

# Supply Chain and Profitability of Cassava in District Trenggalek, East Java

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**Abstract.** Cassava is an important and useful plant in supporting industrial activities. Therefore, understanding supply chain and profitability can be a basis provision for raw materials and increasing farmer's income. This study aims to: (1) know the supply chain of cassava production and the influencing factors, (2) to know the profitability of cassava in integrated farming. The study was conducted in Kabupaten Trenggalek, East Java during the planting season of 2012. The results showed (1) the supply of cassava production 2007-2012 decreased with an average of 4.5% per year. Key contributions are productivity growth of 3.7% and shrinkage of 3.4%. (2) The profitability of cassava that integrates with goat cattle is 2.03, while those of that are not integrated are 2.02. Total household income of farmers integration Rp 1.460.125, - higher than unintegrated Rp 981.530, - In the long run, there is an increase of animal feed, soil fertility improvement, environmental preservation and outpouring work for farmers' family members.

**Key words:** supply chain, profitability, cassava

## INTRODUCTION

The situation of production and consumption needs of cassava affects the inventory balance. When the total production of cassava exceeds the total requirement of cassava, the cassava supply in the area becomes surplus and vice versa. If the total requirement of cassava exceeds from cassava production there will deficit [1][2]. Production is influenced by harvested area and productivity of cassava, while the level of uptake of important contribution is determined by household and industry characteristics. Therefore, knowing the production activity and the uptake of cassava is an important issue in understanding the stock of cassava. Effective inventory management is an important foundation in creating efficient value chains [3][4].

The study shows that the production aspect has an average increase of 5.17%, although the cassava crop has decreased by 0.99% annually, but the other side of cassava productivity increased with the average increase of 4% per year [5].

The depreciation of harvested area is thought to be affected by two extreme conditions occurring at that time where the harvested area is sharply shrinking by 24.66%

unbalanced by increasing the harvest area by 14.54% [6]. Some factors that trigger imbalance are: (1) unstable cassava price level so farmers are not motivated to increase their capacity area, (2) unavoidable conversion of agricultural land to non-agriculture, (3) decrease a number of cassava farmers (4) the competition of land among the agricultural commodities based on the value of sales, which will invest a commodity that gives greater profit [7]. Meanwhile, from the aspect of the average uptake of cassava needs per year reached 253,482.44 tons; 7.376.08 tons of household needs, 154,194.13 tons of raw materials for food industry, raw material industry demand of 137.00 tons and feed raw material industry needs of 91,775.24 tons [8].

Balance production and uptake of cassava is the fundamental problem in the stock of cassava in Trenggalek Regency. Figure (1) shows that cassava stocks decrease with an average of 4.47% per year per year [9]. Although the stock of cassava declines steadily, this supply has a considerable surplus with an average per year reaching 157,738.62 tons [9]. This condition shows that the optimum production has not been built upstream with the downstream industry. The total trend of cassava needs shows an increase, but the uptake of cassava in the downstream industry is smaller than the amount of cassava produced in the upstream. Total cassava consumption of downstream industry is only 253,482.44 tons per year less than that of cassava production which reaches 411.221,07 tons per year, resulting in a surplus of 157,738.62 tons [10].

The low absorption of cassava in downstream industries is caused by the quality of cassava produced by farmers who do not meet the standard requirements of the industry. The average yield of cassava produced by farmers is 20% -30%, while that of cassava is needed above 30% [10].

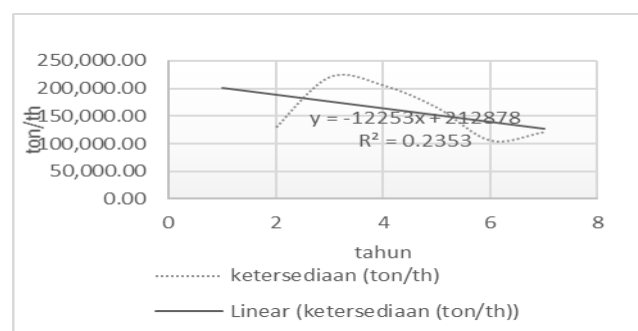


Figure 1. Situation of Cassava Supply

Awareness raising quality of cassava originally has just met the needs of subsistence farmers developed into a commodity trade (cash crop). Implementating Farm Sapta in production activities provides assurance of market certainty. This quality improvement based experts' opinions, the application of various farming technologies through efficient use of production inputs by site-specific yields of high productivity [11], local varieties of cassava with the application of good cultivation techniques management (GAP) show high quality and productivity potential [12]. In addition, there is a regulation from the government with the release of policies that encourage the diversification of the downstream sector, namely Presidential Regulation 22/2009 on the policy of accelerating food consumption diversification and candy no 43/2009 on the acceleration movement of diversification of local resource-based consumption [12].

Other efforts to improve local government cassava uptake encourage the development of small and medium agro-based industries based on cassava as a processing sub-system. The sub-processing system is a continuation of the primary production sub-system as well as part of the demand side strategy.

Various internal and external factors contribute to the absence of upstream production and upstream absorption, in addition to farming practices carried out by farmers and agro-industry actors, as well as from other aspects such as economic, socio-cultural and regulatory pressures of local governments in regulating the development of cassava. This phenomenon is a fundamental problem in this research.

The study was conducted to empirically answer two important issues namely; (1) how cassava is supplied and the influencing factors and (2) how the profitability of cassava is in integrated farming.

## METHOD

The objectives of research are; (1) how cassava is supplied and the influencing factors and (2) how the profitability of cassava is in integrated farming. Empirical answer of these two issues can support the development of cassava agribusiness in Trenggalek Regency and ultimately contribute to improve farmers' welfare and the regional economy. The research was carried out in the 2012 planting season, through field survey activities, group discussions (FGD), and literature study through documents obtained from related agencies, local government and local cassava processing industries. The assessment was carried out in several areas: (1) the location of cassava production, (2) surrounding market area in relation to the supply chain of cassava, (3) visiting traders and processed industries.

## RESULT

### Supply, Production and Absorption of Cassava

Depreciation of average harvest area per year is 0,99% (figure 2a) is affected by two extreme conditions mainly

occurred in 2010 where the harvested area shrank sharply by 24.66% unbalanced by increasing the area of harvest by 14.54% in 2012 [11]. Some of the factors that trigger are: (1) unstable cassava prices, (2) unavoidable conversion of agricultural land to non-agriculture, (3) cassava is an inferior commodity and (4) land competition among agricultural commodities themselves [7].

Different conditions occur in the productivity of cassava showing an increase trend with an average annual increase of 4.00% (figure 2b). This increase in productivity shows that adoption of cassava cultivation technology innovation has now been done at the farm level, although it is still below the effective potential target of 40 ton / ha [6]. This is in line with experts' opinions who say production technology is an entry point in increasing productivity. These technologies include the use of improved varieties, quality seeds, timing of planting, population and spacing, fertilization and harvesting [13].

The total uptake of cassava increases with an average annual increase of 253,482 tons. The need of cassava for household consumption of farmers is on the increase with an average of 7,367 tons, while the need for flour industry raw material decreases by an average of 137 tons. Demands for raw materials of cassava in the food industry show an increasing trend with an average of 154,194 tons and the need for raw materials for animal feed industries tends to decrease by an average of 91,775 tons.

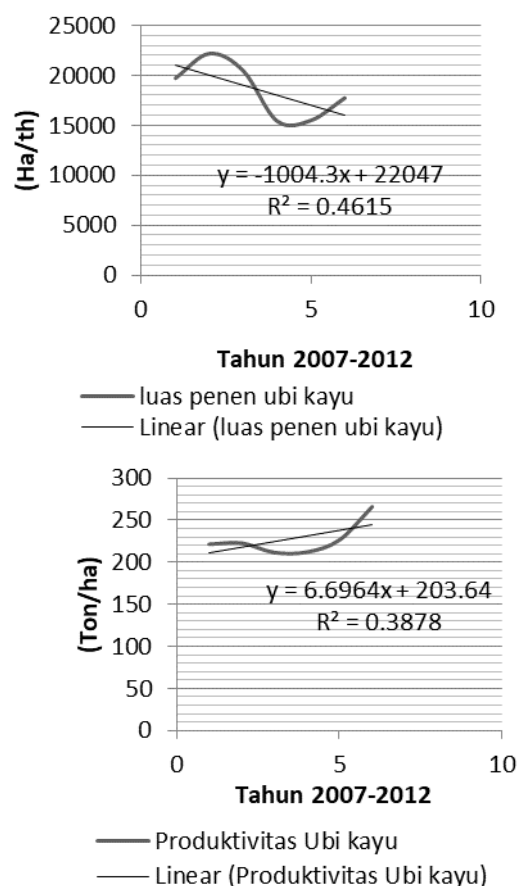


Figure 2: Trend of Area Harvest and Productivity

## Cassava Farming Profitability

The analysis of profitability and income of integration farming system between cassava farming and goat raising in 2012 at the level of respondents shows that integration farming is more feasible to be cultivated than conventional. It is seen from the value of R / C ratio of integration 2.03 greater than the value of R / C conventional ratio 2.02. In addition, the total benefits obtained by farmers integration of Rp 1,460,125 is greater than the conventional method of Rp 981,530, -. Other advantages of long-term integration of farming systems are the increase of livestock feed due to the utilization of cassava skin and leaves, increased soil fertility due to the use of goat feces for crop fertilizers, maintaining a better environment and outpouring work for family members of farmers.

The assumptions used in this analysis are as follows: goat breeding is only one time of delivery period which is for 6 months with 4 goats; the depreciation cost is calculated for one year; the cage area is 6 m<sup>2</sup>. Cassava crop 0.5 ha with plant spacing of 1.5 x 3 meters, work wage of Rp 35,000 / OH, price of peeled cassava ("oncek") Rp 2.300 / kg, the price of cassava skin waste Rp 10.000 / sack.

## CONCLUSION

The results showed (1) the supply of cassava production 2007-2012 decreased with an average of 4.5% per year. Important contribution in supporting cassava stock is productivity growth of 3.7% and shrinkage of 3.4%. (2) The profitability of cassava which is integrated with goat livestock is 2.03, while that of not integrated is 2.02. Total household income of farmers integration is Rp 1.460.125, - higher than unintegrated Rp 981.530, -. In the long run, there is an increase of animal feed, soil fertility improvement, environmental preservation and outpouring work for family members of farmers.

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