

Unveil Indonesia Farmers' Welfare Analysis On Integrated Polyculture Agroforestry Farming (IPAF)

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Abstract: Farmer welfare improvement programs through efforts to reduce poverty have been carried out, but poverty rates are still quite high. The main cause is that farmers are classified as small-scale farmers with land tenure less than 0.5 hectares. Efforts made include the Integrated Polyculture Agroforestry Farming (IPAF) to diversify sources of income. The application of this pattern varies considerably depending on farmer ownership and currently there are various forms of IPAF cropping patterns. The study aims to analyze and identify differences in the welfare level of IPAF farmers in Cibalong and Karangnunggal Districts, West Java, Indonesia. The study was conducted from April to October 2018. Data sources were primary and secondary data. Primary data through a survey of 250 farm households with details from Cibalong 167 farmers and 87 farmers from Karangnunggal. Secondary data were obtained from various research results and literature studies, related institutions and other data sources. Data analysis is descriptive statistical analysis using the level of welfare of farm households based on the National Socio Economic Survey (NSES) 2012 indicators. The level of welfare of IPAF farmer households based on the method of NSES 2012, based on income indicators based on poverty criteria from the Directorate of Land Use, IPAF farmer households in the two districts studied were included in the near-poor category. The level of welfare of farmers, households based on the concept of poverty line, the score of IPAF farmers' household expenditure in Cibalong District is lower (2.96) compared to Karangnunggal District (3.00) and is included in the non-poor criteria. The recapitulation of welfare indicators according to NSES 2012, the level of welfare of IPAF farmers in Cibalong District is lower (75.45%) compared to Karangnunggal (78.31 percent).

Keywords: Indonesia Farmers', Welfare Analysis, Integrated Polyculture Agroforestry Farming (IPAF).

1. INTRODUCTION

Important to clarify the meaning of welfare before conducting research on approved changes in farmers' welfare. Pigou general as the initiator of welfare economics, He first completed the concept of welfare and successfully placed the foundation of traditional welfare theory (Feng et al., 2018). Traditional welfare theory can be divided into two varieties: Objectivist welfare theory and subjectivist welfare theory (Li et al., 2015). Objective welfare theory and calculating the budget from the perspective of actual consumer spending (Danzon, et al., 2018) when needed by every rational person, and the amount of resources needed by each individual (Rose, et al., 2016). Clearly, the objective welfare theory is based largely on calculating the amount and quality of welfare without total consideration of welfare. Thus, a complete profile is difficult to achieve using new ones. For example, it is difficult to measure important variables that have tangible realities about income, such as environmental changes and changes in farmer work status through changes in farmer income.

Besides developing agricultural development aimed at increasing production, it is also directed at efforts to increase community income, expanding employment, improving living standards and improving farmers' welfare. The ability of the agricultural sector to contribute directly to economic growth and the welfare of farmers' households depends on the level of farm income and the surplus generated by the agricultural sector itself. Therefore, the level of farm income is not only a major determinant of the welfare of farmers' households, it is also an important factor that conditions economic growth (Abdullah, et al., 2017). Various programs to improve the welfare of farmers through efforts to reduce poverty have been carried out, but the poverty rate is still quite high. At present,

an estimated 40 percent of the 1.7 million population of Tasikmalaya is still in the poverty line (BPS, 2010). Based on data from BPS Indonesia the percentage of poor people in Tasikmalaya district reached 11.26 percent higher than the percentage of poor people in the province of West Java (9.18 percent) and the percentage of the national poor population (10.96 percent) (Siagian, et al., 2013). The main source of poverty for the rural population, most of whom earn a living as farmers, is because most farmers are classified as small farmers with an average land area of less than 0.5 hectares. In an effort to overcome the limitations of the land it has, the farmers cultivate various types of crop and livestock commodities or carry out polyculture farming as an effort to diversify sources of income sources of income. Diversification of livelihoods is a form of struggle for farm households in dealing with various situations (Deb & Haque, 2016). The livestock-crop farming system has actually become part of the culture of the farming community so that integrated agriculture is not a new phenomenon but is a developing norm in the community. The application of this pattern is quite diverse and varies depending on farmer ownership (Pavlis, et al., 2016; Janus & Markuszewska, 2017; Kuivanen, et al. 2016). The present there are various forms of farming patterns for smallholder plantations and various types of livestock farming in Tasikmalaya District. The existing planting pattern is a form of local wisdom regarding the farming system developed based on the resources owned by farmers, technology, culture and local economy. Local wisdom is the legacy of ancestors in the values of life that are united in the form of religion, culture and customs. In its development, people adapt to developing wisdom in the form of knowledge or ideas, equipment, guided by customary norms, cultural values, and activities to manage the environment to meet their daily needs (Sarooghi, et al. 2015; Burdon, et al., 2018). The order for the government to increase farmer welfare policies on target, data and information at the micro level are needed that can capture the current conditions of farmers' household income levels in rural areas, both from farming and non-agricultural activities, so that

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a general picture of farmers' welfare levels as rural communities can be identified. In this regard, a study was carried out on the Comparative Analysis of the Welfare Level of Farmers of Farmers in Integrated Polyculture Agroforestry Farming (IPAF) in the Districts Cibalang and Karangnunggal, Tasikmalaya Regency.

2. RESEARCH METHODOLOGY

The study was conducted in Tasikmalaya Regency which is an area with a height between 0-2500 above sea level, most of the shape of the area is bumpy to hilly so prone to erosion and landslides. The farm that has three main functions, namely improving the welfare of farmers, food security and maintaining environmental sustainability (Goggins, & Rau, 2016). The area of Tasikmalaya Regency reaches 270,881 hectares, 89.49 percent is agricultural land and 10.51 percent is non-agricultural land. The study was conducted from February to July 2018 in two districts of 39 existing districts namely Cibalang and Karangnunggal districts. The data source used to study the comparative level of welfare of farmers involved in IPAF is the primary data from farmers who are respondents and secondary data. Primary data collection needs through a survey involving 250 farm households with details from Cibalang district as many as 167 farmers and 87 farmers from Karangnunggal District. Secondary data is data obtained from various research results and literature studies as well as from related agencies and other data sources related to research. Analysis of the data used in this study is descriptive statistics (Pickup, et al., 2017) analysis using the level of welfare of farmers, households based on NSES (2012) indicators from BPS as listed in Table 1.

TABLE 1.
IPAF FARMERS HOUSEHOLD WELFARE LEVELS BASED ON NSES INDICATORS

No	Welfare Indicator	Criteria	Weight	Scores
1	Household income	Not poor	25%	3
	Income per capita per year with rice / capita / year consumption	Almost poor		2
		Poor		1
2	Household income	Not poor	16%	3
	Not poor <320 kg almost poor <240 kg Poor <180 kg	Almost poor		2
		Poor		1
3	State of Residence	Permanen t (score 15-21)	13%	3
	Roof: tile (5) / asbestos (4) / zinc (3) / shingle (2) / leaf (1)	Semi-permanent (score 10-14)		2
		Booths: walls (4) / half walls (3) / wood (2) / bamboo (1)		Non-permanent (score 5-9)
	Status: self-owned (3) / rented (2) / hitching (1)			0
	Floors: porcelain (5) / tile (4) / plaster (3) / wood (2) / bamboo			0

No	Welfare Indicator	Criteria	Weight	Scores
4	(1)			
	Floor area: area (100m ²) (3) / moderate (50-100m ²) (2) / narrow (<50 m ²) (1)			0
		Housing Facilities	Complete (score 21-27)	4%
	Yard: Area (> 100m ²) (3) / sufficient (50-100m ²) (2) / narrow (50m ²) (1)	- Sufficient (score 14-20)		2
				1
	Entertainment: Video (4) / TV (3) / tape recorder (2) / radio (1)	- Less (score 7-13)		0
	Cooling: air conditioner (4) / fridge (3) / fan (2) / natural (1)			0
	Lighting source: Electric (3) / Petromac (2) / temple lights (1)			0
	Fuel: gas (3) / kerosene (2) charcoal, wood (1)			0
	Water sources: state water company (6) / bore well (5) / well (4) / spring (3) / rainwater (2) / river (1)			0
Toilet: private bathroom (4) / public bathroom (3) / river (2) / garden (1)			0	
5	Health of Family Members: The number of family members who often get sick in one month	Good (<25% often sick)	10%	3
		Sufficient (25-50% often sick)		2
		Less (>50% often sick)		1
6	Ease of Getting Health Services from Medical Personnel	Easy (score 17-23)	4%	3
	Nearest Hospital Distance: 0 km (4) / 0.01-3 km (3) / >3km (2) / missing (1)	Sufficient (score 12-16)		2
6	Distance to the clinic: 0 km (4) / 0.01-2 km (3) / >2km (2) / missing (1)	Hard (score 7-11)		1
				0
	Medical costs: affordable (3) / sufficient (2) / poor (1)			0
	Treatment: good (3) / Sufficient (2) / bad (1)			0
	Birth control: easy to obtain (3) / easy			

No	Welfare Indicator	Criteria	Weight	Scores
	Sufficient (2) / difficult (1)			
	Family Planning Consultation: easy (3) / Sufficient (2) / difficult (1)			0
	The prices of medicines: affordable (3) / quite affordable (2) / difficult to reach (1)			0
7	Ease of Entering Educational Level Children	Easy (score 8-9)	12%	3
	School fees: affordable (3) / quite affordable (2) / difficult to reach (1)	Sufficient (score 6-7)		2
	School distance: 0 km (3) / 0.01-3km (2) / >3 km (1)	Hard (score 3-5)		1
	Admission procedure: easy (3) / sufficient (2) / difficult (1)			
8	Ease of Getting Transportation Facilities	Easy (score 5-6)	4%	3
	Costs and fees: affordable (3) / sufficient (2) / difficult (1)	Sufficient (score 3-4)		2
	Vehicle facilities: available (3) / enough available (2) / not available (1)	Hard (score 2-3)		1
9	Religious life	High tolerance	4%	3
		Medium tolerance		2
		Low tolerance		1
10	Safety from a Disruption of Crime	Secure	4%	3
		Quite Secure		2
		Less Secure		1
11	Ease of Doing Sports The frequency of respondents doing sports in one week	Easy	4%	3
		Quite Easy		2
		Difficult		1
Total			100%	

3. RESULTS AND DISCUSSION

a. Farmer Identity

The age of farmers, both in District Cibalong (91.62%) and Karangnunggal (89.16%) is in the productive age category (15-64 years). Based on their marital status, more than 90% are married and only about 1-2% are single and widowed / widowed. The largest number of farm family dependents is in the range of less than 3 people and between 3-5 people, the number of farmers who have family dependents of more than 5 people is only around 1-3%. The number of family dependents is closely related to family income and expenses. The increasing number of family dependents will increase family expenses so farmers must consider every change in

their farming to minimize risk as a form of accountability to the family (Baker, 2018). Farmer identity based on education level, in Cibalong and Karangnunggal districts are dominated by farmers with elementary education level (> 50 percent). This shows the level of formal education of farmers is still low which can be a barrier to adoption of technological innovations related to efforts to increase production and productivity of IPAF. The formal education taken by farmers is getting higher, so the ability to respond to innovation will be better and it is hoped that farmers will more easily change their attitudes and behavior to act more rationally in the mindset and reasoning power (O'Donoghue & Heanue, 2016). Related to training, most farmers have attended counseling. The percentage of farmers who have attended counseling in District Cibalong is bigger than in District Karangnunggal and there are farmers who have never attended training in the two locations analyzed. Training is very important to be followed by farmers to improve their knowledge and skills in carrying out farming activities, especially those related to IPAF. The main work of farmers varies greatly, in District Cibalong is dominated by farmers who work as farmers and breeders. Meanwhile, in District Karangnunggal main job is dominated by those who make a living as farmers. Farmers generally do not have side jobs, so the agricultural sector still plays an important role in supporting the community's economy.

TABLE 2.
AREA AND STATUS OF LAND TENURE

	Land Tenure		IPAF Land Area		Land Tenure Status	
	Category	%	Category	%	Category	%
District Cibalong	Narrow (<0,685 Ha)	50,30	≤ 50 %	16,67	Asset	96,43
			51 - 100 %	83,33	Work on	3,57
	Medium (0,686 - 1,344 Ha)	35,93	≤ 50 %	10	Asset	95
			51 - 100 %	90	Work on	5
Large (> 1,344 Ha)	13,77	≤ 50 %	4,35	Asset	100	
		51 - 100 %	95,65	Work on	0	
Maximum	4 Ha		3 Ha	100 %		
Minimum	0,030 Ha		0,028 Ha	14,3%		
Average	0,755 Ha		0,588 Ha	78,5%		
District Karangnunggal	Narrow (< 0,685 Ha)	61,45	≤ 50 %	19,61	Asset	96,08
			51 - 100 %	80,39	Work on	3,92
	Medium (0,686 - 1,344 Ha)	21,69	≤ 50 %	27,78	Asset	94,44
			51 - 100 %	72,22	Work on	5,56
Large (> 1,344 Ha)	16,87	≤ 50 %	14,29	Asset	100	
		51 - 100 %	85,71	Work on	0	
Maximum	9 Ha		7 Ha	100 %		
Minimum	0,028 Ha		0,028 Ha	16,7%		
Average	0,904 Ha		0,677 Ha	75,3%		

The experience of respondent farmers in implementing IPAF is starting from the new one year to those who have been implementing it for more than 40 years. The IPAF experience of farmers who are only 1 year in reality manage IPAF that is already producing or already producing. This is due to the IPAF land that he manages is the land that he obtained from his parents in the form of inheritance. The business experience influences how farmers respond to innovate and respond to risks in their business activities. The experience will contribute to your interests and hopes for more learning (Eakin, et al., 2015). The experience of farmers, they can find out how to overcome various problems that often arise in their business activities and experience that is supported by a formal educational background will change work skills and achievement towards a better direction (Šūmane, et al., 2018). The results of a study of the origin of IPAF knowledge, it is known that farmers generally obtain knowledge about IPAF (more than 60.00 percent) from their parents (inheritance) both in District Cibalong and Karangnunggal. This shows that IPAF is a farm that has long been occupied by farmers on the study site. The average area of land tenure in the two locations studied was dominated by the narrow land use (<0.685 ha) (Table 2). Lisson et. al., (2010) explained that the Indonesian farming system is dominated by small farmers with relatively narrow land ownership. However, there is strong integration between various biophysical elements, namely plants, livestock and land, as well as resource support (quality and quantity of land, food supply, labor and capital) and support for social factors (religion, culture and behavior). The number of smallholder households, aka landless, with an average land ownership of only 0.34 ha (under 1 hectare) due to the rapid depreciation of agricultural land in Indonesia. Farmers are required to utilize their narrow land as optimal as possible so that they land productivity increases, including by conducting polyculture planting patterns (Lowder, et al., 2016). The status of land tenure in three locations has generally owned land (> 90 percent), especially for land that is included in the broad land tenure category, all of which have the status of owned land. In connection with the status of land as ownership rights, farmers get full management rights to the land they have.

b. Welfare LEVEL WITH NSES INDICATORS

The level of welfare of IPAF farmers' households based on the NSES method (2012), from the income indicator it is known that the per capita income per year of IPAF farmers' households in District Cibalong IDR.4, 396,152 and District Karangnunggal IDR 4,363,692. The Directorate of Land Use classifies poverty into four criteria as follows: a) Very poor, if the level of income of a person per capita per year <75% of total expenditures 9 staples (<IDR 1,682,775). b) Poor, if the level a person's income per capita per year ranges between 75-125% of the total expenditure of 9 staples (IDR 1,682,775 – IDR 2,804,625). c) Almost poor, if the level of one's income per capita per year ranges from 126-200 % of the total expenditure of 9 staples (IDR 2,827,062 - IDR 4,464,963). d) Not poor, if a person's income per capita per year is > 200% of the total expenditure of 9 staples (> IDR 4,487,400). Thus, based on the poverty criteria of the Directorate of Land Use, IPAF farmers' households in the two districts studied were included in the near-poor category. The level of welfare of peasant households based on the concept of the poverty line can be measured by including per capita expenditure per year with local rice consumption. The price of rice used is an

average of IDR. 10,600 per kg. This concept divides poverty levels into three criteria: a) Not poor, if someone's per capita income per year <price of rice is 320 kg (<IDR 3,392,000), 2) Almost poor, if someone's per capita income per year <price 240 kg of rice (<IDR 2,544,000), and c) Poor, if someone's per capita income per year <the price of rice is 180 kg (<IDR 1,908,000) (Table 3). From the analysis results it is known that the household expenditure score of IPAF farmers in Cibalong District is lower (2.96) compared to Karangnunggal District (3.00) and is included in the non-poor criteria. BPS (2010) states poverty is a condition of a person's inability to meet basic needs both food and non-food as measured in terms of expenditure. Thus IPAF farmers in the two districts analyzed still have the ability to meet the basic needs of both food and non-food because in the two districts IPAF farmers are not included in the poor criteria. The poverty is a condition of family well-being and is seen as an inability to meet basic food and non-food needs as measured using the poverty line and this poverty line is very sensitive to price factors, determining minimum standards of basic needs, selecting commodity packages and characteristics the region (Burchi, & De Muro, 2016).

TABLE 3.
IPAF FARMERS HOUSEHOLD WELFARE LEVELS BASED ON NSES INDICATORS

No	WI	C	W	INDICATORS				
				S	DC	DK		
				Avg	S x W	Avg	S x W	
1	Household income	Rich	25 %	3	1,47	0,37	1,36	0,34
	Based on the concept Which includes per capita income per year with rice / capita / consumption	Almost poor		2	0	0	0	0
		Poor		1	0	0	0	0
2	Household Expenditure	Rich	16 %	3	2,96	0,47	3,00	0,48
	Criteria for poverty of farm households Rich <320 kg, almost poor <240 kg, poor <180 kg	Almost poor		2	0	0	0	0
		Poor		1	0	0	0	0
3	State of Residence	Permanent (score 15-21)	13 %	3	2,88	0,37	2,84	0,37
	a. Roof: tile (5) / asbestos (4) / zinc (3) / shingle (2) / leaf (1)	Semi-permanent (score 10-14)		2	0	0	0	0

No	WI	C	W	S DC DK				No	WI	C	W	S DC DK					
				Avg	S x W	Avg	S x W					Avg	S x W	Avg	S x W		
	b. Booths: walls (4) / half walls (3) / wood (2) / bamboo (1)	Non-permanent (score 5-9)							(1)								
	c. Status: self-owned (3) / rented (2) / hitching (1)								d. Lighting source: Electricity (3) / Petromacous (2) / outboard lights (1)								
	d. Floors: porcelain (5) / tile (4) / plaster (3) / wood (2) / bamboo (1)								e. Fuel: gas (3) / kerosene (2) / charcoal, wood (1)								
	e. Floor area: large (100m ²) (3) / moderate (50-100m ²) (2) / narrow (<50 m ²) (1)								f. Water sources: PAM (6) / bore well (5) / well (4) / spring (3) / rainwater (2) / river (1)								
	Housing Facilities	Complete (score 21-27)		3	2,04	0,08	2,00	0,08		g. Toilet: private bathroom (4) / public bathroom (3) / river (2) / garden (1)							
4	a. Yard: Large (>100m ²) (3) / moderate (50-100m ²) (2) / narrow (50m ²) (1)	Moderate (score 14-20)	4%	2	0	0	0	0	5	Health of Family Members: The number of family members who often get sick in one month	10%	2	0	0	0	0	0
	b. Entertainment: Video (4) / TV (3) / tape recorder (2) / radio (1)	Less (score 7-13)		1	0	0	0	0		Ease of Getting Health Services from Medical Personnel	Easy (score 17-23)	4%	3	2,75	0,11	2,61	0,10
	c. Cooling: air conditioner (4) / fridge (3) / fan (2) / natural			0	0	0	0	0	6	a. Nearest Hospital Distance: 0 km (4) / 0.01-3 km (3) / >3km (2) / missing (1)	Sufficient (score 12-16)		2	0	0	0	0

No	WI	C	W	S				DC				DK			
				Avg	S x W	Avg	S x W	Avg	S x W	Avg	S x W	Avg	S x W		
7	b. Distance to the clinic: 0 km (4) / 0.01-2 km (3) / >2km (2) / missing (1)	Hard (score 7-11)		1	0	0	0	0	0	0	0	0	0	0	0
	c. Medical costs: affordable (3) / sufficient (2) / poor (1)			0	0	0	0	0	0	0	0	0	0	0	0
	d. Treatment: good (3) / Sufficient (2) / bad (1)			0	0	0	0	0	0	0	0	0	0	0	0
	e. Birth control: easy to obtain (3) / easy Sufficient (2) / difficult (1)			0	0	0	0	0	0	0	0	0	0	0	0
	f. Family Planning Consultation: easy (3) / Sufficient (2) / difficult (1)			0	0	0	0	0	0	0	0	0	0	0	0
	g. The prices of medicines: affordable (3) / quite affordable (2) / difficult to reach (1)			0	0	0	0	0	0	0	0	0	0	0	0
	Ease of Entering Educational Level Children	Easy (score 8-9)		3	2,82	0,34	2,99	0,36							
a. School fees: affordable (3) / quite affordable (2) / difficult to reach (1)	Sufficient (score 6-7)	12 %	2	0	0	0	0								
b. School distance:	Hard (score		1	0	0	0	0								
8	0 km (3) / 0.01-3km (2) / >3 km (1)														
	c. Admission procedure: easy (3) / sufficient (2) / difficult (1)			0	0	0	0	0	0	0	0	0	0	0	0
	Ease of Getting Transportation Facilities	Easy (score 5-6)		3	2,56	0,10	2,00	0,08							
	a. Costs and fees: affordable (3) / sufficient (2) / difficult (1)	Sufficient (score 3-4)		2	0	0	0	0							
	b. Vehicle facilities: available (3) / enough available (2) / not available (1)	Hard (score 2-3)		1	0	0	0	0							
9	Religious life	High tolerance	4%	3	2,99	0,12	2,98	0,12							
		Medium tolerance		2	0	0	0	0							
		Low tolerance		1	0	0	0	0							
10	Safety from a Disruption of Crime	Secure	4%	3	2,97	0,12	2,98	0,12							
		Quite Secure		2	0	0	0	0							
		Less Secure		1	0	0	0	0							
11	Ease of Doing Sports	Easy		3	2,97	0,12	2,98	0,12							
	The frequency of respondents doing sports in one week	Quite Easy	4%	2	0	0	0	0							
		Difficult		1	0	0	0	0							
	Total		100 %	29,10	2,47	28,43	2,44								
Category		Prosperous		Prosperous		Prosperous									

Information:

WI : Welfare Indicator
 C : Criteria
 W : Weight
 S : Score
 DC : District Cibalong
 DK : District Karangnunggal
 Avg : Average

The situation of the residence of the farmer is one indicator to show the social status of the household in the community. Housing conditions assessed are roof conditions, cubicles, status, floors and floor area. The score of IPAF farmers' living conditions in Cibalong district was higher (2.88) compared to Karangnunggal district (2.84) and included in good criteria. In addition, residential facilities can also be used as an indicator of the socioeconomic situation of households in addition to the situation of residence. The better the conditions and facilities of residence, the better the social situation of the household. Residence facilities are the area of the yard, entertainment facilities, cooling facilities, lighting sources, fuel used, water sources, and toilets (Juaidi, et al., 2019). Based on the research results it is known that the IPAF farmer housing facility score in Cibalong District is higher (2.04) compared to Karangnunggal District (2.00) and is included in the sufficient category. Household health criteria are the number of family members who often experience illness in one month. Based on the results of the study note the health score of IPAF farm family members in Cibalong District is lower (2.68) compared to Karangnunggal District (2.70). Health is closely related to individual social welfare. Several criteria are included in the ease of obtaining health services, namely the distance of the nearest hospital, the distance to the Health polyclinic, medical costs, treatment, contraception, family planning consultations and the price of medicines. Based on the results of the study the score of ease of getting health services from medical personnel in Cibalong District is higher (2.75) compared to Karangnunggal District (2.61) and in both districts is included in the category of easily getting health services from medical personnel. Qualified human resources determine the success of regional development. Quality human resources can be seen from the level of education. Based on the results of the study, IPAF farmer households in the study location score of ease of entering children in the education level in Cibalong District are lower (2.82) compared to Karangnunggal District (2.99) and in both districts it is easy to get children into education including in the easy criteria. The ease of getting transportation facilities at the study site greatly affects IPAF farmers to be able to market their IPAF products in the form of wood, plantation crops, horticulture, food crops and livestock products. Based on the results of the study note that the score of ease of obtaining transportation facilities in the District of Cibalong is higher (2.56) compared to the District of Karangnunggal (2.00), and the ease of transportation in the District of Cibalong is included in the easy criteria, whereas in Karangnunggal District is included in the criteria quite easily. The results of the study of the religious field, it is known that all farmers are entirely Muslim. The diversity of life scores in Cibalong district was higher (2.99) compared to to Karangnunggal district (2.98). The next indicator that is examined is the sense of security from crime can be seen from the frequent presence or absence of neighborhoods where farmers experience crime for one month. Based on the results of the study note that the score of security from crime

disorders in the District of Cibalong (2.97) is lower than the District of Karangnunggal (2.98). The ease of doing sport is seen from whether or not farmers often exercise in one week. Based on the results of the study note that the score of ease of doing sports in the District of Cibalong is higher (2.47) than in the District of Karangnunggal (2.44).

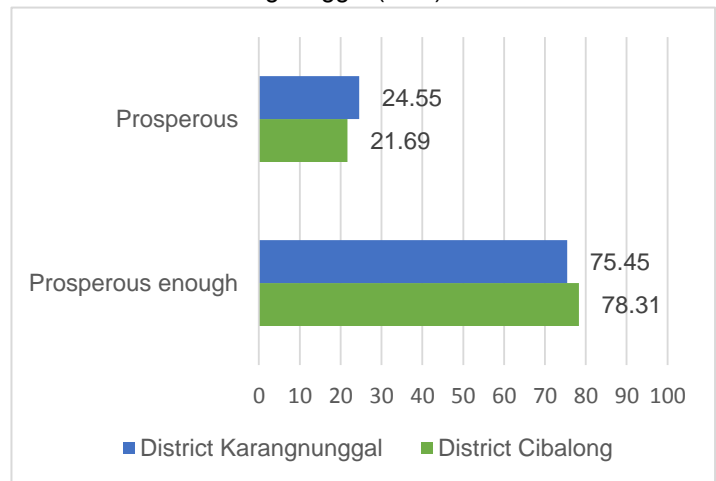


Figure 1. IPAF Farmers Household Welfare Level in Cibalong and Karangnunggal Districts Based on NSES Indicators.

Based on the recapitulation of welfare indicators according to NSES (2012), it can be concluded that the welfare level of IPAF farmers in District Cibalong is lower (75.45%) compared to District Karangnunggal (78.31 %). The Cibalong district is a district whose farm income is highly dependent on IPAF income. The contribution of the agricultural sector to family income in Cibalong District reached 74.31 percent, while in Karangnunggal District it only reached 61.07 percent. The contribution of the non-agricultural sector to family income in Karangnunggal district reached 38.93 percent in Cibalong district only reaching 25.69 percent. This shows that the agricultural sector is still a mainstay for peasant households to pay for their family's lives in addition to income from outside agriculture. Sources of income from the non-agricultural sector plays an important role to sustain the income of farmers so that there needs to be an effort to expand non-agricultural income sources, including through the development of rural industries that utilize agricultural raw materials, including the development of agricultural production facilities trading activities in the form of seeds, fertilizers and pesticides.

4. CONCLUSIONS

The level of household welfare of IPAF farmers based on the NSES method (2012), from income indicators based on poverty criteria from the Directorate of Land Use on IPAF farmers' households in the two districts studied was included in the near-poor category. The poverty line it is known that household expenditure scores of IPAF farmers in Cibalong District are lower (2.96) compared to Karangnunggal District (3.00) and are included in the non-poor criteria. Based on the recapitulation of welfare indicators according to NSES 2012 that the welfare level of IPAF farmers in Cibalong District is lower (75.45%) compared to Karangnunggal District (78.31 percent). Efforts should be made to increase production and productivity of IPAF and expand non-agricultural income sources to increase the income and welfare of farmers and their families.

REFERENCES

- [1] Abdullah, Rabbi, F., Ahamad, R., Ali, S., Chandio, A. A., Ahmad, W., Din, I. U. (2017). Determinants of commercialization and its impact on the welfare of smallholder rice farmers by using Heckman's two-stage approach. *Journal of the Saudi Society of Agricultural*. 18 (2), 224-233.
- [2] Badan Pusat Statistik (BPS), 2010. Profile of Poverty in Indonesia in March 2010. Official Statistics No. 45/07/Th. XIII, 1 Juli 2010. Jakarta.
- [3] Baker, S. R. (2018). Debt and the Response to Household Income Shocks: Validation and Application of Linked Financial Account Data. *Journal of Political Economy*, 126(4), 1504–1557.
- [4] Burchi, F., & De Muro, P. (2016). From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*, 60, 10–19.
- [5] Burdon, D., Boyes, S. J., Elliott, M., Smyth, K., Atkins, J. P., Barnes, R. A., & Wurzel, R. K. (2018). Integrating natural and social sciences to manage sustainably vectors of change in the marine environment: Dogger Bank transnational case study. *Estuarine, Coastal and Shelf Science*, 201, 234–247.
- [6] Danzon, P. M., Drummond, M. F., Towse, A., & Pauly, M. V. (2018). Objectives, Budgets, Thresholds, and Opportunity Costs—A Health Economics Approach: An ISPOR Special Task Force Report [4]. *Value in Health*, 21(2), 140–145.
- [7] Deb, A. K., & Haque, C. E. (2016). Livelihood Diversification as a Climate Change Coping Strategy Adopted by Small-Scale Fishers of Bangladesh. *Climate Change Adaptation, Resilience and Hazards*, 345–368.
- [8] Eakin, H., York, A., Aggarwal, R., Waters, S., Welch, J., Rubiños, C., Anderies, J. M. (2015). Cognitive and institutional influences on farmers' adaptive capacity: insights into barriers and opportunities for transformative change in central Arizona. *Regional Environmental Change*, 16(3), 801–814.
- [9] Feng, D., Wu, W., Liang, L., Li, L., & Zhao, G. (2018). Payments for watershed ecosystem services: mechanism, progress and challenges. *Ecosystem Health and Sustainability*, 4(1), 13–28.
- [10] Goggins, G., & Rau, H. (2016). Beyond calorie counting: assessing the sustainability of food provided for public consumption. *Journal of Cleaner Production*, 112, 257–266.
- [11] Janus, J., & Markuszewska, I. (2017). Land consolidation – A great need to improve effectiveness. A case study from Poland. *Land Use Policy*, 65, 143–153.
- [12] Juaidi, A., AlFaris, F., Saeed, F., Salmeron-Manzano, E., & Manzano-Agugliaro, F. (2019). Urban design to achieving the sustainable energy of residential neighbourhoods in arid climate. *Journal of Cleaner Production*, 228, 135–152.
- [13] Kuivanen, K. S., Alvarez, S., Michalscheck, M., Adjei-Nsiah, S., Descheemaeker, K., Mellon-Bedi, S., & Groot, J. C. J. (2016). Characterising the diversity of smallholder farming systems and their constraints and opportunities for innovation: A case study from the Northern Region, Ghana. *NJAS - Wageningen Journal of Life Sciences*, 78, 153–166.
- [14] Li, H., Huang, X., Kwan, M.-P., Bao, H. X. H., & Jefferson, S. (2015). Changes in farmers' welfare from land requisition in the process of rapid urbanization. *Land Use Policy*, 42, 635–641.
- [15] Lisson, S., N. MacLeod, C. McDonald, J. Corfield, B. Pangelly, L. Wirajawadi, R. Rahman. S. Bahar, R. Padjung, N. Razak, K. Puspadi, Dahlanuddin, Y. Sutaryono, S. Saenong, T. Panjaitan, L. Hadiawati, A. Ash, and L. Brennan. 2010. A Participatory, Farming System Approach to Improving Bali Cattle Production in the Smallholder Crop-Livestock System of Eastern Indonesia. *Agricultural Systems*. 103: 486-497.
- [16] Lowder, S. K., Scoet, J., & Raney, T. (2016). The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide. *World Development*, 87, 16–29.
- [17] O'Donoghue, C., & Heanue, K. (2016). The impact of formal agricultural education on farm level innovation and management practices. *The Journal of Technology Transfer*, 43(4), 844–863.
- [18] Pavlis, E. S., Terkenli, T. S., Kristensen, S. B. P., Busck, A. G., & Cosor, G. L. (2016). Patterns of agri-environmental scheme participation in Europe: Indicative trends from selected case studies. *Land Use Policy*, 57, 800–812.
- [19] Pickup, W., Bremer, P., & Peng, M. (2017). Comparing conventional Descriptive Analysis and Napping®-UFP against physiochemical measurements: a case study using apples. *Journal of the Science of Food and Agriculture*, 98(4), 1476–1484.
- [20] Rose, D. C., Sutherland, W. J., Parker, C., Lobley, M., Winter, M., Morris, C., Dicks, L. V. (2016). Decision support tools for agriculture: Towards effective design and delivery. *Agricultural Systems*, 149, 165–174.
- [21] Sarooghi, H., Libaers, D., & Burkemper, A. (2015). Examining the relationship between creativity and innovation: A meta-analysis of organizational, cultural, and environmental factors. *Journal of Business Venturing*, 30(5), 714–731.
- [22] Siagian, T. H., Purhadi, P., Suhartono, S., & Ritonga, H. (2013). Social vulnerability to natural hazards in Indonesia: driving factors and policy implications. *Natural Hazards*, 70(2), 1603–1617.
- [23] Šūmane, S., Kunda, I., Knickel, K., Strauss, A., Tisenkopfs, T., Rios, I. des I., Ashkenazy, A. (2018). Local and farmers' knowledge matters! How integrating informal and formal knowledge enhances sustainable and resilient agriculture. *Journal of Rural Studies*, 59, 232–241.