF - A European Journal of Islamic Finance*, (1).<http://dx.doi.org/10.13135/2421-2172/908>
- Beekun, R.I, & Badawi, J.A. (2005) Balancing Ethical Responsibility among Multiple Organizational Stakeholders: The Islamic Perspective. *Journal of Business Ethics*, 131-145.
- Bulte, E., Richards, P., & Voors, M. (2018). *Institutions and Agrarian Development - A New Approach to West Africa* (1st ed.). London: Palgrave Macmillan.
- Child, J. (2005). *Organization: Contemporary Principles and Practice*. Malden, MA: Blackwell.
- Elasrag, H. (2016). Islamic Finance for SMEs. *JEST - Journal of Economic and Social Thought*, 3(3), p.417-433. Retrieved 24 June 2018 from <http://kspjournals.org/index.php/JEST/article/viewFile/1009/1065>
- Emerson, R.M., Fretz, R.I & Shaw, L.L. (1995) *Writing Ethnographic Fieldnotes*. Chicago: University of Chicago Press.

- Ernawati, N. (2016). Determinan Penerapan Etika Bisnis Islam di Kendari. *Jurnal Ekonomi Syariah*, 4(1), 1-19.
- Febrianda, R., & Tokuda, H. (2017). Strategy and Innovation of Mushroom Business in Rural Area Indonesia: Case Study of a Developed Mushroom Enterprise from Cianjur district, West Java, Indonesia. *International Journal of Social Science Studies*, 5(6), 21. doi: 10.11114/ijsss.v5i6.2304
- _____. (2018). Learning the Adoption of Mushroom Farming Partnership: Case Study of Farmers and an Enterprise from Cianjur District, West Java, Indonesia. *IJSSS – International Journal of Social Science Studies*, 6 (7), 2324-8033. doi.org:10.11114/ijsss.v6i7.3263
- Global Business Guide Indonesia (GBG). (2014). Horticulture in Indonesia. Retrieved from http://www.gbgingonesia.com/en/agriculture/article/2014/organic_growth_horticulture_in_indonesia.php
- Greif, Avner. 2006. Institutions and the Path to the Modern Economy: Lessons from Medieval Trade. Cambridge: Cambridge University Press
- Greif, A., & Kingston, C. (2011). Institutions: rules or equilibria? In *Political Economy of Institutions, Democracy, and Voting*, ed., N. Schofield and G. Caballero. Berlin, Germany: Springer-Verlag, 13-44
- Hasanuzzaman, S. M. (2003) Islam and Business Ethics, London, Institute of Islamic Banking and Insurance.
- Jansen, K., & Vellema, S. (2011). What is technography?. *NJAS - Wageningen Journal Of Life Sciences*, 57(3-4), 169-177. doi:10.1016/j.njas.2010.11.003
- LaMarco, N. (2019). *Piece Rate Pay Advantage and Disadvantages*. Retrieved 13 February 2019 from <https://smallbusiness.chron.com/piece-rate-pay-advantage-disadvantages-11737.html>
- Lemonnier, P. (1992). Elements for an Anthropology of Technology. Museum of Anthropology, University of Michigan.
- Maman, U., Kusmana, K., & Supiandi, D. (2017). “Al-Musaqah” and Sharia Agribusiness System: An Alternative Way to Meet Staple Food Self-Sufficiency in Contemporary Indonesia. *HUNafa: Jurnal Studia Islamika*, 14(2), 189-231. doi: 10.24239/jsi.v14i2.448.189-231
- Marshall E. & Nair G. (2009). Making money by growing mushrooms. Rome. Food and Agriculture Organisation of the United Nations. Retrieved 15 January 2019 from <http://www.fao.org/3/a-i0522e.pdf>
- Musa, M. (2011). Islamic Business Ethics & Finance: An Exploratory Study of Islamic Banks in Malaysia. Retrieved from http://www.iefpedia.com/english/wp-content/uploads/2011/12/Muhammad.Adli_.pdf
- North, Douglas. 1991. Institutions. *Journal of Economic Perspectives* 5 (1): 97–112
- Nugroho, Y. (2013). Analisis SWOT Terhadap Strategi Pengembangan Bisnis Budidaya Jamur Tiram, Studi Kasus di Perusahaan Jamur di Kabupaten Bogor. Gadjah Mada University. Retrieved from http://etd.repository.ugm.ac.id/index.php?mod=penelitian_detail&sub=PenelitianDetail&act=view&typ=html&buku_id=65678
- Organik Ganesha. (2018). RumaJamuR. Retrieved 3 August 2018 from <https://organikganesha.com/about-us/>
- Ose, S. (2016). Using Excel and Word to Structure Qualitative Data. *Journal Of Applied Social Science*, 10(2), 147-162. doi: 10.1177/1936724416664948
- Ostrom, E. (2009). Understanding Institutional Diversity. Princeton: Princeton University Press.
- Otto, J. (2010). *Sharia incorporated*. Leiden: Leiden University Press.

- Pinch, T. (2008). Technology and institutions: living in a material world, *Theory and Society* 37, 461–483.
- Prater, E. and Ghosh, S. (2005). Current Operational Practices of U.S. Small and Medium-Sized Enterprises in Europe. *Journal of Small Business Management*, 43(2), pp.155-169.
- Richards, P. (2005), To fight or to farm? Agrarian dimensions of the mano river conflicts (Liberia and Sierra Leone), *African Affairs* 104, 571.
- Rust, I., Davis, J., & Goldberg, R. (1957). A Concept of Agribusiness. *Journal Of Farm Economics*, 39(4), 1042. doi: 10.2307/1234228
- Samson, D. and Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management*, 17(4), pp.393-409.
- Saleem, M. Y. (2010). Methods and methodologies in fiqh and Islamic economics. *Review of Islamic Economics*, 14 (1), 103–123.
- Scott, W. (2014). *Institutions and organizations* (4th ed.). Los Angeles, Calif.: Sage Publications.
- Sigaut, F. (1994). Technology. In: Ingold, T. (ed.), *Companion Encyclopedia of Anthropology. Humanity, Culture and Social Life*, Routledge, London, pp. 420–459
- Sinaga, V., & Gallena, J. (2015). Financial Viability of Mushroom Growers (Farmers) at Cisarua, Bandung. Retrieved from <http://isc2017.apiu.edu/conference-papers/aup/Sinaga%20&%20Gallena.Financial.viability.mushroom.pdf>
- Stewart, D. (1996) *Business Ethics*, New York, McGraw-Hill.
- United States International Trade Commission (USITC) (2010). *Mushrooms industry and trade summary*; Office of industries publication. Washington, D. C.
- Venardos, A.M. (2005) *Islamic Banking and Finance in South-East Asia: Its Development and Future*, Singapore, World Scientific Publishing
- Williamson, Oliver E. 1981. The Economics of Organization: The Transaction Cost Approach. *The American Journal of Sociology* 87 (3): 548–577. <https://doi.org/10.1086/227496>.
- Zakariah, M. (2016). Evaluation of Islamic Management of Beef Cattle Development program of Lembaga Mandiri Mengakar Masyarakat: Pondok pesantren al Mawaddah Warrahmah Kolaka - Sulawesi Tenggara Case. *QIJIS (Qudus International Journal of Islamic Studies)*, 5(1), 49. doi: 10.21043/qijis.v5i1.1748
- Zuhdi, A., Dasril, A.SN., Kusumastuti, S.Y. (2015). Portal Based Knowledge Sharing Optimization On Agribusiness Community Development. *IJTEER - International Journal of Technology Enhancements and Emerging Engineering Research*, 3 (12), 2347-4289.
- Zulkifli, C., & Saripuddin, C. (2015). Concept of Business Ethics in Islam - Approach to the Entrepreneur. *Journal Of Asian Business Strategy*, 5(1), 13-18. doi: 10.18488/journal.1006/2015.5.1/1006.1.13.18

Appendices

Appendix 1. *Shariah*-compliant Agribusiness

The following passages explain the general idea of what comprises an agribusiness which is *sharia*-compliant based on the widely discussed literature on Islamic ethics in business and Islamic financing.

Islamic Ethics in Business

In the first place, for Muslims, Islam is not merely a religion but considered as a way of life. At the same time, the absence of an ethical framework governing actions leads to the non-existence of behaviour standards of a civil society, which would result in chaos and disorder (Stewart, 1996; Musa 2011). Therefore, business ethics cannot be separated from ethics in other aspects of a Muslim's daily life (Beekun and Badawi, 2005; Hasanuzzaman, 2003). Ethics has always been a part of business. There is considerable amount of literature on Islamic ethics on business. Zulkifli and Saripuddin (2015) summarise the regulations contained in the Islamic Holy book, Qur'an on entrepreneurial activities as follows:

1. Sincere intention

Intention is the basis of an act because it set a target in heart infusion. Thus, a Muslim entrepreneur should ensure that the real intention is to serve a noble purpose and to gain the pleasure of Allah in all aspects of live, as written in the Qur'an, Surah al-Zumar [39] 2: Meaning: *"Indeed we sent down the Book (the Quran) to (bring) the truth. So worship Allah purifies the (sincere) obedience to Him"*

2. Not involved with practice of usury

Usury is forbidden in Islam because it causes oppression and inequality on society and the national economy itself. In the worst case, this will cause the rich will get richer and the poor will be poorer. This prohibition is mentioned in the Qur'an Surah al-Baqarah [2] 275 as follows: Meaning: *"Those who eat (take) usury will not stand except as stands one whom the Evil one by swaying because of (his) touch it. That is because they say: "Verily trade is like usury". But Allah has permitted trade (merchandise) and prohibits usury. So whosoever receives an admonition that (ban) from his Lord, then it stops (the usury), then what is past (before the ban) is a right, and to judge God. And those who repeat (the act of taking the laptop), they shall be companions of the Fire, they will abide therein"*

3. Avoiding scams element

In the Qur'an, repeatedly reminds traders to be honest and strictly prohibits fraud and corruption in business. Islam prohibits sever ties of kinship. That is why, traders can avoid impartially negative effects on the relationship between traders and their customers. As stated in the Qur'an Surah al-Mutaffifin [83] 1-3: Meaning: *"Woe to those who cheat the people who, when they receive by measure from men, take full and otherwise when they measure or weigh for others they cut (the measurement or weight)"*

4. Be *al-Adl* (Justice)

According to Nor (2012), traders must be temperate in all things without the benefit side, equal treatment or fair to all customers, taking into consideration fair and unbiased and gives the right to the right. It is stated in the Qur'an Surah al-Nahl [16] 90: Meaning: *"Allah commands you to do justice and kindness"*

5. Trust

Traders must conduct all actions and make decisions that are based on the nature of trust. As consequences, traders or entrepreneur cannot cheat, betray customers, selling price too high and delaying payments to suppliers. This is emphasized in the Qur'an Surah al-Anfal [8] 27:

Meaning: “O you who believe! Do not betray (trust) in Allah and His Messenger, and (do) not betray your trusts while you know (them)”

Islamic Finance

Islamic finance offers high ethical standards that reflect Islamic values in all facets of behaviour to bring about collective morality and spirituality, which when integrated with the production of goods and services advance the Islamic way of life (Musa, 2011). The difference between Islamic and conventional financial system is that the former has to preserve certain social objectives and is based on equity rather than debt (Venardos, 2005). Elasrag (2016) highlights that Islamic finance’s underpinning principles of promoting participation, equity, property rights and ethics are all “universal values”. In regard to that, Islamic finance has developed specific financing products. One of the core financing products is partnership-contracts between the lender and the borrower based on the profit-and-loss-sharing principle (Elasrag, 2016). He further explains that a *mudarabah* contract is based on the fact that the lender provides the capital and the borrower provides the effort and know-how. Profits are shared between both parties, whereas losses are borne solely by the lender. Therefore, Islamic finance has the potential to promote financial stability because its risk-sharing feature reduces leverage and its financing is asset-backed and thus fully collateralised (Elasrag, 2016). He summarises the main principles of Islamic finance which include:

- The prohibition of taking or receiving interest;
- Capital must have a social and ethical purpose beyond pure, unfettered return;
- Investments in businesses dealing with alcohol, gambling, drugs or anything else that the *shariah* considers unlawful are deemed undesirable and prohibited;
- A prohibition on transactions involving *maysir* (speculation or gambling);
- A prohibition on *gharar*, or uncertainty about the subject -matter and terms of contracts—this includes a prohibition on selling something that one does not own.

Table 5.Criteria for classification as a *shariah*-compliant agribusiness

Criteria defining a <i>shariah</i> -compliant business	Reference	Attributes found in RumaJamuR
Not involved with practice of usury.	Zulkifli and Saripuddin, 2015, Elasrag, 2016	RumaJamuR funded by a <i>shariah</i> -compliant financing scheme namely <i>Mudarabah</i> contract.
Consent of both parties who are engaged in a transaction, fulfillment of covenant and payment of liabilities.	Ernawati, 2016, Ayub, 2007, Zulkifli and Saripuddin, 2015	RumaJamuR sets transparent price, creates written contract with financiers and middlemen, and also send regular report to the investors.
Free of <i>haram</i> (not permissible in Islam) elements.	Ernawati, 2016	The materials acquired are checked to be <i>halal</i> (not using materials that are not permissible in Islam).
Good manners, forgiveness, appropriate and ethical treatment to the employed workers, hospitable to other related stakeholders particularly to consumers.	Abeng, 1997; Musa, 2011, Ernawati, 2016	The workers in RumaJamuR are treated well such as being paid in relatively fair wage compared to other mushroom business in Cisarua, being paid on time (in weekly basis), being provided appropriate facilities to pray, to rest, and to cook in the farm house, as well as being provided some bonuses for big holidays in Islam and when the profit is high.

Removal of hardship and compensation, mutual cooperation and avoiding betrayal towards business partners, no monopoly.	Abeng, 1997; Musa, 2011, Ayub, 2007, Ernawati, 2016	RumaJamuR has been developing good relationship with their business partners by making the information transparent, and acting responsibly according to the written contract.
Service and sincere motive.	Abeng, 1997; Musa, 2011, Zulkifli and Saripuddin, 2015	"I want this business to be imitated by more mushroom farmers, therefore I have to keep innovating in order to sustain.. Because how could we empower others if we could not even help ourselves first?" - The owner of RumaJamuR.
Honesty - Just and fair dealing, avoiding scams element, mark up pricing.	Ayub, 2007, Zulkifli and Saripuddin, 2015, Ernawati, 2016	RumaJamuR sets transparent price and send monthly reports to the financiers.
Not contributing to environmental damage.	Ernawati, 2016	RumaJamuR has been developing an integrated mushroom farming system that enables zero-waste farming in order to enhance its sustainability
Paying <i>Zakat</i> , one of the five pillars of Islam, which is a religious obligation for all Muslims who meet the necessary criteria of wealth. It is a mandatory alms that will be distributed to the needy	Ernawati, 2016	In the funding scheme, the RumaJamuR owner has allocated 20% of the income for <i>Zakat</i> before the profit is splitted to the financiers.

Appendix 2. RumaJamuR *Shariah* Funding Contract Template

MUDARABAH CONTRACT

بسم الله الرحمن الرحيم

In the name of God, the merciful and compassionate

INTRODUCTION

“I am the third of every two partners as long as neither one betrays the other. If one of them betrays the other, I leave that partnership”

(A Prophetic pronouncement legalized partnership that is attributed to God, Narrated in Hadith Qudsiy by Imam Daruquthni from Abu Hurairah R.A.)

Today, ____ (date)____(month)____(year), in _____, is signed below:

Name :

Identification Number :

Address :

Hereinafter referred to as the **First Party**

Name : Rial Aditya

Identification Number : 3277011104830019

Address : Jl. MargaSari no 45 rt 003/012 Kec. Cibeber Cimahi Selatan 40531

Position : Director of RumaJamuR

Hereinafter referred to as the **Second Party**

Collectively, both parties agree to establish a shariah agreement with the type of *mudarabah* contract in a Mushroom Cultivation business with the following articles set forth the terms:

Article 1.

General Provisions

1. The First Party as the owner of the capital (*Shahibul Maal*) hands over a certain amount of money to the Second Party to be used as business capital in a Mushroom Cultivation business.
2. The Second Party as the entrepreneur (*Mudarib*) of the First Party, manages the business as stated in Article 1 point 1.
3. The Second Party receives a certain amount of capital in the form of money from the First Party before this contract is agreed and signed.
4. Both parties will get benefit from the business results according to the agreed percentage of profit sharing and also bear the losses as stipulated in Article 4 and Article 5.
5. Each party has contribution in the business, both in the form of capital/labor; as further stated in Articles 2, 3 and 4.

Article 2.

Business Capital

1. The amount of the business capital, as referred to in Article 1 point 1 is Rp (_____)
2. The First Party's capital is given before this agreement is signed, which is on ____ (date)____(month)____(year) by transfer to _____

Article 3.

Business Manager

1. In managing the business, the business entrepreneur is assisted by a number of management and staffs whom statuses are employees.

Article 4.

Profits

1. Business profit is the Nett Profit, which is earned from business activities (Cash Profit) minus *zakat* (2.5% of Cash Profit).
2. The ratio of business profit is agreed at 50:50. The First Party as the owner of the capital gets 50% of the Nett Profit, the Second Party as the manager gets 50% of the Nett Profit.

Article 5.

Losses

1. Business losses are gross profit minus total operational costs which are negative.
2. Business losses are borne by both parties in accordance with the law of cooperation agreement with following explanation:
 - a. As business activity contains risks of profit and loss, the business losses resulting from business operational risks are borne by both parties at 50%: 50% of the value of business losses.
 - b. If the business loss is caused by the intentions of the Second Party to make deviation/mistakes, then all business losses will be borne by the Second Party.
 - c. Business losses due to Force Majeure caused by natural disasters, floods, riots, bombings, wars and rebellions are borne entirely by the first party.

Article 6.

Profit-Loss Calculations and Business Reports

1. Monthly profit and loss calculation is carried out on the 5th day in the following month.
 2. The accounting is carried out at the end of the year.
 3. Detailed monthly reports regarding all business activities are sent no later than the 10th of the following month; by the Second Party to the First Party.
 4. The transfer of the profits as referred to in Article 4 point 2 (if profits earned) is carried out no later than 10 days after the profit-loss calculation; and sent by transfer to the account
-

Article 7.

Conditional Period

1. The period of cooperation as referred in Article 1 is two years, unless there is a dismissal of cooperation agreed by both parties.
2. This cooperation agreement will be reviewed at the end of each year to be renewed and/or discussed again by both parties.

Article 8.

Rights and Responsibilities

1. During the period of business cooperation, the First Party:
 - a. is obliged not to interfere with the business policies that are enforced by the Second Party;
 - b. has an obligation not to force the Second Party to carry out suggestions, proposals, or wishes in carrying out the business activity;
 - c. is obliged not to carry out technical activities in the farm without the permission of the Second Party;
 - d. is obliged not to reduce or add certain amount of business capital, except in special circumstances (e.g. saving the business from huge problems, or taking advantage of situation) and this has to be done based on the agreement of both parties;
 - e. has the obligation to pay the loss of the business to the Second Party in regards to the cancellation of the cooperation agreement caused by the First Party's violation of the agreement;
 - f. has the obligation to pay for loss of business management as stated in Article 8 point 1 (e) no later than 3 months after the profit and loss calculation;

- g. has the right to control or review the business activity accompanied by the Second Party;
 - h. has the right to propose suggestions to the Second Party in order to improve the ongoing business activities;
 - i. has the right to cancel the agreement and/or partially withdraw the business capital from the Second Party after it is proven that the Second Party committed fraud and/or betrayed the contents of this agreement.
2. During the period of business cooperation, the Second Party:
- a. is obliged to manage the business capital that has been received from the First Party for a predetermined business activity, no later than 2 weeks after the contract was agreed and signed;
 - b. is obliged to make monthly reports of business activities to be submitted to the First Party;
 - c. is obliged to report special events (calamities) and/or other events that occur in the midst of business activities to the First Party no later than 7 days after the event;
 - d. is obliged to pay the loss of the business as stated in Article 5 point 2a and 2b no later than 3 months after the profit and loss calculation;
 - e. has the right to manage and determine policies in business activities;
 - f. has the right to implement or not implement suggestions, proposals, or wishes of the First Party;
 - g. has the right to cancel the agreement and/or partially return the business capital from the First Party after it is proven that the First Party committed fraud and/or betrayed the contents of this agreement;
 - h. has the right to receive compensation that are worthy for the time, effort and mind that have been put onto the business activity (loss of business management) in regards to the cancellation of the business cooperation agreement as stated in Article 8 point 1 (e).

Article 9. Conflicts

1. In case of a dispute between the two parties, the two parties have to agree in resolving it through a deliberation.
2. Everything that is the result of conflict resolution will be documented in an official report.

Article 10. Others

1. This agreement legally binds both parties.
2. Other things that might appear later and have not been regulated in this contract will be discussed by both parties and will be stated in the form of an addendum.
3. This contract is made in duplicates and all signed by both parties after a duty stamp has been affixed.

Cimahi ____ (date)____(month)____(year)

First Party

Second Party

(_____)

(Rial Aditya)

Appendix 3. RumaJamuR *Shariah* Funding Scheme

1 slot of stock (1.500.000) : 500 baglog 1 season : 100 days The investment multiply applies per : 500 baglog				
Financing allocation	Unit	Cost per unit	Quantity	Cost value
I. Operational Cost				
Baglog	log	2.400	500	1.200.000
Mushroom growing huts	season	200	500	100.000
Water and electricity	season	750	100	75.000
Maintenance	season	1.250	100	125.000
Total Investment				1.500.000
II. Sales				
Gross profit		10.000	200	2.000.000
III. Revenue				
Cash profit	season		1	500.000
<i>Zakat</i> and productive charity	%		20	100.000
Nett profit	season		1	400.000
*Profit sharing for RumaJamuR (50%)	season		1	200.000
*Profit sharing for Financier (50%)	season		1	200.000
**Estimated Return of Investment (ROI)	% season			13
**Estimated Return of Investment (ROI)	% month			4
Payback period	season			8

* The percentage of profit sharing depends on the mutual agreement between the owner and the financier

** This percentage is only estimation because the owner still has to count the exact Nett profit that will be known in the third month (the end of the season). After the exact net profit is known, the percentage of return of investment will be calculated.