The Role of Sukuk Financing for Sustainable Development of Smallholder Farmers

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Abstract:

The greatest advance made by mankind was probably the agricultural revolution that has been developed into agricultural development along with population growth in the forms of agricultural expansion and agricultural intensification. The global land grab driven by the acquisition of land has caused radical changes in the use and ownership of land and has important implications for equitable and sustainable development in which local people have been moved to marginal locations. To ensure that the agricultural activities are sustained, a balance of three concepts of people, planet, and profit (*3P*) are critical to achieve long term social, environmental, and economic issues. One of recently popular instruments to fairly treat the people is an equity based *Sukuk* in which profit will be shared based on pre-agreed ratio between the investors and the people involved. In term of conservation of planet, strategy in selecting the agricultural commodities and the timing of harvesting are critical. An investment decision-making process by using agricultural appraisal process is established to ensure that the agricultural activities are financially profitable.

Keywords: agricultural appraisal, agricultural development, investment decision, smallholder farmers, *sukuk* financing, sustainable development

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INTRODUCTION

There are two major schools of thought dominating literatures relating to the population growth and agriculture in which population growth requires an increase in agricultural production that could lead to either agricultural expansion or agricultural innovation. The increase in agricultural production through agricultural expansion may lead to deforestation and environmental degradation (Amacher *et al.,* 2008; Fuglie, 2010; Kangalawe & Lymo, 2010; Quaye *et al.,* 2010), whereas increase in agricultural production through agricultural intensification is closely related to the development of new technology (Craren, 2005; Carr, 2009; Pacheto, 2009; Purnamasari, 2010). In most cases, the agricultural development has pushed governments and business entities to search for productive land resources that create wealth which, in some cases, has led to social and environmental problems. Such phenomena was observed by Zoomers (2011) who identified that the global land grab caused radical changes in the use and ownership of land, and had important implications for equitable and sustainable development in which local peoples were forced to move to marginal locations. In line with Zoomers (2011), Gradl *et al.* (2012) stated that in the industrialised countries with limited ability to increase the quantity of land for agriculture, the demand on food production was met from developing countries and emerging economies where the majority of agricultural land is owned and cultivated by smallholders farmers. There are two phenomena underlying this research firstly agricultural land grab in fertile lands by large corporations and secondly the existence of smallholder farmers that are pushed into marginal unproductive lands.

This research had been carried out in Yogyakarta Province, Indonesia where 53% of the area is covered by marginal agricultural drylands. In 2013, among nine industrial activities, agriculture experienced the lowest gross regional domestic product at an amount of 0.63% whereas overall gross regional domestic product reach an amount of 5.40% (BPS, 2014). The average gross regional domestic product in the last five years (2009 – 2013) was 5.04% in which average gross regional domestic product of agriculture was the lowest at 1.17%. Among five regencies in Yogyakarta Province, agriculture was the highest contributor to the regional gross domestic product in Gunung Kidul Regency in which 70% of the area are covered by drylands. In 2012, the poverty rates in Gunung Kidul Regency was 22.72% compare to an average of 15.88% for overall Yogyakarta Province (Susenas, 2012). Based on these statistical data, this research had been conducted in Gunung Kidul Regency.
The smallholder farmers in Gunung Kidul Regency faced several problems to develop their marginal drylands such as limited educated and skilled human resources, and limited access to technology, financial, and market. In depth study had been carried out by Sugiharto (2013) for the development model of integrated agribusiness in the dryland areas of Yogyakarta Province. The profit generating issues were elaborated in detail through agricultural appraisal (Sugiharto *et al*., 2012c; 2013; 2014; Suroso *et al.*, 2014) whereas the environmental issues were discussed related to integrated activities and timing of harvesting (Sugiharto *et al*., 2012b; 2013; 2014). The social issues were brieftly discussed in the form of community empowerment through grass-root movement (Sugiharto *et al.*, 2012a; 2012c); however, none of the previous study concerned on the financial benefit of agricultural development from the view point of smallholder farmers. Therefore, it is the interest of this research to explore a financing model for agricultural development to fairly treat these smallholder farmers.

Daneshfar *et al.* (2010) suggested that one of financing arrangement that give a fair treatment is profit sharing among the stakeholders involved in the agricultural activities. There are several motives for the adoption of profit sharing such as labor productivity, cost monitoring,

and wage flexibility. In addition, profit sharing could create a self-motivated stakeholders to achieve the challenging goals of the company. In Islamic capital market, such profit sharing arrangement is called *Sukuk* that includes securities, notes, papers or certificates with features of liquidity and tradebility. One of the most popular instruments is equity based *Sukuk* in which participatory contracts involve *mudarabah* and *musharakah*. With this arrangement, if the business is profitable, the profit will be shared based on a pre-agreed ratio and if the business experience any loss, the loss will be the responsibility of the investor (Dusuki, 2010).

RESEARCH FRAMEWORK AND RESEARCH METHOD

Research Location, Scale, Time Frame, and Man Power

Yogyakarta Province, Indonesia covers an area of 3,186 square kilometers in the mid-southern part of Java island between 7^0 3' – 8^0 12' south latitude and 110^0 00' – 110^0 50' east longitude with the population of nearly 3.5 million. The province is devided into five regencies namely Kulon Progo, Bantul, Gunung Kidul, Sleman and Kodya Yogyakarta (Figure 1). Yogyakarta Province shares its border with Central Java Province to the west, north and east, and Indian ocean to the south.

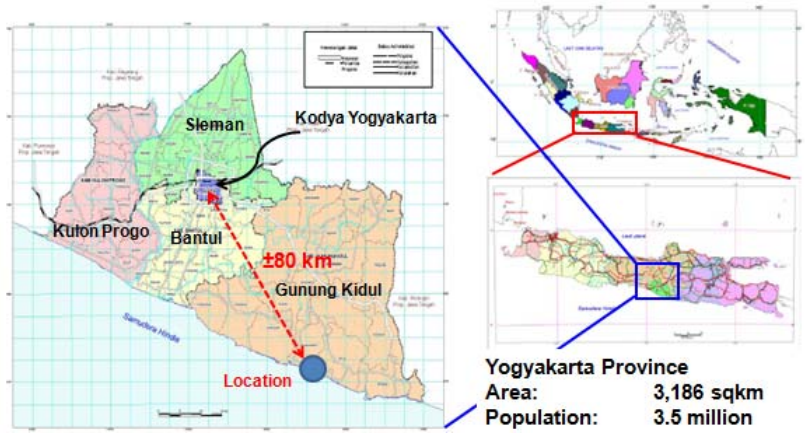

Figure 1: Research location in Gunung Kidul Regency, Yogyakarta Province, Indonesia

For the purpose of this research, an area of five hectares was selected in the southern part of Gunung Kidul Regency, Yogyakarta Province approximately 80 kilometers to the south east of the center city of Kodya Yogyakarta. Gunung Kidul Regency is located between 7^0 46' – 8^0 09' south latitude and 110^0 21' – 110^0 50' east longitude covering approximately 46% of Yogyakarta Province in which 70% of the regency are covered by dryland area. The activities were started in June 2008 and being evaluated to December 2013. One agricultural graduate and three local farmers were employed to operate the activities.

Research Framework

From the investor's point of view, Sugiharto *et al.* (2014) proposed a framework for agricultural appraisal as can be seen in Figure 2. The main valuation was mainly focused on project planning, enterprise budget, financial projection, and valuation measurements to arrive at overall appraisal.

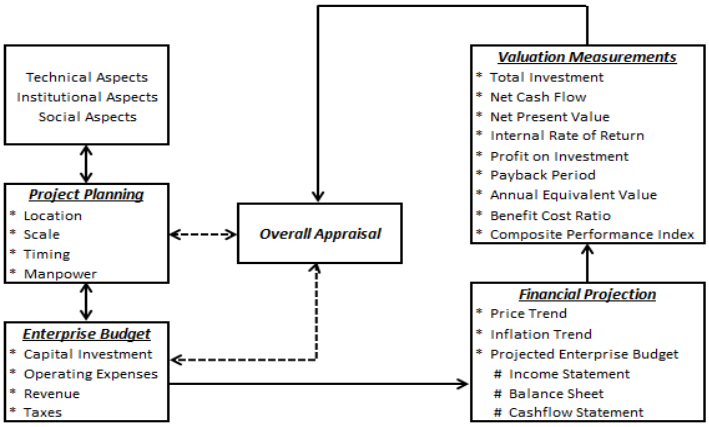

Figure 2: Agricultural appraisal framework (Sugiharto *et al.*, 2014)

The project planning consisted of determination of location, scale of the program, timing of the activities, and manpower being employed. The enterprise budget considered the allocation of capital investment, operating expenses, revenue, and the payment of tax. Costs and sales price increment were incorporated into projected income statement, projected balance sheet, and projected cashflow statement. Further, Sugiharto *et al.* (2014) evaluated the investment criteria consisted total investment, net cash flow (*NCF*), net present value (*NPV*), internal rate of return (*IRR*), profit on investment (*P/I*), payback period (*PBP*), annual equivalent value (*AEV*), composite performance index (*CPI*), and benefit cost ratio (*BCR*). In the earlier model however, Sugiharto *et al.* (2014) assumed that all financing decisions were the interest of investor leaving the skilled-worker, smallholder farmers, land-owners as fully paid parties. This article exercise other financing scenario in which all stakeholders are entitled for profit sharing instead of purely fully paid parties.

In terms of financing to smallholder farmers, Gupta & Aubuchon (2008) claimed that microfinance proved to improve the lives of the poor farmers. In line with Gupta & Aubuchon (2008), Latief *et al.* (2011) stated that microcredit in Pakistan had positive impact in alleviating poverty in which farmers were able to borrow money at lower bank rates and start a small business. In contrast, Adams & Bartholomew (2010) stated that in Ghana, the impact of microfinance for farmers were socially and financially marginal. Similarly, Karnani (2007) found that microfinance programs with though microcredit did not significantly alleviate poverty.

Another alternative source of agriculture financing was studied by Kaleem & Wajid (2009) *ie. Bai Salam* (forward sale agreement) in which contract locks agriculture inputs with the output against advance payments in full. The purpose of this agreement was to meet the needs of the smallholder farmers who need funds to grow their crops and to feed their family up to the time of harvesting. This *Bai Salam* agreement is similar to contract farming in which an agent provides credit inputs and technical advices to the farmers, as well as purchases the harvests with advance contract in terms of the amount and price of the commodities being produced by the farmers. This contract farming has been practiced all over the world such as in Turkey, Costa Rica, Vietnam, Malaysia (Tadlidil & Aktürk, 2004; Sáenz-Segura, 2006; Setboonsarng, 2008; Saigenji & Zeller, 2009; Samah *et al.,* 2010; Shaffril *et al.,* 2010; Uli *et al*., 2010).

Another type of agricultural financing is profit sharing among the stakeholders involved in the agricultural activities with several motives such as labor productivity, cost monitoring, and wage flexibility (Daneshfar *et al.,* 2010). Labor productivity is achieved through higher employees motivation and involvement whereas monitoring system occurs because the employees could observe the actions of other employees. Wage flexibility provides the company transfer part of the fix costs of salary into variable costs. Adoption of profit sharing also create a self-motivated employees to achieve the goals of the company.

Recently there is an instrument being used in Islamic capital market called *Sukuk* that includes securities, notes, papers or certificates with features of liquidity and tradebility. There are several structures of Sukuk such as *bay' bithamin Ajil* (deferred payment sales), *murabahah* (cost-plus sale), *salam* (forward sale), *istisna* (manufacturing sale), *ijarah* (leasing), *musharakah* (joint venture), *mudarabah* (partnership) and *wakalah* (agency). One of the most popular instruments is equity based *Sukuk* in which participatory contracts involve *mudarabah* and *musharakah*. The Malaysian Securities Commission defines *mudarabah* as a contract between two parties (a *rabb al-mal* or an investor who provides the capital and a *mudharib* or an entrepreneur who manages the project) to finance a business venture. If the venture is profitable, the profit will be shared based on a pre-agreed ratio and if there is any loss, the loss will be the responsibility of the investor (Dusuki, 2010). Figure 3 illustrates the structure of *mudarabah Sukuk.*

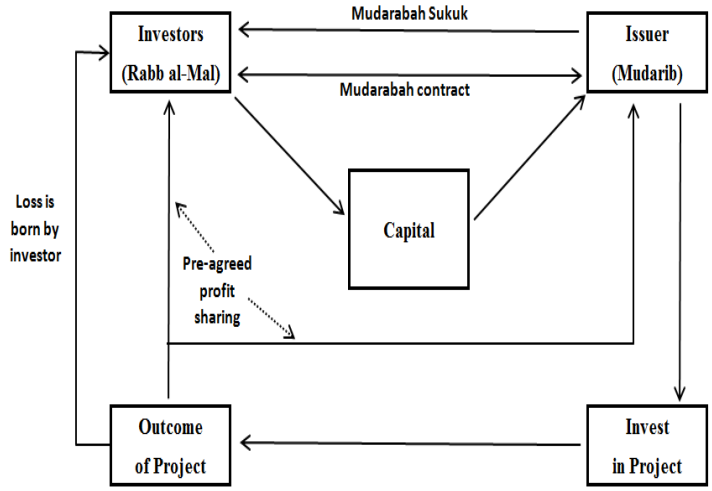

Figure 3: *Mudarabah Sukuk* structure (adapted from Dusuki, 2010)

In line with Daneshfar *et al.* (2010) and Dusuki (2010), a profit sharing arrangement is proposed for the agricultural development in the research area as can be seen in Figure 4. The investor and the farmers/land-owners signed an agreement to utilize investor's fund for the agricultural development. All parties should agree in advance whether farmers/land-owners prefer to receive a full-paid-salaries/land-rental or profit sharing out of the agricultural development.

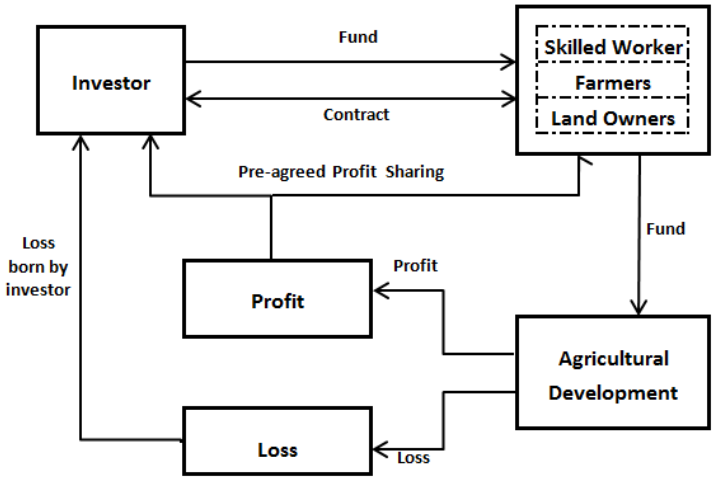

Figure 4: Framework of profit sharing

If the agricultural development yields any profit, the profit is shared among the investor, skilled-worker, farmers and land-owners in accordance with a pre-agreed profit sharing. For the purpose of this study, a profit sharing of 30% was allocated to the skilled-worker/farmers and a profit sharing of 20% was allocated to land-owners. If the agricultural development experiences any loss, however, the loss is fully born by the investor.

Research Design

The agricultural commodity being developed in this research was mainly teak plantation (Sugiharto, 2013). This was considered as field exploratory study in which limited information on similar issues was available in the past. A noncontrived research was conducted in natural environment where the researcher's interference was minimal to moderate such as the selection of clones of teak trees, treatment, and the strategy for the start of the activities as well as the timing of harvesting. The growth of teak's diameter and height were observed as longitudinal study in which more than one points in time being measured in longitudinally across a period of time.

Sample Design and Data Collection

The sample design and data collection had been discussed in the previous study by Sugiharto *et al.* (2014) as follows: the teak trees were planted between the period of June 2008 and February 2011 to a total of 4,650 trees. At the date of measurement in December 2013 there were 4,068 trees survived trees representing 87.5% of the planted trees. The trees were planted in sandy to shally soils as well as in the karst dominated rocks. Four different clones of teak trees were planted in the middle of dry season, at the beginning of rainy season, and at the end of rainy season, with trees density between 1,100 and 2,500 trees per hectare with grid spacings of 3 x 3 meters and 2 x 2 meters respectively. Systematic random sampling (measured in every five trees) and cluster sampling (based on the plant locations, time of plantations, and teak's clones) were employed. The data being used were both primary data and secondary data. The primary data was obtained specifically designed for the purpose of the study such as direct measurement of the diameters and heights of teak trees whereas the secondary data was obtained from the existing information such as research publications (Pérez, 2008; Pramono *et al.,* 2010; Hallet *et al.,* 2011; Sugiharto, 2013), and government publications and decrees (Perhutani, 2011). From July 2011 to December 2013, 648 trees were observed in term of their diameters (*dbh*, diameter at breast height) and heights (from

the surface to free from branches). Each sample had been measured between six to ten times at an interval of three months period. Before being analized, the samples were screened to exclude any outliers and irregulatities. The forecasted diameters and heights were projected by using time series method. The forecasted errors were calculated by using mean absolute deviation, mean square of error, and mean absolute error. After being screened, there were 546 reliable samples for further analysis.

Analytical Tools

It is important in investment decision-making process to estimate the capital costs, operating expenses, and revenues; and to evaluate quantitatively for accepting or rejecting any proposed activity. Detail quantitative valuation were calculated by Sugiharto *et al.* (2014) including total investment, *NCF*, *NPV*, *IRR*, *P/I*, *PBP*, *AEV*, and *BCR*. For skilled-worker/farmers and land-ownera, the *NPV* and *AEV* are the most relevant criteria to compare between fully-paid-salaries/rental and profit sharing arrangement.

NPV is defined as the present values of the expected stream of net cash flows, discounted at the cost of capital, minus the initial cost of the project and can be formulated as follows (Salvatore, 2008):

$$NPV = \sum_{t=1}^{n} \frac{R_t}{(1+k)^t} - C_0$$

where:

R_t is the estimated net cash flow of the project at year *"t"*,

k is the expected return, and

C_0 is the initial costs of the project.

An expected return of 12% per annum were calculated by using capital asset pricing model (Sugiharto, 2013)

The *AEV* is to estimate a level of income stream that would have the same net present value as the actual cash flows (Godsey, 2008) and being defined as:

$$\text{AEV} = \text{NPV} \Big/ \sum_{t=1}^{n} \frac{1}{(1+k^*)^t}$$

where: NPV is net present value, and k^* is internal rate of return.

Valuation Measurement Comparison

The main purpose of this research is comparing between fully-paid-salaries/land-rental and sukuk-based-profit-sharing. Sugiharto *et al.* (2014) concluded that harvesting schedule being proposed by Hallet *et al.* (2011) *ie*: harvesting schedule at the age of three years (36%), six years (14%), 10 years (14%), 15 years (9%) and 23 years (27%), started with the smallest diameter as part of the thinning activities, yields the best outcome. Therefore, only this harvesting scenario will be used for comparison.

RESULTS AND DISCUSSIONS

The measured diameters and heights of the trees had been published by Sugiharto *et al.* (2014) as follows: measured diameters were between 3.36 and 21.72 cm, and the heights were between 2.0 and 14.00 meters respectively. Table 1 demonstrates the teakwood growth mearument being compared with measument by Pérez (2008) and Pramono *et al.* (2010). The

average diameters growth were between 1.56 cm per year and 2.65 cm per year and the average height growth were between 1.15 meters and 2.34 meters per year.

Table 1: Teakwood growth data comparison

	Field Measurement	**Perez (2008)**	**Pramono *et al.* (2010)**
Population	4,068	-	-
Samples	546	25	-
Ages (years)	2.7 – 4.3	8.0 – 46.0	10.0 – 110.0
Diameters (cm)	3.36 – 21.72	9.4 – 55.4	5.8 – 85.1
Heights (meter)	2.00 – 14.00	12.4 – 33.3	5.8 – 49.4

Further, future diameters and heights of the teak were forecasted using the pattern of similar tree growth being published from the data from Costa Rica (Pérez, 2008) and Indonesia (Pramono *et al.,* 2010) as can be seen in Figure 5.

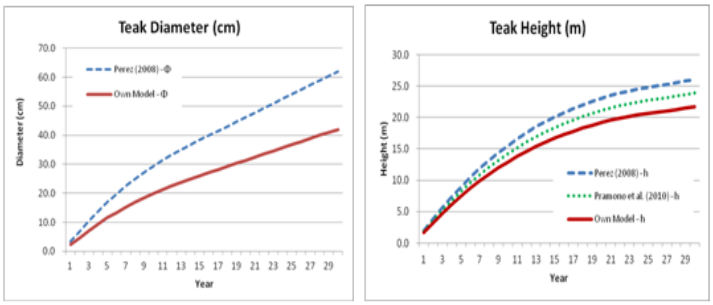

Figure 5: Forecasted diameter and height of teak wood reported by Pérez (2008) and Pramono *et al.* (2010)

Enterprise Budget

There are three main components of enterprise budget namely capital investment or fixed costs, operating expenses or variable costs, and revenue (Godsey, 2008). Fixed costs are costs attributed to resource ownership that occur regardless of any productive activities (Godsey, 2008). The capital investment for five hectares of teakwood plantation consists of water well (IDR 12,500,000 with useful life of 25 years), field camp (IDR 10,000,000 with useful life of 15 years, chainshaws (IDR 5,000,000 with useful life of 10 years) and other items (IDR 2,500,000 with useful life of 10 years) as it was applied in the valuation by Sugiharto *et al.* (2014).

The operating costs in this research involved establishment (field survey and socialization at IDR 500,000 per hectare, land clearing at IDR 1,000,000 per hectare, planting expenses at IDR 1,000,000 per hectare, planlet price at IDR 13,500 per tree), maintenance (fertilizer at IDR 750 per kilogram per tree per month, harvesting costs at IDR 200,000 per m3, and overhead of 10% of total operating costs). Previously, Sugiharto *et al*. (2014) considered the salary of one graduate professional (at IDR 1,750,000 per person per month), the wages of three farmers (at IDR 850,000 per person per month), and land rental (at IDR 3,500,000 per heactare per year) as maintenance cost. This research exercise another alternative in which a profit sharing of 30% was allocated to replace the salary of one graduate professional and the wages of three farmers. A profit sharing of 20% was allocated to replace land rental costs.

The forecast revenue streams were calculated based on forecasted production volume and forecasted price of harvested teak wood whereas the production volume was defined from the forecasted diameter and forecasted height of teak wood plantation. The price of teak wood for the year 2012 was published by Perhutani (2011) as can been in Table 2. From the statistic data in the last 25 years, the price of teak wood doubles every five years (*JAR,* 2012). This is equivalent to approximately 15% increases per year. For the purpose of the base model, the price increment of 15% per year was used.

Table 2: Teak price per m^3 for the year 2012

Diameter (cm)	**Price /m3 (IDR)**
4 – 7	767,500
10 – 13	1,509,500
16 – 19	2,366,500
21 – 23	*2,937,200*
24 – 26	3,534,600
27 – 29	4,032,200
30 – 34	5,541,167
35 – 39	6,234,000
40 – 44	6,926,667
45 – 49	7,619,167
50 – 54	8,311,833
55 – 59	9,004,500
60 – 64	9,904,833
65 – 69	10,805,333

* Calculated based on Perhutani (2011)

The corporate taxable income in Indonesia was calculated based on the gross income after being deducted from, among others, the costs and expenditures, depreciation and amortisation, pension fund, operating loss, unrecoverable receivable, social charity expenditures, natural disaster, education, sport *etc*. For the purpose of this research, a fixed tax rate of 25% was applied to profit being generated from the harvested teak wood.

Valuation Measurement

The required rate of return or discount rate being used for financial valuation was calculated using the formula $E(R_i) = R_f + \beta_i (R_m - R_f)$. The risk-free rate "$R_f$" was taken from the government's long term loan being issued by the Government of Indonesia (Minister of Finance, 2012) whereas the "β" was taken by averaging all available "β" data of public companies in agriculture in Indonesia (Reuters, 2013). The market risk premium $(R_m - R_f)$ in Indonesia was publised by Fernández *et al.* (2011). The calculated required rate of return was 11.71 and, therefore, for the purpose of this research, the required rate of return of 12% was used (Sugiharto, 2013).

Valuation Results

For comparison purposes a model of harvesting schedule being proposed by Hallet *et al.* (2011) was applied. Two scenarios of fully paid salaries and land rental has been compared with sukuk-based profit sharing. Table 3 is the comparison summary between these two scenarios.

Table 3: Valuation comparison between fully-paid and sukuk-based profit sharing

		Fully Paid (Sugiharto *et al.*, 2014)	**Sukuk-Based Profit Sharing**	Adjusted Sukuk-Based
Investment	Million IDR	961.33	187.35	961.33
NCF	Million IDR	322,330.28	163,094.03	836,889.42
NPV	Million IDR	20,741.98	10,740.17	55,111.39
IRR	%	34.47	37.79	37.79
P/I		335.29	870.55	870.55
PBP	Years	16.00	10.15	10.15
AEV	Million IDR	2,627.01	1,360.26	6,979.96
BCR		16.14	52.22	52.22

Table 3 demonstrates that by applying sukuk-based profit sharing, total investment being born by investor is reduced from IDR 961.33 million to IDR 187.35 million. For the purpose of equal comparison, it is assumed that there are identical projects that could be conducted so that all IDR 961.33 million would be fully spent for the sukuk-based profit sharing. The output is displayed in the adjusted sukuk-based column. The total undiscounted net cash flow in the case of sukuk-based profit sharing is increase to IDR 836,889.42 million from IDR 322,330.28 million in the case of previous fully-paid salaries whereas the *NPV* is increase to IDR 55,111.39 million from IDR 20,741.98 million. The sukuk-based profit sharing scenario yields an *IRR* of 37.79%, an increase from 34.47% in the case of fully-paid salaries and rental. The *P/I* of the sukuk-based profit sharing is also increase to 870.55 from 335.29, whereas the *PBP* is reduced to 10.15 years in the case of sukuk-based profit sharing compare to 16.00 years from the previous model of fully-paid salaries. The *AEV* also increase to IDR 6,979.96 million in the case of sukuk-based profit sharing from IDR 2,627.01 million. The *BCR* is also increase to 52.22 compare to 16.14 from the common fully-paid salaries. It is demonstrated that for investor point of view, all criteria being valued are in favour of sukuk-based profit sharing compare to fully-paid salaries and rental despite the fact that the investor receive only 50% of the profit.

Table 4 demontrates the valuation comparison from the view of skilled worker and farmers. Instead of receiving a fixed monthly salaries, the skilled-worker and farmers receive a 30% of profit sharing. The *NPV* being received by skilled worker and farmers increase from IDR 735.41 million in the case of fully-paid salaries to IDR 6,568.93 million in the case of sukuk-based profit sharing. Similarly, the *AEV* is also increase from IDR 93.14 million to IDR 831.97 million.

Table 4: Valuation comparison being received by skilled worker and farmers

		Fully Paid (Sugiharto *et al.*, 2014)	**Sukuk-Based Profit Sharing**
NPV	Million IDR	735.41	6,568.93
AEV	Million IDR	93.14	831.97

From the point of view land-owners, the comparison between fully-paid rean is compared to a 20% sukuk-based profit sharing as it is displays in Table 5. The *NPV* being received by land-owners increase from IDR 211.00 million in the case of fully-paid rental to IDR 4,379.29 million in the case of sukuk-based profit sharing. Similarly, the *AEV* is also increase from IDR 26.72 million to IDR 554.65 million respectivelly.

Table 5: Valuation comparison being received by land-owners

		Fully Paid (Sugiharto *et al.*, 2014)	**Sukuk-Based Profit Sharing**
NPV	Million IDR	211.00	4,379.29
AEV	Million IDR	26.72	554.65

Table 4 and Table 5 demonstrate that all skilled-worker, farmers, and land-owners receive better compensation if they are treated based on sukuk-based profit sharing instead of fully-paid salaries and rental.

CONCLUSION

It is concluded that from all criteria valuation aspects, the sukuk-based profit sharing among the stakeholders *ie:* investor, skilled-worker, farmers, and land-owners give a better output than common fully-paid arrangement. Please take note, however, that income being received by skilled-worker, farmers, and land-owners will only be received after the activities realise profit.

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