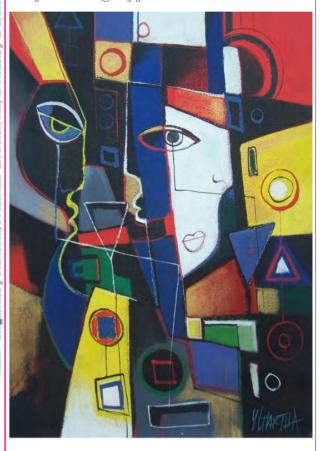
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Welfare and Bargaining Power of Farmers in Bromo-Tengger-Semeru, Agropolitan Area, East Java

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Abstract

Bromo-Tengger-Semeru is an agropolitan area in East Java, which was developed to encourage the welfare improvement of the local community, especially local farmers who are involved in the cultivation business in the agricultural sector. This study involves 400 farmers in Malang, Probolinggo, Pasuruan and Lumajang, where they participated in interviews. This study found that the problematic situation faced by farmers is funding and efforts to add value to the products they produce are apparently not comparable to the selling price of the product. Most farmers said they would rather sell their raw products. In determining the price of agricultural products, farmers often lose out to middlemen or moneylenders. Currently, the agropolitan area development program, for local farmers has not been very useful in improving the bargaining position and the level of welfare of local farmers.

Keywords: Agropolitan, Welfare, Farmers, Bargaining Position

Bienestar Y Poder De Negociación De Los Agricultores En Bromo-Tengger-Semeru, Área Agropolitana, Java Oriental

Resumen

Bromo-Tengger-Semeru es un área agropolitana en Java Oriental, que se desarrolló para alentar la mejora del bienestar de la comunidad local, especialmente de los agricultores locales que participan en el negocio de cultivo en el sector agrícola. Este estudio involucra a 400 agricultores en Malang, Probolinggo, Pasuruan y Lumajang, donde participaron en entrevistas. Este estudio encontró que la situación problemática que enfrentan los agricultores es la financiación y los esfuerzos para agregar valor a los productos que producen aparentemente no son comparables con el precio de venta del producto. La mayoría de los agricultores dijeron que preferirán vender sus productos crudos. Al determinar el precio de los productos agrícolas, los agricultores a menudo pierden a intermediarios o prestamistas. Actualmente, el programa de desarrollo de áreas agropolitanas para agricultores locales no ha sido muy útil para mejorar la posición de negociación y el nivel de bienestar de los agricultores locales.

Palabras clave: Agropolitan, Bienestar, Agricultores, Posición de negociación

1. INTRODUCTION

One of the efforts developed by the Government of East Java Province to accelerate the improvement of farmers' welfare is through the agropolitan area development program. More than just an effort to encourage equitable development in rural areas, the agropolitan area development program places farmers as subjects of development that are expected to benefit from the development of the agropolitan sector in their region. In contrast to the business capital assistance program, technology assistance and segmentation agriculture modernization, through the agropolitan area development program, in the long run, the program is expected to be more integrated and based on the potential of local resources that benefit farmers (DJAKAPERMANA, 2007).

In the East Province itself, Java currently has four established strategic agropolitan areas which serve as centers for regional growth in order to encourage regional development in the context of regional equity. According to the Regional Regulation of the Province of East Java Number 5 of 2012 concerning the Provincial Spatial Plan for 2011-2031, several agropolitan areas are expected to trigger the regional development and equity, including: (1) Madura Agropolitan Clusters consisting of Bangkalan Regency, Sampang Regency, Pamekasan Regency and Sumenep Regency; (2) Ijen Agropolitan Cluster consisting of Jember Regency, Situbondo Regency, Bondowoso Regency, and Banyuwangi Regency; (3) Bromo Tengger Semeru Agropolitan Cluster consisting of Malang Regency, Pasuruan Regency, Probolinggo Regency, Lumajang Regency, and Sidoarjo Regency; and (4) Wilis Agropolitan Cluster consisting of Madiun Regency, Magetan Regency, Ngawi Regency, Ponorogo Regency, and Pacitan Regency, and Madiun City.

Through the development of the agropolitan area, the outline of the strategy developed by the Government of East Java Province is: First, to encourage the growth of the potential of superior local natural resources optimally and to support the small and medium industrial community as a major supplier of regional markets. Second, to boost the development of commodity clusters to accelerate the growth of commodities and the organization of those growths in the agropolitan area. Third, to encourage product expansion and economic improvement of the community by promoting efforts to acknowledge the linkage of local markets with regional markets.

According to the Law of the Republic of Indonesia Number 26 Year 2007 concerning Spatial Planning, the law refers to Agropolitan Area as an area consisting of one or more primary activities that centre around rural areas as a system of agricultural production and management of certain natural resources, as indicated by the existence of functional and hierarchical linkages in spatial areas as a settlement and agribusiness system unit. Meanwhile, East Java Regional Regulation Number 5 Year 2012 concerning the 2011-2031 Provincial Spatial Plan, Article 6 states that the Provincial Spatial Planning aims to deliver high competitiveness and sustainable provincial territories through the development of agropolitan and metropolitan systems (DRIYZEK, 2005; SOEMARWOTO, 2001).

This article aims to: (1) Discuss the benefits of the agropolitan area development program to improve the welfare of farmers and agricultural businesses; (2) outline the problematic situation and identify the constraints

faced by local farmers in the effort to develop the agricultural business they occupy; and (3) identify the bargaining position of local farmers within the structure of agricultural commodity trade chain in the agropolitan area.

2. RESEARCH METHODS

This study was carried out in four regions in the Province of East Java, namely the regencies of Probolinggo, Malang, Pasuruan and Lumajang. These four regions were selected to represent the Bromo-Tengger-Semeru agropolitan area.

In this study, primary data were collected by conducting interviews with 400 farmers, 100 farmers in each region. The respondents recruited had to meet the following criteria: being farmers, residing in the study locations and running the business of cultivation within the past year. In addition to surveys of 400 farmers, in-depth interviews were also conducted. The in-depth interviews were carried out with a number of key informants, namely public figures, village/district government apparatus and officials of related offices/local government task force (SKPD).

Table 1 Research Locations

Hamlet	Village	District	Regency	Size
Krajan	Poncokusumo	Poncokusumo	Regency of	100
Jabung	Jabung	Jabung	Malang	
Krajan Satu	Tutur	Tutur	Regency of	100
Krajan	Wonokitri	Tosari	Pasuruan	
Waturiti	Lumbang	Lumbang	Regency of	100
Jetak	Jetak	Sukapura	Probolinggo	
Pasrujambe	Pasrujambe	Pasrujambe	Regency of	100
Krajan	Burno	Senduro	Lumajang	
Total			·	400

The data collected were edited and tabulated using SPSS. The data presented were processed from the 400 questionnaire results obtained directly from the field.

3. RESULTS AND DISCUSSION

Modernization in rural areas should not result in marginalization and should be friendly and provide opportunities for local resources to improve their social lives, instead (PRIBADI, PUTRA, & RUSTIADI, 2015). In establishing an area as a center for sustainable development of agricultural products, for example, the Bromo-Tengger-Semeru agropolitan area, it is necessary to not only make sure that the progressing development is carried out with due consideration for environmental sustainability (DRIYZEK, 2005), but also guarantee local communities, especially local farmers involved in the business of cultivation in the agricultural sector, welfare improvement (ANNIBAL, LIDDLE, & MCELWEE, 2013).

In the effort to develop the Bromo-Tengger-Semeru agropolitan area as well as other agropolitan areas, local farmers must be positioned as a subject or center of interest in considering to which direction the development is heading. Agropolitan in concept refers to an area development movement and effort that relies on the agricultural sector intended to spur and trigger local communities' welfare and economic improvement while still paying attention to environmental sustainability (SHAFFRIL, NASIR, & IDRIS, 2010). Unlike in traditional agricultural sector development, in an area that is established as an agropolitan area, farmers are not only encouraged to increase their production capacity and volume, but also assured to gain proportional profits from their products (NGAH ET AL., 2012).

3.1. Agricultural business development shortcomings

In the Bromo-Tengger-Semeru agropolitan area, the agricultural sector has been the main support and source of livelihood to local communities for generations. In the regencies of Probolinggo, Pasuruan, Malang and Lumajang, not only rice and plantation commodities such as vegetables are produced, but also horticultural products such as fruits and decorative plants. Local communities are heavily dependent on these agricultural commodities.

To local farmers in the Bromo-Tengger-Semeru agropolitan area, a strategic effort that can be made in spurring improvement of farmers' income is adding value to the commodities produced. However, encouraging farmers to add value to their products is admittedly challenging. This research found that the majority of the farmers found it difficult to increase the added value of their products due to the following: the profits generated were considered disproportionate to the costs incurred; the effort had caused the production cost to increase; they lacked supporting technologies; there was no guarantee that the marketing would generate profits; the marketing became even harder; they perceived that their products were inferior to

imported horticultural products; and they had inadequate necessary skills to add value to their products (ABDULLAH, & ABU SAMAH, 2014). According to the results of the research conducted in some regions in East Java, it was found that most farmers found it difficult, or even extremely difficult, to increase the added value to their product because this effort had caused the production costs to increase instead (73.5 percent). Meanwhile, 93.5 percent of farmers revealed that they mildly perceived, moderately perceived or even strongly perceived that adding value will render the profits generated disproportionate to the costs incurred. They also revealed that they lacked supporting technologies (73 percent); had no one guaranteeing that their marketing would generate profits (73.8 percent); found an even greater difficulty in marketing (73.5 percent); felt that their products were inferior to imported horticultural products (86.8 percent); and had inadequate necessary skills to add value to their products (93.8 percent).

Table 2
Problematic Situations Faced by Local Farmers in Improving the Added value in Agribusiness (n = 400)

Problems Faced by Farmers	Strongly Perceive	Moderately Perceive	Mildly Perceive	Not Perceive At All
The effort caused the production cost to increase	36%	23.5%	14%	26.5%
The profits were disproportionate to the costs incurred Lacking supporting technologies	56%	23.5%	14%	6.5%
No guarantee that the marketing would generate	35%	23%	15%	27%
profits	0	23%	50.8%	26.2%
Marketing became even more difficult				
Local products were inferior to imported	0	23.2%	50.2%	26.5%
horticultural products	2.5%	34%	50.3%	13.2%
Lacking necessary skills to add value to products	36%	43%	14.8%	6.2%

The local farmers interviewed mentioned a number of shortcomings they had to deal with if they were to improve the added value to their products. The limitation they faced over and over was related to not only lacking capital, but also lacking supporting technologies and place for processing. Of 400 farmers, 74.5 percent shared that the capital problem had been hindering their effort to add more value to their products. To the majority of the farmers, capital shortness had immensely restricted their movement in running their business activities, especially those associated with product development. Moreover, with limited capital, they found it arduous to provide supporting technologies that could help improve value (SUYANTO,

2008). Consequently, what was common at the time this research was conducted is that farmers marketed agricultural products raw directly from the farmland without any processing using particular technologies.

Admittedly, supporting technologies have a central role in creating added value. In spite of the time taken to master such technologies, those technologies still came in handy. Many of the farmers said that they would learn and try to master such technologies to increase the products' added value. Unfortunately, virtually all farmers (97.2 percent) were still facing limitation in supporting technology procurement, causing them to only make a little effort to improve their products' added value.

Table 3
Obstacles to Improve Agricultural Products' Added Value (n = 400)

Obstacles/Hindrances	Restrictive	Non-Restrictive
Lack of capital	74.5%	25.5%
Lack of supporting technologies	97.2%	2.8%
Lack of place for processing	84.8%	15.2%

Other than the lack of supporting technologies, the obstacle significantly affecting local farmers in their effort to improve their products' added value was the lack of place for processing. Of 400 farmers, 84.8 percent stated that the lack of place for processing had been hindering their effort to improve their products' added value. To local farmers, a place for processing products is critical not only for packaging products but also for processing raw products into more varied products with a touch of technology. Banana, for instance, is marketed not only in its raw form, but also as keripik pisang (banana chip) and sale pisang (preserved, sweetened banana) after undergoing processing and later served in interesting wrapping with the touch of supporting technologies. Hence, it is instrumental in providing an adequate space or place for processing until the products are ready to market, which will enable farmers to develop productive business activities.

3.2. Bargaining power and benefits of the agropolitan area development program

This study found that, in general, farmers sold their harvest raw (84.8 percent) and only few of them (15.2 percent) sold it in processed forms. This was based on not only their lack of supporting technologies and necessary skills to process their harvest, but also their belief that selling products

raw is fairly profitable (49.8 percent), profitable (34.2 percent) or even highly profitable (17 percent). To market their agricultural products, many of them relied on middlemen. Despite that, more than a half of all farmers (51.5 percent) stated that selling prices were set on a mutual agreement basis. The remaining (46.5 percent) admitted that the setting of selling prices was dominated or controlled by middlemen. This has raised a question as to why, in marketing products, many farmers leaned towards relying on middlemen.

It is assumed that farmers favored selling products to middlemen for the following reasons: (1) Farmers had neither access to the market nor wide marketing network and had little understanding on the ins and outs of agriculture-sector trading. They could yield products in the agricultural sector, but their marketing effort was limited; (2) Farmers believed that selling products to middlemen is more practical as middlemen proactively approached them, both at home or in their farmland, to make a bargain or transaction of their agricultural products; (3) The involvement of middlemen in the agricultural product marketing was considered to help cut transport costs; (4) Farmers could conserve energy for marketing and could concentrate more at home or on cultivating their lands; (5) Payment was made in cash, which, according to the farmers, was quite appealing. At times, middlemen offer the farmers loans prior to harvest for the farmers to sell their products to them. This direct or cash payment system, to the farmers, was quite beneficial as this system allowed them to directly enjoy the profits from the sales and to fulfil their daily needs. Additionally, this cash payment system also allows for the maintenance of business circulation. Despite the few benefits offered by this system, it was widely applied by farmers.

The domineering role of middlemen has weakened farmers' bargaining power. According to an existing record, at least 46.5 percent of farmers stated that agricultural product prices were set by middlemen most of the time. Although quite a lot of farmers stated that middlemen's involvement played a big part in their product marketing, their bargaining power in the pricing of their products was considered to be the same as that of middlemen (85.5 percent). In this context, there was an impression that the bargaining power of farmers and middlemen was interpreted to be equal. Even the majority of the farmers claimed that they gained profits from their latest harvest. Of the 400 farmers involved in this research, 49.8 percent said that their latest harvest was fairly profitable, 34.2 percent said that it was profitable and the remaining 17 percent even said that it was

highly profitable. Furthermore, farmers also believed that the selling prices of their agricultural products and the labor taken were proportionate (68.5 percent). The profits from the last three years' sales were believed to be relatively the same (62.5 percent).

To farmers, the business in the productive agricultural sector had been offering them some profits, albeit in a small amount. Although the profits were not considerable in amount, they were sufficient for sustaining the everyday lives of the farmers' families. Admittedly, the profits from the businesses in the agricultural sector varied over time. At times, farmers were able to monopolize the profits, but many a time they had to share the profits with middlemen for them to help with the marketing. The agricultural products were marketed not only directly to consumers, but also indirectly through middlemen. Many of the farmers had to take care of their domestic works in addition to cultivating their farmlands. Additionally, some farmers believed that middlemen had a greater access to market their products in a shorter period of time. Hence, they trusted the selling of their products to middlemen with profits being shared according to prior agreement.

Table 4

Marketing dynamics, bargaining power and profits gained by farmers from harvest (n = 400)

Profits gained from latest harvest	Highly profitable Profitable	17% 34.2%
narvest	Fairly profitable	49.8%
	Unprofitable	8%
	Highly unprofitable	0
Form of agricultural products	Raw	84.8%
sold by farmers	Processed	15.2%
The one setting the selling	Farmers themselves	2%
prices of farmers' agricultural	Middlemen	46.5%
products	Factory	0
	Mutual agreement	51.5%
Bargaining power of farmers in	Rising	3%
the setting of agricultural	Stagnant	85.5%
product selling prices in	Declining	11.5%
comparison to middlemen		
Comparison between the	Highly proportionate	3%
selling prices of the agricultural	Fairly proportionate	68.5%
products and the cost as well as	Less proportionate	28.5%
labor taken from planting to	Disproportionate	0
harvesting time	Highly disproportionate	0
Last three years' profits from	Tend to increase	3%
agricultural product sales	Relatively the same	62.5%
	Tend to decrease	34.5%
Farmers' intending to have	Yes	0.8%
occupations outside the	No	99.2%
business of cultivation in the		
agricultural sector		220/
Farmers' awareness of	Aware	22%
agropolitan area development	Unaware	78%
programs implemented in their		
region		

Farmers in the agropolitan area turned out to still use the old pattern in marketing their products. The conventional marketing pattern with the involvement of middlemen was still widely applied, which made it even harder for farmers to access the market and expand their marketing network. Middlemen promised farmers a lot of convenience in varying forms for the sake of their business continuity. However, behind such widespread business practice applied by farmers and middlemen was farmers' powerlessness in a modern agricultural constellation.

Agropolitan area development is supposed to empower farmers in a multitude of aspects, including product marketing, enabling farmers to stand on their own feet through the access to the market on a wider scale. However, this development has apparently failed to give a significant benefit to farmers in the agricultural sector activities. Even the data prove that the majority of the farmers were unaware of the ongoing agropolitan area development program in their region (78 percent) and only a small portion of them (22 percent) knew about it.

It is unfortunate that farmers had limited knowledge on the agropolitan area development program as, in fact, it can be of help in the agricultural business activities in remote areas, for example, in helping satisfy farmers' need for seeds and fertilizer, opening an access for farmers to the market, setting selling prices of agricultural product desirable to farmers and helping processing products post-harvest. The numerous elements of the business activities in the agricultural sector are important to the increase in the products' added value and quality, satisfying the need for access to a wider market and giving better profits to farmers.

To farmers, the existing agropolitan area development program had been perceived as giving little benefits to their agricultural business activities. Of 400 farmers, the majority stated that their agricultural business condition was relatively stagnant in terms of seed need fulfilment (76.2 percent), fertilizer need fulfilment (76.2 percent), access to market (68.8 percent), selling prices of agricultural products (66.2 percent), selling price setting (71.2 percent) and post-harvest product processing (75.8 percent).

Although most of the farmers claimed that they did not feel any significant benefit from the agropolitan area development program, the data show that quite a few farmers enjoyed some benefits because their condition had improved, notably in the aspects of agricultural product selling prices and access to the market (stated by more than 30 percent of farmers).

Productive Business Activities	Better	Stagnant	Worse	
Seed need fulfilment	23.8%	76.2%	0	\neg
Fertilizer need fulfilment	23.8%	76.2%	0	
Agricultural product selling prices	33.8%	66.2%	0	
Selling price setting	28.8%	71.2%	0	
Post-harvest product processing	24.2%	75.8%	0	
Access to the market	31.2%	68.8%	0	

Table 5
Benefits enjoyed by farmers in the agropolitan area development program (n= 400)

As described above, it is not an easy task for farmers to engage in the agricultural sector and develop their enterprise due to a number of factors. The results of the study in a number of regions in East Java have provided information on these factors: the issues of capital, marketing, raw material availability, intense competitive climate, limited market share, business management limitation, technology availability, to name but few. Thus, support from multiple parties, notably the government, is instrumental in the effort to develop the agricultural sector, for example, by making policies regarding capital, production equipment assistance, management, seed, fertilizer, marketing assistance and other facilities that support business development in the agricultural sector (DEATH, 2010; SUBADYO & ARIEF, 2012).

4. CONCLUSION

This study found that the problematic situation faced by farmers is funding and efforts to add value to the products they produce are apparently not comparable to the selling price of the product. Most farmers said they would rather sell their products in raw form. In determining the price of agricultural products, farmers often lose out to middlemen or moneylenders. The agropolitan area development program, for local farmers, has not been very useful in improving their bargaining position and the level of welfare.

To ensure that local farmers in the Bromo-Tengger-Semeru agropolitan area do not experience marginalization, and become subordinates, in addition to improving the quality of local farmers' resources, it is equally important to place local farmers in positions as subject of change.

First, considering that local farmers still do not have a strong bargaining position and are often disadvantaged in the distribution of profit margins in the trade of agricultural commodities, then in the future, one important agenda that needs to be the main concern of local governments is how to improve the distribution of profit margins that are more beneficial for local farmers.

Second, to help local farmers not only benefit from the selling price of raw agricultural commodities, one thing that should be developed is how to encourage local farmers to be involved in processing and in providing added value of post-harvest agricultural products. Providing training for farmers to possess skills in processing post-harvest agricultural commodities and administering technological assistance or assets that enable local farmers to independently add value to the commodities they produce, will make farmers more likely to reap more benefits.

REFERENCES

ABDULLAH, F. & SAMAH, B.A. (2014). Factors influencing inclination toward agriculture entrepreneurship among students in agriculture learning institute. Asian Social Science, 10(2), pp.273–278.

ANNIBAL, I., LIDDLE, J. & MCELWEE, G., (2013). Animating "bottom-up" sustainable strategies in village settings. International Journal of Sociology and Social Policy, 33(11), pp.742–761. Available at: http://www.scopus.com/inward/record.url?eid=2-s2.0-84885461209&partner-ID=tZOtx3y1.

DEATH, C. (2010) Governing Sustainable Development: Partnerships, Protest and Power. Routledge.

DJAKAPERMANA, R.D. (2007). Pengembangan Kawasan Agropolitan Dalam Rangka Pengembangan Wilayah yang Berbasis Rencana Tata Ruang Wilayah Nasional. Jakarta: Direktorat Jendral Penataan Ruang Departemen Pemukiman dan Prasarana Wilayah RI.

DRIYZEK, JOHN (2005). The Politics of the Earth: Environmental Discourses. Oxford: OUP.

NGAH, K. et al., (2012). Regional development policies practiced in the rural development approach in Malaysia: A case study in Seberang Perai. Asian Social Science, 8(11), pp.186–192.

CORONEL, N. (2005). The Movemento Sem Terra (MST): Corporatism Community Relations and Agrarian Reform in Rural Brazil. the University of Oregon. Available at: http://journals.cambridge.org/abstract_S0165115300023299.

PRIBADI, D.O., PUTRA, A.S. & RUSTIADI, E., (2015). Determining optimal location of new growth centers based on LGP???IRIO model to reduce regional disparity in Indonesia. Annals of Regional Science, 54(1), pp.89–115.

ROSDIANA, H., (2013). Does State Levies Policy Support Minapolitan Program in Indonesia., 20(1), pp.1–9.

HASSAN, M.S. ET AL., (2012). The credibility of television in disseminating agricultural information to farmers in Malaysia. Asian Social Science, 8(12), pp.133–139.

SAMAH, B.A. ET AL., (2011). The impact of female university students 'acceptance towards agriculture contract farming on Malaysian economy. African Journal of Business Management, 5(15), pp.6625–6631.

SHAFFRIL, H., NASIR, A. & IDRIS, K., (2010). Agriculture project as an economic development tool to boost socio-economic level of the poor community: The case of Agropolitan project in Malaysia. African Journal of Business Management, 4(11), pp.2354–2361. Available at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.188.6997&rep=rep1&type=pd.

SOOI, C.C., (2011). Providing homes for rural folks. Malaysian Business, (January).

SUYANTO, B. & KARNAJI (2005). Kemiskinan dan Kesenjangan, Ketika Pembangunan Tak Berpihak Kepada Rakyat. Surabaya: Airlangga University Press.

SUYANTO, B. (2017), Anatomi Kemiskinan dan Strategi Penanganannya. Malang: Intrans Publishing.

SUYANTO, S., (2008). Penguatan Strategi Pengembangan Kawasan Agropolitan Berbasis Peningkatan Daya Saing Produk Unggulan Agribisnis Unggulan di Kabupaten Semarang. Thesis. Semarang: Program Studi Magister Agribisnis, Program Pascasarajana Universitas Diponegoro.

SUBADYO, H.A.T. & ARIEF, A.Z., (2012). Eksistensi Infrastruktur dan Performansi Kemandirian Kawasan Agopolitan Poncokusumo. Simposium Nasional RAPI XI FT UMS.

SOEMARWOTO, O., (2001), Analisis Mengenal Dampak Lingkungan. Yogyakarta: Gajah Mada University Press.

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