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STRATEGY AND ANALYSIS ON ECONOMIC BEHAVIOUR OF RICE FARMER HOUSEHOLD IN SOUTH SULAWESI PROVINCE IN INDONESIA

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ABSTRACT

The research aims to measure and analyze the minimum standard of optimum land area (land operation)of rice farmer household, economic behavior, income of family labors in rice farming, condition of production capacity of rice farming, consumption need of rice farmer household in South Sulawesi, as well as formulate the proper strategy to raise rice farmer's welfare.
Tool of analysis used to measure the land operation, income of family labors, as well as production capacity is Z score, whereas the strategy formulation uses SWOT.
The research conducted in five regencies in South Sulawesi:Bone, Soppeng, Wajo, Sidrap, and Pinrang. These regencies are the main producers of rice, as well as highly represent the farming condition in South Sulawesi. The respondents divided into three groups: landowner and sharecropper at once; sharecropper only and owner only, and; farm worker. The number of respondent is 400 rice farmers.
The result shows that optimum land area (land operation) for proper life is 0.55 ha/people for technical irrigated(owner and sharecropper at once), and 0.99 ha for rain fed field (owner and sharecropper at once). Whereas, for landowner only and sharecropper only (profit share), the land operation are 1.10 ha/people for technical irrigated, and 1.97 ha/people for rain fed field.For farm worker, the land operation for minimum proper life is 2.8 ha/person.
The average income for family labor of landowner and sharecropper is Rp 1,199,408.33/ month, Rp 599,704.17/month for landowner only or sharecropper only (profit sharing system), and Rp. 198,148.15/month for farm worker. The average production capacity for technical irrigated fieldis 7.1 tons/ha/harvest, and 5.12 tons/ha/harvest for rain fed field. The average consumption needs for proper life in general approximately Rp. 6.808.500/year, equal to 801kg of rice.In addition, the suggested strategy in order to increase farmer's welfare is defensive strategy.

Key Words: ***Economic Behavior, Optimum Land Area, Rice Farmers' Income and Welfare***

INTRODUCTION

The farming development in the level of rice farmer household plays an important role in increasing farmers' income, family welfare, as well as providing work field, through production and consumption activities. Farmers' expectations are the increasing of production and productivity and family welfare, and no unemployment. Increased production and farmers' income are then will be allocated for expenses, investment, farming credit, as well as savings.

Limited land ownership results in insufficiency of farming income in meeting farmer's household needs. In addition, the high increasing of consumer goods' prices is not proportional to the increasing price of farming commodities. Therefore, the production decision of food crop, such as rice, is a unit of small-scale farming household playing double roles as producer and consumer.

The economic behavior of farmer householdis rational both in allocating household resources to produce goods and services and in utilizing goods and servicesto meet household needs. Allocation of resources is grouped in production decision, whereas the utilizing of goods and servicesis grouped in consumption decision.The rational production and consumption decision need precise information on the price of goods and services' resources.That is market

price resulted from the structure of perfect competition market, even though the farmer households in Indonesia are generally facing imperfect competition market due to the existence of transaction cost, asymmetric market information, monopoly and monophony powers, as well as government-intervened policies (Kusnadi, 2005).

Various government policies to increase farmers' production has no significant effect on increased economic rate of farmers. According to the data of BPS (Central Board of Statistic), it is clear that, the number and percentage the poor in South Sulawesi in September 2011 increased to 835.910 people ora 0,31 percent increase from March 2011. Even though in small rates, these escalations have embedding bad image and perception on the effectiveness of poverty resolving in South Sulawesi. These escalations are also having potential to generate disbelief towards various claims of the success of economic development by regional government (Agussalim, 2012).

In comparing the poverty rate in South Sulawesi with other provinces in Sulawesi Island, it is clear that the number of poor people in South Sulawesi is at the first rank, though its percentage placed the second after North Sulawesi. In 2011, the number of poor people in South Sulawesi is twice larger than Central Sulawesi, and four times larger than North Sulawesi and Gorontalo, whereas Gorontalo has the highest percentage of poor people in Sulawesi Island (Agussalim, 2012).

If observed spatially, areas that become the concentration of poor people in South Sulawesi are Pangkep, Jeneponto, Bone, SouthToraja, South Luwu,Luwu, and Maros Regencies. Almost half of poor people in South Sulawesi live in these areas. These areas have relatively high number and percentage of poor people.Based on the proportion, the percentage of poor people in these areas is averagely above fourteen percent of total population. The city of Makassar and Gowa have a large number of poor people, though relatively small in percentage (Agussalim, 2012).

Based on ongoing phenomenon as well as existing empirical studies, it is obvious that there is an increase in economic growth in South Sulawesi unaccompanied by the declining poverty. In fact,the contrary situation occurs. According to existing theories of growth, such as theory of Harold Domar, Neoclassical of Solow, and Endogen theory of Romer, we can draw a conclusion that there are three main factors of economic growth: 1) capital accumulation covering all forms or types of new investment, 2) population growth, and 3) technological advancement. Those sources of growth are expected to decline poverty since if economic growth emerged, investment will grow along. In turn, it results in labor recruitment by government and private, more innovative and productive technological advance, and population growth through the increasein human capital, as described by supply-side economics school that focus on policies made to increase national output through capital accumulation.

According to the above explanation, the main problems discussed in the research are: how much is the minimum standard of optimum land area (land operation) of rice farmer for proper life; how is the income condition of family labors in rice farming; how is the condition of production capacity as well as consumption need of rice farmer household in South Sulawesi, and; what is the proper strategy to increase the rice farmers' welfare.

1. Literature review and model development

1. Farmer Household and Empirical Model of Its Decision Making

In the last decade, household theories that studied household behavior as the decision maker in production and consumption activities that related to time and income allocation, and the analysis done by simultaneous approach have been developing. Bagi and Singh (1974) formulated the micro economic model of this decision making for cases in developing countries. The form of decision-making done by farmer household is divided into: production, consumption, marketed surplus, employment of labor from inside and outside the family, investment and financial decisions.

Yotopoulos and Lau (1974) also analyzed household production and consumption by using microeconomic approach and Cobb-Douglas production functionassuming that: (1) household as consumer will maximize its satisfaction,which is a function of leisure time and other commodity consumption with resources constraint; (2) household as producer will maximize its profit with constraints of resources technology and production facilities price, (3) labors inside and outside family is substituted perfectly, and (4) household participation in labor market. Barnum dan Squire (1978) analyzedfarming production behavior, consumption, and labor supply in semi-commercial farming in competing labor market. The result showed that there was close relationship between production and consumption decision in farmer household.

Farmer household as a complex economic unit is a farming with family labors and consumers that maximizing their utilities to gain satisfaction. Farmer household maximizing utilities function with limited resources that rationally moving towards a balance point. As an economic unit, farmer household has a simultaneous relationship between production and

consumption behavior that does not occur in a company organization. A company only conducts production activities of goods and services to maximize profit. Consumption derived from individual behavior that rationally tries to maximize satisfaction with particular budgetary constraint, thus it is a function of household demand. A simultaneous relationship between production and consumption behavior in farmer household causes farmer household behavior needs unique economic theoretical base.

2. Measurement of Minimum Physical Needs

In the same area, the carrying capacity can be differs by different approaches. For areas with majority of peoplemaking their living in agricultural sector, carrying capacity is calculated from the production of foodstuffs.

It is calculated from Minimum Physical Needs (Kebutuhan Fisik Minimum/KFM) based on calorie needs per person per day, which is 2600 per person per day or 265 kg of rice per person per year

Comprehension of calorie as a basis for measurement based on consideration that to live healthily, one needs calories in particular amount sourced from foodstuff in form of protein, fat, and carbohydrate plus mineral and vitamin. By this calorie basis, all foodstuffs are included. Another consideration is since most of farming product are carbohydrate, such as rice, corn, cassava, sweet potato, soybean and peanut, which are the biggest sources of calorie in foodstuff composition (Odum et al., in Suhardjoand Tukiran, 1990).

Value of minimum physical basic needs is the value that shows that one can live normally, so that they can work to meet their life needs. Therefore, foodstuffs are needed as human's basic needs.

Food Crop Land Area Needed Per Capita to Reach Self-sufficiency

Food crop land area needed per capita to reach food self-sufficiency "K" (ha/person) is one of important components in the measurement of farming land carrying capacity. K value is calculatedby dividing minimum physical need (KFM) by food crop production per year, converted from original ton unit to calorie, and then converted one more time to kilogram of rice for every commodity. This value will be compared with converted food crop production from each region so that the calculation unit will become kilogram of rice/person/year.

The smaller the K value, the better the carrying level of farming land. The value of food cropland area needed per capita to reach food self-sufficiency is always fluctuating by time and space since it is affected by KFM and land capability to produce food crop.

The smaller the K value, the higher the farming land carrying capability. Therefore, in areas with high K value, an effort to decline the value is needed through increasing the productivity of food crop or broadening the food crop area.

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3. Minimum Land Area for Proper Life

Minimum land area for proper life represented with Z value. Z value is calculated by comparing amount of expense for proper life per head, with net value gained for every 1 ha farming land for one year.

Z value is gained by comparing the amount of expense needed for proper life by a family or household with net value obtained in every 1 ha land for one year.According to Prof. Sayogya, as IDT basis, rice unit is used to measure life feasibility, which is twice of what needed to live above poverty line or equal to 2 x400 kg = 800 kg per capita per year. Whereas production value for every 1 hectare farming landis obtained from mean value of each crop variety produced from the area.

4. Farmer Household and Empirical Model

Poverty is a condition of multi-deficiency experienced by a person that he/she cannot meet his/her minimum life needs.The emerging of poverty is affected by various interrelated factors. Those are income, health, education, access to goods and services, geographical condition, etc.Furthermore, life standard or minimum needs is differs in one region to another, depends on habit/custom, transportation and distribution facility, as well as geographical location (Badan Pusat Statistik, 2010).

Minimum land area is defined as the measurement tool for farmer's income rate used to fulfill goods and services needed for household consumption, both food and non-food need, as well as the need of further farming production.(Department of Agriculture, 2003)

Generally, household consumption size is divided into two groups, i.e. food expense and non-food expense in form of housing, clothing, education, health, fueling, and saving needs.The expense rate in both group for each different land area will be differ. Generally, the size of household expense value in villages varies according to their income. This phenomenon will occur when the income is low where the priority will be given to their subsystem needsthan others, mainly the need of food expense. It will be different if the income earned is higher, thus a shift will occur from foodstuff needs to non-food needs (Nurmanaf, R. et al.. 2004).

People expense, especially consumption, basically, is affected by various factors, both quantitative and qualitative. Several quantitative factors that are believed to affect people's

consumption pattern such as income and number of family members. Whereas qualitative factors such as level of education and taste. The size of quantitative factors influence towards people's consumption is relatively easier to calculate than the qualitative. The relationship between income rate pattern and consumption pattern has been long studied. Popular finding related to this is Egell (Engel's law), suggested that the higher the income the lesser the percentage of food consumption. This means that food consumption share towards total consumption is relatively can be used as indicator of welfare rate compared and it became more relevant since there is a difference of commodity prices consumed inter-region. Thus, the absolute inter-region consumption value comparison in a given time is less acceptable (Badan Pusat Statistik, 2008).

Household welfare rate is manifestly measureable from income rate compared with minimum need for proper life. Change in welfare rate is observable from household expense pattern that divided into two: food and non-food expense. In developing countries, generally, food expense is the biggest part of total household consumption expense. Contrary, in relatively developed countries, expense for various goods and services, such as healthcare, education, etc., are the biggest part of total household expense. Every change of those percentages in each year can shows the development of household life rate (Badan Pusat Statistik, 2009).

5. Formulation of SWOT Strategy

To formulate strategic steps to increase farmer's welfare, a SWOT analysis is used. For this purpose, internal factors that describe the strengths and weakness of rice farmers are summarized into internal strategic factor analysis summary (IFAS); whereas environmental factors that reflect opportunity and threat are summarized into external internal strategic factor analysis summary (EFAS).

2. Research Method

1. Research Design

Research design used was survey research design. It based on problem formulation that only contains single variables without making comparison or linking to other variables. In addition, the research only described facts and characteristics of a population.

2. Research Instrument

Data collection instrument was a list/data input table. Data collection was done by downloading secondary data, such as region's profile, number of labors, etc.

3. Sample Population

The population of the research was all rice farmers living in South Sulawesi Province. Whereas, targeted population was regions that is determined by central government through the Ministry of Agriculture as the center of rice production in South Sulawesi. Those were: Soppeng,Sidrap, Wajo,Bone, and Pinrang Regency (*Dinas Pertanian Tanaman Pangan dan Holtikultura Sulawesi Selatan*, 2011).

Using the *slovin* formula, a sample of 400 people is obtained. This sample will be spread to five regencies by using simple random sampling.

4. Data Type and Source

Data used in the research was primary and secondary data. Primary data was collected by survey method through in-depth interview by using question list

5. Analysis Method and Tools

1. Determination of Lowland Rice Farming Land Operation

Land operation area of lowland rice farming in the research was determined through expense approach to fulfill farmer's Proper Life Need (*Kebutuhan Hidup Layak*/KHL).

Estimation of lowland rice farming minimum land (Lahan Minimal/Lm) was calculated using Monde (2008) Formula:

Z = KHL/Pb ..... (5)
where:
Z = minimum land area (ha)/person
KHL = farmer's proper life needs (Rp KK-1 year-1)
Pb = Farming Net Income (Rp ha-1 year-1)

2. Farmer's Household Analysis

To get an image of family labor's income in rice farming, condition of rice farming production capacity, as well as rice farmer household consumption needs in South Sulawesi, data obtained was analyzed descriptively. Then a quantitative analysis was used to explain factors that influenced household decision in allocating income for consumption, as well as opportunity cost if family labors use their leisure time.

3. Welfare Calculation by Farmer's Exchange Rate Model

One of farmer's welfare elements is farmer's purchasing power from their income to meet farmer household's expense needs. Welfare increasing can be measured from the increasing of income purchasing power to meet the expense. The higher the farmer income purchasing power on consumption needs the higher the farmer's exchange rate. This means that they are relatively more prosper. Farmer's exchange rate refers to the relative purchasing power of agricultural product produced/sold by farmers on goods and services they bought/consumed.

Conceptually, the direction of farner's exchange rate (*Nilai Tukar Petani*/NTP) height will

increase or decreasebecause of direction power of each of its components. Those components are income component thathas a positive direction, and payment component that has a negative direction. If the income rate is higher from the payment, farmer's exchange rate increased, vice versa. The upward or downward movement of NTP describes the increasing and decreasing of farmer's welfare.

Naturally, NTP has a decreasing tendency characteristic. This is related to the characteristics embedded to agricultural and non-agricultural commodities. Those are: (1) Agricultural product income is inelastic, while non-agricultural product tends to be more elastic; (2) Technological change with different rates gives advantage to manufacture products, and; (3) The difference in market structure, where the market structure of agricultural product tends to be more competitive, while the one of manufacture product tends to be less competitive and heading towards monopoly/oligopoly market. (Rachmat ,2000)

4. Formulation of SWOT Strategy

To formulate strategy in order to increase rice farmer's welfare, a SWOT analysis was used. For this purpose, internal factors that describe strengths and weaknesses of rice farmers was summarized into internal strategic factor analysis summary (IFAS); while the environmental factors that reflect opportunity and threat summarized into external internal strategic factor analysis summary (EFAS).

Calculation and assessment of contribution of each factors towards the final conclusion was made by following conditions:

- Every single factor in the IFAS and EFAS is weighted according to the importance level on a scale start from 1 (not important) to 9 (very important). The value of each factor is normalized, so that the total value is 1;
- Each factor in the IFAS and EFAS is weighted or rated on a scale from 1 to 9 according to their influenceon commodities. Scale 5 is in a balance or neutral position. Positively influencing factors (all that regarded as strength and opportunity) valued above 5, while negatively influencing factors (all that regarded as weakness and threat) valued below 5.

3. Result and Discussion

1. Determination of Land Operation

Land operation determination of lowland rice farming in the research was divided into three groups. Those were: sharecropper, landowner, and landowner and sharecropper at once. Calculation of land operation of lowland rice farming used z score value with expense amount needed by a family or household for proper life with net value obtained on 1 hectare of farming land for 1 year.

Whereas the result of calculation of lowland farming land operation is presented in the following Table 1

Tabel 1. Calculation of Z score in five regencies in South Sulawesi

Z Value (land operation)					
Owner and sharecropper	Bone	Soppeng	Wajo	Sidrap	Pinrang
technical irrigation (ha/person)	0.50	0.55	0.48	0.20	0.20
Rainfed (ha/person)	0.96	0.99	0.90	0.95	0.97
Owner only or sharecropper only					
technical irrigation (ha/person)	1.01	1.10	0.96	0.39	0.41
Rainfed (ha/person)	1.92	1.97	1.81	1.89	1.95

Source : primary data, processed 2015

According to the result of Table 1 above, it is clear that from the five sample regencies, the highest score for owner and sharecropper in technically irrigated field was in Sopperng Regency with the score of 0.55, while the lowest was Sidrap and Pinrang Regency as low as 0.20. For rain fed field, the lowest score was 0.90 in Wajo, and the highest was 0.99 in Soppeng. The result provides interpretation that the minimum land area that must be managed by owner and sharecropper for proper life is 0.50 ha for technically irrigated field and 0.99 ha for rain fed field.

For farmers as owner only or sharecropper only, the highest z score was 1.10 in Soppeg and the lowest was 0.39 in Sidrap for technically irrigated field. While for rain fed field, the highest score was 1.97 in Soppeng, and the lowest was 1.81 in Wajo.

2. Analysis of Farmer's Production and Consumption

The consumption needs in the five regencieswas nearly similar, approximately 800 kg. The highest minimum physical need was in three regencies: Bone, Soppeng dan Pinrang, as high as 321 kg per capita, and the lowest was in Sidrap with 319 kg per capita. Whereas, minimum expenses for Bone, Soppeng dan Pinrang was similar, as high as Rp. 6.821.250, Rp. 6.800.000 for Wajo, and Rp. 6.778.750 for Sidrap.

Rice production in five regencies differs according to the field type model. Rice production of Bone for technically irrigated field was averagely 7.1 tons per harvest, and 5.1 tons for rain fed

field.Average rice production in Soppeng was 6.8 ton for technically irrigated field, and 5.1 tons for rain fed field. Average production of Wajo was 7.3 tonsfor technically irrigated field, and 5.2 tons for rain fed field. Sidrap produce averagely 7.2 tons for technically irrigated field, and 5.12 tons for rain fed. Pinrang produced averagely 7.1 tons for technically irrigated field, and 5.1 tons for rain fed field.

3. Strategy of Farmers' Welfare Advancement

Farmers' welfare rate is often measured by farmers' exchange rate (NTP). Calculation of NTP is obtained from the comparison of price index received by farmers towards price index paid (in percentage). NTP is one of relative indicators of farmers' welfare rate. The higher the NTP, relatively the more prosper the farmers' life rate.One of reasons ofthe decreasing NTP indexis that the farmers are perceptive of technological advance that is faster than the price advancement. Therefore, production advancement increases rapidly exceeding the ability of the "market" to absorb.

The change of farmers' exchange rate (NTP) in fact, is more becomes a loss instead of benefit. It means that in farming, the income earned by the farmer is smaller than production cost or the change of income ratio in agricultural sector against non-agricultural sectorrampageous is more often to be negative instead of positive. Therefore, NTP has a correlation with poverty. To find out farmers' welfare (especially lowland rice farmers) rate in a whole, we need to observe the other side of the box, that is the progress of their expenses, both for consumption and production needs.

Whereas the result of calculation of farmer's NTP in the five regencies is presented in the following table

Table 2. Farmers' Exchange Rate (NTP) in South Sulawesi

Variable	Regencies				
NTP (owner and sharecropper)	Bone	Soppeng	Wajo	Sidrap	Pinrang
Technical Irrigation (ha/person)	141.81	134.15	146.54	192.83	188.73
Rain fed (ha/person)	101.86	100.61	104.38	102.14	101.17
NTP (owner only or sharecropper only)					
Technical Irrigation (ha/person)	99.46	94.43	102.62	156.98	153.86
Rain fed (ha/person)	71.45	70.83	73.10	71.66	71.10

source : Primary data, processed 2015

According to the table above, it appears that in average, farmers' exchange rate for landowner and sharecropper, both in technically irrigated and rain fed fields, was above 100% for all regencies. This indicates that NTP > 100 means that the farmers experience a surplus. The production prices increased higher than the consumption price, thus it categorized as prosper.

For farmers work as sharecropper only, there were two regencies with NTP score < 100. Those were Bone and Soppeng, both in technically irrigated or rain fed fields. For other regencies, such as Wajo, Sidrap and Pinrang, only those who were sharecropper in rain fed field possess NTP score < 100. Whereas for those in technically irrigated fields possess NTP score> 100. This indicates that NTP<100 means that the farmers suffer a deficit. This is caused by the low income, since the production is relatively smaller than the increasing of consumption goods.

The result indicates that farmers' welfare rates viewed from the farmers' exchange rate differs between that of landowner and sharecropper at once and that of sharecropper only or landowner only. Those who are landowner and sharecropper at onceappear to be more prosper than those who are sharecropper only or landowner only.

The result of income survey in farm worker level was worse, where the net annual income as a farm worker was around Rp. 2.300.000, or equal to Rp.198.000 per month. Therefore, the minimum land to cultivate to reach proper life was 2.8 ha/person.

To increase the lowland rice farmers' welfare, a strategic analysis was needed to alleviate their life burden. In this research, a Swot strategy formulation was used.

Analysis of Internal Factors (strength and weakness) and External Factors (opportunity and threat) on the Increasing of Lowland Rice Farmers' Exchange Rate

Based on field observation, and in line with several methods used to find out internal factors (strength and weakness) and external factors (opportunity and threat) on lowland rice farmer's exchange rate. The first stage is "Data Collection Stage". Through this stage, internal and external factors were found as following.

Strength

1. Farmers' knowledge on good cultivation and production technique is very good.
2. Farmers are generally persistence at work, patient and tough, and having high spirit of co-helping.
3. Rice production scale has not reached its peak yet, thus it still can be optimized.
4. Production facilities are easy to access.
5. Irrigation water in five regencies is still reliable.

6. There are a lot of land that are convertible into lowland.

Weakness

1. Generally, surveyed farmers are not higheducated (under high school level). Thus, they are internalized by old value of paternalistic.
2. Access and control of resources are weak.
3. Low level of bargaining position has caused their unhulled rice to be sold at low price.
4. Attack of pest and crop disease.
5. A lot of farmers group do not play role in developing rice farming.
6. Low capital.

Opportunity

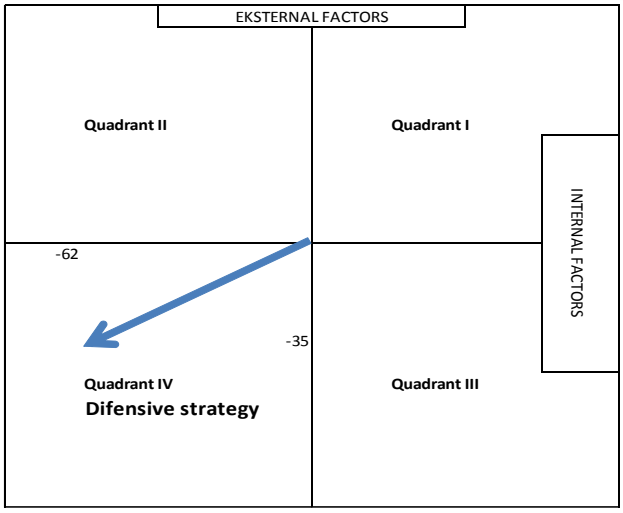
1. There isongoing farming infrastructure development by government in the fiveregencies.
2. The high dependency on rice for public consumption in research sites (five regencies), even across Indonesia.
3. Market demand for rice needs is always exist.

Threat

1. The price of fertilizers still too high for farmers.
2. The price of pesticide is also relatively high for farmers.
3. Agriculture extension workers are unable to change farmer's way of thinking.
4. Information and communication technology in rural area is not well supporting. Nearly allfarmers cannot operate computers or internet to support educational medium in developing their farming.
5. Many farming fields are converted to housings and factories.
6. No regional or ministry regulation prohibited the conversion of lowland farming fields.
7. Production in other area, such as Java, has reached 10 ton/ha per harvest.
8. Unpredictable climate disorders are still occurring frequently.

The weighting calculation is in attachment.

After executing weight calculation of each internal and external factor, position matrix analysis was conducted. This matrix was used to discernthe position of lowland rice farmer's exchange rate advancing strategy in research sites. According to Table … above, it shows that X < 0, and Y < 0. The coordinate position can be referred in the following Cartesius chart.



According to the matrix of internal-external obtained from total weighting score on lowland rice farmers' welfare advancement in research sites, internal factors was scored -62. This means that the score is a difference between strength and weakness, where the strength is smaller than the weakness. Meanwhile, the external factor was scored -35. This means that the score is a difference between opportunity and threat, where the threat score is higher than opportunity's.

From the score above the condition obtained is located at quadrant iv, means defensive strategy. This quadrant describes a bad organizational circumstance, since beside the emerging internal weaknesses, there are also threats from the outside. Therefore, the alternative strategy is defensive strategy, such as reduction or efficiency in all sectors.

In this model, farmers are suggested to save production factors. However, instead by reducing quality, they are suggested to use other alternative of production factor substitutions, such as using standardized organic fertilizer.

4. Conclusion and Suggestion

Conclusions that can be drawn are:

1. Land operation for proper life is 0.55 ha/person for technically irrigated field (owner and sharecropper at once) and .99 ha/person for rain fed field (owner and sharecropper at once). For farmers as owner only, land operation is 1.10 ha/person for technically irrigated field, and 1.97 ha/person for rain fed field.
2. The family labors' income of owner and sharecropper in average is Rp 1,199,408.33/month, Rp 599,704.17/month for owner only or sharecropper only (profit sharing system), and Rp 198,148.15/month for farm workers.
3. Production capacity for technically irrigated field in average is 7.1 tons/ha per harvest, and 5.12 tons/ha per harvest for rain fed field. For farmers'

consumption needsfor proper life in average is Rp. 6,808,500 per year, equal to 801 kg of rice.
4. Suggested strategy to advance farmers' welfare is defensive strategy.

Suggestions:

1. To live in proper condition, farmers are suggested to farm at least on minimum area as obtained in conclusions above.
2. To increase farm workers' income, it is suggested to use profit sharing system instead of wage only.
3. Production capacity is still can be increased as long as efficiency in production factor as well as effective land utilization are executed.

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Appendix 2

	Strength	Rating	Weight	Scoring x Weight
1	Farmer's knowledge on good cultivation and production technique is very good	9	13	117
2	Farmers are generally persistence at work, patient and tough, and having high spirit of co-helping	10	8	80
3	Rice production scale has not reached its peak yet, thus it still can be optimized	8	12	96
4	Production facilities are easy to access	4	4	16
5	Irrigation water in five regencies is still reliable	6	6	36
6	There are a lot of land that are convertible into lowland	7	7	49
		44	**50**	**394**
Weaknesses				
1	Generally, surveyed farmers are not high educated (under high school level). Thus, they are internalized by old value of paternalistic.	8	10	80
2	Access and control of resources are weak	9	6	54
3	Low level of bargaining position has caused their unhulled rice to be sold at low price	10	10	100
4	Attack of pest and crop disease.	9	6	54
5	A lot of farmers group do not play role in developing rice farming	8	6	48
6	Low capital	10	12	120
		54	**50**	**456**
	Strengths and Weaknesses Variance			**-62**
Opportunities				
1	There is ongoing farming infrastructure development by government in the five regencies.	8	20	160
2	The high dependency on rice for public consumption in research sites (five regencies), even across Indonesia.	10	15	150
3	Market demand for rice needs is always exist	10	15	150
		28	**50**	**460**
Threats				
1	The price of fertilizer is still too high for farmers.	10	10	100
2	The price of pesticide is also relatively high for farmers	10	10	100
3	Agriculture extension workers are unable to change farmer's way of thinking	9	5	45
4	Information and communication technology in rural area is not well supporting. Nearly all farmers cannot operate computers or internet to support educational medium in developing their farming	10	5	50
5	Many farming fields are converted to housings and factories	10	6	60
6	No regional or ministry regulation prohibited the conversion of lowland farming fields	10	4	40
7	Production in other area, such as Java, has reached 10 ton/ha per harvest	10	6	60
8	Unpredictable climate disorders are still occurring frequently.	10	4	40
		79	50	495
	Strengths and Weaknesses Variance			**-35**

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Appendix 1

Land Operation

Description	Bone	Soppeng	Wajo	Sidrap	Pinrang
Farmer Consumption					
Minimum Physical Need (KFM)	321	321	320	319	321
Health and recreation (50% *KFM)	160,5	160,5	160	159,5	160,5
Education and Social Activities (50% *KFM)	160,5	160,5	160	159,5	160,5
Insurance and Saving (50% *KFM)	160,5	160,5	160	159,5	160,5
Proper life (kg/tahun) (250% *KFM)	**802,5**	**802,5**	**800**	**797,5**	**802,5**
Minimum expenses (Rp)	**6.821.250**	**6.821.250**	**6.800.000**	**6.778.750**	**6.821.250**
Lowland Rice Production					
Technical Irrigation (ton)	7,1	6,8	7,3	7,2	7,1
Rain fed(ton)	5,1	5,1	5,2	5,12	5,1
Farmer's income/ harvest					
Technical Irrigation (Rp)	22.720.000	21.760.000	23.360.000	23.040.000	22.720.000
Rain fed(Rp)	16.320.000	16.320.000	16.640.000	16.384.000	16.320.000
Annual Income					
Technical Irrigation (Rp)	22.720.000	21.760.000	23.360.000	57.600.000	56.800.000
Rain fed(Rp)	16.320.000	16.320.000	16.640.000	16.384.000	16.320.000
Production Cost					

Technical Irrigation (Rp)	9.200.000	9.400.000	9.120.000	23.050.000	23.275.000
Rain fed(Rp)	9.200.000	9.400.000	9.120.000	9.220.000	9.310.000
Net Yield					
Technical Irrigation (Rp)	13.520.000	12.360.000	14.240.000	34.550.000	33.525.000
Rain fed(Rp)	7.120.000	6.920.000	7.520.000	7.164.000	7.010.000
Z Value(Land Operation)					
Technical Irrigation (ha/person)	**0,50**	**0,55**	**0,48**	**0,20**	**0,20**
Rain fed (ha/person)	**0,96**	**0,99**	**0,90**	**0,95**	**0,97**

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