Available online freely at www.isisn.org

Bioscience Research

Print ISSN: 1811-9506 Online ISSN: 2218-3973

Journal by Innovative Scientific Information & Services Network

RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2019 16(3): 2730-2737. **OPEN ACCESS**

The development of Cassava commodities using agribusiness system integration approach

Ida Syamsu Roidah[1,2*], Ratya Anindita[3], Djoko Koestiono[3] and Budi Setiawan[3]

[1]Departement of Agriculture, Faculty of Agriculture, Tulungagung University, Jl. Ki Mangun Sarkoro-Beji, Tulungagung, East Java 66233, **Indonesia**
[2]Doctoral Program of Agricultural Science, Faculty of Agriculture, Brawijaya University, Jl. Veteran, Malang, East Java 65145, **Indonesia**
[3]Agribusiness Program Study, Department of Social Economy, Faculty of Agriculture, Brawijaya University, Jl. Veteran, Malang, East Java 65145, **Indonesia**

***Correspondence:** ida_syamsu@yahoo.co.id **Accepted:** 30 July 2019 **Published online:** 05 Aug 2019

This research analyzed the factors influencing the subsystem of agribusiness in the development of cassava industry seen from the farmers' income as the parameter. A regression method proposed by Tobit was employed to compare the success of the industrialization and income level. 200 farmers in Trenggalek District were selected as research respondents using purposive sampling method. The results of this research showed that the input subsystem, production subsystem, processing subsystem, marketing subsystem and support subsystem affected the success of cassava industrialization, in which the processing subsystem played the biggest role. Other factors were also identified to affect the revenue including the use of pesticides (*dummy)*, cultivation method (*dummy)*, storability (*dummy)*, market and use of loan (*dummy)*. In addition, the development of cassava industrialization was also affected by economic factors, social factors, and higher participation from farmers followed by better attitude among farmers. Therefore, the development of cassava industrialization led to higher income among farmers.

Keywords: Agribusiness system, Cassava, Tobit method

INTRODUCTION

The success of cassava industrialization can be analyzed from higher export figures of fresh cassava and processed cassava products. Year 2012 the export value of both fresh for US$ 169,000 and processed cassava increased to US$ 17,683,000, while year 2016 the export value of fresh cassava and the processed cassava has increased each US$ 632,000 and US$ 11,989,000 (BPS, 2017). Indicating that there is a decrease and a shift in the quantity of fresh product export to be processed product export. It shows that the agricultural industrialization has not yet achieved the expected outcome.

The development of cassava processing industry will spur growth in the service sector and agricultural sector. The rapid growth of the processing industry will increase the growth of agricultural sector which will be able to provide quality raw materials for the industry. Therefore, developing the cassava processing industry is a strategic alternative for it offers several advantages as it gives added-value to larger agricultural commodities. Unfortunately, the development of cassava industry has not yet been optimal due to weak synchronization between consumer expectation and the product (Shaffner et al*.,* 1998).

Several issues occur in the development of cassava industrialization including inability to

provide guarantee, inadequate quality of the raw material, inability to produce export-standard agricultural processed products that can be accepted by the international market, low-skilled worker, insufficient infrastructure, undeveloped technology, lack of funding given to farmers, the size of industry that is relatively small, weak marketing strategies, and the unavailability of clear policies that encourage the industrialization of cassava (Priono, 2011). Regarding those problems, to develop this industry, ones have to find strategies to increase the productivity, improve the product quality, give added-value, improve farmers' welfare, and maintain the stability of cassava price to fulfil the continuous demand.

The development of cassava industry relates with agribusiness development in general which includes input subsystems, production subsystems, processing subsystems, marketing subsystems, and supporting subsystems (Davis and Ray, 1957; Downey and Erickson, 1987; Dy, et al., 2003). Components in the agribusiness system are the main drivers of cassava industrialization with stronger emphasis on the integration of those agribusiness subsystems. A number of factors and related parties contribute to the success of agribusiness development. This research was conducted to analyze the factors affecting agribusiness subsystem within the context of cassava industry development.

MATERIALS AND METHODS

Geographic area

The area chosen for research on the development of industrialization cassava in Trenggalek Regency, East Java, Indonesia. The area is the third largest producer of cassava after Pacitan and Ponorogo regencies. This research study was conducted by interviews to cassava farmers using questionnaires. The research was conducted in seven (7) sub-districts, among others 1-Dongko, 2-Pule, 3-Karangan, 4-Pogalan, 5-Trenggalek, 6-Tugu, and 7-Bendungan.

Research samples

Research samples are cassava farmers with representative sampling procedures. So the determination of the sample using *Slovin* formula with the following:

$$n = \frac{N}{1 + N(e)^2}$$

Thus, from the formula obtained a sample of 200 farmers.

Analysis method

Factors affecting the development of industrialization cassava are based on the influence of the agribusiness subsystem namely the input subsystem, production subsystem, processing subsystem, marketing subsystem, and support subsystem. Factors that affect the input subsystem among others, the cassava seeds, the use of fertilizer (dummy), the use of pesticides (dummy), the use of agricultural tools (dummy). Production subsystems include the cultivation (dummy), cassava production, land area, and distance to the market. Processing subsystems include the use of working capital (dummy), the storability (dummy), the use of machines (dummy), the production capacity, the amount cassava (dummy), and the price cassava. Marketing subsystems include the forms (dummy), the production, the selling price, and the market. And supporting subsystems are the instructors, length of training, and use of loan (dummy).

Tobit regression Model to compare the success rate of industrialization with the high level of income compared with farmers who are only farming in the cassava and farmers who do farming and value-added activities Other, especially processing. Farmers who follow the industrialization of cassava, then farmers not only doing farming but also doing other activities that increase the value added especially processing. If $Y_i^* > \bar{Y}$ is an observable variable the higher income level, where the farmer conducts cassava farming activities and other value-added activities. While $Y_i^* \leq \bar{Y}$ The variables are observed smaller income levels, where farmers only do farming cassava. Formulation Tobit model in Greene (2008) as follows.

$$\begin{cases} Y_i = \beta_i X_i + \varepsilon_i, & jika \quad Y_i^* > \bar{Y} \\ Y_i = 0, & jika \quad Y_i^* \leq \bar{Y} \end{cases}$$

Dimana:

Y_i : Censored dependent variables
Y_i^* : Dependent variables that show the success and development of industrialization cassava can or cannot be observed directly
$\beta_i X_i$: Scale the product of two vector
X_i : Independent vector
ε_i : The error normally distributed and independently with value of 0 and varian constants σ^2

RESULTS AND DISCUSSION

Factors influencing agribusiness system in the development of industrialization cassava is seen from the income level consist of input subsystem, production subsystem, processing subsystem, marketing subsystem, and support subsystem.

Effect of input subsystem on income

The input subsystem involves supply of different combinations agricultural production inputs. Variable input subsystem among other number of seedlings and use of fertilizers (*dummy)*, use pesticide, the use of agricultural tools is described in the following table 1

Table 1 shows the number of cassava seedlings and its change in probability of $0,47x10^{-4}$, that every increase in the number of cassava seedling 1 unit will be followed by the increase in income of $4,7x10^{-3}$ %. The number of cassava seedlings and its change in probability of $0,47x10^{-4}$, that every increase in the number of cassava seedling 1 unit will be followed by the increase in income of $4,7x10^{-3}$ %. Research Thamrin et al. (2013) also showed that increases in the number of cassava seedling will lead to higher income because it is a major factor of the increase in cassava production. Wrong choice of seeds will result in a decrease in production and less optimal production of cassava. The use of fertilizer and its change in probability of 0,05. Its show that increases 1 kg in the amount of fertilizer applied per hectare will reduce the opportunity of income change 5%. In line with this view, research Liu and Hualin (2019) also mention that if farmers reduce the amount of fertilizers and pesticides, the level of pollution will be reduced, but the production and farmers' income will be reduced as well. The use of pesticides and its change in its indicate that every additional pesticide used will increase the chance of obtaining higher income. The use of pesticides can reduce crop losses which eventually increase farmers' income. If farmers reduce the amount of fertilizers and pesticides, the pollution level will be reduced, but their production and income will also become lower. On the other hand, the use of agricultural equipment and a change in its probability value indicates of 0,14 that every addition of 1 the unit agricultural equipment will reduce the chance of change in income level of 14%. The use of farming equipment decreases the level of income due to depreciation expense and maintenance cost on agricultural equipment which will reduce farmers' income (Ibendhal, 2015).

Effect of production subsystem on income

Economic activity in the production subsystem to produce primary agricultural products. Variable production subsystems consist of dummy cultivation method, cassava production, land area, and distance to the market described in table 2

Table 2 the explain cultivation method and a change in its probability value of 0,06 show that every 1 additional knowledge about the most appropriate method of cassava cultivation will increase the chances of changes in income of 6%. In line with this view Awerijie (2014) research also state that the monoculture and intercropping method applied in Nigeria were inadequate is 40%, which condition 60% could be improved by using available inputs, technology, and cooperating with professional advisor. Cassava production and a change in probability value of $0,17x10^{-4}$ show that every additional cassava production 1 kg will increase the opportunity for income changes charge of $1,7x10^{-3}$%. Cassava production is determined by the number of seedlings used. Furthermore, as the amount of production increases, the added value of cassava will increase as well (Kehinde and Aboaba, 2016). This means that the higher the added value, the higher the income (Ayodele et al., 2016). On the other hand, if the yield or amount of production produced is smaller, the level of income of cassava farmers will be lower. The distance between cassava farm and the market also can change the probability value of $0,58x10^{-4}$ since longer distance will reduce the chance of changes in income $5,8x10^{-3}$%. In line with the research Omotayo and Adefemi (2016), if a farmer spends higher production cost in the form of transportation cost, the farmer will obtain lower profit.

Effect of processing subsystem on income

The processing system is an economic activity that processes primary agricultural products into processed products, both the initial product and the final product. Variable processing subsystem include dummy use working capital, dummy storing cassava, dummy use machine, production capacity, dummy amount of cassava, and the price of cassava is presented in the table 3.

Table 1; Factors affecting the income of cassava in Input subsystem in Trenggalek District

Variable	MLE	Standard Error	Change in Probability $\partial F(z)/\partial x$	Marginal Effect $\partial Ey/\partial x$	Change among Adopters $\partial Ey^*/\partial x$
Constanta	-140637	0,02	-0,06	-782121	-586524
The number of seedlings	106258*	123772	0,47x10^{-4}	591	443
Use of fertilizers (Dummy)	-103459*	0,01	-0,05	-575365	-431475
Use pesticide (Dummy)	-191589*	0,4x10^{-1}	0,09	106547	799018
Use of agricultural tools (Dummy)	-308411*	0,02	-0,14	-171565	-128659
Log Likelihood = -1374 **Censored Observation** = 75 **Uncensored Observation** = 125 **Pseudo R²** = 0,31			Z=XB/σ = 0,14 f(z) = 0,39 $[f(z)/\sigma]$ =4e^{-8}		F(Z)= 0,56 σ = 8.871.62 $[E(y^*)] = 0,42$

Source: Primary Data 2019, (processed) Description:* significant at 5%

Table 2; Factors affecting the income of cassava in the production subsystem in Trenggalek District

Variable	MLE	Standard Error	Change in Probability $\partial F(z)/\partial x$	Marginal Effect $\partial Ey/\partial x$	Change among Adopters $\partial Ey^*/\partial x$
Constanta	-3224055	0,03	-0,18	-158154	-113035
Cultivation method *(Dummy)*	1148557*	0,03	0,06	563419	402686
Cassava production	313*	40,23	0,17x10^{-4}	154	110
Land area	-225	234,89	-0,12x10^{-4}	-110	-79
Distance to the market	-1,04*	149,33	0,58x10^{-4}	-512	-366
Log Likelihood = -1352 **Censored Observation** = 75 **Uncensored Observation** = 125 **Pseudo R²** = 0,05			Z=XB/σ = -0,02 f(z) = 0,4 $[F(z)/\sigma]$ = 6e^{-8}		F(Z)= 0,49 σ = 7.209.66 $[E(y^*)] = 0,35$

Description:

f (Z) = Normal density function.

F (z) = Scale factor for marginal effect or total marginal effect (cdf).

[F (z) /σ] = Fraction of mean probability of agribusiness system.

[E (y *)] = {1-Z f (Z) / F (Z) - f (Z) 2 / F (Z) 2} = The fraction of total effect due to the effect above the limit.

∂F (z) /∂xi = The Change in the probability of income for every unit change in the explanatory variable. This is equivalent to f (z)β/σ.

∂ey /∂xi = The marginal effect of the explanatory variables against the expectation value E(y) of the income. This is computed by multiplying β and F(z).

∂Ey * /∂xi = The effect of variable change clarity on the value expectations above average income. This was computed by multiplying [E (Y *)] and β.

Table 3; Factors affecting the income of cassava in the processing subsystem in Trenggalek District

Variable	MLE	Standard Error	Change in Probability $\partial F(z)/\partial x$	Marginal Effect $\partial Ey/\partial x$	Change among Adopters $\partial Ey^*/\partial x$
Constanta	862776	0,31	0,02	772187	-140835
Use working capital (Dummy)	-4081667*	0,22	-0,08	-3653104	666268
Storing cassava (Dummy)	544680*	0,27	0,11	4873004	-888759
Use machine (Dummy)	-1459559*	0,26	0,03	1306310	-238250
Production cassava	107*	29,56	0,22x10^{-5}	96	-18
Amount of cassava (Dummy)	5212447*	0,25	0,11	4665155	-850850
Price of cassava	-5600*	561,89	-0,12x10^{-3}	-5012	914
Log Likelihood = -1367 **Censored Observation = 75** **Uncensored Observation = 125** **Pseudo R^2 = 0,04**			Z=XB/σ = 1,25 f(z) = 0,18 $[F(z)/\partial]$ = 2,08e^{-8}		F(Z)= 0,9 σ = 8.755.27 $[E(y^*)]$ = -0,16

Table 3 shows the spending of working capital also changes the probability value of 0,08, which means that increases 1% in the use of working capital will affect the income of 8%. That amount of capital used has a significant effect on income increase, meaning that any increase in capital will increase farmers' income (Neonbota and Simon, 2016). Capital is directly related to the output of cassava production that will increase farmers' income (Nandi et al., 2011). The changes in the probability value of storing cassava raw materials 0,11 show that changes in the additional storability of cassava 1 day will increase the chance of changes in income of 11% as the industry does not have to wait for the harvest time to make production. Therefore, the continuity of raw materials supply can be maintained. In addition, cassava plants should not be stored for long time 30 day because the quality of cassava will be reduced (Sungthongwises et al., 2016). The use of machinery changes the probability value of 0,03, meaning that every additional machine used 1 unit for cassava processing will increase the chance of changes in income 3%. In line with the research Ajieh and Chuks (2014), the adoption of technology will increase revenue. However, lack of information regarding the use of technology and higher production cost become the constraints of this effort. Production capacity and a change in its probability value 0,22x10^{-5} show that higher cassava production 1 kg will increase the opportunity for income changes of 2,2x10^{-4}%. In line with this research Leasa et al., (2018), business development has a significant and positive effect on production capacity. Therefore, the more intensive the processing activities, the higher the production capacity will be. The change in the probability of the amount of cassava 0,11 means that each additional supply of cassava 1 kg will increase the chance of changes in income 11%. Appropriate planning is important in the procurement of raw materials because it will increase production efficiency and reduce production costs, while simultaneously maintaining the consistency of raw material supply (Suvittawat et al., 2014). The price of cassava with a change in its probability value 0,12x10^{-3} show that higher price of cassava 1 % will reduce the chance of changes in income 0,012%. Other studies suggest Omolara et al., (2017) that cassava prices can increase income as the demand of cassava will be higher, leading to higher cassava price which eventually increases farmers' income.

Effect of marketing subsystem on income

The marketing subsystem has a very important role in the performance of marketing activities, so it will conduct the product movement in the marketing activities in the inputs to the consumer chain. The marketing subsystem factors include dummy type of processed, cassava yield, selling price, and the market is

presented in table 4.

Table 4 explains the processed cassava product and a change in its probability value of 0,04 show that each additional 1 type of processed cassava product will reduce the chance of changes in income 4%. Producing more processed product item is a strategy that can give opportunities for farmers to earn additional income. However, it poses greater economic risks vulnerability to price fluctuations that are strongly related to changes in demand and supply (Nicolova and Marusya, 2011). Cassava yield and a change in its probability value 0,01x10^{-3} show that each additional yield 1 kg will increase the chance of changes in income 1x10^{-3}%. Whereas cassava processing aimed to increase the durability of cassava for consumption and increase its economic value that eventually lead to higher income (Valentina, 2009). A market with a change in probability value 0,2 means that every additional market 1 unit will increase the opportunity for changes in income of 20%, indicating that farmers whose productivity is high tend to have greater participation in the market (Rios et al., 2008). Hence, investment in market infrastructure will allow increases in farmers' income to take place. On the other hand, increases in structure and agricultural capital have the potentials to increase productivity and market participation.

Effect of supporting subsystem on income

Supporting subsystem serves to support and serve the development of activities in agribusiness system. Factors that influence income on supporting subsystems, among others extension workers, long training, and dummy use of loan are presented in table 5.

Table 5 In general, the use of loan within the supporting subsystem is the variable that leads to income increase. Meanwhile, the number of extension agents and length of training are the variables that decrease the income. The use of higher loan creates grater chance for farmers to obtain higher income as they are able to enhance their production processes. Longer working hours of farmers will also increase agricultural income of 30,1% (Abdallah et al., 2018). On the other hand, longer training cause lesser working hour for farmers to cultivate their lands (Bifarin et al., 2010; Nahraeni, 2012). Some farmers have participated in training for about inputs and suppliers, but farmers still tend to use less modern agricultural inputs due to limited capital and income (Kem, 2017). They assumed that by participating in the training they would need to buy more modern equipment which will reduce their income.

Table 4 ; Factors affecting the income of cassava in the marketing subsystem in Trenggalek District

Variable	MLE	Standard Error	Change in Probability $\partial F(z)/\partial x$	Marginal Effect $\partial Ey/\partial x$	Change among Adopters $\partial Ey^*/\partial x$
Constanta	-5562818	0,01	-0,32	-336942	-239782
Type of processed (Dummy)	-753569*	0,02	-0,04	-442893	-324823
Cassava yield	170*	18,2	0,01x10^{-3}	100	73
Selling price	96	129,45	0,06x10^{-4}	57	41
The market	3532437*	0,03	0,2	2076111	1522641
Log Likelihood = -1359 **Censored Observation = 75** **Uncensored Observation = 125** **Pseudo R^2 = 0,06**			Z=XB/σ = 0,22 f(Z) = 0,39 $[F(z)/\partial]$ = 6e^{-8}		F(Z)= 0,59 σ = 6.737.947 $[E(y^*)]$ = 0,43

Table 5; Factors affecting the income of cassava in supporting subsystems in Trenggalek District

Variable	MLE	Standard Error	Change in Probability $\partial F(z)/\partial x$	Marginal Effect $\partial Ey/\partial x$	Change among Adopters $\partial Ey^*/\partial x$
Constanta	16900579	5750444	0,92	106.941	728.540
Extension workers	-2147764*	619.687,5	-0,12	-135.904	-925.845
Long training	-2204402*	1223917	-0,12	-139.488	-950.260
Use of loan (Dummy)	3461668*	1406871	0,19	219.044	149.224
Log Likelihood = -1403 **Censored Observation = 75** **Uncensored Observation = 125** **Pseudo R^2 = 0,01**			Z=XB/σ = 0,34 f(Z) = 0,38 $[F(z)/\partial]$ = 5e^{-8}		F(Z)= 0,63 σ = 6.923.82 $[E(y^*)] = 0,43$

CONCLUSION

Factors that affect cassava income include input subsystems, production subsystems, processing subsystems, marketing subsystems, and supporting subsystems. In the input subsystem, the use of pesticides (*dummy*) appears as the strongest variable in affecting farmers' income, while the one that lowers the income is the use of agricultural tools (*dummy)*. In the production subsystem, cultivation method (*dummy*) is known to increase income, while the distance between the farm to the market decreases farmers' income. In the processing subsystem, raw material storability (*dummy*) increases farmers' income, while the use of working capital decreases farmers' income. Within the marketing subsystem, the market increases farmers' income, while varied processed products decrease farmers' income. Finally, within the supporting subsystem, the use of loan *(dummy)* increases farmers' income, while the length of farming training decreases farmers' income.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

ACKNOWLEGEMENT

The author acknowlegement this research has been successfully done with supported S3-BPPDN scholarship from Higher Education Technology Research (Kemenristekdikti-RI).

AUTHOR CONTRIBUTIONS

All authors have reviewed this article and made equal contributions in this study.

Copyrights: © 2019 @ author (s).

This is an open access article distributed under the terms of the **Creative Commons Attribution License (CC BY 4.0)**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author(s) and source are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

REFERENCES

Abdallah, A.H, Micheal A., and Joseph A.A. 2018. *Impact of Agricultural Credit on Farm Income Under the Savanna and Transitional Zones of Ghana*. Agricultural Finance Review 79(1):60-84

Awerijie, B. 2014. *Exploring the Potential of Cassava for Agricultural Growth and Economic Development in Nigeria.* (Thesis). University of Plymouth: Nigeria

Ayodele, O.V., S.D.Y Alfred, and R.A Akinnmoyegun. 2016. *Effect of Farmers Socio-Economic Characteristics on their Perception on Cassava Production in Ondo State, Nigeria.* Asian Journal of Agricultural Extension, Economics & Sociology 8(4):1-10

Bifarin J.O., Alimi T., Baruwa O.I., Ajewole O.C. 2010. *Determinant of Technical, Allocative, and Economic Efficiencies in Plantain (Musa spp) Production Industry, Ondo State Nigeria*. ISHS Acta Horticulturae 879:IV International Symposium on Banana: International Conference on Banana and Plantain in Africa: Harnessing International Partnerships to Increase Research 96(2). Mombasa, Kenya, hal 199-210

BPS Provinsi Jawa Timur. 2017. *Provinsi Jawa Timur dalam Angka 2017.* Badan Pusat Statistik Provinsi Jawa Timur: Surabaya

Davis, J.H and Ray A.G. 1957. *A Concept of Agribusiness*. Harvard University, Boston: USA

Downey, W.D and Erickson, S.P. 1987. *Manajemen Agribisnis*. Penerbit Erlangga: Jakarta

Dy, R., Garcia P., Loida M., David H., Le V.T., Manuel L., Nerlita M., Bob P., David S., Erna V.D., Jimmy W. 2003. *Agribusiness Management: Systems Approach*. Seameo Searca, Collage: Philippines.

Greene, W.H. 2008. *Econometrics Analysis, 6th Edition*. Prentice Hall: New Jersey

Ibendhal, G. 2015. *The Effect of Machinery Costs on Net Farm Income*. Journal of the American Society of Farm Managers and Rural Appaisers (ASFMRA): 113-123

Kehinde, A.L. and Aboaba K.O. 2016. *Analysis of Value Addition in the Processing of Cassava Tubers to "garri" among Cottage Level Processors in Southwestern Nigeria*. Invited poster presented at the 5th International Conference of the African Association of Agricultural Economic, Addis Ababa, Ethiopia

Kem, S. 2017. *Commercialisation of Smallholder Agriculture in Cambodia: Impact of the Cassava Boom on Rural Livelihoods and Agrarian Change*. A thesis submitted for the degree of Doctor of Philosophy at The University of Queensland: Australia

Liu, G. and Hualin X. 2019. *Simulation of Regulation Policies for Fertilizer and Pesticide Reduction in Arable Land Based on Farmers Behavior -Using Jiangxi Province as an Example*. Journal Sustainability 11(1):136-157

Nahraeni W. 2012. *Efisiensi dan Nilai Keberlanjutan Usahatani Sayuran Dataran Tinggi di Provinsi Jawa Barat.* (Disertasi). Institut Pertanian Bogor: Bogor

Nandi, J.A., Patience G., and Evans N.Y. 2011. *Economic Analysis of Cassava Production in Obubra Local Government Area of Cross River State, Nigeria*. Asian Journal of Agricultural Sciences 3(3): 205-209

Neonbota, S.L. and Simon J.K. 2016. *Faktor-Faktor yang Mempengaruhi Padi Sawah di desa Haekto Kecamatan Noemuti Timur*. Jurnal Agribisnis Lahan Kering 1(3):32-35

Nicolova, M. and Marusya L. 2011. *Risk Diversification in the Agricultural Sector in Bulgaria*. The Amfiteatru Economic Journal 13(29): 305-320

Omotayo, A.A and Adefemi J.O. 2016. *Profitability of Cassava-based Production Systems*. Journal of Human Ecology India 56(1,2):196-203

Priono, Y. 2011. *Studi Dampak Pariwisata Bukit Batu Kabupaten Kasongan Ditinjau Dari Aspek Ekonomi, Sosial dan Budaya*. Jurnal Perspektif Arsitektur 6(2): 23-33

Rios, A.R., Masters W.A., and Shively G.E. 2008. *Linkages Between Market Participation and Productivity: Results from a Multy-Country Farm Household Sample* (Conference Paper). American Agricultural Economics Association Annual Meeting. Orlando, FL

Shaffner, D.J., William R.S and Mary D.E. 1998. *Food Marketing: An International Perspective*. McGraw-Hill USA

Sungthongwises, K., Arunee P., Anucha L., and Anan P. 2016. *Effect of Methods and Duration Storage on Cassava Stake Characteristics*. Asian Journal of Plant Sciences 15(3-4): 86-91

Thamrin, M., Ainul M., and Samsul E.M. 2013. *Analisis Usahatani Ubi Kayu (Manihot utilissima)*. Jurnal Agrium (Journal of Agricultural Research)18(1): 57-64