

SHORT COMMUNICATION

DOES AGRICULTURAL GROSS DOMESTIC PRODUCT AFFECT HAPPINESS? A STUDY IN INDONESIA

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ABSTRACT

National development in every country aims to create people's welfare. Agriculture plays an important role in improving the economic welfare of the Indonesian population. Research on the effect of agriculture on the Indonesians economic welfare has been widely carried out, while the effect of agriculture on the Indonesians happiness was still limited. This research aims to analyze the effect of GDP, agricultural GDP, and livestock GDP on Indonesians happiness. The study was conducted in January-April 2021. A regression model was applied with the dependent factor of the Happiness Index and independent factors of GDP, agricultural GDP, and livestock GDP of the Indonesians in 34 provinces in 2014 and 2017. GDP had no significant effect on the Indonesians happiness. GDP could be considered as one of the happiness components and should be combined with other indicators. Agricultural GDP had no significant effect on the Indonesians happiness. Agriculture was a producer of staple foods (basic human needs). When basic needs have been met and income has increased, the happiness was strongly influenced by non-material factors. Livestock GDP had no significant effect on the Indonesians happiness. Livestock was a producer of food sources of animal protein. For most Indonesians, animal food was still considered luxury goods with the characteristic that their expenditure for animal food was still very low.

Keywords: Agriculture; GDP; Happiness; Livestock

INTRODUCTION

National development in every country aims to create people's welfare. People's welfare may be a condition for the fulfillment of the material, spiritual, and social needs of citizens to live decently and be able to create themselves, to carry out their social capacities. To evaluate the state of social well-being, one can recognize two in general categories; economic indicators and non-economic indicators (Cuijpers, 2009). Economic measures incorporate different indices such as per capita income, unemployment, poverty, trade rates, inflation, and economic progress. Even though the fact that economic measures are of tall significance for a human's well-being, non-economic indicators were indeed more crucial determinants of social well-being. Four of the major non-

economic indicators of well-being were quality of life, education, health, and environment.

In the era of the 1970s-2000s, national development was focused on efforts to improve people's welfare through economic development. Gross Domestic Product (GDP) was often used by economists and politicians as a proxy for welfare (material prosperity) or at least economic well-being (Dydan and Sheiner, 2018). GDP was the total market value of all final goods and services produced in the domestic economy for a year (Bergh, 2009). The World Bank divides countries in the world based on GDP per capita into four groups: Low-income economies (less than USD 1,025), Lower-middle income economies (USD 1,025-4,035), Upper-middle-income economies (USD 4,036-12,475), and High-income economies (more than USD

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12,476). High GDP was interpreted by high production. The high number of production was connected to the purchasing power of the community which was also high. This was why when the GDP figures rose, there was a presumption that the country was also increasingly prosperous.

Starting in 2011, when the Organization for Economic Co-operation and Development (OECD) launched the OECD's Better Life Initiative, welfare no longer describes a condition of material prosperity but leads to the concept of happiness. Happiness incorporated a meaning and scope that was not only limited to conditions of material prosperity (welfare or well-being) but also in conditions of a good life (being-well or the good life) and meaningful life conditions. Happiness was characterized as subjective fulfillment with one's life-as-a-whole (Veenhoven, 2012). Happiness was deciphered as something that was felt from the accomplishment of seeking after and satisfying exertion to one's potential and reason for life (Forgeard *et al.*, 2011). Happiness describes the level of subjective well-being includes three dimensions, namely life satisfaction, affection, and the meaning of life (Deci and Ryan, 2008; Dodge *et al.*, 2012; Huppert, 2009). Happiness was frequently disregarded in development economics even though it was generally considered the ultimate objective in life (Sohn, 2010).

Agriculture, including livestock, plays an important role in improving the economic welfare of the Indonesian population. Agriculture accounts for 13.70% of IDR 15,434,151.80 billion Indonesia's GDP at the current price (BPS, 2020), second-largest under the Manufacturing Industry. Agriculture also plays a role in supporting economic growth, providing employment, providing food, earning foreign exchange, driving the growth of the industrial sector, and poverty alleviation and welfare rural communities (Syafa'at *et al.*, 2003). The amount of agricultural contribution to GDP and economic welfare has not been an indicator of happiness. Some economists criticized that GDP has always been a measure of output, not of happiness, but it can be considered a component of happiness (Oulton, 2012).

They saw happiness as 'a more ambitious and laudable policy objective'. Research on the effect of agricultural GDP on the Indonesians economic welfare has been widely carried out, while the effect of agricultural GDP on the Indonesians happiness was still limited. This research aims to analyze the effect of GDP, agricultural GDP, and livestock GDP on Indonesians happiness.

MATERIALS AND METHODS

This study utilizes data on the Happiness Index of Indonesians, Gross Domestic Product (GDP), agricultural GDP, and livestock GDP, each of 34 provinces in Indonesia. Indonesia's population happiness survey was conducted twice in 2014 and 2017, so GDP data were also taken in the same year. All data utilized were secondary data from the website of BPS (Statistics Indonesia) on GDP, Agricultural GDP, and Livestock GDP from 34 provinces in 2014 and 2017, 68 data respectively.

The study was conducted in January-April 2021. A regression model was applied with the dependent factor of the Happiness Index and independent factors of GDP, agricultural GDP, and livestock GDP. The Indonesian Happiness Index was a composite index that was weighted using three dimensions and 19 indicators on a scale of 0-100. The Life Satisfaction Dimension consists of 10 indicators (Education and Skills, Main Jobs, Household Income, Health, Housing, Family Harmony, Work-Life Balance, Social Relationship, Environmental Condition, Security), the Affection Dimension was three indicators (Positive Emotions, Negative Emotion, Depressed), and the Life Meaning Dimensions was six indicators (Purpose in Life, Positive Relation with Others, Personal Growth, Environmental Mastery, Autonomy, and Self Acceptances) (BPS, 2017a). The regression equation was formulated as follows:

$$Y_{it} = \alpha + \beta_{1it} X_{1it} + \beta_{2it} X_{2it} + \beta_{3it} X_{3it} + \varepsilon$$

Where:

Y = Happiness Index

α = Constant

$B_{1,2,3}$ = Regression Coefficient

X1 = GDP (IDR trillion)
 X2 = Agricultural GDP (IDR trillion)
 X3 = Livestock GDP (IDR trillion)
 i = Individual (34 Provinces in Indonesia)
 t = Year (2014 and 2017)
 ε = Error Term

RESULTS AND DISCUSSION

Regression results

The results of the model from Table 1 showed that GDP, Agricultural GDP, and Livestock GDP were not significant on Indonesians happiness at 10% level of significance as $F(3, 67) = 0.488$; $p = 0.692$.

Table 2 showed the results for explained variation which was only 2.2% of GDP, Agricultural GDP, and Livestock GDP responsible for Happiness Index in Indonesia.

Table 3 describes individual coefficients analysis in the model which indicated that GDP, Agricultural GDP, and Livestock GDP were not significant effects on the Indonesian Happiness Index.

GDP and Happiness

Table 4 showed the progress of the GDP and the share of agricultural GDP and livestock GDP in Indonesia's GDP in 2014 and 2017. GDP consists of 17 industrial origins which were grouped into three sectors, namely agriculture (including livestock), industry, and services. GDP per capita was the result of the division of the national income of a country with the population of the country and reflects the total change in the economic welfare of the population (Hudakova, 2017). Indonesia's GDP per capita of IDR 41.87 million (USD 3,432) in 2014 increased to IDR 51,950 million (USD 3,921) in 2017, classified as Lower-middle income economies. In 2019, Indonesia's GDP rose to USD 4,050 and raised Indonesia's class to become Upper-middle-income economies.

The Indonesian Happiness Index in 2017 was 70.69, an increase of 2.41 points compared to 2014 which was 68.28 (BPS, 2017a). The higher the happiness index value, the happier the life level of the population. The Indonesian Happiness Index was a composite index

that was weighted using three dimensions (Life Satisfaction, Affection, and Life Meaning) and 19 indicators (Education and Skills, Main Jobs, Household Income, Health, Housing, Family Harmony, Work-Life Balance, Social Relationship, Environmental Condition, Security, Positive Emotions, Negative Emotion, Depressed, Purpose in Life, Positive Relation with Others, Personal Growth, Environmental Mastery, Autonomy, and Self Acceptances) (BPS, 2017a). The World Happiness Report (WHR) 2019 ranked Indonesia 92 out of 156 countries. When compared with ASEAN countries, Indonesia lags behind Singapore (34), Thailand (52), the Philippines (69), and Malaysia (80), and was ahead of Vietnam (94), Cambodia (105), Laos (109), and Myanmar (113).

GDP had no significant effect on Indonesians happiness (Table 3). In 2014 and 2017, the highest GDP was The Special Capital Region of Jakarta Province, but the highest happiness index rankings were Riau Province and North Maluku Province respectively. This study was following with the Easterlin Paradox that the increase in GDP per capita was not significantly related to a person's well-being or happiness (Coppola, 2013; Easterlin and Angelescu, 2009). Income did not go with happiness (Sohn, 2010). This fact had been consistently found over different times and countries, yet it had been largely neglected in development economics. Happiness was a function of income, but not the only one (Yusuf, 2020). The happiness of Indonesians was indicated by several indicators, namely: expenditure, property, health, education, age, and marriage (Landiyanto *et al.*, 2011). Indonesians happiness was positively influenced by income, education level, health status, and social capital (Rahayu, 2016). The factors identified in influencing one's happiness include income, expectations, relationships, faith, gratitude behavior, pro-environmental behavior, health, gender, social and cultural capital (Putra and Sudibia, 2019).

GDP was often used to describe people's living standards or well-being (Bergh, 2009). GDP per capita has been widely criticized for not satisfactorily describing human well-being

Table 1: Analysis of Variance

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	7.980	3	2.660	.488	.692
Residual	348.900	64	5.452		
Total	356.881	67			

Note: The regression analysis has met four regression analysis assumptions (multicollinearity tests, heteroskedasticity tests, autocorrelation tests and linearity tests).

Table 2: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.150 ^a	.022	-.023	2.33486

a. Predictors: (Constant), GDP (X1), Agricultural GDP (X2), Livestock GDP (X3)

Table 3: Regression Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	70.406	.391		179.929	.000
GDP (X1)	1.988E-7	.000	.044	.270	.788
Agricultural GDP (X2)	-3.749E-6	.000	-.088	-.355	.723
Livestock GDP (X3)	-2.314E-5	.000	-.094	-.377	.707

a. Dependent Variable: Happiness Index (Y)

Table 4: The Indonesia's GDP and Happiness Index 2014- 2017

GDP and Happiness	2014		2017	
	IDR trillion	%	IDR trillion	%
Indonesia's GDP	10,681.774	100.00	13,742.287	100.00
Agricultural GDP	1,411.629	13.22	1,773.981	12.91
Livestock GDP	163.971	1.54	216.586	1.58
Population (million person)	255.10		264.60	
GDP per Capita (USD)	3,432		3,921	
Happiness Index	68.28		70.69	

Source: BPS (2017, 2020)

and progress (Hudakova, 2017). This utilizes GDP (per capita) was not supported by any macroeconomic theory of the significance of the welfare of GDP (Bergh and Antal, 2014). The economy did not offer support for GDP as a level of social welfare (Bergh, 2009). Further subjective welfare studies appear that absolute individual income was not an appropriate proxy of individual well-being. Relative income and different income-independent components also affect an individual's well-being or happiness. Subsequently, impossible that the accumulation of individual absolute

income in GDP gives a strong indicator of social well-being at the national level (Bergh, 2009). Even though the fact that GDP levels were related to numerous indicators of living standards, the relationship was not universal and enhancements in GDP may not reflect the increase experienced by representatives of parts of society (Aitken, 2019).

GDP was considered a failure to measure the well-being of a society because it did not take into account the social and environmental dimensions (Hudakova, 2017). GDP as a meas-

ure of economic activity ignores variations in wealth, household production services, natural environmental damage, quality of social relations, life expectancy, personal safety, and economic security (Fleurbaey, 2009). Modern economies have lost sight of the fact that the standard metric of economic growth and GDP, merely measures the size of a nation's economy and doesn't reflect a nation's welfare (Kapoor and Debroy, 2019).

GDP has been a measure of output (the value of goods and services) produced for final consumption, private and public. The volume of goods and services available to the average person clearly contributes to happiness in the wider sense, though of course, it was far from being the only component (Oulton, 2012). GDP could be considered as one of the happiness components and should be combined with other indicators. There are 14 indicators for moving beyond GDP as a measure of national welfare, namely: poverty, health, education, employment, income and wealth, shelter, natural environment, political participation, civil society, economic participation, human rights, national stability and sustainability, family well-being, and personal well-being (Leon and Boris, 2010). GDP per capita was one of the 8 indicators of happiness in WHR 2019 in addition to healthy life expectancy at birth, social support, freedom to make life choices, generosity, perceptions of corruption, positive affect, and negative affect (Helliwell, Layard, and Sachs 2019).

Agricultural GDP and Happiness

Agricultural GDP contributes around 13.22% (2014) and 12.91% (2017) to Indonesia's GDP (Table 4), the third-largest under the Manufacturing Industry, and Wholesale and Retail Trade. Agricultural GDP had no significant effect on the Indonesians happiness (Table 3). Agricultural GDP measures the value of agricultural goods and services produced for final consumption. Agriculture was a producer of staple foods such as rice, corn, vegetables, and fruit. Indonesian population consumption of rice reaches 114.6 kg/capita/year. This level of rice consumption makes Indonesia the largest rice-consuming country in the world, far above the world's average

consumption of rice of 60 kg, and some neighboring Asian countries like Japan 58 kg, Thailand 70 kg, and Malaysia 80 kg/capita/year. In Maslow's hierarchy of needs, staple foods were classified as physiological needs (basic human needs). According to Maslow, when basic needs have been met and income has increased, individuals will try to meet higher needs, namely: safety needs, belonging needs, understanding needs, esteem needs, aesthetic needs, and self-actualization needs (Aruma and Hanachor, 2017). When basic needs have been met and wealth had increased, then differences in individual happiness were strongly influenced by non-material factors such as social relations (Kesebir and Diener, 2008).

Food consumption expenditure was an indicator of people's welfare. Engel's law states that the smaller the household income, the larger the share of income used for food consumption expenditures (Clements and Chen, 2010; Clements and Si, 2018; Gao, 2012). Engel's law was used to look at a country's living standards, where the richer a country was, the smaller the proportion spending on food. In 2014, Indonesian per capita expenditure per month is IDR 776,032, spent on food IDR 388,350 (50.04%). In 2017, per capita expenditure per month increased by IDR 1,036,496, food expenditure by IDR 527,956 (50.94%). The percentage of expenditure on food was around 50% indicating that the Indonesian population was still less prosperous.

Agriculture was the major source of livelihood in many Asia-Pacific countries (Venu *et al.*, 2018), including Indonesia. A total of 33,487,806 people (12.66%) of Indonesian work as farmers (BPS, 2018b). Farmers who manage agricultural businesses were usually ranged in low-income stratum (Nguyen, 2017), and are even classified as poor (Sri, 2019). Farmers in Indonesia are a community, most of which (around 49.41%) were included in the poor population group (Yacoub and Mutiaradina, 2020). The income of rice farmers was only IDR 1.238 million/month, corn IDR 1.047 million/month, peanuts IDR 1.052 million/month, cassava IDR 869 thousand/month, green beans IDR 469 thousand/month, and soybean IDR 307 thousand/month (BPS,

2018b). In 2017, the Poverty Line was used as a boundary to classify the Indonesian population as being poor or not poor amounting to IDR 387,160/capita/month (BPS, 2018a).

There was a disconnect between household income and farmers' well-being (Garrett and Ferreira, 2017). The perception of rural households towards happiness was not determined by absolute income. Even though the income of farmers was low, even classified as poor, the life of the farmers was classified as happy and even very happy. Most farmers in Malaysia would be living below the absolute poverty line, but they were happy and proud to be a farmer (Kamaruddin *et al.*, 2013). About 96.5% of rice farmers in Thailand had a moderate to a relatively high level of life satisfaction (Hansasiripot, 2017). In the USA, about 99.0% of 400 Ohio farmers reported satisfaction with their overall quality of life (Windon *et al.*, 2014). A new happiness index in the UK found that people working in the countryside as farmers were among the most satisfied workers in the country (Khaleeli, 2012). Seven out of every ten subsistence farmers in Ghana, who were seldom prosperous, were at least happy with the ends of their lives as a whole (Yakubu and Aidoo, 2015).

Livestock GDP and Happiness

Livestock contributes around 1.54% (2014) and 1.58% (2017) to Indonesia's GDP (Table 4). Livestock GDP had no significant effect on Indonesians happiness (Table 3). Livestock GDP measures the value of livestock goods and services produced for final consumption. Livestock was a producer of meat, egg, and milk, food sources of animal protein. Livestock has an important contribution in the provision of rural and urban food as well as contributing to family nutrition, the provision of animal protein. For most Indonesians, beef and chicken meat were still considered luxury goods with the characteristic that their demand was elastic to changes in prices and population income (Aritonang, 2015). This was different from developed countries where the price elasticity and income elasticity of the three commodities were inelastic (Andreyeva *et al.*, 2010). Price elasticity and

income elasticity of beef and chicken in Indonesia were elastic (Umaroh and Vinantia, 2018), while eggs are inelastic (Febrianto and Putritamara, 2017). The 2017 population expenditure for livestock food consumption was only IDR 24,987 (2.41%) for meat and IDR 29,357 (2.83%) for eggs and milk of the total monthly expenditure of IDR 1,036,496.

Livestock farming was a source of additional income for farmers. The income of beef cattle farmers was IDR 1,109,280/head/year, dairy cows IDR 1,995,230/head/year, broilers IDR 48,605,050/5000 birds/year, and layer chickens IDR 72,641,240/1000 birds/year (BPS, 2017b). In addition to playing a role in improving the income and well-being of peasant families, livestock species also play an important economic, social, and cultural role or function for rural households (Bettencourt *et al.*, 2015). Livestock farming offers numerous perceived social advantages, including a quiet lifestyle, safety, and social status (Garrett and Ferreira, 2017). In India, livestock was an important source of rural prosperity and in general was important for people's wealth, health, enjoyment, amusement, and general happiness (Mandal *et al.*, 2006).

CONCLUSION

GDP had no significant effect on the Indonesians happiness. GDP has been a measure of output available to the average person that clearly contributes to happiness in the wider sense. It was far from being the only component. GDP could be considered as one of the happiness components and should be combined with other indicators. The Indonesian Happiness Index was calculated using 19 indicators (Education and Skills, Main Jobs, Household Income, Health, Housing, Family Harmony, Work-Life Balance, Social Relationship, Environmental Condition, Security, Positive Emotions, Negative Emotion, Depressed, Purpose in Life, Positive Relation with Others, Personal Growth, Environmental Mastery, Autonomy, and Self Acceptances).

Agricultural GDP had no significant effect on the Indonesians happiness. Agricultural GDP measures the value of agricultural goods and services produced for final consumption. Ag-

riculture was a producer of staple foods that were classified as physiological needs (basic human needs). When basic needs have been met and income has increased, the happiness was strongly influenced by non-material factors.

Livestock GDP had no significant effect on the Indonesians happiness. Livestock GDP measures the value of livestock goods and services produced for final consumption. Livestock was a producer of food sources of animal protein. For most Indonesians, animal food was still considered luxury goods with the characteristic that their expenditure for animal food was still very low.

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AUTHOR CONTRIBUTION

S conceived the idea, supervised the overall research work, prepared the final manuscript and incorporated the changes suggested by the reviewers. WA prepared the survey instrument and collected data. SA prepared the initial draft of the study. PI prepared the initial draft of the study. IJT and TA interpreted the results. TA analyzed the data.

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