Parameters Affecting Household Income Diversity of Farmer's Tribes in South Sumatra Tidal Wetland

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Abstract: The research aimed to determine parameters affecting household income diversity of farmer's tribes in South Sumatra tidal wetland, especially studied from the aspect of land acreage, education level, age of farmers and tribes of farmers. The research was using survey method and carried out from June-August 2016 in the Delta Telang I Banyuasin, South Sumatra. The data were recorded by questionnaire for 145 respondents of farmers. Data was processed, described and correlated to see the relevance of the parameters with other parameters. The research concluded that the character of household economy of farmers explaining the relation between production decisions to increase rice production is land acreage, education, age, experience of farmers, number of household members, and labor allocation. Multi commodities farming (rice and plantation) was very favorable compared to monoculture rice fields? But this is a little bit contradictive with government policy that the research area is pointed out as the center of rice production. Therefore, government policy needs to motivate farmers that they can manage their farming from upstream to downstream and they work full in their own farming. The government policy should be site-specific and appropriated with the tribes of farmers

Keywords: Household, income, diversity, tribes, tidal wetland

Abstrak (Indonesian): Penelitian ini bertujuan untuk menentukan parameter yang mempengaruhi keragaman pendapatan rumah tangga suku petani di lahan pasang surut Sumatera Selatan, terutama dari aspek luas lahan, tingkat pendidikan, usia dan suku petani. Metode penelitian adalah survey lapangan yang dilakukan pada bulan Juni-Agustus 2016 di Delta Telang I Banyuasin. Data direkam dengan kuesioner untuk 145 responden. Data diproses, dijelaskan dan dibuat korelasi untuk melihat hubungan parameter satu dengan parameter lainnya. Hasil penelitian menyimpulkan bahwa ekonomi rumah tangga petani menentukan keputusan untuk berproduksi. Produksi padi ditentukan oleh luas lahan, pendidikan, usia, pengalaman petani, jumlah anggota rumah tangga, dan alokasi tenaga kerja. Pertanian multicropping (padi dan perkebunan) sangat menguntungkan dibandingkan dengan monokultur padi, akan tetapi hal ini sedikit bertentangan dengan kebijakan pemerintah bahwa daerah penelitian telah ditetapkan sebagai sentra produksi padi. Oleh karena itu, perlu kebijakan pemerintah untuk memotivasi petani untuk tetap monokultur padi, tetapi petani harus mengelola pertaniannya mulai dari hulu sampai ke hilir. Kebijakan pemerintah ini harus bersifat spesifik dan disesuaikan dengan suku-suku petani.

Kata kunci: Rumah tangga, pendapatan, keanekaragaman, suku, pasang surut

1. Introduction

The agricultural sector, especially rice fields and plantations, is a form of livelihood of the most dominant in the tidal area Delta Telang I of South Sumatra. In general farmers in tidal area manage their farming practices and land use efficiently and effectively as an attempt to ensure the survival of the economy, household food security, and to reduce the risk of crop failure and to mitigate climate change [1] [5-6].

Generally, in the research sites, there are three dominant tribes of farmers cultivating farming in tidal land, namely local farmers, newcomers and spontaneous migrants. Local farmers are farmers in general coming from the region of South Sumatra Province. Newcomers are Javanese farmers who were transmigrated through the government transmigration program. Spontaneous migrants are Buginese farmers (originating from South Sulawesi) and Banjarnese farmers from South Kalimantan, who came early to the

research sites and not associated with the transmigration program. The Buginese and Banjarnese farmers do farming in different ways not only in preparing the tidal land, but also the basic concept of agricultural management [7].

The use of tidal land for farming is closely related to the farmer's decision with respect to actual land use. This is influenced by the farmer's rationality to ensure household food security; total household income; risk minimization; maximization of leisure related to the time allocation, and to ensure household members in good condition and well-being as well as to achieve certain social classes in the community [2] [4].

Household heads of farmers play dual roles, namely agricultural production and coordination of the consumption of household members through the time allocation between work, both rice fields or plantations (on-farm) and off-farm as well as a relaxing time (leisure). Agricultural business usually done by farmers is subsistence, which is characterized by no separation between production and consumption decision-making of farmer household [3].

Farmers will make production decisions that will directly affect the amount of total income to be received. The level of earned income will affect the farm household consumption decisions because the amount of household consumption depends on the amount of income and the price level. If the income from farming is low, then automatically it will encourage members of farmer household to look for ways to earn extra income in order to guarantee the well-being of household members and to meet the needs of household expenditure (for both food and non-food consumption). This will be manifested in the form of labor allocation of the household members on the additional income-generating activities, particularly the activities on-farm and off-farm sectors.

Farmer household economic decision-making in terms of shedding its workforce was influenced by internal parameters and external parameters. Various internal parameters which play a crucial role in determining farmer household economic decisions, such as skills, knowledge, education, gender, household size, age, experience and a household income of farmers. External parameters include such as wages, agricultural input and output prices, interest rates, technology and social structure.

Farmer household decisions include decisions taken in producing rice, allocate work time, income and expenditures. Based on the above explanation, it is necessary to analyze the parameters that influence the household income decisions of farmers in the Delta Telang I South Sumatra. Specifically, the research aimed to determine parameters affecting household income diversity of farmer's tribes in South Sumatra tidal wetland, especially studied from the aspect of land acreage, education level, age of farmers and tribes of farmers.

2. Experimental Sections

This research was conducted from June to August 2016 at the Delta Telang I Banyuasin, South Sumatra. Purposive sampling was done by the multi-stage sampling method on the basis that the research area belongs to the rice production center in the South Sumatra Province. Banyuasin District was intentionally chosen because it is one of the regions that has the largest tidal land in South Sumatra Province and consideration of tidal land use is over 57.52%. Farmers in this area also allocated works on activities in rice fields and plantations (rubber, oil palm and coconut). The field data were obtained by using a questionnaire to 145 respondents. The primary data was obtained, among other data farm household, ownership of assets and land, farm descriptions, input and output prices, farm income from rice fields and plantations.

3. Result and Discussion

The research results and discussions will focus specifically on characteristics of farmer respondents, labor allocation and rice production, and household income diversity of farmers.

Characteristics of Respondents

Most of respondents are very different from each other in terms of behaviors, characters and the way that they manage their farming. Behavior and character of the respondent are analyzed, among others land acreage, education level, age of farmers, farming experience and the number of household members. Characteristics of the average respondents in the research area are summarized in Table 1.

The land acreage would theoretically affect the total household income if the land is cultivated by the farmers, not the abandoned land. Local farmers have the most minimal land acreage, which is an area of 0.75 ha, followed by newcomer area (2 ha) and spontaneous migrants have the largest land, which is an area of 3.10 ha. The more land owned and managed by farmers is, the more allocation of household labor is needed. Land use for rice fields significantly affect the labor use for rice production or in other words the labor use in the household is influenced significantly by land acreage. The average area of land owned by the farmer household is 1.95 ha.

The education level of farmers is finished and do not complete primary school (SD) around 20 farmers (44.44%), secondary school education (SMP) were 21 farmers (46.67%), approximately 3 farmers (6.67%) have a level of education equivalent of senior high school (SMA) and one farmer reached the college level (2.22%).

Table 1. Characteristics of the average respondents in the research area

No	Parameters	Farmer's tribes [a]			Average value
		A	B	C	
1	Land acreage (ha)	0.75	2.00	3.10	1.95
2	Education level (years)	8.73	9.27	9.29	9.10
3	Age (years)	48.67	48.81	52.88	50.12
4	Experiences (years)	27.67	28.31	33.38	29.79
5	Household members (people)	3.40	3.46	3.76	3.54

Note : [a] A: Local farmers; B: Newcomers; C: Spontaneous migrants
Source : The calculation result of the primary data (2016)

Table 2. Characteristics of the average labor allocation and rice yield

Nr	Parameters	Farmer's tribes [a]			Average value
		A	B	C	
1	Allocation of labor in the household (HOK/year)[b]	436.71 (69.10%)	490.84 (60.74%)	480.02 (62.34%)	469.19 (64.06%)
2	Allocation of labor outside the household (HOK/year)	195.31 (30.90%)	317.32 (39.26%)	290.01 (37.66%)	267.55 (35.94%)
3	Total allocation of labor (HOK/year)	632.02 (100%)	808.16 (100%)	770.03 (100%)	736.74 (100%)
4	Rice yield (ton MDG/ha/year)[c]	2.5-3.1	3.5-4.7	3.0-4.2	2.5-4.5

Note : [a] A: Local farmers; B: Newcomers; C: Spontaneous migrants,
[b] HOK: working person-days, [c] MDG: Milled Dry Gains
Source : The calculation result of the primary data (2016)

It can be concluded that the condition of education level is still low, but in general the average mostly heads of household of farmers have reached the compulsory education for nine years. The low level of education is clearly to impact on farmers' ability to absorb and implement agricultural technologies is limited.

Age of farmers was around 20-66 years and the average age of farmers was 50.12 years. Approximately 82% of the farmers can be classified as the productive age (15-55 years). The average age of local farmers is the youngest (48.67 years) than newcomers (other 48.81 years). The average lifespan of spontaneous migrants is the oldest (52.88 years). This is due indeed that spontaneous migrants are the farmer tribe who first entered the research area, followed by newcomers and local farmers.

Experience of farmers also determine the ability of farmers to manage the farm, the experienced household, then the probability of failure of agricultural activity can be minimized. In general, most farmers experience is low, namely 27.67 years for local farmers, newcomers have experience as much as 28.31 years and the highest is spontaneous migrants having experiences of around 33.38 years. The average experience of farmers was 29.79 years. Spontaneous migrants were the first tribe to start agricultural activities in the research area, therefore their average experience for farming is the highest.

The number of household members will affect the great expenditure for food consumption (either food produced by own farming and food purchased by the household). Grain consumption of own production is influenced by a variable number of household members. Household size also affects the consumption expenditure. Total number of average household farmer is 3.54, the most high-demonstrated by the spontaneous migrants, newcomers and local farmers with an average value of 3.40; 3.45; and 3.76 people respectively.

3.2. Labor Allocation and Rice Production

The allocation of household labor can generally be divided into two groups, namely the allocation of labor within and outside household of farmers. In general, the use of labor from outside of the household is triggered because the farmer's household are not able fully to do the agricultural activity or farming household allocate their workforce in the off-farm sector or in other sectors. Allocation of labor conditions of farmers both from within and outside household of farmers and rice production is presented in Table 2.

The relationship between the work allocation of labors in the rice fields and plantations (on-farm) and off-farm should be a substitutive relationship. In the research area, household members not only allocate their work time on farming activities, but also allocate their time to work in the off-farm activities or the other activities, so the majority of agricultural production

activities would be given to labors from outside the household.

The field observation showed that newcomers are the most active and the most initiative tribe to work. It is seen that they are the most industrious, followed by spontaneous migrants and the least work is local farmers with the labor allocation as much as 808.16; 770.03; and 632.02 working person-days (HOK)/year respectively. Allocation of the most dominant work in farming activities are local farmers, and spontaneous migrants and newcomers with a value of 69.10%; 62.34%; and 60.74% respectively.

Generally, newcomers were a tribe of farmers using up most of the workforce outside the household, followed by spontaneous migrants and local farmers for 39.26%; 37.66%; and 30.90% respectively. A lot of use of outside labor in the household means a reflection that farmers work outside the agricultural sector (off-farm) with the aim to seek additional sources of income to migrate seasonally for carpenters, laborers, traders meatballs, drivers, hawkers and others. Therefore, it can be said that the relationship of income from rice fields and plantations (on-farm) and from off-farm is also a complementary relationship and not substitutes.

The minimum rice yield was obtained by local farmers, followed by spontaneous migrants and the maximum rice yield was got by newcomers with the value range of 2.5-3.1; 3.0-4.3; and 3.5-4.7 tons MDG/ha/year respectively and the average rice yield was around 2.5-4.5 tons MDG/ha/year. Newcomers obtaining the maximum rice production is due to two main parameters, namely the use of high-yielding rice varieties and maximum labor was allocated, so rice fields were done with optimal treatments, namely fertilization, pest and disease controls, soil and water management and any others.

3.3. Household Income Diversity of Farmers

If total household income is increasing, the share of income used to meet non-food needs is also growing. In addition, the number of household members also affected the production of non-food consumption. This is quite reasonable because the non-food production for household consumption expenditure components are associated with investing in education. To see the income diversity, then a correlation approach of dominant parameter with a total household income of farmers was made. The dominant parameters are such as land acreage, education, age, experience of farmers, number of household members, and labor allocation. Correlation between total household incomes with the dominant parameters are presented in Table 3.

Correlation between Land Acreage with Total Household Income of Farmers

The cultivated land acreage effected very significant on the increase in total household income with the determination coefficient (R^2) of 0.652. This means that around 65.20% of the total household income of farmers was determined by the land acreage and the rest 34.80% was depended on other parameters, such as differences in the parameters of production inputs of each farmer's land, land types and so on. Theoretically it is not found the right size on the amount of optimal R^2 value for determining that the land acreage variable became the main determinant variables for total household income. It can be said that if the value of R^2 is greater (meaning it closes to 1), then the R^2 value is becoming increasingly appropriate as a means to estimate the total household income of farmers. In addition, based on the calculation is found that the bigger n (sample size) is taken, then the R^2 value tends to be smaller. The wider the land acreage is determined, then the contribution of total household income from the plantation sector are also increased. It is caused that farmers lacked labors to cultivate their rice fields, so most land of farmers was converted into plantations, which only required relatively little labor allocation.

Correlation between Education Levels with Total Household Income of Farmers

It tends that the higher the education level of farmers (in this case the household head), the total household income level of farmers have also increased, but at the same time the non-food household expenditure is also getting bigger. Education level effected very significant on total household income with R^2 value of 0.621, which meaning approximately 62.10% of total household income is directly related to education level. Interesting to note that the higher the education of farmers is determined, thus the household income contribution from the plantation sector is increasing. At the level of primary education level, approximately 76.66% of total household income was contributed by rice fields and plantations sector only contributed about 23.34%, in contrast with the college education level, the contribution from the rice fields was reduced to 50.34% and the plantation sector increased to 49.66%. In other words, it can be mentioned that the education level will lead farmers to choose strategic livelihood and to make more informed decisions for improving total household income.

Correlation between Farmer's Ages with Total Household Income of Farmers

The age of farmers effected very significant on increasing the total household income of farmers. The R^2 value showed the values of 0.534, which meaning around 53.40% of the total income of farm household is determined by the age of farmers, and around 46.60% of the total income of farm household is dependent on other parameters. Age of farmers is closely related to the experience and skills of farmers in managing their

farming to be more efficient, effective and sustainable. It is estimated that in the age range of 40-50 years, farmers will culminate in farming. It tends that the older the farmer is, the total household income levels have also increased, but we keep in mind that the income contribution from rice fields decreased with increasing age of farmers. The income contribution from the plantation sector increased with increasing age of farmers.

Table 3. Correlation between dominant parameters with total household income of farmers

Variable	Income (Mill Rp /year)	Rice fields		Plantations [a]		R^{2} [b]
		%	(Mill Rp /year)	%	(Mill Rp /year)	
Land acreage (ha)						
0.5-1.0	12.98	81.82	10.62	18.18	2.36	0.652
1.1-1.9	26.67	77.87	20.77	22.13	5.90	**
2.0-2.9	52.55	57.15	30.03	42.85	22.52	
> 3.0	88.35	51.09	45.14	48.91	43.21	
Education level						
SD	25.14	76.66	19.27	23.34	5.87	0.621
SMP	31.79	75.56	24.02	24.44	7.77	**
SMA	47.78	74.32	35.51	25.68	12.27	
PT	78.09	50.34	39.31	49.66	38.78	
Age of farmers (years)						
< 25	20.34	78.21	15.91	21.79	4.43	0.540
26-35	40.01	75.23	30.10	24.77	9.91	**
36-45	46.77	72.34	33.83	27.66	12.94	
46-55	60.56	71.22	43.13	28.78	17.43	
> 56	70.41	65.57	46.17	34.43	24.24	
Tribes of farmers						
Local farmers	24.34	89.02	21.67	10.98	2.67	0.667
Newcomers	38.03	88.29	33.58	11.71	4.45	**
Spontaneous migrants	50.89	40.11	20.41	59.89	30.48	

Note : [a] Rubber, oil palm & coconut, [b] R^{2}: Determination coefficient (value 0-1)
      **/ very significant at level 1%
Source : The calculation result of the primary data (2016)

Correlation between Farmer's Tribes with Total Household Income of Farmers

Tribe of farmers showed a highly significant difference where the local farmers are highly significantly different with the newcomers and spontaneous migrants with the determination coefficient (R^{2}) of 0.667, which means that the tribes of farmers play a role around 66.70% in determining the total household income of farmers. At the spontaneous migrants the highest income contribution was given by the plantation sector (59.89%), whereas the rice fields contributed only about 40.11%. Especially for local farmers and newcomers, the largest income contribution was given by rice fields, which amounted to 89.02% and 88.29% respectively and the remaining 10.98% and 11.71% was contributed by the plantation sector.

4. Conclusion

Characteristics that play an important role in the decision making to increase the production of rice yields and total house hold income, are land use, education levels, age of farmers, farmers' experience, number of household members, and labor allocation in farming. Important parameters, that was correlated significantly different to the total household income, are land use, education level, age and tribes of farmers with R^{2} values namely 0.65; 0.62; 0:53; and 0.67 respectively. Plantation sector is able to increase total household income, and the farmer's decision to farming with multi commodity approach is the right way to increase total household income. However, this decision is less suitable to be implemented in the research area because it is opposed to government policy that determine the research area is categorized as a center of rice production.

It needs policy to increase on-farm activity in rural areas by optimizing the potential of local resources as

well as household-based, for example by making rural agro-industry to increase the added value of agricultural products such as rice and cassava processing into derived products such as rice flour; cassava chips; cassava chips; processing corn into corn flour for household-scale animal feed and others. This policy is expected to optimize the allocation of labor potential owned farming households, so that farmers are increasingly shedding of labor in farming activities ranging from upstream to downstream. This policy depends on the specific conditions of a region and a tribe of farmers.

Acknowledgement

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