Economic determination in increasing agricultural production in Lamongan district

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Abstract. Agriculture is an important factor in the basic economic sustainability of the population of Lamongan Regency. The large number of people whose livelihoods are farmers makes agriculture as the main commodity of the local community. It is undeniable that the agricultural sector in Lamongan Regency is an agricultural product contributing to the top ten of East Java's GRDP. If agriculture occurs the problem will have an impact on the decline in agricultural production. The variables used in this study are labor, agricultural land, irrigation, subsidies as independent variables and the production of dependent variables. The methodology of this study uses a quantitative approach using multiple linear regression, partial tests, simultaneous tests and dominant tests. The data source in this study was conducted in the period between 2010-2018 with the approach of 3 multiple linear regression models, so that it can compare the models that look good and have an impact on agricultural production. The analytical tool used in this study was eviews 10. The results of this study partially occurred a positive relationship between labor, land, and irrigation to production, while partially a negative relationship occurred between subsidies to production. But simultaneously there is a simultaneous or joint relationship between labor, land, irrigation and subsidies affecting production. The dominant value of the four variables of labor, agricultural land, irrigation and subsidies is in the labor force.

1. Introduction
Countries Indonesia predominately livelihood in the agricultural sector: agriculture. The number of people who made their living farming sector makes the need for a large enough workforce in this sector. The number of first quarter 2018 labor force working in the agricultural sector amounted to 127.07 million which consisted of three business fields of labor contributor most of agriculture, forestry and fisheries percentage of 30.46 percent, or 38.70 million people. Meanwhile, trade sector according to BPS data by 18.53 percent, or 23.55 million people. Manufacturing sector according to BPS data amounted to 14.11 percent, or 17.92 million people. But the existence of this data by disclosing that the work of the agricultural sector continued to decrease throughout the year, although the agricultural sector still accounts for the number of the largest labor in Indonesia, where the majority of its workforce berahli functions to other sectors which guarantee greater wage or regularly throughout the month, plus a reduction in land berahli agricultural functions into residential and industrial sectors. One contributor to the province's largest agricultural products in Indonesia is East Java where five districts in East Java is Jombang, agricultural success crops East Java is not free from the problems that exist.
The problem of declining productivity of the agricultural sector crops (Ton / ha) due to the expert functions of agricultural land crops East Java, which cause a reduction in agricultural land crops. If the condition in those years in the future will need the results of agricultural resources crops will experience a shortage, therefore the necessary solutions to improve agricultural production crops, Even the government's efforts to maintain farmers' land through LP2B program (Sustainable Agriculture Development Land) where the land may not be sold by the farmer had not been effective [1–3].

In this study, researchers wanted to see more specific or detailed Lamongan into five major producer of agricultural products in East Java. Lamongan district is the northern region of the province of East Java, where most people are farmers. The area is divided on three of the first areas north adjacent to the northern coast of populous livelihood of fishermen, but also work in the agricultural sector. The central region consisting of valleys and basins where many residents work in agriculture, plantation, administration offices and fisheries. The third area is in the south where many who work in agriculture and plantation. This is the feature of this region because of different geographical areas have yet to produce five major agricultural production in eastern Java.

Economic progress in the region depends on the seed sector in the region, where the district of Lamongan some community work in the agricultural sector, if the farm with its production increases, the impact on the welfare of the people in Lamongan. Lamongan agricultural problems are the main issues in eastern Java, Indonesia experienced even in this region where as agricultural land throughout the year continued to decrease due to the expert in land use, Labor continues to decrease even be called lost generation melenial or is that due to the industrial sector or the business sector more promising huge wage or monthly and job security, the problem of irrigation throughout the year continued to haunt which time the rainy floods and dry season water shortages. The last maslahan are government subsidies that are still not on target or acquisition uneven division since due to political interests therein. From the above problems will inevitably result in an impact on agricultural production. The last maslahan are government subsidies that are still not on target or acquisition uneven division since due to political interests therein. From the above problems will inevitably result in an impact on agricultural production.

2. Previous Research Review
Many who have identified how the effects of agricultural productivity and poverty especially in developing countries. All studies that there is a bias grouped based approach in calculating productivity bias grouped among others, by using the ratio of output per input such as, among others Thitle, irz, Lin, Hill, and Wiggins [4] estimate cross section data as many as 40 countries, using production indicators per acre and the amount of labor as a measure of productivity, concludes that productivity variable effect on poverty reduction.[5] using the ratio of the value of agricultural sector production per worker while Dhrifi [6] by the percentage of added value agricultural sector per Gross Domestic Product (GDP).

3. Materials and Method
The methodology in this study using qualitative research with data sources in Lamongan agriculture for 9 year period 2010-2018 obtained from the Central Bureau Satatistik Lamongan processed. Or input variables in this research are labor, land, irrigation and subsidy, while the dependent variable is output or production. Analysis using multiple linear regression approach with some of the techniques regression test method which will dicoba. Simulasi models will do as much as the options proposed model. Specifications of the model used was adapted from several previous studies by making adjustments considered would give better results to explain Determination Economics in Agricultural Production Increase In Lamongan.
a. The model I developed a mathematical function as follows:

\[
\text{Logproduction} = F (\text{Labor, Land, Irrigation, Logsubsidy})
\]  

(1)

Of function (1) can be modified into an econometric model as a basis of the equation is as follows:

\[
\text{Logproduction} = \alpha + \text{LABOR}X_1 + \text{LAND}X_2 + \text{IRRIGATION}X_3 + \text{LOGSUBSIDY}X_4 + \epsilon
\]

b. Model II built a mathematical function as follows:

\[
\text{production} = F (\text{Labor, Land, Irrigation, subsidy})
\]  

(2)

Of function (2) can be modified into an econometric model as a basis of the equation is as follows:

\[
\text{PRODUCTION} = \alpha + \text{LABOR}X_1 + \text{LAND}X_2 + \text{IRRIGATION}X_3 + \text{SUBSIDY}X_4 + \epsilon
\]

c. Model III built a mathematical function as follows:

\[
\text{logproduction} = F (\text{logLabor, logLand, logIrrigation, logsubsidy})
\]  

(3)

Of function (3) can be modified into an econometric model as a basis of the equation is as follows:

\[
\text{Logproduction} = \alpha + \text{LOGLABOR}X_1 + \text{LOGLAND}X_2 + \text{LOGIRRIGATION}X_3 + \text{LOGSUBSIDY}X_4 + \epsilon
\]

4. Results and Discussion

This study uses three different models where the model is determined which model is best that could affect agricultural production in Lamongan. 10 eviews the results table of the three models below can be concluded that the model I have seen quite a real relationship on problems facing agricultural production in Lamongan.

Model I:

\[
\text{LOGPRODUCTION} = \alpha + \text{LABOR}X_1 + \text{LAND}X_2 + \text{IRRIGATION}X_3 + \text{LOGSUBSIDY}X_4 + \epsilon
\]

\[
\text{LOGPRODUCTION} = 168.7062 + 3.30E - 05X_1 + 1.12E - 05X_2 + 0.000283X_3 + (-17.09995)X_4 + \epsilon
\]

Model II:

\[
\text{PRODUCTION} = \alpha + \text{LABOR}X_1 + \text{LAND}X_2 + \text{IRRIGATION}X_3 + \text{SUBSIDY}X_4 + \epsilon
\]

\[
\text{PRODUCTION} = (-2.27E + 08) + 107.9913X_1 + 53.2198X_2 + 2387X_3 + \text{SUBSIDY}X_4 + \epsilon
\]

Model III:

\[
\text{LOGPRODUCTION} = \alpha + \text{LOGLABOR}X_1 + \text{LOGLAND}X_2 + \text{LOGIRRIGATION}X_3 + \text{LOGSUBSIDY}X_4 + \epsilon
\]

\[
\text{LOGPRODUCTION} = -33 - .8061 + (-18.11796)X_1 + 26.7865X_2 + 1.243963X_3 + 16.11605X_4 + \epsilon
\]

| Variable / Coefficient | Logproduction t-Statistic | Production t-Statistic | Logproduction t-Statistic |
|-------------------------|---------------------------|------------------------|---------------------------|
| C                       | 168.7062                  | 0.489181               | -2.27E + 08               | -3.327170               | -330.8061               | -1.951838               |
| Labor                   | 3.30E-05                  | 2.965436               | 107.9913                  | 2.207060                |
| Land                    | 1.12E-05                  | 0.884142               | 53.2198                   | 0.946464                |
| Irrigation              | 0.000283                  | 1.167715               | 2387.373                  | 2.225603                |
| Logsubsidy              | -17.09995                 | -0.544441              |                           | -18.11796               | 3.089451                |
From the analysis above can be described as a picture of the results of the above discussion, the partial test can be seen as an overview on the state of the labor variable \((x_1)\) where if the value is \(2.965436 > 2.2616\), then accept or significant \(H_1\) labor variables \((x_1)\) no partial effect in the model of the variable production \((Y)\), elaboration on land variable \((x_2)\) if the value is \(0.884142 < 2.2616\), then accept or meaningful \(H_2\) land variable \((x_2)\) partial effect in the model of the variable production \((Y)\), Irrigation variables \((x_3)\) portrait that if the value is \(1.167715 < 2.2616\), then accept or significant \(H_3\) irrigation variables \((x_3)\) partial effect in the model of the variable production \((Y)\) and the last variable is the subsidy \((x_4)\) explains, if the value is \(-0.544441 < 2.2616\), then accept or significant \(H_4\) subsidy variables \((x_4)\) partially negative effect on the variables in the model production \((Y)\).

Overview F test or tests simultaneously on the results eviews 10 above can portray that relationship is seterenta sustainability of variables independent of input or output variables or bound dijelakan as follows F table value of 0.275 with F-statistic as big as 106,967 where F table > F-statistic research critical limit, so that it can be concluded accept \(H_1\). Receive \(H_1\) in simultaneous test means that of the four independent variables \((x)\) simultaneously to significantly influence the dependent variable \((y)\). Picture shows the third issue of the four variables above can be seen Variable Coefficient value \(3.30E-05\) land is greater in comparison three other independent variables, it can be explained that the variable land more dominant than the other three free variable.

### 4.1. Determination Economics in Agricultural Production Increase in Lamongan

Lamongan district agriculture into a discussion today make major pororitas for local government, where the government in the GDP demanded increases with an increase in industrial and service sectors, but on the other hand maintain agricultural production, even obliged to increase agricultural output in Lamongan. From the analysis above can be seen that labor \((x_1)\) still makes a prima donna or a safety factor in terms of the creation of employment opportunities for workers who have not been or are not absorbed in the industrial sector or other services. Although throughout the year the number of workers in this sector on average has declined by [7], But in the aggregate they can have a positive impact on agricultural production by [8,9].

Impact of land in the agricultural sector of the production is still regarded as a significant and positive impact, although the problems of agricultural land where there is expert in land use continues in Lamongan by (Aba, Yussof, and Mohd, 2015; Travers and Ma, 1994), But this is all not just occur in Lamongan, but has become a problem even the problem of East Java province of Indonesia.

The impact of irrigation on the production of a positive impact because of the large infrastructure development involving the construction of an irrigation canal where the amount of water flow repaired area that would need little water is resolved in Lamongan though refused [8]. The latter is a subsidy issues which the policy carried out by the central government, the provision of subsidy in Lamongan make major pororitas to reduce costs in agricultural production directly. But the number of funds targeted subsidies plus the number of beneficiaries who do not clearly make its own problems in the agricultural sector by [12].
5. Conclusion
1. Labor (x1) still makes a prima donna or a safety factor in terms of the creation of employment opportunities for workers who have not been or are not absorbed in the industrial sector or other services.
2. Impact of land in the agricultural sector of the production is still regarded as a significant and positive impact, although the problems of agricultural land where there is expert in land use continues in Lamongan.
3. The impact of irrigation on the production of a positive impact because of the large infrastructure development involving the construction of an irrigation canal.
4. Subsidy is a policy carried out by the central government, the provision of subsidy in Lamongan make major peroritas to reduce costs in agricultural production directly.

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