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Editorial Notes

Does the Covid-19 Pandemic Have Any Positive Impact on SDGs?

It has been a half year after the first case of novel coronavirus disease (COVID-19) reported in December 2019 in Wuhan, Hubei Province, China. No country in the world could escape from the spreading such deadly infectious disease. While only small countries reported a significant reduction of the new case, the outbreak is still escalating in other parts of the world. As of August 26, 2020, the global death toll from COVID-19 has reached 832,879, with 24,537,560 people confirmed cases (WHO, 2020).

All countries and international institutions have taken various actions to respond to COVID-19. Almost all people around the globe have experienced drastically their new life. Social interaction has been restricted. Schools, public works, markets dan tourist destinations have been closed. Public transportation, praying public places, sports activities, and other places are prohibited. Working activities are mainly conducted from home. It has not only changed a lifestyle, but also it might lead to economic impacts. Almost countries either developed or poor countries reported that economic growth dropped, even minus. It is predicted that it will continue until the next one even another two or three years.

From the Sustainable Development Goals (SDGs) context, the pandemic has impacted many issues among 17 agendas stipulated in the SDGs (United Nations, 2020). A consequences, it will also influence the achievement of the SDGs in 2030. The first impact, of course, is the “good health and wellbeing” (third goal). In contrast to the goal, the pandemic has been threatening health and well-being that affected the essential of sustainable development. The global health crisis is clearly causing human suffering and destroying the social structure of people around the globe.

The second issue that will be brought is “zero hunger”. In the short-term, Covid-19 hit the people who have work in informal sectors with low income. Many experts said that pandemic could push about million people into extreme poverty in the short and middle term. Pandemic will inevitably lessen to chance to improve “no poverty” as the first goal in the SDGs. Although all countries would share the new poor people, low and middle-income countries are significantly affected by a large outbreak. The World Bank, for example, projected that the new poor would be 23 million in Sub-Saharan Africa and 16 million in South Asia (Sánchez-Páramo, 2020).

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Another agenda of SDGs that will be affected by a pandemic is the quality of education. Most governments around the world have closed schools to reduce the spreading of the Covid-19. According to UNESCO, educational closures cause more than 60% of the global student population (UNESCO, 2020). Given that some countries adopted distance learning or online learning, some vulnerable and disadvantages people are still limited to have such access to education. In some countries, internet facilities have not been provided. The inequalities are not the only issue in education, but it also applies in other aspects such as economic, social, justice, internet access, access to a better job, etc. In other words, the pandemic will mostly likely alter other goals such as gender inequality, decent work, and economic growth, peace, justice, and strong institutions.

On the other side, there has been a "positive" impact of pandemic although it is just temporary (The Jakarta Post, 2020). As major economic and transportation activities have been lockdown the environmental quality showed improving. Studies in the most affected countries such as China, the USA, Italy, and Spain concluded that the impact of COVID-19 has resulted in improving air quality, clean beaches and environmental noise reduction (Zambrano-Monserrate et al., 2020). Other indirect impacts of the pandemic have been also discussed such as improved hygiene, optimized digital transformation, collaboration across gender, race, countries, peace, and connectedness (Gbenga, 2020); (Haski-Leventhal, 2020).

As well as the negative impact of a pandemic, "positive impact" on SDGs should be explored. For example, one of the effective ways to reduce the spreading of Covid-19 is collaboration, particularly cooperation between country to country. As stipulated in the one of the SDGs, partnership meant that a successful development agenda required strong global and inclusive partnership. Another "positive" impact of the pandemic to SDGs is towards goal 7, "affordable and clean energy". It is the time for policymakers to think seriously considering that energy is becoming more sustainable and widely accessible. We should focus on investing in developing clean energy for poor people and expanding the use of renewable energy.

As global effort focused on responding to the negative impact of COVID-19, the positive impact of the pandemic to SDGs should be started to discuss. As presented in the second edition of this journal, we explored the various themes of the topic related to SDGs. As responded to the urgent of the digital transformation, we present research papers discussing ICT in the context of prosperity. The first paper is entitled "The Role of ICT and Human Capital Development in Pursuing a Demographic Dividend and Improving Economic Welfare in Indonesia". Meanwhile, the second paper is entitled "Impact of ICT Adoption on Inequality: Evidence from Indonesian Provinces".

Economic themes are still dominated with current volume such as "Determining Leading Economic Sectors, by Large Distribution or Extreme Growth?", "Strengthening Community Economy Inclusively through Literacy for Prosperity" (National Library of Indonesia's Role to Support Sustainable Development Goals (SDGs) and The Capacity of Government of the Kulon Progo Regency in the Efforts to Achieve Economic Self-Reliance". Another interesting paper is related to energy titled "Sustainable Development of Energy Supply Planning for Productive Economy in Isolated Island". The rest of the papers are "Ensuring Sustainable Urban Transformation in Indonesia: Toward Indonesia Emas 2045" and "A Review of Suramadu Regional Development Acceleration towards Sustainable Development Concept".

Finally, while we are in the midst of historic experience that changes all aspects of our lives, the pandemic crisis should be an opportunity for global people to reshape social and economic as well as health behaviors to ensure sustainable development.

Wignyo Adiyoso
(Editor in Chief)

References

Gbenga, A. M. (2020). *Here are four positive effects of the covid-19 pandemic*.

Haski-Leventhal, D. (2020). *Seven positive outcomes of COVID-19*.

Sánchez-Páramo, C. (2020). *COVID-19 will hit the poor hardest. Here's what we can do about it*. The World Bank. https://blogs.worldbank.org/voices/covid-19-will-hit-poor-hardest-heres-what-we-can-do-about-it

The Jakarta Post. (2020). *It's a non-emergency emergency, BNPB says regarding COVID-19 pandemic*. The Jakarta Post. It's a non-emergency emergency, BNPB says regarding COVID-19 pandemic

UNESCO. (2020). *Education: From disruption to recovery*. https://en.unesco.org/covid19/educationresponse

United Nation. (2020). *About Sustainable Development Goals*. https://www.un.org/sustainabledevelopment/sustainable-development-goals/

WHO. (2020). *Coronavirus disease (COVID-19) pandemic*. https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Zambrano-Monserrate, M. A., Ruano, M. A., & Sanchez-Alcalde, L. (2020). Indirect effects of COVID-19 on the environment. *Science of the Total Environment*, *728*. https://doi.org/10.1016/j.scitotenv.2020.138813

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Research Paper

The Role of ICT and Human Capital Development in Pursuing a Demographic Dividend and Improving Economic Welfare in Indonesia

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Abstract

This article aims to provide evidence that Information and Communication Technology (ICT) and human development play an important role in pursuing a demographic dividend and accelerating economic welfare in Indonesia by exploiting provincial data from 2012 to 2017. The empirical evidence implemented in this research is Two-Stage Least Squares and dynamic system Generalized Method of Moments (GMM) techniques. The results show that a 1%-point rise in ICT development growth potentially leads to an approximately 0.24%-point increase in economic welfare growth, whereas an in life expectancy may decrease GDP per capita. The analysis also finds that a 1%-point increase in the ratio of the participation rate will promote a nearly 0.16%-point rise in per capita output. Meanwhile, a 1%-point increase in the share of the working-age population will generate roughly 0.19%-point rise in per capita income. A recent paper suggests that policymakers have to promote more supportive ICT and human development policies to pursue a demographic dividend since even though they have a positive impact on per capita income, the magnitude remains relatively low.

Keywords: ICT, Human Development, Demographic Dividend, Economic Welfare.

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1. Introduction

The present paper examines the critical role that Information and Communication Technology (ICT) and human development may have in pursuing a demographic dividend, which in turn accelerates the country's standard of living. The motivation of the article is to try to follow the analysis of Cruz and Ahmed (2018) whose analytical framework is based on the decomposition theory of Bloom & Canning (2005) and Bloom & Finlay (2008). In their work, Cruz and Ahmed (2018) underlined the potential endogeneity issues in the previous research. They, therefore, proposed the application of the system General Method of Moments (system-GMM) as an econometric tool to analyze the impact of demographic changes on the growth of Gross Domestic Product (GDP) per capita and poverty.

Their work is similar to the work presented in this article in the attempt to relate demographic changes to economic growth. However, the present analysis deviates from what Cruz and Ahmed (2018) have done in two aspects. While their work assumes that the growth of participation rate is constant, the present work sheds the assumption by trying to estimate the coefficient of that variable in the decomposition as well. Secondly, due to the scarcity of literature, this paper focuses on a single country analysis to obtain more comprehensive findings.

Other novelties that are different from previous papers (Baerlocher et al., 2019; Choudhry & Elhorst, 2010; Liu & Hu, 2013; Mason et al., 2016; Misra, 2017; Wongboonsin & Phiromswad, 2017) are the two main insights. Firstly, the paper addresses endogeneity problems with two simulations. Treating only one variable that suffers from endogeneity issues will be the first simulation and treating all variables as suspected endogenous is the other simulation. The first simulation treats ICT development as an endogenous one and determines human capital development indicators as instrumental variables for it. ICT development becomes one of the determinants of the output per worker variable decomposed by Bloom & Canning (2005). Meanwhile, the second simulation treats all regressors as predetermined variables or to be suspected endogenous by adopting a dynamic system-GMM technique. The estimation method allows the lagged dependent variable to be one of the regressors in addition to other independent variables.

Another new insight from this paper is the exploitation of the ICT Development Index (IDI). IDI is a more comprehensive measurement of ICT or technology development indicator that is less frequently used since it is relatively new. The ICT proxies broadly used in the previous research are mobile phone subscriptions, internet adoption and penetration, and fixed broadband subscriptions. Including an ICT development indicator in the analysis is extremely necessary as its role in improving output per worker is incredible. As found by R. Solow, technical progress contributed to more than 80% of the growth in output per worker hour in the USA during the 1909-1949 period (Dornbusch et al., 2011).

The research takes Indonesia as the sample. Indonesia is currently experiencing a demographic transition. The number of the working-age population in Indonesia has continued to increase significantly, whereas the dependency ratio has been gradually decreasing recently. Based on recent data, the dependency ratio of Indonesia has been below 50% since 2012, and the projection shows it will continue to decline until it reaches its lowest point in 2028-2031 (Kementerian PPN/Bappenas, 2014). This demographic change economically benefits the country since it creates many more opportunities, meaning that it becomes a demographic dividend. A research conducted by Bloom and Finlay (2008) claims that an increase in the working-age population contributed to around 40% of output growth in Indonesia from 1960 to 2005 (the Assistance Team for Fiscal Decentralization, the Ministry of Finance the Republic of Indonesia, 2011). Moreover, many East Asian countries such as China, Japan, and South Korea also enjoyed it during 1960-1990 (Bloom et al., 1999; Bloom & Finlay, 2008). They have succeeded in taking advantage of the demographic changes to become a demographic bonus so that it becomes their economic miracles.

Unfortunately, when demographic shifts take place, demographic gains do not automatically arise (Bloom et al., 2011). A country can seek a demographic dividend by promoting a set of supportive policies for example, improving human capital. To pursue that dividend, the government of Indonesia has taken steps focusing on human capital in the National Midterm Development Plan 2015-2019 (Kementerian PPN/Bappenas, 2014). Policymakers, then, continue to set policies in the Government Work Plan 2019

(RKP 2019) and the Technocratic Design of the National Midterm Development Plan 2020-2024 (Kementerian PPN/Bappenas, 2018, 2019). In the RKP 2019, policymakers emphasize heavily two policies, namely human resources and equality across regions (Kementerian PPN/Bappenas, 2018). Another effort to pursue a demographic dividend is enhancing ICT that is also one of the strategic policies in Indonesia (Kementerian PPN/Bappenas, 2014).

This paper aims at examining the role of ICT and human development in helping to pursue a demographic dividend and to improve welfare in Indonesia. By implementing a rigorous analysis, it may yield comprehensive findings, which provide excellent suggestions for future research and valuable recommendations for policymakers, particularly in developing countries which are encountering demographic changes.

The rest of the structure of this article is as follows: Section 2 explores the literature review from previous papers; Section 3 describes the data and methodology; Section 4 discusses the findings; Section 5 presents the conclusions and recommendations; and finally, Section 6 provides the limitations of the research.

2. Literature Review

There are a significant number of researchers that have examined the relationship between ICT development and economic growth, which in turn influences per capita output. For example, Vu (2013) conducted research in Singapore and found that there is a strong positive relationship between the intensity of ICT use and economic output and labor productivity growth. He also concluded that during 1990-2008, the ICT investment contributed around one percentage point to Singapore's GDP (Vu, 2013). Erumban and Das (2016) in India, and Hong (2017) and Hwang & Shin (2017) in Korea also stated that ICT investment has a strong relationship with economic growth. Moreover, Hariani RS (2017) found that the number of internet users has a positive and significant effect on economic growth in Indonesia. These results are also in line with those of multinational study cases such as the research conducted in Asian countries (Das et al., 2016), OIC countries (Aghaei & Rezagholizadeh, 2017), and BRICS economies (Latif et al., 2018).

There are also numerous studies on the relationship between human development and economic output when countries experience demographic change. Most of them conclude that human capital development plays a critical role in improving the countries' welfare. A study by Mason et al. (2016) exemplified those linkages. They claimed that changes in the age-structure of human capital investment over the demographic shifts have a crucial impact on the standard of living (Mason et al., 2016). Taking Brazil as a sample, Baerlocher et al. (2019) also found the same results. They argue that age-structure shifts will have a significant effect on growth rates after controlling human capital, especially the level of education (Baerlocher et al., 2019). That finding strengthens previous research conducted by Wongboonsin and Phiromswad (2017) who revealed that education is a channel through which an increase in the share of middle-aged workers has a positive impact on output growth in developed countries.

Several studies have also revealed how demographic shifts have an impact on per capita output. In 1999, Bloom and Channing examined the relationship between demographic change and output growth in Asia using data between 1965 and 1990. They found that despite the little significance of population growth, the age-structure changes have an incredible impact on growth rates. Additionally, the demographic shifts are a source of economic miracles in East Asian countries since they can be a catalyst for their economies (Bloom et al., 1999; Bloom & Finlay, 2008). Choudhry and Elhorst (2010) presented a similar perspective after examining the links between demographic transitions and economic growth by adopting a Solow-Swan Model from 70 countries over the period 1961-2003. Their main finding is that GDP per capita has a positive association with the working-age population and differences in total population growth (Choudhry & Elhorst, 2010). This finding resembles that of Cruz and Ahmed's (2018) study, that attempted to determine which demographic shifts could influence economic output. The study by Misra (2017) and Fang (2018) also yielded similar results as they scrutinized the links between

demographic transition and economic outcomes. Finally, Liu and Hu (2013) concluded that the average annual GDP per capita growth rate of China rose by 1.19 and 0.73 percentage points during 1983-2008.

3. Methodology

3.1 Data

This research uses only secondary data collected from BPS-Statistics Indonesia. The structure of the data is a balanced panel consisting of 33 provinces from 2012 to 2017. The 34th province in Indonesia, North Kalimantan, is excluded from the analysis due to limited data availability as a new province in Indonesia.

The foundation of the analysis relies on the decomposition formulated by Bloom & Canning (2005) and Bloom & Finlay (2008). They attribute demographic change to economic welfare as follows;

$$\frac{Y}{N} = \frac{Y}{L}\frac{L}{WAP}\frac{WAP}{N} \quad (1)$$

In this equation, Y represents aggregate economic output; N indicates the total population of a country; L serves as the total number of labors; and WAP denotes the population of working-age 15-64 years. The left-hand side variables refer to per capita income since the formula divides the output by the total population. The analysis uses per capita income as a proxy for real Gross Domestic Product (GDP) per capita data published by BPS-Statistics Indonesia. To calculate real GDP per capita, each provincial real GDP (GRDP) must be divided by the number of residents in the middle of the year. This paper uses population data based on an official projection also measured by BPS-Statistics Indonesia.

In the meantime, the labor force and the working-age population depict the number of people aged 15-64 years in the societies who actively participate in economic activities and those who do not, respectively. That decomposition explains that GDP per capita ($\frac{Y}{N}$) equals productivity per labor growth ($\frac{Y}{L}$) times the participation rate ($\frac{L}{WAP}$) times the share of the working-age population ($\frac{WAP}{N}$).

Taking the natural logarithm on both sides of the equation (1), it yields:

$$\text{Log}\frac{Y}{N} = \text{Log}\frac{Y}{L} + \text{Log}\frac{L}{WAP} + \text{Log}\frac{WAP}{N} \quad (2)$$

Equation (2) above can be written as follows;

$$G_y = G_{opw} + G_{pr} + G_{swap} \quad (3)$$

Assuming that the growth in output per worker is a function of X variables, such that G_{opw} = a + bf(X), the final equation becomes:

$$G_y = \text{a} + \text{bf(X)} + G_{pr} + G_{swap} + \varepsilon \quad (4)$$

where ε is the error term.

The present analysis implements two indicators for measuring the growth of output per worker. Those indicators are ICT development and human development since it is undeniable that they significantly affect the output per worker growth. For example, a 2013 study conducted by Vu (2013) found that the intensity of ICT use has a strong positive relationship with economic growth and labor productivity growth at the sector level. As mentioned above, the use of the ICT Development Index (IDI) as a proxy of the ICT development indicator is less frequent in literature. This paper aims to fill that gap. The use of IDI may give new insights into literature since it is likely to produce more comprehensive results than those that only exploit individual ICT indicators such as mobile telephone subscriptions, internet subscriptions, or fixed broadband subscriptions.

The IDI comprises three sub-indices, namely ICT access, ICT use, and ICT skills. ICT access sub-index represents the readiness of infrastructure and access to ICT, while ICT use sub-index indicates the intensity level of the usage of ICT in societies. ICT skills sub-index describes the outcome of the efficient and

effective use of ICT. BPS-Statistics Indonesia released several years of IDI data used in research whose calculations adopted the measurement of the International Telecommunication Union (ITU). However, for the purpose of completing the series of data, we also recalculated IDI data in the time series when the official agency did not release the data.

Another proxy used to explain the growth in output per worker is human development. Many economists believe that human capital development has a strong contribution to the growth of output per worker so that it leads to the production of much work on economic growth theories incorporating human capital as one of the determinants affecting countries' economic performance (Acemoglu, 2009). Scholars have also widely accepted the use of the Human Development Index (HDI) as a comprehensive measure of human capital development. Therefore, another X variable in this study is HDI. HDI consists of three dimensions, namely life expectancy representing the health level of a country, education dimension depicted by Mean Years of Schooling (MYS) and Expected Years of Schooling (EYS), and per capita consumption as an economic dimension.

A problem may arise when utilizing both IDI and HDI altogether because they both have education variables. For example, IDI has ICT skills, while HDI has MYS and EYS. Therefore, the article avoids employing education dimension twice so that the paper opts to use the overall IDI and only the health dimension of the HDI. Table 1 presents the definitions and summary of the data used in the analysis.

Table 1: Definition and summary of data used in the analysis

Variable	Definition	Measurement Unit	Mean	Std. Dev.	Min	Max
percapgdp	Real GDP per capita	Million Rupiahs	35.82	27.10	10.03	157.64
prate	Participation rate	Ratio	0.68	0.06	0.51	0.92
swap	Working-age population share	Ratio	0.66	0.03	0.53	0.72
idi	ICT Development Index	From 0 to 10	3.80	1.06	1.91	7.61
le	Life expectancy	%	69.09	2.64	63.04	74.74
eys	Expected years of schooling	Years	12.50	0.89	9.11	15.42

Source: Author's computation, 2020.

3.2 Econometric Model

Empirical evidence is used in this research to scrutinize the relationships between demographic change variables, ICT and human development variables, and economic welfare formulated in the equation (4) above. The analysis implements two econometric strategies, namely Two-stage Least Squares (2SLS) and the dynamic system Generalized Method of Moments (GMM) developed by Arellano-Bond (1991), Arellano-Bover (1995), and Blundell-Bover (1998).

In the 2SLS specification, the analysis attempts to estimate equation (4) by implementing instrumental variables. In this case, the suspected endogenous variable is the IDI, meaning that the IDI is correlated with past or contemporaneous disturbances. Meanwhile, the instrumental variables are human development dimensions such as life expectancy and the EYS since the only variable that intersects with IDI is MYS. The specification based on 2SLS is as follows:

$$lpercapGDP_{i,t} = \alpha + \beta_1 lprate_{i,t} + \beta_2 lswap_{i,t} + \beta_3 lidi_{i,t} + \beta_4 lle_{i,t} + \eta_i + \varepsilon_{i,t} \quad (5)$$

In this equation, *lpercapGDP* is the natural logarithm value of per capita income of province *i* at period *t*; α is a constant term; $lprate_{i,t}$ depicts the participation rate; $lswap_{i,t}$ is working-age population share; $lidi_{i,t}$ represents the overall IDI value; and $lle_{i,t}$ indicates the life expectancy of province *i* at period *t*. Finally, η_i and $\varepsilon_{i,t}$ serve as province-specific effects and disturbances.

As in the Ordinary Least Squares (OLS), the 2SLS technique also has diagnostic tests, namely endogeneity test and over-identification restriction test (OIR test). Since the 2SLS estimator can have an extremely high standard error compared to the OLS estimator, it is crucial to test whether the use of the technique is necessary (Wooldridge, 2013). The test, then, principally compares the estimators produced from those techniques. The basic principle of the endogeneity test lies in the significance of the difference

between the estimators from 2SLS and OLS. Wooldridge (2013) stated that if the difference is statistically insignificant, the OLS is the best estimation and vice versa.

Another diagnostic test is the OIR test. As external instrumental variables are available and they outnumber the endogenous variable and satisfy the minimum rank condition, it is possible to test whether or not some of them are uncorrelated with the structural error. Since the analysis uses two external instrumental variables (LE and EYS) while only having one endogenous variable (the IDI), it is possible to do the OIR test and come to a conclusion whether instrumental variables proposed in the specification are valid. The OIR test used in the paper is the Hansen test or J-statistics test.

In the meantime, the purpose of using the dynamic system GMM is to provide another insight into the analysis. As claimed by Roodman (2009), the motivation for using the dynamic system GMM is for the following situations: the data has a few periods and a large number of individuals; there is a linear functional relationship; there is a lagged dependent variable as regressors; the regressors are not strictly exogenous; there are fixed effects; there are heteroskedasticity and autocorrelation within individuals.

In the dynamic system GMM, the analysis introduces a lagged dependent variable as also one of the regressors on the right-hand-side variables. Therefore, there will be a one-period lagged per capita income variable in the independent variable lists. The paper only includes one-period lag of GDP per capita since it follows the work of Asongu and Odhiambo (2019).

The model specifications both in level (equation 1) and first-difference (equation 2) are as follows:

$$lpercapGDP_{i,t} = \alpha + \beta_1 lpercapGDP_{i,t-1} + \beta_2 lprate_{i,t} + \beta_3 lswap_{i,t} + \beta_4 lidi_{i,t} + \beta_5 lle_{i,t} + \eta_i + \mu_t + \varepsilon_{i,t} \quad (6)$$

$$lpercapGDP_{i,t} - lpercapGDP_{i,t-1} = \alpha + \beta_1(lpercapGDP_{i,t-1} - lpercapGDP_{i,t-2}) + \beta_2(lprate_{i,t}\text{-}lprate_{i,t-1}) + \beta_3(lswap_{i,t}\text{-}lswap_{i,t-1}) + \beta_4(lidi_{i,t}\text{-}lidi_{i,t-1}) + \beta_5(lle_{i,t}\text{-}lle_{i,t-1}) + (\mu_t - \mu_{t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (7)$$

i = 1, 2, … 33; and t = 2, 3, … T.

The variables are mostly the same as those in equation (5) above. The difference is only in the existence of μ_t that represents a time-specific constant to cover the time variation. The use of the time dummies is for making the assumption more likely to hold (Roodman, 2009). The analysis applies orthogonal deviations to maximize the sample size, rather than the difference transformation.

The research considers that all the regressors are predetermined, whereas, for time-invariant variables, the analysis treats them as strictly exogenous variables. It follows what Asongu and Odhiambo (2019) did when examining the relationship between ICT and income inequality in 48 African countries between 2004 and 2014. Roodman (2009) argued that time-invariant is unlikely to be endogenous after a first-difference transformation.

As in OLS and 2SLS, there are also specification tests for testing whether the specification is correct. In GMM estimation, there are two specification tests, namely the Sargan/Hansen test for examining the validity of instrumental variables used in the model, and serially uncorrelated error test exploiting AR(1) and AR(2) . Following Cameron and Trivedi (2009), the serially uncorrelated test has to reject the null hypothesis at order one and accept the null hypothesis at order two and higher.

Another specification test is the Sargan/Hansen test. This test functions to examine the over-identification restrictions (OIR), determining whether or not the population moment conditions are appropriate. The Sargan/Hansen test must not reject the null hypothesis stating that over-identifying restrictions are valid.

4. Results and Discussions

Equation (4) describes the relationship between GDP per capita growth equal to the sum of the growth of output per worker (ICT and human development), the growth in participation rate, and the growth in the share of the working-age population. On the other hand, there are also two X variables reflecting the growth of productivity per labor ($\frac{Y}{L}$), which are the ICT Development Index (IDI) and the health dimension

of the Human Development Index (HDI), namely Life Expectancy (LE). As explained, the analysis began by examining equation (4) by applying Two-stage Least Squares (2SLS) and then continued with the implementation of the dynamic system GMM developed by Arellano-Bond (1991), Arellano-Bover (1995), and Blundell-Bover (1998). Table 2 provides the results of the 2SLS strategy, while table 3 illustrates the output of the dynamic system-GMM technique.

4.1 ICT, Human Development, and Economic Development

The role of ICT development in significantly improving welfare is undeniable. Table 2 depicts the results of adopting the 2SLS strategy with AR(1) error for dealing with no serial correlation assumption (Wooldridge, 2013, p. 540). According to the estimation, ICT development strongly affects economic prosperity as measured by GDP per capita. The effect is positively significant, implying the crucial role of ICT in generating the country's income. In other words, every 1%-point increase in ICT development growth can possibly lead to an approximately 0.24%-point increase in economic welfare growth. The finding is in line, both in sign and in magnitude, with the results of a research conducted by Vu (2013) in Singapore during 1990-2008. However, this analysis estimates in different accounting, whereas Vu (2013) analyzed the linkage in level accounting.

In the 2SLS estimation strategy, Life Expectancy (LE) and Expected Years of Schooling (EYS) are external instrumental variables for ICT Development Index (IDI) in addition to participation rate (PR) and working-age population share, which serve as internal instrument variables for themselves. In the specification, therefore, the IDI is endogenous, while PR and SWAP are exogenous. It may be well-accepted that the development of ICT depends on the human development of the country. There are a significant number of human development indicators, but this paper utilizes the health dimension and one of the education dimensions, namely LE and EYS, with the reasons explained in the previous section.

Table 2. Estimation of the GDP per capita growth by applying 2SLS strategy

No	Variables	Coefficient	t-Statistic	p-value
1	C	3.2296	0.1729	0.0000
2	LOG(PRATE)	0.0756	0.0541	0.1647
3	LOG(SWAP)	0.0716	0.0683	0.2961
4	LOG(IDI)	0.2372	0.0902	0.0096
5	AR(1)	0.7825	0.1271	0.0000
Adj R-squared		0.9987	Instrument rank	41
Durbin-Watson stat		2.2653	F-statistic	4999.6
Prob(J-statistic)		0.1474	Prob(F-statistic)	0.0000

Source: Author's computation, 2020.

The difference is indeed significant compared to the IDI estimate in table 3 since they are different in the transformation processes. The 2SLS technique uses AR(1) coefficient estimated in table 2 for its transformation, while the system GMM uses AR(1) which equals one in its transformation process. Nonetheless, IDI variables are positively significant both in table 2 and in table 3 (Model 2 and Model 3), meaning that the effect is robust in both specifications.

Table 3. The effect of ICT and human development on economic welfare by adopting the dynamic system-GMM technique
Dependent Variable – lpercapgdp

	(1) M1	(2) M2	(3) M3
L.lpercapgdp	**0.9821*****	**0.9691*****	**0.9749*****
	(0.000)	(0.000)	(0.000)
lprate	**0.1552*****	**0.1593*****	**0.1333*****
	(0.000)	(0.000)	(0.000)
lswap	**0.1810*****	**0.1909*****	**0.1642*****
	(0.000)	(0.000)	(0.000)
lidi		**0.0207***	**0.0706*****
		(0.063)	(0.000)
lle			**-0.5300*****
			(0.000)
constant	0.0000	0.2480***	0.0000
	(.)	(0.000)	(.)
Time-specific effect	Yes	Yes	Yes
N	165	165	165
j	23	29	35
ar1p	0.0879	0.0807	0.0876
ar2p	0.2566	0.2516	0.1931
sarganp	0.0000	0.0000	0.0000
hansenp	0.1720	0.4213	0.6048
F_p	0.0000	0.0000	0.0000

p-values in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Source: Author's computation, 2020.

Based on table 3, one of the human development dimensions, namely life expectancy, negatively influences per capita output. Its significance is remarkably high at 1% significance level, meaning that an increase in life expectancy may decline GDP per capita. The reason may be because productivity will plunge as the people or the population grow old. It also implies that younger people tend to be more productive since they may contribute more to economic activities. Since the overall IDI includes the educational level of societies, which is in the ICT skills sub-index, and the estimate is also positively significant, in line with that, the development of humans will also become positive and significant. These findings are in line with the analysis of Cruz & Ahmed (2018) who concluded that improving human development such as increasing school attainment ratio and reducing teenage pregnancies has a critical role in fostering per capita income since it can reduce the fertility rate.

The analysis recommends policymakers to take steps while Indonesia is encountering a demographic change. For example, the government can prioritize enhancing the level of ICT development, creating much more employment to absorb the productive age population, and providing great support for everyone, especially women, who wish to participate in economic activities.

4.2 Pursuing a Demographic Dividend

Demographic dividend is a condition when the number of the working-age population rises, leading to a plunge in dependency ratio. When an abundant working-age population contributes more to economic output and welfare, this shift refers to the terms demographic dividend and demographic disaster the other way around. Therefore, it is necessary to examine whether the booming working-age population happening in Indonesia is a demographic dividend or not.

The effect of demographic change as represented by the rate of participation and the share of working-age population on a country's welfare is positive and significant. It implies that the country's labor market can absorb the abundant working-age population and give opportunities to participate in the development. This will potentially lead to higher prosperity, meaning that the country is pursuing a demographic dividend. Even though the estimation of both the 2SLS and the dynamic system-GMM techniques is quite complicated in its interpretation due to the transformation processes, both the sign and magnitude are in line with previous research. For example, Cruz & Ahmed (2018) find that a 1%-point increase in the share of the working-age population induces a 1.6%-point increase in per capita output growth.

The growth of participation rate significantly contributes to the growth of per capita output. A 1%-point increase in the ratio of the participation rate will promote a nearly 0.16%-point rise in GDP per capita. Meanwhile, a 1%-point increase in the share of the working-age population will generate roughly 0.19%-point increase in per capita income. Both analyses in the 2SLS and the dynamic system-GMM produce relatively the same estimates either in the sign or the magnitude so that they indicate that those estimations are robust.

Even though the SWAP variable has a positive effect on per capita income, the impact remains relatively low. It implicitly shows that the abundant working-age population has not yet been maximized by the country. Previous studies have concluded that the magnitude is around 1.4-2% point (Bloom & Canning, 2005; Bloom & Finlay, 2008). Thereby, policymakers can regulate more supportive policies to make the working-age population participate more actively in the labor market. The policies should encourage more people to participate in economic activities such as inviting women to be involved in the economy. The government must ensure that they can provide much more employment to absorb the abundant working-age population and assure the stability of the labor market.

4.3 Robustness Checks

In the 2SLS technique, this paper implements the 2SLS with AR(1) error strategy to cope with the potential of no serial correlation assumption issues. Wooldridge (2013, p. 539) states that as in the OLS case, it is challenging to satisfy no serial correlation assumption. Using AR(1) is an alternative to address the autocorrelation assumption violation. There is also EYS, in addition to LE and other exogenous regressors, in the instrumental variables with the hope of holding an Overidentifying Restrictions (OIR) test. As explained, the 2SLS can only test the OIR as it has enough rank conditions.

The probability of J-statistics is 0.1474 that outnumbers the significance level of 5%. We then fail to reject the null hypothesis stating that a set of instrumental variables (41 instruments rank) that the analysis proposes is valid. The model is in accordance with the adjusted R-squared of 99.87%, meaning that the variance of the independent variables explains the 99.87% variation in per capita income.

In the meantime, specification tests of a dynamic system-GMM estimation method consist of serially uncorrelated error assumption and OIR test. Table 3 has shown a result of AR(1) and AR(2) probabilities; for example, in Model 3, the p-values of AR(1) and AR(2) equal 0.0876 and 0.1931 respectively, which means that the serially uncorrelated error assumption spplird. Finally, in contrast to the Sargan test that rejects the hypothesis stating that the instrumental variables are correct, the Hansen test accepts null-hypothesis and concludes that the instrumental variables used in the analysis are appropriate.

5. Conclusions

Rapid demographic transitions can be beneficial to Indonesia due to the abundance of working-age societies. The productive working-age population can lower the level of dependency ratio, leading to demographic dividends. This does not occur automatically, but it needs a set of strategic policies that take this phenomenon into considerations. Some of those policies are improvement in human capital and enhancement of ICT development.

The article is to provide a shred of evidence to prove the crucial role of ICT and human development on societies' welfare. The paper follows the work of Cruz and Ahmed (2018) whose analysis adopts the

decomposition theory of Bloom & Canning (2005) and Bloom & Finlay (2008). That final decomposition depicts that per capita output growth comprises the growth of participation rates, the share of working-age population growth, and productivity per labor growth, which are represented by ICT and human development.

To deal with endogeneity issues, we have implemented two techniques, namely 2SLS and dynamic system-GMM. In the 2SLS method, we have allowed ICT indicators to be endogenous, and allowed life expectancy and expected years of schooling to be instrumental variables for IDI. In the meantime, we treat all regressors as predetermined variables in the system-GMM estimation.

The analysis finds that a 1%-point increase in ICT development growth can potentially lead to about 0.24%-point rise in per capita income. On the other hand, a rise in life expectancy can decrease the growth rate of GDP per capita as productivity is likely to decline when people grow old. Another dimension of human development is education, which includes IDI, which is the ICT skills sub-index. We, therefore, imply that the estimation is also positively significant due to the positive effect that ICT has on economic welfare.

The demographic change in Indonesia possibly leads to a demographic dividend. The results show that for every 1%-point increase in the ration of the participation rate, the economic welfare will rise by 0.16% point. Meanwhile, a 1%-point increase in the share of the working-age population will generate a roughly 0.19%-point increase in per capita income. These findings are robust since they satisfy the specification tests such as the serially uncorrelated error assumption test and the OIR test.

For policy implications, policymakers should set more policies supporting the working-age population in the labor market. Even though the SWAP variable has a positive impact on GDP per capita, the magnitude remains relatively low. The findings recommend policymakers to first prioritize enhancing the level of ICT development. Second, the government need to assure that the economy creates much more employment to absorb the abundant working-age population to ensure the stability of the labor market. Finally, policies must encourage more people to participate in economic activities such as persuading women to be involved in the economy.

6. Limitations

Future studies should improve the analysis by dividing the ICT Development Index (IDI) into its sub-indices, namely ICT access, ICT usage, and ICT skills. It is recommended that this distribution of ICT be carried out to enrich the analysis of the links between ICT and human development and economic welfare.

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References

Acemoglu, D. (2009). Introduction to modern economic growth. In *Princeton University Press Published*. Princeton University Press.

Aghaei, M., & Rezagholizadeh, M. (2017). The Impact of Information and Communication Technology (ICT) on Economic Growth in the OIC Countries. *Economic and Environmental Studies*, *17*(2), 255–276. https://doi.org/10.25167/ees.2017.42.7 1.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29–51.

Asongu, S. A., & Odhiambo, N. M. (2019). How enhancing information and communication technology has

affected inequality in Africa for sustainable development: An empirical investigation. *Sustainable Development*, *27*(4), 647–656.

Baerlocher, D., Parente, S. L., & Rios-Neto, E. (2019). Economic effects of demographic dividend in Brazilian regions. *Journal of the Economics of Ageing*, *14*(April), 100198. https://doi.org/10.1016/j.jeoa.2019.100198

Bloom, D. E., & Canning, D. (2005). *Global Demographic Change: Dimensions and Economic Significance* (Issue 1).

Bloom, D. E., Canning, D., & Malaney, P. N. (1999). Demographic Change and Economic Growth in Asia. In *East Asia* (Issue 15).

Bloom, D. E., Canning, D., & Rosenberg, L. (2011). *Demographic Change and Economic Growth in South Asia* (Issue 67).

Bloom, D. E., & Finlay, J. E. (2008). *Demographic Change and Economic Growth in Asia* (Issue 41).

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143.

Cameron, A. C., & Trivedi, P. K. (2009). Microeconometrics Using Stata. In *A Stata Press Publication*. Stata Press.

Choudhry, M. T., & Elhorst, J. P. (2010). Demographic transition and economic growth in China, India and Pakistan. *Economic Systems*, *34*(3), 218–236. https://doi.org/10.1016/j.ecosys.2010.02.001

Cruz, M., & Ahmed, S. A. (2018). On the impact of demographic change on economic growth and poverty. *World Development*, *105*, 95–106. https://doi.org/10.1016/j.worlddev.2017.12.018

Das, A., Khan, S., & Chowdhury, M. (2016). Effects of ICT Development on Economic Growth in Emerging Asian Countries. In B. Dey, K. Sorour, & R. Filieri (Eds.), *ICTs in Developing Countries: Research, Practices and Policy Implications*. Palgrave Macmillan. https://doi.org/10.1057/9781137469502

Dornbusch, R., Fischer, S., & Startz, R. (2011). Macroeconomics. In *The McGraw-Hill Companies, Inc.* (Eleventh). McGraw-Hill.

Erumban, A. A., & Das, D. K. (2016). Information and communication technology and economic growth in India. *Telecommunications Policy*, *40*, 412–431. https://doi.org/10.1016/j.telpol.2015.08.006

Fang, C. (2018). Population dividend and economic growth in China, 1978–2018. *China Economic Journal*, *11*(3), 243–258. https://doi.org/10.1080/17538963.2018.1509529

Hong, J. Pyo. (2017). Causal relationship between ICT R&D investment and economic growth in Korea. *Technological Forecasting and Social Change*, *116*, 70–75. https://doi.org/10.1016/j.techfore.2016.11.005

Hwang, W. S., & Shin, J. (2017). ICT-specific technological change and economic growth in Korea. *Telecommunications Policy*, *41*(4), 282–294. https://doi.org/10.1016/j.telpol.2016.12.006

Kementerian PPN/Bappenas. (2014). Rencana Pembangunan Jangka Menengah Nasional 2015-2019: Buku I Agenda Pembangunan Nasional. In *Kementerian PPN/Bappenas*. Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional.

Kementerian PPN/Bappenas. (2018). Rencana Kerja Pemerintah Tahun 2019. In *Kementerian PPN/Bappenas*. Kementerian PPN/Bappenas.

Kementerian PPN/Bappenas. (2019). Rancangan Teknokratik Rencana Pembangunan Jangka Menengah Nasional 2019-2024. In *Kementerian PPN/Bappenas*. Kementerian PPN/Bappenas. https://www.bappenas.go.id/id/data-dan...dan.../rpjmn-2015-2019/

Latif, Z., Mengke, Y., Danish, Latif, S., Ximei, L., Pathan, Z. H., Salam, S., & Jianqiu, Z. (2018). The dynamics of ICT, foreign direct investment, globalization and economic growth: Panel estimation robust to heterogeneity and cross-sectional dependence. *Telematics and Informatics*, *35*(2), 318–328. https://doi.org/10.1016/j.tele.2017.12.006

Liu, S., & Hu, A. (2013). Demographic change and economic growth: Theory and evidence from China. *Economic Modelling*, *35*, 71–77. https://doi.org/10.1016/j.econmod.2013.06.041

Mason, A., Lee, R., & Jiang, J. X. (2016). Demographic dividends, human capital, and saving. *Journal of the Economics of Ageing*, *7*, 106–122. https://doi.org/10.1016/j.jeoa.2016.02.004

Misra, R. (2017). Impact of Demographic Dividend on Economic Growth: A Study of BRICS and the EU. *International Studies*, *52*(1–4), 99–117. https://doi.org/10.1177/0020881717714685

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, *9*(1), 86–136.

RS, P. H. (2017). Impact of Icts Development on economic growth in Indonesia. *IOSR Journal of Economics*

and Finance (IOSR-JEF), *8*(5), 49–56. https://doi.org/10.9790/5933-0805034956

the Assistance Team on Fiscal Decentralization for the Minister of Finance Republic of Indonesia. (2011). Indonesia's Intergovernmental Transfer: Response on Future Demographics and Urbanization Shifts. In *the Assistance Team on Fiscal Decentralization for the Minister of Finance Republic of Indonesia* (Issue November).

Vu, K. (2013). Information and communication technology (ICT) and Singapore's economic growth. *Information Economics and Policy*, *25*(4), 284–300.

Wongboonsin, K., & Phiromswad, P. (2017). Searching for empirical linkages between demographic structure and economic growth. *Economic Modelling*, *60* (February 2016), 364–379. https://doi.org/10.1016/j.econmod.2016.09.023

Wooldridge, J. M. (2013). Introductory Econometrics, A Modern Approach, Fifth Edition. In *Cengage Learning*. Cengage Learning.

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Research Paper

Impact of ICT Adoption on Inequality

Evidence from Indonesian Provinces

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Abstract

This study investigates the relationship between ICT adoption ratio and income inequality. While the majority studies explain the impact of ICT on income inequality via labor market, this study offers a different perspective on this relationship. The fast-growing ICT has influenced, not only the employment income, but also the household income, such as property income, consumer surplus, etc. Thus, this study seeks to show the impact of ICT on income inequality via household income channel. The large internet economy and the remarkable internet adoption increase in Indonesia demonstrate the considerable impact of ICT on the lives and income of people in Indonesia. By using panel data regression, this paper shows an inverted U-shape relationship between ICT adoption and income inequality. Low ICT adoption increased income inequality until a certain turning point, whereby higher ICT adoption reduced income inequality in society. The turning point relating to average adoption ratio of mobile phone, computer, and internet was 25%; while there was an average adoption ratio of 17% for computer and internet.

Keywords: Income Inequality, ICT, Indonesia, household income

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1. Introduction

The impact of information, communication, and technology (ICT) adoption on the inequality of income distribution is a widely discussed topic by economists because of the speedy advancement on ICT development nowadays. It is important to pay remarkable attention on this issue as ICT is diffused into almost all aspects of human life and become a key factor on determining the sustainable development. On one side, the ICT diffusion gives benefit on people who use it, but on the other side, it widens the productivity gap between the ICT users and non-ICT users. However, as the prices are lower and more people can afford it, the benefit of ICT is spread to almost all the layers of society and is projected to lower the income inequality level. Therefore, this study provides evidence of the impact of ICT adoption on income inequality.

In recent decades, income inequality within countries is argued to be rising (Atkinson, 2003; Goesling, 2001). Literature has shown that several factors are recognized as the source of income inequality. Technical change is acknowledged as one key element of rising inequality over the world in recent decades. Since most new technologies are skill-intensive, the introduction of new technology leads to a technical change that has a skill-biased characteristic, where skilled workers are preferred and the demand for such workers increase. This leads to a rise in their prices (wages) relative to their unskilled counterparts and leave the employees behind with low wage. ICT is one of the fastest growing technologies that pilots technical change and probably influences inequality in society in recent times.

The use of ICT by producers and consumers across the globe has grown rapidly since the last decade of the 20th century. In the early phases, a lot of literature focused on the impact of ICT use in production and productivity from a producer perspective; however, the involvement of consumers and households in the use of ICT has increased substantially over years. Moreover, the service content of ICT has increased rapidly over the years. There were substantial changes in ICT during the last decade. In this case, the earlier studies discussed about computer and software, nowadays, people talk about cloud computing and ICT services more than a computer. Through these new forms, ICT has influenced almost all aspects of human life such as transportation, services, entertainment, communication, etc. People increasingly use the technology to communicate with others to order transportation services, to make virtual financial transactions, to shop products and services that are delivered to their home, and to access entertainment services. All of them can be done either using their mobile phones or computers.

However, not everyone benefits from the advancement of ICT, as the digital divide or the uneven distribution in the access to ICT across different socio-economic groups still persist (Norris, 2001). This is particularly correct in some developing countries, where the gap between the rich and poor is often large (Chinn & Fairlie, 2004; Pick, Sarkar, & Johnson, 2015). Rich people/countries, who have the capital to acquire ICT, have bigger opportunity to enjoy the benefits of the technology quickly, while the poor ones need time to get the benefit of using ICT, to earn more capital to acquire ICT or to wait until the ICT's price is lower and affordable for them (Ziemba, 2016). Even the price of ICT products has gone down drastically, there is still gap on ICT accessibility between the poor and the rich - the digital divide, that will create multiple impacts on society and economy - on growth, poverty, and inequality.

Provinces of Indonesia provide good data that help test the relationship between change in ICT adoption ratio and the change in inequality. With ICT adoption rate varying from the 19.26% internet adoption ratio in Papua and the 76.96% internet adoption ration in Jakarta in 2017, ICT adoption ratio among the provinces in Indonesia shows high difference. The internet adoption ratio in Indonesian provinces in 2016 are shown in Figure 1. This data variation is also supported by the average ICT adoption growth in Indonesia, which grew from 30% in 2012 to more than 45% in 2016.

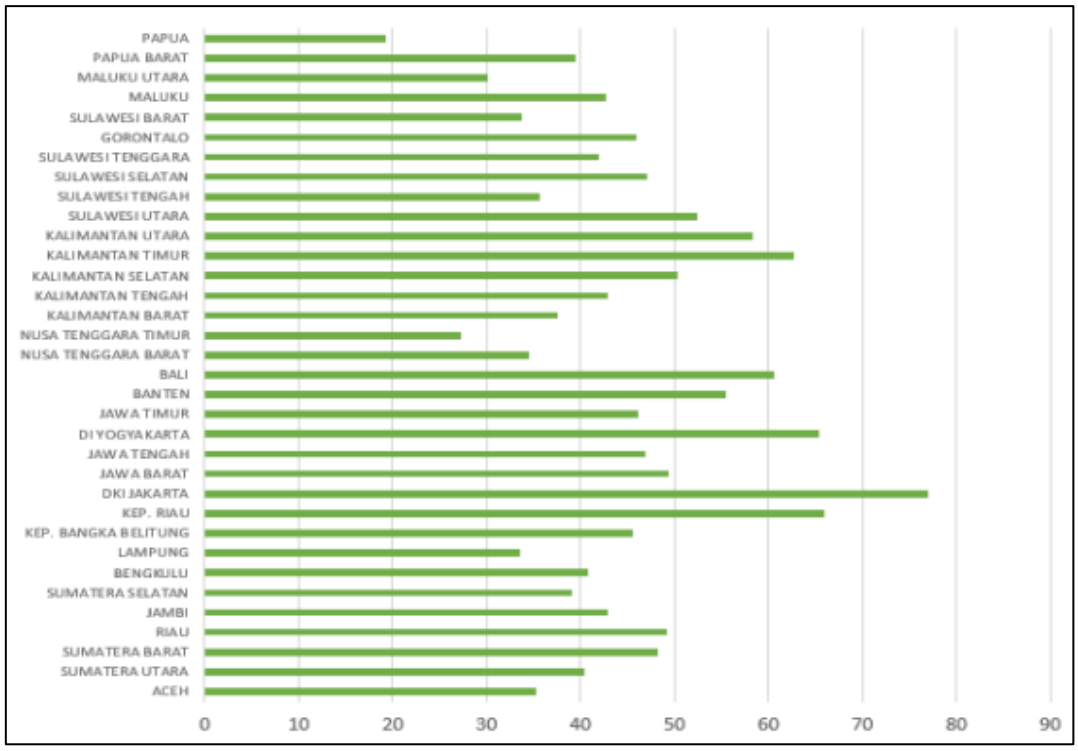

Figure 1. Internet adoption ratio in Indonesian provinces in 2016 (source: bps.go.id)

In addition, the inequality level in Indonesia is on an increasing trend, so it is important to find the determinant of the rising inequality as a way to solve it. By using a panel data of ICT adoption rate and income inequality level in thirty-four provinces from 2012 to 2016, we investigated the relationship between ICT adoption rate and inequality across Indonesian provinces and tested if the inverted U-shaped relationship persists.

2. Literature Review

In this section, we reviewed a number of studies related to the impact of ICT on income inequality. However, it is important to take a look at the role of ICT on economic growth previously because one of the channels of ICT influence economic growth is by means of the productivity effect which plays a vital role in determining income inequality. By recognizing that ICT can influence labor productivity, we showed how ICT can influence income inequality in the labor market. This channel has been extensively discussed both in developing and developed countries, as theoretical or empirical studies. Moreover, we provided literature reviews regarding the impact of ICT on households, which reveal the role of ICT on increasing household income. Further, we looked at the impact of ICT on income inequality through the household channel, as the uneven distribution of ICT persists in society.

2.1 Impact of ICT on Economic Growth

The onset of new technology can have disruptive effects initially, as envisaged by Schumpeter's famous creative destruction process (1942). New technologies can make existing technologies obsolete faster and firms are forced to discard their capital that uses the existing technology (Abdul Azeez Erumban & Timmer, 2012). It is during this initial phase of transition that several advanced economies fail to see improvement in productivity. However, once the deployment stage is over and technology is in place, studies have observed the positive impact of ICT on economic growth in three different channels, namely: production effect, investment effect, and productivity effect.

ICT-production sectors have been characterized by rapid technological progress. The Organization for Economic Co-operation and Development (OECD) (2001) showed evidence of a conspicuous increase in Multi-Factor Productivity (MFP) in ICT-producing sectors in the US and Finland from 1990-1999. This

increasing MFP was then followed by very large economies of scale (Colecchia & Schreyer, 2003), whereby producing a large number of ICT products, such as semiconductors, made the price of the products lower. Moreover, the capability of advanced technology makes the development of better quality products faster, which in turn influences the price of existing lower quality products to become lower (van Ark, Gupta, & Erumban, 2013). This price drop further creates considerable increase in demand and contributes to the economy (Ahmed, 2017).

As the price of ICT is decreasing globally, ICT has become more affordable for more firms and industries. Consequently, they are increasing their investment in ICT to gain an increase in MFP (van Ark et al., 2013). By performing growth accounting studies, some researches showed a positive relationship between investment in ICT and economic growth in a country (Cette, MAIRESSE, Kocoglu, & Mairesse, 2002; Colecchia & Schreyer, 2003; Abdul A. Erumban & Das, 2016; Timmer & van Ark, 2005). Moreover, empirical studies also described the significant positive impact of ICT investment on economic growth (Acharya, 2016; Aghaei & Rezagholizadeh, 2017; Spiezia, 2013; Stanley, Doucouliagos, & Steel, 2018).

By using ICT in the production process, labor can perform more efficient work to produce output, therefore, they can increase the amount of output produced. In terms of MFP, ICT provides a better method of combining capital and labor to produce output (van Ark et al., 2013). This study was supported by Oliner and Sichel (2002) and Jorgenson et al. (2002) in the US, Van Ark (2003) in the US and the EU, Faha and Vaumi (2015) in Cameroon and Wamboye et al. (2016) in sub-Saharan countries. Thus, based on the previous studies above, it is clear that ICT plays important role on economic growth and productivity.

2.2 Impact of ICT on Households

Instead of only influencing activity in firms and industries, ICT nowadays influences almost all aspects of human life. Countless studies provided evidence of the benefit experienced by households due to the adoption of ICT. For instance, a study asserted that ICT can benefit households by reducing asymmetric information between economic agents (Lindbeck & Wikstrom, 2000). This argument was supported by another study that presented a literature study on the benefits of the mobile phone by reducing negative factors (e.g. corruption, crimes, expensiveness) and increasing the positive (e.g. education, efficiency, health) through easier access to information and transparency (Bahmani-Oskooee, Hegerty, & Wilmeth, 2008). Further studies even showed the possibility that household income can be increased by adopting ICT, as shown in Table 1.

Table 1. Literature of the Impact of ICT Adoption on Households

Authors	Impact of ICT adoption on households
Irvine & Anderson (2008)	Increasing efficiency of the business process in hospitality services in Scotland
Cramer & Krueger (2016)	Greater utilization of ICT-equipped taxi driver (Uber) than the conventional taxi driver in the US during 2014-2015
McNamara (2003)	Learning better methods for producing, pricing and marketing their products and connecting them to the government to match their needs and the services provided
Mbuyisa & Leonard (2017)	Increasing market access, reducing production costs, and rising efficiency on information gathering
Flor (2016)	Reducing transportation cost, providing updated information, increasing networking, making it easier to run personal businesses and increase security
Hübler & Hartje (2016)	Information exchange, providing a job, weather information, mobile financial transactions, social networks, etc.
Cecchini (2003)	Having better access to markets, health, education, and financial services
Silva & Ratnadiwakara (2008)	Possibility of reducing transaction costs significantly by providing access to ICTs
Monga, Lin, Aker, & Blumenstock (2014)	Information sharing, money transfers, saving money and as devices to use in learning
Brynjolfsson, Hu, & Smith (2003)	Improving efficiency on book markets
Kim (2018)	Positive net consumer welfare of using mobile instant messenger in Korea
Byrne & Corrado (2017)	Consumer surplus in digital content delivery services

source: author

From these studies, we can see that there are numerous advantages to be gained by households adopting ICT instead of just an increase in employment income. However, household incomes cover all of the ICT benefits in property income as other income from other non-financial assets. By looking at ICT adoption at the household level, we can measure the households that experience income increases as a result of ICT.

2.3 Impact of ICT on Income Inequality

As previously mentioned, the diffusion of ICT is advantageous for economic growth by increasing productivity, both in industries and in households. However, there is a growing concern about the impact of this increasing productivity on income inequality, seeing as ICT does not benefit all types of workers in industries and the presence of the 'digital divide' at the household level.

Most of studies used the labor market channel to measure the impact of ICT on income inequality. The skill-biased characteristics of technology is suggested as the main reason for changes in the wage structure (Bound & Johnson, 1989). Computer technology plays a crucial role in increasing demand for high-skilled laborers relative to the medium-skilled and low-skilled laborers (Autor, Katz, & Krueger, 1997). Further research showed that the introduction of new technology might increase the wages of high skill laborers and reduce the wages of laborers whose jobs can be replaced by new technology (Acemoglu & Autor, 2010). This study is supported by Michaels Guy & Natraj Ashwini (2014) stating that there was a shift in demand from medium-skilled labor to high-skilled labor in fast-growing ICT industries in the US, Japan and nine European countries from 1980 until 2004.

Some other studies tried to offer a different perspective on the relationship between ICT and income inequality. Uneven ICT distribution among households means that only a limited number of people can enjoy the benefits of ICT and increase their income. In this situation, there will be an increasing income gap between households with ICT and ones without ICT (Bourdeau de Fontenay & Beltran, 2008; Ziemba, 2016). However, as the adoption of ICT has increased, more people benefit and earn higher incomes, which in turn further reducing the income inequality level. Asongu (2015) highlighted the positive income equalizing effect of mobile phones in 52 African countries from 2002-2009. A further study used the mobile phone as the proxy of ICT to study its impact on income distribution between eleven countries in Africa in 2011. By involving not only the adoption rate but also the intensive use of mobile phones, this study found that mobile phone usage has an income equalizing effect between countries (James, 2014). The summary of the channels of ICT influence income inequality is shown in Figure 2.

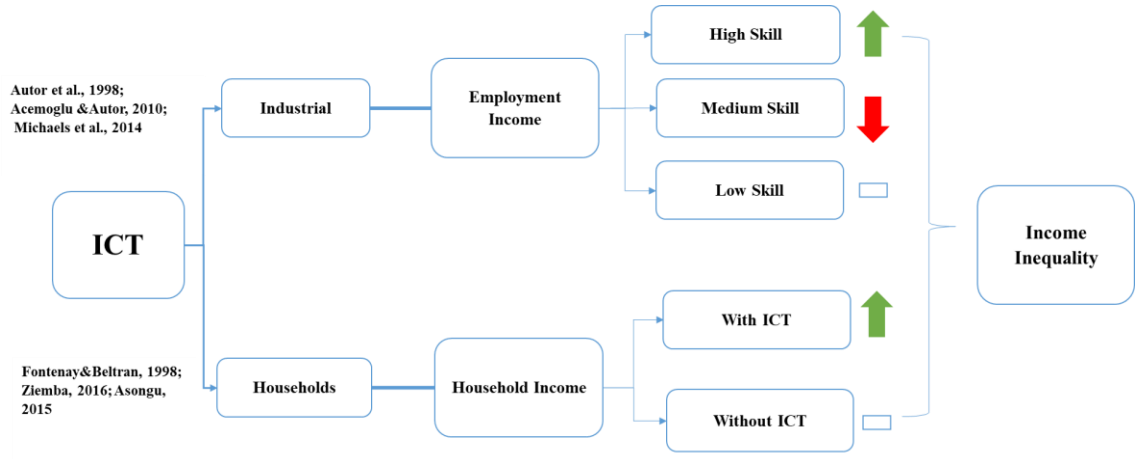

Figure 2. The summary of the channels of ICT influence income inequality (source: author)

In the light of the interesting previous literature, we were unable to find any study about the impact of ICT adoption on income inequality in Indonesia. The most prominent channel of the relationship

between ICT and income inequality, as identified by the previous literature, is by way of the supply side/labor market, but the benefit of ICT for households and the presence of the digital divide might also play a vital role in determining income inequality. While the income inequality study via labor market is widely available, the household channel, which can also change the income structure by reducing transaction cost, provide consumer surplus, etc., gets less attention. It is important to do this study because ICT diffusion influences almost all the aspects of human life instead of just in labor market. In 2019, Indonesia was recorded as the largest internet economy in the world with US$27 billion economic value and 49% compound annual growth rate during 2015-2018. In addition, four technology companies in Indonesia turned out to be billion dollars "unicorn" and became part of 300 biggest technology companies in the world. This diffusion changes not only the wage of labor, but also change the income structure in household level. Given the data limitations about the wage structure in Indonesia, we were not able to investigate the impact of ICT adoption on income inequality in the labor market. Therefore, this study examined the impact of ICT adoption in households on income inequality in Indonesia. In addition, the relationship between ICT adoption and income inequality remains unclear because some studies showed the possibility of ICT increasing income inequality (Bourdeau de Fontenay & Beltran, 2008; Ziemba, 2016), though other researches demonstrated the equalizing effect of ICT on income distribution (Asongu, 2015; James, 2014). Therefore, in this case, there might be an opportunity to implement the inverted U-shaped relationship of economic growth on income inequality introduced by Kuznets (1955).

3. Methodology

By observing the household adoption rate of ICT, we can get information about how far people, which are assumed to have a low capability on acquiring ICT, get benefit from ICT, where a high adoption ratio shows that more poor people gain the advantage from ICT. By controlling other factors that affect inequality, the effectiveness of newly-adopted (people who do not access ICT in previous periods) using ICT to increase their income and influence the gap to the rich. This study provided a contribution in three ways, namely: adding literature about the determinants of income inequality in Indonesia, providing empirical evidence about income inequality in the regional study, and showing the probability of inverted U-shape relationship between ICT adoption ratio and income inequality.

3.1 Hypotheses

In this study, we sought to answer the impact of ICT adoption ratio on income inequality in Indonesian provinces. For this, we used data of Indonesian provinces (the whole data used in this study was collected from the Indonesian Bureau of Statistic (bps.go.id) on Dynamic Table session) because of the variation in ICT adoption ratio and the data availability. After reviewing the existing studies related to the impact of ICT, we postulated the following hypotheses:

"The change of ICT adoption rate has a significant impact on the change of income inequality in Indonesia and the relationship is inverted U-shaped. At low adoption rate, the income gap between those who have access to the technology and those who do not will increase. Meanwhile, high ICT adoption rate means that more people enjoy the advantage of ICT that will reduce the income gap in society."

In this research, we used the mobile phone, computer, and internet access as the proxies of ICT because these devices are the most common ICT products that are used by households compared to other kinds of ICT proxies. Most of ICT benefits can be obtained by using a mobile phone. Nonetheless, the mobile phone has limited capacity to increase people productivity. A computer has better capacity on increasing productivity; however, to access ICT and gain benefit from it, a computer needs internet access.

The research method should be appropriate with the statement of the research problem. It should cover method used, measurement instrument, sampling method, data collection technique and data analysis. Data are described and adequate.

3.2 Methodology

Since the objective of the thesis was to understand the impact of ICT penetration on income inequality, we needed to measure income inequality, ICT and several possible control variables. We used the Gini coefficient as a measurement of income inequality, and multiple indicators including mobile phone, personal computer, and internet adoption ratio to capture the ICT adoption as a main explanatory variable. The study was a year of schooling, unemployment ratio, price index, and foreign direct investment in each province used as control variables that may have a significant impact on inequality.

The model we used in this thesis postulated a relationship between income inequality and ICT adoption, whether higher adoption ratios had any impact on income inequality. In addition, we also hypothesized that the impact of ICT adoption ratio on income inequality can be an inverted U-shape. Thus, we expected a positive significant impact of ICT on income inequality in low ICT adoption ratio, but a negative significant impact of ICT on income inequality in high ICT adoption ratio. To test the significant impact of ICT adoption on income inequality in Indonesian provinces, we followed the model that was used by (Dartanto, Yuan, & Sofiyandi, 2017) to measure the impact of structural change on income inequality and add ICT variables into the model. Moreover, to test if the relationship is inverted U-shape, we added the ICT square variable into the model. A positive impact of ICT and a negative impact of ICT square variables on inequality implied an inverted U-shape relationship between ICT and inequality.

$$lnGINI_{it} = \alpha_i + \beta_1 lnICT_{it} + \beta_2 lnICT_{it}^{\ 2} + \beta_3 RGDP_{it} + \beta_4 AGRI_{it} + \beta_5 MANU_{it} + \beta_6 FIN_{it} + \beta_7 GOV_{it} + \beta_8 EDU_{it} + \beta_9 UNEMP_{it} + \beta_{10} PRICE_{it} + \beta_{11} FDI_{it} + \beta_{12} POV_{it} + \varepsilon$$

lnGINI : the log of Gini coefficient.
LnICT : the average of log of adoption rate of mobile phone, computer, and internet
RGDP : real GDP per capita (in thousand US dollar)
AGRI : share of agriculture on GDP (percentage)
MANU : share of manufacture on GDP (percentage)
FIN : share of finance on GDP (percentage)
GOV : share of government expenditure on GDP (percentage)
EDU : average years of schooling
UNEMP : Open Unemployment Ratio (percentage)
PRICE : Price Index
FDI : Foreign Direct Investment Ratio to GDP
POV : Poverty Rate
i : province, i=1, …, 33
t : year t=2012, 2013, …, 2016

Since our data consist of 33 provinces and five years, we used a panel data analysis. A panel data can be estimated using pooled OLS (POLS), fixed effects (FE), or random effects (RE) estimation methods. The main difference between these methods can be found in the assumption of the coefficients of the variable. While POLS assumes that coefficients β_1 β_2 β_3 do not differ between individuals ($y_{it}=\beta_1+\beta_2 x_{2it}+\beta_3 x_{3it}+\varepsilon_{it}$), FE assumes different intercepts β_{1i} between individuals but keep a constant slope coefficients β_2 β_3 ($y_{it}=\beta_{1i}+\beta_2 x_{2it}+\beta_3 x_{3it}+\varepsilon_{it}$). In RE, all individuals differences are captured by the intercept coefficient ($\beta_{1i}=\bar{\beta}_1+u_i$) but presented as an average and random value so the model l become $y_{it}=\bar{\beta}_1+\beta_2 x_{2it}+\beta_3 x_{3it}+v_{it}$, where $v_{it}=\varepsilon_{it}+u_{it}$. FE is chosen if we are interested on individual effects of the sample, while RE is preferred if the individual effects is not our interest. Moreover, POLS is preferred when there are no random or fixed individual differences among sample members. However, in our study, we did a number of statistical tests to make the appropriate choice, namely:

1. Chow test to choose between POLS and FE,
2. Hausman test to choose between FE and RE, and
3. Lagrange Multiplier (LM) test to choose between POLS and RE.

Besides, we considered the impact of control variables on income inequality. A good empirical model provides a significant result on control variables as in the literature review. Thus, the significance of control variables was also considered to choose the model in this study.

3.3 Data and Variables

The whole data used in this study were collected from the Indonesian Bureau of Statistic (bps.go.id) on Dynamic Table session. Since the objective of the thesis is to understand the impact of ICT penetration on income inequality, we needed to measure income inequality, ICT and several possible control variables. We used the Gini coefficient as a measurement of income inequality, and multiple indicators including mobile phone, personal computer, and internet adoption ratio to capture the ICT adoption as a main explanatory variable. The study was conducted across 33 provinces across Indonesia in the period of 2012-2016. In addition, real GDP per capita, the share of agriculture, manufacture, finance, trade, and government on GDP, poverty rate, average years of schooling, unemployment ratio, price index, and foreign direct investment in each province were used as control variables that may have a significant impact on inequality.

Gini Coefficient (GINI) is the most common indicator used to measure income inequality. This coefficient is obtained from the Lorenz curve, which is the sort of people from the lowest income to the highest income in a country or region and shows the population accumulation in axis x and the income accumulation in axis y. If the value of GINI is one, the population is considered to have perfect inequality, while zero indicates a perfectly equal population. There are some other measurements that are used to estimate the inequality, such as top 1 percent and top 10 percent income, Interdecile p50/p10, Palma ratio, s80/s20 quintile ratio, etc. We used GINI in this study because of the availability of the data. Indonesian Bureau of Statistic provided data on Gini coefficient for urban area, rural area, and the combination of both areas. The website (bps.go.id) provide an option for Gini coefficient for the first and second half of the year and also for the whole year, from 2002 until 2018. However, the data are only available for the first half year, while the second half and the whole year's option resulted in no data. For this study, we used the combined data of both rural and urban areas that represented the whole condition of a province in Indonesia. We used the period of 2012-2016 because of the lack of data on some other indicators. It is important to evaluate whether the analysis should address the research problem or not. Analysis should also address the implications and link to the research problem. The argument should be also based on the strong theoretical framework, data and valid information.

Average ICT adoption ratio (ICT): The average value of mobile phone, computer, and internet adoption ratio in a province in Indonesia, where mobile phone adoption ratio shows the percentage of households that own or have the right to use a mobile phone in a province; computer adoption ratio indicates the percentage of households that own or have the right to use a personal computer in a province; and internet access ratio offers the ratio between the number of households that access the internet at least once in the last three months before the survey was done and the total number of households in a province. The use of these three tools as proxies of ICT is important because they are the most general and affordable ICT devices that can be used by households to access the benefit of ICT. However, mobile phone adoption ratio does not provide information regarding the type of mobile phone that is owned by households, in which smartphone provides a larger benefit than a conventional mobile phone. An increase in the average ICT adoption ratio shows that there are new people who use ICT in their daily life and be exposed by the benefit of ICT.

In this study, we assumed that increasing income inequality in low average ICT adoption ratio because, in the early phase, only rich people had access to ICT, while the poor left behind and led to a wide gap between them. However, as the adoption ratio increases, more people have access to ICT and enjoy the benefit of ICT that elevate their whole life quality and finally reduce the welfare gap in society. Therefore, in this study, we assumed a positive significant relationship between ICT and GINI, and negative significant relationship between ICT2 and GINI.

Regional Gross Domestic Product (RGDP): Regional gross domestic products provide the per capita expenditure in each province during 2012-2016. This variable used constant price in 2010. The importance

of this economic indicator was pretty clear in some studies, but the direction of the impact was ambiguous because some studies showed a positive impact of economic growth to income equality, while the others explained different situations.

Economic Structure (AGRI, MANU, FIN, GOV, TRADE): The GDP share of agricultural, manufacturing, financial service, government expenditure, and trade sector on total GDP. It is important to control these indicators because some studies showed the impact of structural economic changes to inequality, where the shift from agriculture to manufacturing, agriculture to services, and manufacture to services increased income inequality in Indonesia. Moreover, an increase in government share means that the government has more money to solve the social problems exists in society, where income inequality is one of the problems. Trade plays an essential part in the Indonesian economy because of the high number of small and medium enterprises (SMEs) in Indonesia. Previous studies showed that a higher share of trade sector on GDP reduced the income inequality.

Poverty Rate (POV): Number of people who live under the poverty line in a province in Indonesia. This poverty line is the summation of food and non-food poverty lines, where the food poverty line is described as the minimum expenditure that must be spent by an individual to gain 2,100 kilocalorie food per capita per day and the non-food poverty line is the minimum expenditure to gain commodity such as housing, clothing, education, and health, based on Basic Needs Commodity Package Survey 2014 in Indonesia. There are two periods of time available for this data yearly, first and second half-year. For this study, we used the average of the first and second half year. An increase in poverty rate means a lower average income in society that will increase income inequality.

Average Years of Schooling (EDU): The average years of schooling for people with age more than 15 years in a province. Finishing basic school is measured as a six-years of schooling, finishing primary high school is measured as a nine-years of schooling, and finishing secondary high school is measured as a twelve-years of schooling, without considering any longer times of schooling in those schools. Higher education is measured as the years attempted in certificates. Higher education level is expected to have a negative significant relationship on income inequality.

Unemployment Rate (UNEMP): The percentage of the workforce that does not have a job, including people that are still seeking for a job, getting ready to be an entrepreneur, not seeking for the job because they think that they will not have any job, and people that have a job, but don't start to work. This concept is based on the ILO Manual and Concept Methods. There are three options of data that are provided in Indonesia's Bureau of Statistics website, namely: February, August, and yearly data. In this study, we used the average between February and August data because the yearly data was currently not available. Existing studies indicated a positive relationship between unemployment condition with inequality, where high unemployment level led to high income inequality.

Inflation Rate (PRICE): Inflation rate is the change in the prices of goods and services. If the change in the domestic price of goods and services increases, the inflation rate increases. This increasing price will result in a lower value of the domestic currency in term of the general value of goods and services. In this study, we used the data of the general price index to describe inflation with the year 2010 as the base year (price=100). The data were available for some cities in a province, but in this study, we used the data of the capital city of each province. Based on previous studies, we assumed a negative impact of inflation on income inequality.

Foreign Direct Investment (FDI): total investment from foreign countries that come to a province in one year. This investment was measured in million US dollars. The previous study offered a positive effect of foreign direct investment on income inequality.

The summary of the data used in this study is shown in Table 2.

Table 2. Hausman and Breusch and Pagan Lagrangian Multiplier Tests Results

Variable	Observation	Mean	Std. Dev.	Min	Max
lnGINI	165	-.990	.105	-1.290	-.816
lnICT	165	3.594	.265	2.788	4.168
lnICT2	165	12.988	1.880	7.772	17.370
RGDP1000	165	35.806	28.557	10.031	149.848
AGRI	165	20.035	9.664	.090.090	41.901
MANU	165	15.837	11.226	1.248	43.720
FIN	165	2.951	1.574	.862	10.928
GOV	165	6.037	3.945	1.631	20.162
TRADE	165	12.002	3.479	4.586	18.381
EDU	165	7.923	.972	5.73	10.88
UNEMP	165	5.044	2.258	1.37	10.68
PRICE	165	125.586	11.380	108.43	152
FDIR	165	.514	.828	.001	6.970
POV	165	11.997	6.282	3.635	31.33

source: bps.go.id (calculated by author)

4. Results

We did some regressions following the formulated model. In doing the regression, we did it by using full model as we included all the ICT variables in regression, and partial models where we relaxed one ICT proxies to see the impact of one ICT without the existence of other ICT tools. Moreover, we relaxed the education variable to avoid the presence of endogeneity problem because education might influence other independent variables. After doing Hausman and Lagrange tests to choose a preferred regression approach, we decided to use random effects method because the full model shows a weakly significant result of the difference in coefficients. Even though the result was significant when we removed the mobile phone in measuring the average ICT adoption, we kept using the random effect to make it comparable with the full model. Moreover, we considered that there were no specific characteristics in each province that influenced the regional inequality level. The results of the tests are shown in Table 3.

Table 3. Hausman and Breusch and Pagan Lagrangian Multiplier Tests Results

	Full Model	COM+INT	Full Model-EDU	COM+INT-EDU
Hausman Test				
Chi2	21.20	31.43	18.24	53.59
Prob>chi2	0.0476	0.0029	0.0762	0.0000
Breusch and Pagan Lagrangian Test				
Chibar2	102.05	94.41	109.98	103.09
Prob>chibar2	0.0000	0.0000	0.0000	0.0000

By using the random effects approach, we got the regression result as shown in Table 4.

Table 4. Regression Result

Variable	Full Model	COM+INT	Full Model-EDU	COM+INT-EDU
lnICT	.9604*		.9471*	
lnICT2	-.1536**		-.1506**	
lnCOMINT		.5713**		.5657**
lnCOMINT2		-.1059**		-.1043**
RGDP1000	-.0012	-.0011	-.0010	-.0010
AGRI	-.0024	-.0023	-.0022	-.0022
MANU	.0018	.0018	.0018	.0019
FIN	.0518***	.0533***	.0522***	.0537***
GOV	-.0103**	-.0100**	-.0095**	-.0093**
TRADE	-.0165***	-.0167***	-.0163***	-.0166***
EDU	.0113	.0101		
UNEMP	.0025	.0025	.0028	.0027
PRICE	.0000	.0001	.0000	.0001
FDIRATIO	-.0032	-.003	-.0031	-.0032
POV	.0073***	.0076***	.0066***	.0069***
_cons	-2.4725***	-1.7584***	-2.2856***	-1.6858***
Observations	165	165	165	165

legend: * p<0.1; ** p<0.05; *** p<0.01

The regression result of the full model show that when we included all the variables and measured average ICT adoption as the average adoption in mobile phone, computer, and internet adoption, the adoption rate offered weakly significant positive impact of ICT adoption on income inequality, meaning that the increase in ICT adoption would increase income inequality in Indonesian provinces. After excluding the mobile phone adoption ratio from the average ICT adoption, we found that the impact of ICT adoption became stronger, but with a lower coefficient. This might happen because we could not distinguish the types of mobile phone used by the households, either a conventional mobile phone or a smartphone, where a smartphone provides higher benefit for the users than the conventional one. One percent increase on the average percentage of computer and internet adoption increased the Gini coefficient by 0.57 percent; meanwhile, one percent increase on the average percentage of mobile phone, computer, and internet adoption increased the Gini coefficient by 0.96 percent. However, the significant negative impact of the square of ICT adoption on income inequality showed the inverted U-shape relationship between ICT adoption and income inequality. With this inverted U-shape relationship, we could calculate the turnover value of the log of average ICT adoption, which was beyond this average ICT adoption, and an increase in ICT adoption lowered the income inequality. By assuming the first difference of the Gini was equal to zero, we calculated the turning point of the log of ICT adoption as: (1) the average mobile phone, computer, and internet adoption: 22.79%; and (2) the average computer, and internet adoption: 14.84%.

Therefore, by reaching the average ICT adoption ratio for mobile phone, computer, and internet by 22.79 percent or average adoption of computer and internet by 14.84 percent, ICT could have a positive impact on income equality. This result is in line with Kuznets' inverted U-shape relationship of economic growth and income inequality to the relationship between ICT adoption and income inequality. This is probably because of the similar characteristic of economic growth and ICT, where both of them can be beneficial for poor people if only the distribution experienced by the poor. While the distribution of economic growth was not easy to measure, the distribution of ICT can be reflected in ICT adoption ratio, where the rich usually adopt ICT earlier. A high ICT adoption ratio implied a well-distributed ICT that made a negative impact of ICT on income inequality in society. This finding is in line with the studies stating that ICT is beneficial for households (Hübler & Hartje, 2016; Lindbeck & Wikstrom, 2000). This also supports the poverty reduction function of ICT (Agüero & de Silva, 2011; Cecchini, 2003; Jensen, 2007; Mbuyisa & Leonard, 2017; McNamara, 2003). Thus, this paper provided the behavior of how ICT adoption can help poor people in Indonesia.

Moreover, the insignificant impact of real GDP per capita on inequality denied the previous study that used the US as the object (Panizza, 1999). This might occur due to a different characteristic of Indonesia and the US, where Indonesia is an developing country and the US is a developed country; wherein developed countries, the income might have distributed more equal compared to the distribution in developing countries. However, this unimportant role of economic growth on determining income inequality was also found in previous study (Bahmani-Oskooee et al., 2008).

Economic structure, which has a critical function on settling the income inequality in Indonesia (Afandi, Rantung, & Marashdeh, 2017; Dartanto et al., 2017; Novalia, 2014), also showed an essential part on this study. Even agriculture and manufacture do not provide a significant impact on income inequality, the financial sector which is considered as a service sector shows a positive significant effect on income inequality. This was probably because this service sector usually required high-skilled workers, so an increasing share in this sector will increase the demand of this type of labor and finally raise their income which will finally expand the gap with the low-skilled workers. The role of the government sector on controlling inequality is clearly seen in this study. In this case, an increase in government shares on GDP decreased inequality among society. This finding supports the research that the government has an important part of providing ICT for the poor to reduce poverty (Flor, 2016). As a democratic country, all resources in Indonesia that are essential for society are managed by the country for people interest. As ICT is one of central resource needed by public, government play important role on regulating it. Yet, ICT is not the only tool for the government to reduce poverty and increase inequality. Another economic structure variable, the share of trade on GDP, also participate in specifying the inequality level. Rise of the trade portion on GDP will reduce the inequality within the society. This might relate to the high segment of small and medium enterprises (SMEs) in Indonesia, hence an increasing portion of trade means that more poor people engage in trades that probably increase their life quality and reduce the income inequality.

Education surprisingly became insignificant factors to influence income inequality in Indonesian provinces. This result opposed the existing literature studies that explicate the importance of human capital on alleviating poverty. Actually, this immaterial role of education also happened in a study of income inequality in Indonesia (Dartanto et al., 2017). The low average years of schooling in Indonesia might cause this unimportant role of human capital on influence inequality. As described in the data description, the average years of schooling in Indonesia are less than 8 years, which means that more than half of the young people in Indonesia do not graduate from a secondary high school. Different from existing literature, unemployment was a minor aspect to influence income inequality in Indonesia (Akinbobola & Saibu, 2004). This might correlate with the finding stating that unemployment can make an impact on inequality in case of extreme inequality, while the inequality in Indonesian provinces was not extreme (Tregenna, 2011). This finding is also in line with a study that didn't find any systematic relationship between income inequality and unemployment (Saunders, 2002). The low average income level in Indonesian provinces might be the reason for the insignificant impact of unemployment on income inequality. The low average income and non-extreme inequality provided small gap between the employed and the unemployed people, where the change of unemployed people did not influence the gap that was already small.

Inflation, in the form of the price index, also performed a little part in determining income inequality in this study. The possible explanation for this condition is that inflation influences almost all levels of society. Even though the literatures explain the equalizing effect of inflation because of its benefit for the middle-income people (Adam & Zhu, 2016; Meh & Terajima, 2011), it also creates a loss for the poor people that severe the income inequality between the middle income and the poor. As a result, the gap between the rich and middle-income people got closer, but the gap between the middle-income people and the poor got wider.

The incoming investment to Indonesian provinces does not provide essential impact on inequality in Indonesia provinces. This fact declines the study that FDI influence inequality through the transfer of technology that leads to skill-biased technological change (Lee & Wie, 2015). In this study, a low level of transfer of knowledge can be considered as the main aspect in a small impact of FDI to inequality. In this study, we can see that it is not only the level of incoming investment that influence the income inequality. Transfer of knowledge that is embedded in FDI must also be considered on measuring the relationship between incoming FDI and income inequality.

5. Conclusions

Income inequality is always an important issue in a country because of its essential impact on economy and society. Many studies have been done to find out the determinants as a way to find the solution to this problem. However, there is a limited number of studies performed to revise the income inequality determinants in Indonesia. On the other hand, the increasing diffusion of ICT in society shows its rising needs for a better life. The growing significance of ICT on determining the quality of life might also influence the income inequality condition in a region. By looking at the ICT adoption ratio, we get the description of the distribution of ICT among the households in Indonesian provinces. Well-distributed ICT will increase the number of people who can enjoy the benefit of ICT and increase their life quality. This study contributed on providing more literature about the determinants of inequality in Indonesia and supporting the possibilities of an inverted U-shape relationship between ICT adoption and income inequality. By knowing the turning point of the inverted U-shape relationship, we can get a minimum ICT adoption ratio that must be achieved to reduce income inequality in society, otherwise, the ICT will increase the income inequality.

There are three important points that can be taken from this empirical study of 33 provinces in Indonesia during 2012-2016. First, ICT adoption rate is important to determine the level of income inequality in Indonesia. From the regression result, we get that ICT adoption has two different effects on income inequality. On one hand, it increases the income inequality, but on the other hand, the effect is slowing as the adoption rate increase. Because of the existence of these opposite effects, ICT adoption will give no impact on income inequality in a certain point. By passing this certain ICT adoption level, government can use ICT to reduce income inequality in society. Second, it is important for the government to reach about 23 percent of the average adoption rate of mobile phone, computer, and internet or about 15 percent of the average adoption rate of computer, and internet to generate a positive impact of ICT on inequality. Third, the government can support the trade sector to increase reduce inequality in society.

There are some developments that can be done to support this study. Categorizing the speed of internet, the type of mobile phone and computer, or the coverage of internet in sample area will provide a more accurate result on the impact of ICT adoption on income inequality. Moreover, a more sophisticated regression method can be applied to see this problem in different viewpoint.

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References

Acemoglu, D., & Autor, D. (2010). Skills, Tasks and Technologies: Implications for Employment and Earnings. *NBER Working Paper*, *16082*.

Acharya, R. C. (2016). ICT use and total factor productivity growth: Intangible capital or productive externalities? *Oxford Economic Papers*, *68*(1), 16–39. https://doi.org/10.1093/oep/gpv058

Adam, K., & Zhu, J. (2016). Price-Level Changes and the Redistribution of Nominal Wealth across the Euro Area. *Journal of the European Economic Association*, *14*(4), 871–906. https://doi.org/10.1111/jeea.12155

Afandi, A., Rantung, V. P., & Marashdeh, H. (2017). Determinant of income inequality in Indonesia. *Economic Journal of Emerging Markets*, *9*(2), 159–171. https://doi.org/10.20885/ejem.vol9.iss2.art5

Aghaei, M., & Rezagholizadeh, M. (2017). The Impact of Information and Communication Technology (ICT) on Economic Growth in the OIC Countries. *Economic and Environmental Studies*, *17*, 257–258.

Agüero, A., & de Silva, H. (2011). Bottom of the Pyramid Expenditure Patterns on Mobile Phone Services in Selected Emerging Asian Countries. *SSRN Electronic Journal*, *7*(3), 19–32. https://doi.org/10.2139/ssrn.1551775

Ahmed, E. M. (2017). ICT and Human Capital Spillover Effects in Achieving Sustainable East Asian Knowledge-Based Economies. *Journal of the Knowledge Economy*, *8*(3), 1086–1112. https://doi.org/10.1007/s13132-016-0430-4

Akinbobola, T. O., & Saibu, M. O. O. (2004). Income inequality, unemployment, and poverty in Nigeria: a vector autoregressive approach. *The Journal of Policy Reform*, *7*(3), 175–183. https://doi.org/10.1080/1384128042000261800

Asongu, S. A. (2015). The impact of mobile phone penetration on African inequality. *International Journal of Social Economics*, *42*, 706–716.

Atkinson, A. C. (2003). Income Inequality in OECD Countries: Data and Explanations. *CESifo Working Paper*, *881*.

Autor, D. H., Katz, L. F., & Krueger, A. B. (1997). Computing Inequality: Have Computers Changed The Labor Market?

Bahmani-Oskooee, M., Hegerty, S. W., & Wilmeth, H. (2008). Short-Run and Long-Run Determinants of Income Inequality: Evidence from 16 Countries. *Journal of Post Keynesian Economics*, *30*(3), 463–484. https://doi.org/10.2753/PKEO

Bound, J., & Johnson, G. (1989). Changes in the Structure of Wages during the 1980's: An Evaluation of Alternative Explanations. *NBER Working Paper*, *2983*(May). Retrieved from

http://www.nber.org/papers/w2983

Bourdeau de Fontenay, A., & Beltran, F. (2008). Inequality and economic growth: Should we be concerned by the digital divide? *International Telecommunications Society*, *17*(May), 1–37.

Brynjolfsson, E., Hu, Y. J., & Smith, M. D. (2003). Consumer surplus in the digital economy: Estimating the value of increased product variety at online booksellers. *Management Science*, *49*(11), 1580–1596. https://doi.org/10.1287/mnsc.49.11.1580.20580

Byrne, D., & Corrado, C. (2017). ICT Prices and ICT Services: What do they tell us about Productivity and Technology? *Finance and Economics Discussion Series*, *2017*(015), 150–181. https://doi.org/10.17016/feds.2017.015

Cecchini, S. (2003). Tapping ICT to reduce poverty in rural India. *IEEE Technology and Society Magazine*, *22*(2 SPEC), 20–27. https://doi.org/10.1109/MTAS.2003.1216239

Cette, G., MAIRESSE, J., Kocoglu, Y., & Mairesse, J. (2002). Diffusion of ICTs and Growth of the French Economy over the Long-term, 1980-2000. *International Productivity Monitor*, *4*, 27--38.

Chinn, M. D., & Fairlie, R. W. (2004). The Determinants of the Global Digital Divide. *NBER Working Paper*, *10686*. Retrieved from http://www.ssc.wisc.edu/~mchinn/chinn_fairlie.pdf

Colecchia, A., & Schreyer, P. (2003). The Contribution of Information and Comunication Technologies to Economic Growth in Nine OECD Countries. *OECD Economic Studies*, *2002*(1), 153–171. https://doi.org/10.1787/eco_studies-v2002-art5-en

Cramer, J., & Krueger, A. B. (2016). Disruptive change in the taxi business: The case of uber. *American Economic Review*, *106*(5), 177–182. https://doi.org/10.1257/aer.p20161002

Dartanto, T., Yuan, E. Z. W., & Sofiyandi, Y. (2017). Two Decades of Structural Transformation And Dynamics of Income Equality in Indonesia. *Asian Development Bank Institute*, (783). Retrieved from https://www.adb.org/sites/default/files/publication/371316/adbi-wp783.pdf

Erumban, Abdul Azeez, & Timmer, M. P. (2012). The Dark Side of Creative Destruction: Innovation and Retirement of Capital. *Industrial and Corporate Change*, *21*(5), 1149–1174. https://doi.org/10.1093/icc/dts005

Erumban, Abdul A., & Das, D. K. (2016). Information and communication technology and economic growth in India. *Telecommunications Policy*, *40*(5), 412–431. https://doi.org/10.1016/j.telpol.2015.08.006

Flor, A. (2016). *ICT pathways to poverty reduction: empirical evidence from East and Southern Africa*. *Information Technology for Development* (Vol. 22). https://doi.org/10.1080/02681102.2014.923595

Goesling, B. (2001). Changing Income Inequalities within and between Nations : New Evidence. *American Socilogical Review*, *66*(5), 745–761.

Hübler, M., & Hartje, R. (2016). Are smartphones smart for economic development? *Economics Letters*, *141*(2016), 130–133. https://doi.org/10.1016/j.econlet.2016.02.001

Irvine, W., & Anderson, A. R. (2008). ICT (Information Communication Technology), Peripheraility and Smaller Hospitality Business in Soctland. *International Journal of Entreprenurial Behaviour & Research*, *14*(4), 200–218.

James, J. (2014). Mobile Phone Use in Africa: Implications for Inequality and the Digital Divide. *Social Science Computer Review*, *32*(1), 113–116. https://doi.org/10.1177/0894439313503766

Jensen, R. (2007). The digital provide: Information (technology), market performance, and welfare in the South Indian fisheries sector. *Quarterly Journal of Economics*, *122*(3), 879–924. https://doi.org/10.1162/qjec.122.3.879

Kim, D. (2018). Consumer welfare of informative messages via mobile instant messenger: A case of KakaoTalk's Info-Talk. *Telematics and Informatics*, *35*(6), 1643–1655. https://doi.org/10.1016/j.tele.2018.04.010

Lee, J. W., & Wie, D. (2015). Technological change, skill demand, and wage inequality: Evidence from Indonesia. *World Development*, *67*, 238–250. https://doi.org/10.1016/j.worlddev.2014.10.020

Lindbeck, A., & Wikstrom, S. (2000). The ICT revolution in consumer product markets. *Consumption Markets & Culture*, *4*(1), 77–99. https://doi.org/10.1080/10253866.2000.9670350

Mbuyisa, B., & Leonard, A. (2017). The Role of ICT Use in SMEs Towards Poverty Reduction: A Systematic Literature Review. *Journal of International Development*, *29*(2), 159–197. https://doi.org/10.1002/jid.3258

McNamara, K. S. (2003). Information and Communication Technologies, Poverty and Development: Learning from Experience. *InfoDev*. https://doi.org/10.12968/bjon.2017.26.20.1092

Meh, C. A., & Terajima, Y. (2011). Inflation , nominal portfolios , and wealth redistribution in Canada. *THe Canadian Journal of Economics*, *44*(4), 1369–1402.

Michaels Guy, Natraj Ashwini, V. R. J. (2014). Has ICT Polarized Skill Demand? Evidence from Eleven Countries over 25 Years. *Review of Economics and Statistics*, *96*(1), 60–77. https://doi.org/10.1162/REST

Monga, C., Lin, J. Y., Aker, J. C., & Blumenstock, J. E. (2014). The Economic Impacts of New Technologies in Africa. *The Oxford Handbook of Africa and Economics*, (November), 1–15. https://doi.org/10.1093/oxfordhb/9780199687107.013.021

Norris, P. (2001). Digital Divide: Civic Engagement, Information Poverty, and The Internet Worldwide. Retrieved from https://www.academia.edu/2750047/Digital_divide_Civic_engagement_information_poverty_and_the_Internet_worldwide

Novalia, Y. (2014). Dampak perubahan struktur ekonomi terhadap ketimpangan distribusi pendapatan di Indonesia [Tesis]. *Tesis*.

Panizza, U. (1999). Income Inequality and Economic Growth: Evidence from the American Data. *Working Paper*, *404*.

Pick, J. B., Sarkar, A., & Johnson, J. (2015). United States digital divide: State level analysis of spatial clustering and multivariate determinants of ICT utilization. *Socio-Economic Planning Sciences*, *49*, 16–32. https://doi.org/10.1016/j.seps.2014.09.001

Saunders, P. (2002). The direct and indirect effects of unemployment on poverty and inequality. *SPRC Discussion Paper No. 118*, (118), 1–31.

Silva, H. de, & Ratnadiwakara, D. (2008). Using ICT to reduce transaction costs in agriculture through better communication: A case study from Sri Lanka. *LIRNEasia, Colombo, Sri Lanka,* (January), 20. Retrieved from http://unpan1.un.org/intradoc/groups/public/documents/UNPAN/UNPAN037348.pdf%5CnSilva_2008_Using ICT to reduce transaction costs in agriculture through better communication A case study from Sri Lanka (2).pdf

Spiezia, V. (2013). ICT investments and productivity. *OECD Journal: Economic Studies*, *2012*(1), 199–211. https://doi.org/10.1787/eco_studies-2012-5k8xdhj4tv0t

Stanley, T. D., Doucouliagos, H., & Steel, P. (2018). Does Ict Generate Economic Growth? a Meta-Regression Analysis. *Journal of Economic Surveys*, *32*(3), 705–726. https://doi.org/10.1111/joes.12211

Timmer, M. P., & van Ark, B. (2005). Does information and communication technology drive EU-US productivity growth differentials? *Oxford Economic Papers*, *57*(4), 693–716. https://doi.org/10.1093/oep/gpi032

Tregenna, F. (2011). Earnings inequality and unemployment in South Africa. *International Review of Applied Economics*, *25*(5), 585–598. https://doi.org/10.1080/02692171.2011.557053

van Ark, B., Gupta, A., & Erumban, A. A. (2013). The Linked World: Measuring the Contribution of ICT to Economic Growth. *The Conference Board*.

Ziemba, E. (2016). Factors affecting the adoption and usage of ICTs within Polish households. *Interdisciplinary Journal of Information, Knowledge, and Management*, *11*, 89–113. https://doi.org/10.28945/3507

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Research Paper

Determining Leading Economic Sectors, by Large Distribution or Extreme Growth?

(The Case of Tulungagung Regency, Province of East Java)

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Abstract

The leading economic sectors of Tulungagung Regency are determined by their contributions to the GRDP. The sectors are expected to boost economic growth. However, in the last 12 years, economic growth in Tulungagung Regency still has been slower than the entire Province of East Java. The aim of this study is to determine alternative leading economic sectors not only by contributions. Analyses of SLQ and DLQ, average contributions, growth rate, shift-share, and net shift were performed to observe the contributions, competitiveness, and progressive growth of economic sectors. Based on the assessment by criteria scoring, the economic sectors were ranked to determine the leading ones. The assessment showed that Education Services ranked first, followed by Information and Communication. Meanwhile, the traditional leading economic sectors of Processing Industry, Large and Retail Trade & Car and Motorcycle Repair, and Agriculture, Forestry, and Fishery only ranked fourth, sixth, and ninth respectively.

Keywords: economic sector, LQ analysis, regional economies, shift-share, Tulungagung

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1. Introduction

Economic development is one of the development goals of a nation. Economic development is not only for improving welfare, but is also believed to be able to reduce inequality and disparity at both the regional and national levels. After World War II, when many new nations became independent and attempted to catch up in economic development, many heated discussions about economic development occurred among developed countries. A classical question that appeared then was how a nation with abundant resources can instead have a lower economic growth than nations with poor resources, which was often the case (Ackah *et al*., 2019; Attah, 2015; Gylfason, 2001; Obeng-Odoom, 2013; Sachs & Warner, 1999).

Many indicators were utilized to measure success in economic development, including economic growth, income per capita, poverty rate, and others (Chisadza & Bittencourt, 2019). To establish a set of targets that can be applied universally and measured to balance the three dimensions of sustainable development – which are the environment, society, and economy – in 2012, all 195 member states of the United Nations committed to create a unified framework of 17 sustainable development goals (SDGs) and their 169 targets, after a significant theme in the 2005 review of the MDGs (Anasi *et al*., 2018; Imaz & Sheinbaum, 2017; Raub & Martin-Rios, 2019), with regional planning considered as media that can communicate regional development goals to external and internal stakeholders (Chimhowu *et al*., 2019).

Regional planning has traditionally been associated with guidance of spatial development and reduction of socioeconomic disparities (Galland, 2012). In recent times, decentralization, which is called "regional autonomy" in Indonesia, has given authority and freedom to regional governments for developing their regions. In Indonesia, the national development planning system is divided into three layers of planning: national planning, provincial planning, and regency/city planning. The transformation of regional planning has demanded local governments worldwide to possess more commitment to bring innovative and integrated policies together with collaborative approaches on regional planning to achieve development goals (Castán Broto, 2017; Frantzeskaki *et al*., 2014; Hölscher *et al*., 2019; Huang-Lachmann & Lovett, 2016). Consequently, development actors are not only national authorities, but also regional and local governments, local communities, businesses, and research institutes or universities (Anasi *et al*., 2018; Burch *et al*., 2016; Frantzeskaki *et al*., 2014; Galland, 2012; Hölscher *et al*., 2019). Yet, decentralization policies that are not properly addressed can bring about greater regional disparity and inequality. The uneven distribution of resources creates regional disparity in the rate of economic growth among regions. Inequality of resources reflected on economic activities concentration which occurred in certain regions only (Devkota & Upadhyay, 2016). Thus, economic growth and reduction of inequality was established as the eighth and tenth SDG goals respectively (United Nations, 2015).

Tulungagung Regency has had a unique phenomenon of economic growth. From 2008-2019, the economic growth of Tulungagung Regency, indicated by the Gross Domestic Regional Product (GRDP) value, was greater than the average Gross Domestic Product (GDP) growth of Indonesia, but was less than the GRDP growth of the Province of East Java. In other words, it was less than the average economic growth of other regencies or cities. Furthermore, the economic growth was less than the 7% target of SDGs (Bappenas, 2018). This phenomenon showed that something was wrong with the economic development in Tulungagung Regency, which lagged behind other regencies or cities in the Province of East Java.

The plan and strategy for economic development is focused on the development of leading economic sectors. This condition is based on the argument that improvement and growth of leading economic sectors affect economic growth (D. Achmad & Hamzani, 2015). The economic sectors that are established as leading economic sectors for Tulungagung Regency are Agriculture, Forestry, and Fishery; Processing Industry; and Large and Retail Trade & Car and Motorcycle Repair. These sectors were determined as leading economic sectors based on their contributions to the GDRP (-, 2019).

Indeed, the contributions of economic sectors that were determined as leading economic sectors for Tulungagung Regency are very dominant. In 2008, the contributions of the three leading economic sectors made up 63.55% of the GRDP total value. This tended to be stable from 2008-2019 at a value of greater

than 60%, although there has been a change in that the contributions of Processing Industry since 2017 and Large and Retail Trade & Car and Motorcycle Repair since 2018 have surpassed that of Agriculture, Forestry, and Fishery. This dominance is also supported by land use in Tulungagung Regency (Figure 1). The sector of Agriculture, Forestry and Fishery dominates land use by 74.88% (-, 2012).

Problems then arose from 2008-2019; the growth of the sector of Agriculture, Forestry, and Fishery as one of the leading economic sectors became depressed six times in 2010, 2013, 2014, 2016, 2017, and 2018. In 2018, this sector even became depressed to a negative growth rate of -0.63%. After dominating the GRDP distribution from 2008 to 2016, the Agriculture, Forestry, and Fishery sector began to lag behind the two other leading economic sectors. Although the Large and Retail Trade & Car and Motorcycle Repair sector could maintain its position as one of the top three for the GRDP, the sector also became depressed after its growth rate of 8.46% in 2011 fell to only 5.80% in 2019, although not as bad as the Agriculture, Forestry, and Fishing sector. The other leading economic sector of Processing Industry was still stable with an average growth of 6.11% from 2008-2019.

Meanwhile, the growth rates of non-leading economic sectors are of interest. The average growth rates of economic sectors for the GRDP from 2008-2019 showed that the top five sectors with the highest average growth rates were Information and Communication (9.99%); Accommodations & Food and Drink Services (8.36%); Health Services and Social Activities (8.34%); Financial and Insurance Services (7.83%); and Education Services (7.48%). The leading economic sectors with the highest average growth rates were Large and Retail Trade & Car and Motorcycle Repair (6.34%), which only ranked ninth, and Processing Industry (5.90%), which ranked tenth. Incredibly, the Agriculture, Forestry, and Fishing sector was the slowest sector of the 17 sectors for the GRDP with an average growth rate of 2.55%.

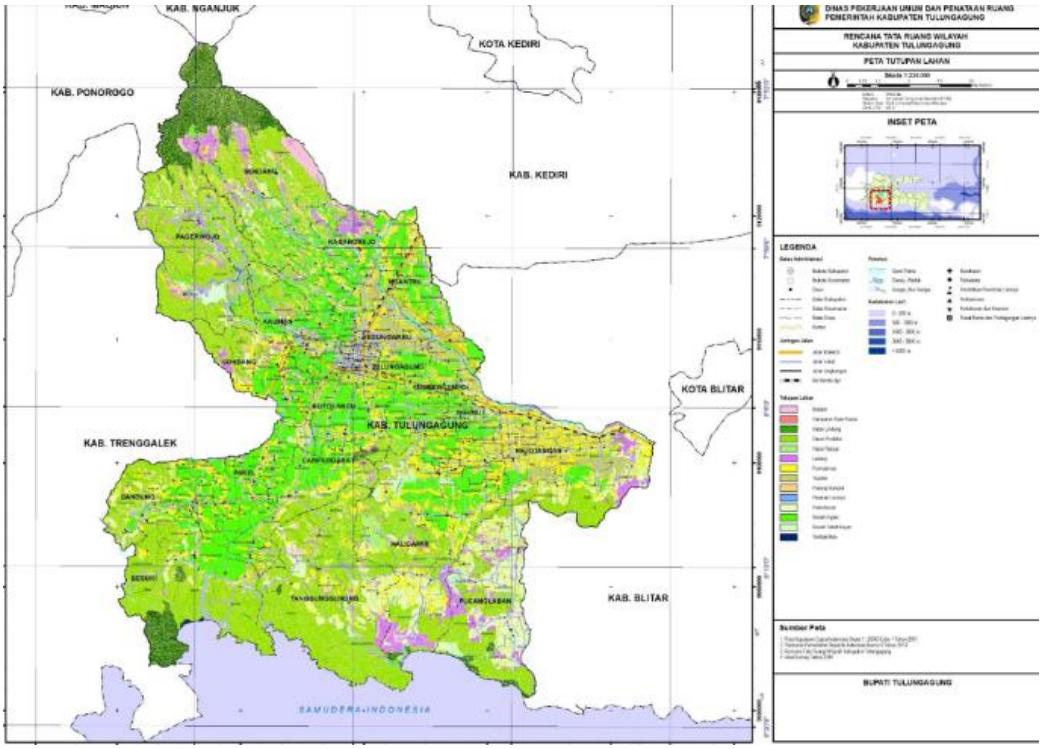

Figure 1. Land Use Map of Tulungagung Regency (Source: RTRW Tulungagung, 2012-2032)

Further questions about the roles of leading economic sectors to economic growth can be asked. From 2008-2019, when Agriculture, Forestry, and Fishery became depressed six times, the overall economic growth of Tulungagung Regency increased four times, and in 2015, when Agriculture, Forestry, and Fishery increased, economic growth became depressed. The same conditions also occurred for the sectors of Processing Industry and Large and Retail Trade & Car and Motorcycle Repair. This condition leads to questions about the roles and contributions of leading economic sectors in boosting the economic growth of Tulungagung Regency, in that the leading economic sectors still could not support economic growth.

Therefore, is it true that leading economic sectors boost economic growth? Does structural transformation have more impact on economic growth? On the other hand, is the real problem the incorrect decision to determine leading economic sectors by just their contributions?

Nevertheless, it is too early to conclude that economic transformation had happened and the leading economic sectors had changed. Yet, leading economic sectors have to be evaluated, because superior sectors often have slow growth even though they dominate the economic activities of people. Meanwhile, sectors with higher growth still contribute less to the GRDP. Therefore, there is the opinion that leading economic sectors must be selected from those that are strongly competitive. Regional competitiveness is one of the measuring instruments of sustainable development. Regional competitiveness also has a positive relationship to the welfare of people (Khusaini, 2015).

Researchers and scholars have presented many theories on economic development, especially on developing economic sectors. However, on a practical level, a certain problem in economic development strategies is determining the leading economic sector by only one perspective, their contributions to the GRDP. This occurred not only for Tulungagung Regency, but also for many other regions. Whereas, determining the leading economic sector requires in-depth review and analysis, and this decision particularly requires sufficient and consistent information observed over the long term.

In Indonesia, there are many previous studies on determining the leading economic sectors. Yet many weaknesses were apparent in these studies. First is the use of short time-series data (2-5 years), which allows bias to occur. Second, the research only focused on the competitive advantages of economic sectors to larger reference areas (province/national), with the assumption that greater competitiveness of regions means greater welfare of people (Khusaini, 2015), without consideration of sector dominance to economic activity or GRDP. Third and finally, to draw conclusions, most of the studies utilized quadrant models (Klassen typology, overlay analysis, and so on), which can make many economic sectors appear to be leading economic sectors. The result is that the leading economic sector, as the most superior one, was unclear. To solve this problem, some researchers created lists of criteria to determine the leading economic sector. One research conducted by Achmad (2018) utilized several criteria to measure and give scores to economic sectors in order to find out the leading economic sector (Z. Achmad, 2018).

From the background above, the aim of this study is to determine the leading economic sector based on three criteria that focus on specific aspects. First is by the contribution to the GRDP, to show which economic sectors have dominant roles on economic activities of the people (Z. Achmad, 2018; Aryee, 2001); second is by competitive advantage to a larger reference area, to find which sectors improve regional economic competitiveness (Andhyka, 2019; Budd & Hirmis, 2004; Harmono & Nirwanto, 2016; Khusaini, 2015); and third is by the growth rate of the sectors, for their development in the future (Vadlamannati, 2008). This study was conducted for Tulungagung Regency because not many studies were found to have been conducted for this region and no studies have yet to utilize criteria scoring to draw conclusions, as well as to find out the economic sectors that have less growth and are less competitive. This study utilized time-series data of a period of 12 years, longer than most previous studies that only utilized time series data of periods of 2-5 years, and this becomes a novelty of this study.

2. Methodology

Many previous studies for determining leading economic sectors utilized location quotient (LQ) or shift-share (SS) analysis. However, many of them generally utilized short time-series data. LQ requires time-series data of longer periods to avoid bias. The advantage of using LQ analysis is the ability to detect the true superiority of economic sector contributions to the GRDP. Previous studies in economics have utilized LQ analysis, for example, on the trade sector (S. H. Chiang, 2009), industry concentration (Billings & Johnson, 2012), carbon emissions (Trappey *et al*., 2013), the marine sector (Morrissey, 2014), economic development (Alhowaish, 2015), toll road project development (Berawi *et al*., 2017), determining development strategies for water, energy, and food (Purwanto *et al*., 2018), and changing import commodity (Mo *et al*., 2020). Meanwhile, shift-share analysis is a well-known and often applied method to decompose growth rates into structural and competitive components (Khusaini, 2015). This method is utilized to observe economic structure and its shift through the growth of regional economic sectors in

comparison to similar sectors on larger areas, for example province to national, regency or city to province, district to regency, or village to district. Overall, shift-share analysis is a good and simple method in providing information about regional or sectoral economic policy (S. hen Chiang, 2012; Dogru & Sirakaya-Turk, 2017; Márquez *et al*., 2009; Mo *et al*., 2020; Oyewole, 2016), although this analysis cannot sufficiently show detailed information, particularly on sector role and economic policy (Tervo & Okko, 1983). Some previous studies also utilized shift-share analysis to find out the relationship of structural transformation to economic growth (de Vries *et al*., 2012; Maroto-Sánchez & Cuadrado-Roura, 2009; Maudos *et al*., 2008).

For the conceptual framework of this study, determining the leading economic sector was carried out with three criteria and the usage of several methods. First, the sector would have a significant distribution to the GRDP total value, indicating that the sector dominates the economic activities of people. Second, the sector would have a better growth ratio as well as a larger area for the GRDP and therefore a positive value of net shift. Third, the sector would have a competitive advantage to a similar sector in the reference area, here the Province of East Java. This indicates that the sector has competitiveness for the regional economy (Figure 2). This is necessary to prevent economic development from being stuck in a traditional paradigm, and this is directed to further development in the future. For determining the leading economic sector in line with this concept, assessment by scoring was conducted for each economic sector, a modification from the study performed by Achmad (2018).

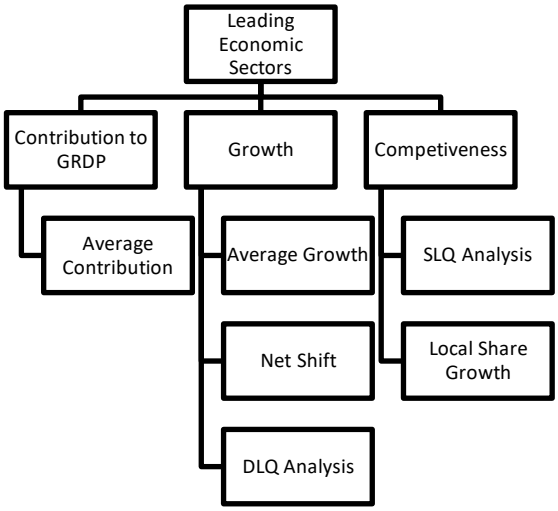

Figure 2. Method to Determine Leading Economic Sectors

Details of the criteria scoring to determine the leading sectors are shown in Table 1 below.

Table 1: Criteria Scoring of Economic Sectors

Criteria	Score				
	5	4	3	2	1
Contribution	Ranks 1-3	Ranks 4-7	Ranks 8-11	Ranks 12-14	Ranks 15-17
SLQ Analysis	Ranks 1-3	Ranks 4-7	Ranks 8-11	Ranks 12-14	Ranks 15-17
Average Growth	Ranks 1-3	Ranks 4-7	Ranks 8-11	Ranks 12-14	Ranks 15-17
DLQ Analysis	Ranks 1-3	Ranks 4-7	Ranks 8-11	Ranks 12-14	Ranks 15-17
Local Share Growth	Ranks 1-3	Ranks 4-7	Ranks 8-11	Ranks 12-14	Ranks 15-17
Net Shift	Ranks 1-3	Ranks 4-7	Ranks 8-11	Ranks 12-14	Ranks 15-17

Source: Author

The data utilized for this study was secondary data obtained from the Central Statistics Agency (BPS). The analyzed data was the GRDP of Tulungagung Regency as the study area from 2008-2019, and the GRDP of the Province of East Java for the same period as the reference area. The data for this study began from 2008 because economic sectors were classified differently before 2008, when it was expanded from 9 to 17 economic sectors. The concern is that economic sector analysis based on GRDP before 2008 would lead to incorrect information. The data were analyzed with Microsoft Excel.

2.1 Economic Sector Contributions to the GRDP

Economic sector contributions to the GRDP were calculated through comparing the average value of sector *i* to the GRDP in the period from 2008-2019 to the average value of the total GRDP for the same period.

$$\text{Economic Sector Contribution} = \frac{\text{Average of sector } i \text{ in GRDP}}{\text{Average GRDP}} \times 100\%$$

2.2 LQ Analysis

LQ is a method that expands shift-share analysis, and this method helps to determine the capacities of regional economic sectors and to measure economic activity concentrations in a region against the role of economic sectors on the national economy (Crawley *et al.*, 2013; Delgado *et al.*, 2014; Resbeut & Gugler, 2016). As a result, the leading economic sector can be identified. LQ Analysis is a simple economic development tool that can be used to determine economic sectors that can boost economic growth.

In LQ analysis, economic sectors of a region are classified into two categories:

1. Base sectors, economic activities serving the market within this region and outside the region; and
2. Non-base sectors, economic activities serving only the market within this region.

There are two kinds of LQ analysis: Static LQ (SLQ) and Dynamic LQ (DLQ). The two kinds have the same analysis procedure, but DLQ includes the growth rate of economic sector to the economic growth rate for the period from year 0 to year *n*. SLQ analysis yields base sectors, while DLQ analysis yields potential sectors (Sutikno & Suliswanto, 2015).

The following is the formula for calculating SLQ:

$$SLQ = (vi/vt) / (Vi/Vt)$$

Where:
vi is value of sector i in a region
vt is total GRDP value in a region
Vi is value of sector i in a province or nationally
Vt is total GRDP value of in a province or nationally

The results obtained from SLQ analysis show that (1) if the SLQ value > 1, then the sector has a specialized and competitive advantage than the similar sector for the reference area (region/national), and (2) if the SLQ value < 1, then the sector has less competitive advantage than the similar sector for the reference area (region/national). For this study, the reference area is the Province of East Java.

2.3 Economic Sector Average Growth

The average growth of the economic sectors is calculated as the average growth of each economic sector from 2008-2019. The calculation shows the rank of sectors from those with fast growth to those with slow growth.

2.4 DLQ Analysis

As mentioned above, DLQ analysis is a development of LQ analysis, which includes the comparison of the average growth rate of an economic sector to the GRDP average growth rate against the similar sector for the reference area.

$$DLQ = \frac{1 + gij / 1 + gj}{1 + Gi / 1 + G}$$

Where:

DLQ	:	economic sector potential index for Tulungagung Regency
gij	:	growth rate of sector *i* for Tulungagung Regency
gj	:	average rate of economic growth for Tulungagung Regency
Gi	:	growth rate of sector *i* for the Province of East Java
G	:	average rate of economic growth for the Province of East Java

DLQ classifies economic sectors into two categories:

a. If DLQ > 1, sector *i* is classified as a potential sector, a sector with faster growth than the similar sector for a larger area; and
b. If DLQ < 1, sector *i* is classified as a non-potential sector, a sector with depressed growth.

2.5 Shift-share Analysis

Generally, shift-share analysis involves three main components: the national growth component, the proportional or industry mix component, and the regional share growth component (Stevens & Moore, 1980). Many studies have utilized shift-share analysis to compare regional/province economies to national economies, while in this study shift-share analysis is utilized to compare the economies of Tulungagung Regency and the of Province East Java. A similar study had been performed for Banyuwangi Regency (Khusaini, 2015), where the three main components became the Regional Growth Share Component (RGS), Industry Mix Share Component (IMS), and Local Share Growth Component (LS).

Below is the shift-share analysis formula:

$$e_i^{t+n} - e_i^t = RGS + IMS + LS$$

Where:

e_i^{t+n} = economic sector value at the final year

e_i^t = economic sector value at the initial year

RGS = e_i^t x G, with G as the change in the 2008-2019 GRDP of the Province of East Java

IMS = e_i^t x ($G_i - G$), with G_i as the change in value of sector *i* in the 2008-2019 East Java GRDP

LS = e_i^t *x* ($g_i - G_i$), with *gi* as the change in value of sector *i* in the 2008-2019 Tulungagung Regency GRDP

Shift-share analysis results in two pieces of information: first, the development of an economic sector in a region compared to a similar sector, and second, the development of a region compared to a larger area. Shift-share analysis can be reformulated into Net Shift (NS) as the sum of IMS and LS to identify regional growth or sectoral growth in a region (Khusaini, 2015). Shift-share analysis results are utilized in two assessment criteria: first, the LS value that indicates sector competitiveness, and second, the net shift that indicates the growth rate of the sector (progressive or depressed).

3. Results and Discussion

3.1 Economic Sector Contributions to the GRDP

The 2008-2019 average GRDP of Tulungagung Regency at constant price is 20,806.730 billion rupiahs (-, 2020a). The 2008-2019 GRDP of Tulungagung Regency was dominated by contributions of three sectors: Agriculture, Forestry, and Fishery; Processing Industry; and Large and Retail Trade & Car and Motorcycle Repair. Agriculture, Forestry, and Fishery had an average GRDP value of 4,138.867 billion rupiahs, while Processing Industry had a value of 4,361.310 billion rupiahs and Large and Retail Trade & Car and Motorcycle Repair had a value of 4,427.994 billion rupiahs (Table 2). The total contribution of the three sectors in 2008 was 63.55% and slowed down in 2019 to 61.96%, while the average contribution of the three sectors from 2008-2019 was 62.78% of the total value of the GRDP.

As such, within the period, the three sectors dominated economic sector contributions to the GRDP of Tulungagung Regency, exceeding the sectors of Construction, Information and Communication, and Education Services. Agriculture, Forestry, and Fishery ranked first with an average contribution of 21.44%, Processing Industry ranked second with 21.03%, and Large and Retail Trade & Car and Motorcycle Repair ranked third with 20.31%. The top ten economic sectors with the highest average contributions to the 2008-2019 GRDP can be seen in Table 3.

Table 2: Average GRDP of Tulungagung Regency from 2008-2019 (in billions of rupiahs)

Code	Sector	Avg. GRDP
A	Agriculture, Forestry, and Fishery	4,138.867
B	Mining and Excavation	803.473
C	Processing Industry	4,361.310
D	Electricity and Gas Services	9.573
E	Water Supply, Trash and Waste Management, and Recycling Services	19.110
F	Construction	1,884.529
G	Large and Retail Trade & Car and Motorcycle Repair	4,427.994
H	Transportation and Warehousing	438.475
I	Accommodations & Food and Drink Services	384.136
J	Information and Communication	1,293.261
K	Financial and Insurance Services	446.144
L	Real Estate	440.273
M, N	Company Services	75.498
O	Government Administration, Defense, and Compulsory Social Security	707.489
P	Education Services	869.807
Q	Health Services and Social Activities	220.357
R, S, T, U	Other Services	286.434
Gross Regional Domestic Product		20,806.730
Gross Regional Domestic Product without Oil and Gas		20,806.730

Source: BPS of Tulungagung (2020)

Table 3: Top Ten Highest Contributing Sectors to the GDRP

Rank	Code	Sector	Avg. Contribution
1	A	Agriculture, Forestry, and Fishery	21.44
2	C	Processing Industry	21.03
3	G	Large and Retail Trade & Car and Motorcycle Repair	20.31
4	F	Construction	9.26
5	J	Information and Communication	5.38
6	P	Education Services	4.13
7	B	Mining and Excavation	3.99
8	O	Government Administration, Defense, and Compulsory Social Security	3.60
9	K	Financial and Insurance Services	2.14
10	H	Transportation and Warehousing	2.03

Source: BPS of Tulungagung, processed

Based on the table above, it can be seen that the dominance of the three leading economic sectors in contributing to the GRDP far exceeded the other economic sectors. Among the sectors of Agriculture, Forestry, and Fishery; Processing Industry; and Large and Retail Trade & Car and Motorcycle Repair, the differences are only 1.13%. Below the sector of Large and Retail Trade & Car and Motorcycle Repair, the contributions of economic sectors to the GRDP are only of percentages of single digits. This data showed that economic activities in Tulungagung Regency are dominated by these three sectors, and this is the basis of why these sectors became considered as leading economic sectors in Tulungagung Regency development plan documents.

3.2 Base and Non-Base Sectors

The average value of the GRDP of the Province of East Java at constant prices from 2008-2019 was 1,239,729.95 billion rupiahs (-, 2020b), while the GRDP without oil and gas from 2008-2019 was 1,194,421.42 billion rupiahs. Similar to Tulungagung Regency, the sectors that dominated the GRDP of the Province of East Java from 2008-2019 are Agriculture, Forestry, and Fishery; Processing Industry; and Large and Retail Trade & Car and Motorcycle Repair. In contrast to Tulungagung, Processing Industry more dominated the Province of East Java GRDP with an average contribution of 29.50%, followed by Large and Retail Trade & Car and Motorcycle Repair with 17.76% and Agriculture, Forestry, and Fishery sector with 13.14% (Table 4).

Table 4: Average GRDP of the Province of East Java from 2008-2019 at Constant Price (in billions of rupiahs)

Code	Sector	Avg. GRDP	Avg. Contribution
A	Agriculture, Forestry, and Fishery	150,451.02	13.14
B	Mining and Excavation	63,545.16	4.70
C	Processing Industry	367,350.56	29.50
D	Electricity and Gas Services	4,376.27	0.39
E	Water Supply, Trash and Waste Management, and Recycling Services	1,258.24	0.10
F	Construction	113,693.43	9.29
G	Large and Retail Trade & Car and Motorcycle Repair	225,733.81	17.76
H	Transportation and Warehousing	35,628.64	3.12
I	Accommodations & Food and Drink Services	62,922.28	5.21
J	Information and Communication	65,939.36	4.62
K	Financial and Insurance Services	30,572.22	2.54
L	Real Estate	21,115.06	1.64
M, N	Company Services	9,626.67	0.80

O	Government Administration, Defense, and Compulsory Social Security	29,150.00	2.51
P	Education Services	32,154.23	2.61
Q	Health Services and Social Activities	7,803.42	0.60
R, S, T, U	Other Services	18,409.58	1.47
Gross Regional Domestic Product		1,239,729.95	
Gross Regional Domestic Product without Oil and Gas		1,194,421.42	

Source: BPS of East Java (2020), processed

SLQ analysis results showed that of the 17 economic sectors in Tulungagung Regency, seven sectors could be identified as base sectors (SLQ > 1). The seven sectors are Health Services and Social Activities (1.65); Agriculture, Forestry, and Fishery (1.63); Education Services (1.58); Government Administration, Defense, and Compulsory Social Security (1.44); Real Estate (1.23); Information and Communication (1.16); and Large and Retail Trade & Car and Motorcycle Repair (1.14%). Surprisingly, the sector of Processing Industry, which is often considered as a leading economic sector, was evidently identified as a non-base sector (0.71). This is because the Processing Industry sector for the GRDP of the Province of East Java had an average contribution of 29.50% (-, 2020a), greater than the average contribution by the sector for Tulungagung (21.03%).

The seven base sectors by their SLQ values for Tulungagung Regency can be seen in Table 5.

Table 5: Base Sectors by SLQ Values for Tulungagung, 2008-2019

Code	Sector	Avg. Distribution of GDRP		SLQ	Criteria
		Tulungagung	East Java		
Q	Health Services and Social Activities	0.99	0.60	1.65	Base Sector
A	Agriculture, Forestry, and Fishery	21.44	13.14	1.63	Base Sector
P	Education Services	4.13	2.61	1.58	Base Sector
O	Government Administration, Defense, and Compulsory Social Security	3.60	2.51	1.44	Base Sector
L	Real Estate	2.02	1.64	1.23	Base Sector
J	Information and Communication	5.38	4.62	1.16	Base Sector
G	Large and Retail Trade & Car and Motorcycle Repair	20.31	17.76	1.14	Base Sector

Source: BPS of Tulungagung, processed

3.3 Average Growth of Economic Sectors

The GRDP of Tulungagung Regency has had continuous growth since 2008 with a value of 15,145.943 billion rupiahs to 27,299.802 billion rupiahs in 2019. The growth rate of the Tulungagung Regency GRDP at that period fluctuated with an average growth of 5.50%. There were 11 economic sectors that grew more rapidly than the average growth of the Tulungagung Regency GRDP. Uniquely, the leading economic sectors had average growths that were not promising. Large and Retail Trade & Car and Motorcycle Repair ranked ninth with an average growth of 6.34%, while Processing Industry ranked tenth with an average growth of 5.90%. Ironically, the sector of Agriculture, Forestry, and Fishery had the lowest average growth among the 17 sectors, with an average growth of 2.47%. Indeed, this sector recorded negative growth in 2018 with a value of -0.63%.

The top ten economic sectors with the highest average growth for 2008-2019 were Information and Communication (9.99%); Accommodations & Food and Drink Services (8.36%); Health Services and Social

Activities (8.34%); Financial and Insurance Services (7.83%); Education Services (7.48%); Transportation and Warehousing (7.41%); Real Estate (6.45%); Company Services (6.43%); Large and Retail Trade & Car and Motorcycle Repair (6.34%); and Processing Industry (5.90%).

Table 6: Top Ten Economic Sectors with the Highest Average Growth from 2008-2019

Rank	Code	Sector	Avg. Growth
1	J	Information and Communication	9.99
2	I	Accommodations & Food and Drink Services	8.36
3	Q	Health Services and Social Activities	8.34
4	K	Financial and Insurance Services	7.83
5	P	Education Services	7.48
6	H	Transportation and Warehousing	7.41
7	L	Real Estate	6.45
8	M, N	Company Services	6.43
9	G	Large and Retail Trade & Car and Motorcycle Repair	6.34
10	C	Processing Industry	5.90

Source: BPS of Tulungagung, processed

3.4 Potential Sectors by DLQ Analysis

The 2008-2019 GRDP of the Province of East Java had an average growth of 5.81%, higher than the average growth for the GRDP of Tulungagung Regency (5.50%). For the Province of East Java, the sectors that had the highest average growths were Information and Communication (9.81%), Health Services and Social Activities (8.35%), and Accommodations & Food and Drink Services (7.69%).

DLQ analysis for Tulungagung Regency economic sectors was similar to the Province of East Java economic sectors for 2008-2019, resulting in some potential economic sectors. There were 14 economic sectors with DLQ > 1, which showed that Tulungagung Regency economic sectors have great potential to grow and be competitive, compared to similar economic sectors for the Province of East Java. All leading economic sectors had DLQ > 1. Nevertheless, one leading economic sector did not make the top ten of DLQ values, which was Large and Retail Trade & Car and Motorcycle Repair. The top ten DLQ values can be seen in Table 7.

Table 7: Top Ten DLQ Values of Tulungagung Regency Economic Sectors, 2008-2019

Rank	Code	Sector	DLQ Value
1	D	Electricity and Gas Services	1.38326475
2	H	Transportation and Warehousing	1.17778974
3	K	Financial and Insurance Services	1.140130781
4	I	Accommodations & Food and Drink Services	1.127715828
5	P	Education Services	1.113119492
6	C	Processing Industry	1.094542238
7	M, N	Company Services	1.093992131
8	L	Real Estate	1.080914999
9	J	Information and Communication	1.064479752
10	A	Agriculture, Forestry, and Fishery	1.060076537

Source: BPS of Tulungagung, processed

3.5 Shift-Share Analysis

Shift-share analysis for the economy of Tulungagung Regency was performed with the economic sector variables of the 2008-2019 GRDP of both Tulungagung Regency and the Province of East Java. The GRDP values of these two areas can be seen in Tables 8 and 9.

Table 8: Tulungagung Regency GRDP at Constant Price, 2008-2019 (in billions of rupiahs)

Code	Sector	2008	2019	Change	
				Value	%
A	Agriculture, Forestry, and Fishery	3,511.56	4,588.75	1,077.19	30.68
B	Mining and Excavation	641.74	917.31	275.56	42.94
C	Processing Industry	3,182.75	5,974.29	2,791.55	87.71
D	Electricity and Gas Services	7.66	11.65	3.99	52.14
E	Water Supply, Trash and Waste Management, and Recycling Services	15.09	24.38	9.29	61.59
F	Construction	1,396.65	2,535.62	1,138.97	81.55
G	Large and Retail Trade & Car and Motorcycle Repair	3,083.59	6,049.07	2,965.48	96.17
H	Transportation and Warehousing	294.84	645.90	351.06	119.07
I	Accommodations & Food and Drink Services	233.68	565.15	331.47	141.85
J	Information and Communication	678.62	1,916.39	1,237.77	182.40
K	Financial and Insurance Services	265.91	605.92	340.01	127.87
L	Real Estate	304.69	605.34	300.65	98.67
M, N	Company Services	51.46	101.93	50.47	98.08
O	Government Administration, Defense, and Compulsory Social Security	556.31	844.50	288.18	51.80
P	Education Services	556.99	1,230.00	673.01	120.83
Q	Health Services and Social Activities	132.57	316.95	184.37	139.07
R, S, T, U	Other Services	231.83	366.65	134.81	58.15
Gross Regional Domestic Product		15,145.94	27,299.80	12,153.86	80.25
Gross Regional Domestic Product without Oil and Gas		15,145.94	27,299.80	12,153.86	80.25

Source: BPS of Tulungagung, processed

Table 9: Province of East Java GRDP at Constant Price, 2008-2019 (in billions of rupiahs)

Code	Sector	2008	2019	Change	
				Value	%
A	Agriculture, Forestry, and Fishery	127,404.03	165,665.39	38,261.36	30.03
B	Mining and Excavation	38,971.01	83,770.52	44,799.51	114.96
C	Processing Industry	274,406.12	498,875.23	224,469.11	81.80
D	Electricity and Gas Services	3,474.73	4,561.03	1,086.30	31.26
E	Water Supply, Trash and Waste Management, and Recycling Services	986.67	1,588.35	601.68	60.98
F	Construction	81,246.74	153,689.59	72,442.85	89.16
G	Large and Retail Trade & Car and Motorcycle Repair	156,581.88	307,838.27	151,256.39	96.60
H	Transportation and Warehousing	24,338.33	48,471.40	24,133.07	99.16
I	Accommodations & Food and Drink Services	40,614.70	91,711.07	51,096.37	125.81
J	Information and Communication	34,983.22	97,070.64	62,087.42	177.48
K	Financial and Insurance Services	19,538.12	41,398.81	21,860.69	111.89
L	Real Estate	14,674.77	28,441.50	13,766.73	93.81
M, N	Company Services	6,845.25	13,128.02	6,282.77	91.78

Code	Sector	2008	2019	Change	
				Value	%
O	Government Administration, Defense, and Compulsory Social Security	22,430.26	34,984.34	12,554.08	55.97
P	Education Services	20,999.26	44,018.96	23,019.70	109.62
Q	Health Services and Social Activities	4,695.30	11,277.80	6,582.50	140.19
R, S, T, U	Other Services	14,615.49	23,652.24	9,036.75	61.83
Gross Regional Domestic Product			1,650,143.15	763,337.27	86.08
Gross Regional Domestic Product without Oil and Gas			1,588,058.98	726,894.31	84.41

Source: BPS of East Java, processed

Based on the data above, the 2008-2019 Tulungagung Regency GRDP grew by 12,153.86 billion rupiahs, or by 80.25%. Meanwhile, the Province of East Java GRDP grew by 763,337.27 billion rupiahs, or by 86.08%. In the Tulungagung Regency GRDP, the economic sector that had the highest growth was Information and Communication (182.40%), while the economic sector that had the lowest growth was Agriculture, Forestry, and Fishery (30.68%). Similarly, for the Province of East Java GRDP, the economic sector with the highest growth was Information and Communication (177.48%), and the economic sector with the lowest growth was Agriculture, Forestry, and Fishery (30.03%).

Shift-share analysis results for the RGS component showed that the economic growth of East Java affected the economic growth of Tulungagung Regency at a value of 1,303,719.683 billion rupiahs, or by 107%. However, the GRDP growth of Tulungagung Regency was actually only 1,215,385.893 billion rupiahs, because the two other components of IMS and LS had negative effects, being -73,327.404 and -15,006.385 respectively. Overall, the sum of the three shift-share analysis components resulted in three economic sectors with the highest values, which are Large and Retail Trade & Car and Motorcycle Repair; Processing Industry; and Information and Communication.

The negative IMS value showed that the GRDP growth of Tulungagung Regency tends to slow down. Nevertheless, there were 11 economic sectors with a positive IMS value. The economic sector with the largest negative value was Agriculture, Forestry, and Fishery, being -196,807.888, while the economic sector with the largest positive value was Information and Communication, being 62,025.949. Along with Agriculture, Forestry, and Fishery, Industry Processing was a leading economic sector with a negative IMS value, while Large and Retail Trade & Car and Motorcycle Repair had a positive IMS value.

The negative LS value indicated that Tulungagung Regency has a weak competitiveness. Nevertheless, 11 economic sectors showed positive LS values, meaning that those sectors have strong competitiveness. Processing Industry had the largest LS value with 18,800.971 billion rupiahs, followed by Transportation and Warehousing, and Education Services. The economic sectors with low competitiveness were Mining and Excavation, Construction, and Government Administration, Defense, and Compulsory Social Security. The complete results for shift-share analysis can be seen in Table 10.

Table 10: Shift-share analysis on Tulungagung Regency GRDP, 2008-2019

Code	Sector	RGS	IMS	LS	Shift-share
A	Agriculture, Forestry, and Fishery	302,265.493	-196,807.888	2,261.176	107,718.781
B	Mining and Excavation	55,239.688	18,532.882	-46,216.126	27,556.444
C	Processing Industry	273,961.495	-13,607.398	18,800.971	279,155.068
D	Electricity and Gas Services	659.337	-419.868	159.928	399.396

Code	Sector	RGS	IMS	LS	Shift-share
E	Water Supply, Trash and Waste Management, and Recycling Services	1,298.812	-378.676	9.249	929.385
F	Construction	120,219.675	4,311.255	-10,633.753	113,897.177
G	Large and Retail Trade & Car and Motorcycle Repair	265,426.586	32,444.772	-1,323.569	296,547.789
H	Transportation and Warehousing	25,378.796	3,856.326	5,870.902	35,106.023
I	Accommodations & Food and Drink Services	20,114.096	9,284.014	3,749.257	33,147.368
J	Information and Communication	58,413.396	62,025.949	3,337.485	123,776.830
K	Financial and Insurance Services	22,889.032	6,863.273	4,249.125	34,001.430
L	Real Estate	26,226.850	2,356.802	1,481.544	30,065.196
M, N	Company Services	4,429.588	293.622	323.884	5,047.094
O	Government Administration, Defense, and Compulsory Social Security	47,885.753	-16,749.310	-2,318.042	28,818.401
P	Education Services	47,943.798	13,113.868	6,243.335	67,301.001
Q	Health Services and Social Activities	11,411.502	7,174.348	-148.594	18,437.256
R, S, T, U	Other Services	19,955.787	-5,621.376	-853.157	13,481.253
Gross Regional Domestic Product		1,303,719.683	-73,327.404	-15,006.385	1,215,385.893

Source: BPS of Tulungagung, processed

While LS showed the competitiveness of economic sectors or the GRDP, net shift (NS) showed the growth of economic sectors or an area. The NS value of Tulungagung Regency is -88,333.789, which indicates that Tulungagung Regency has a position of slow growth. However, there are 10 economic sectors with progressive growth. Those sectors are Information and Communication (65,363.434), Large and Retail Trade & Car and Motorcycle Repair (31,121.203), Education Services (19,357.203), Accommodations & Food and Drink Services (13,033.272), Financial and Insurance services (11,112.398), Transportation and Warehousing (9,727.228), Health Services and Social Activities (7,025.754), Processing Industry (5,193.573), Real Estate (3,838.347), and Company Services (617.506). The sector of Agriculture, Forestry, and Fishery is the only leading economic sector with a negative NS value as well as the slowest economic sector (-194,546.711).

Table 11: Tulungagung Regency Net Shift (Largest to smallest)

Code	Sector	IMS	LS	Net Shift
J	Information and Communication	62,025.949	3,337.485	65,363.434
G	Large and Retail Trade & Car and Motorcycle Repair	32,444.772	-1,323.569	31,121.203
P	Education Services	13,113.868	6,243.335	19,357.203
I	Accommodations & Food and Drink Services	9,284.014	3,749.257	13,033.272
K	Financial and Insurance Services	6,863.273	4,249.125	11,112.398
H	Transportation and Warehousing	3,856.326	5,870.902	9,727.228
Q	Health Services and Social Activities	7,174.348	-148.594	7,025.754

Code	Sector	IMS	LS	Net Shift
C	Processing Industry	-13,607.398	18,800.971	5,193.573
L	Real Estate	2,356.802	1,481.544	3,838.347
M, N	Company Services	293.622	323.884	617.506
D	Electricity and Gas Services	-419.868	159.928	-259.941
E	Water Supply, Trash and Waste Management, and Recycling Services	-378.676	9.249	-369.427
F	Construction	4,311.255	-10,633.753	-6,322.498
R, S, T, U	Other Services	-5,621.376	-853.157	-6,474.533
O	Government Administration, Defense, and Compulsory Social Security	-16,749.310	-2,318.042	-19,067.352
B	Mining and Excavation	18,532.882	-46,216.126	-27,683.244
A	Agriculture, Forestry, and Fishery	-196,807.888	2,261.176	-194,546.711
Gross Regional Domestic Product		-73,327.404	-15,006.385	-88,333.789

Source: BPS of Tulungagung, processed

3.6 Discussion

Studies on determining leading economic sectors have been performed by many researchers or scholars, including in Indonesia. LQ analysis and shift-share analysis become popular and well-known analysis methods for the studies. To draw conclusions, most researchers have utilized overlay quadrant or Klaasen typology to categorize economic sectors as superior leading, potential, or depressed sectors. As previously mentioned in the background, the concept for this study is different from most studies, and Achmad (2018) previously implemented it to determine economic sectors in East Kalimantan. In this study, the economic sectors are given scores for all criteria. The top ten economic sectors with the highest total scores and recommended to be leading economic sectors can be seen in Table 12.

Table 12: Top Ten Economic Sectors

Rank	Code	Sector	Avg. Cont.	LQ	Avg. Growth	DLQ	LS	Net Shift	Total
1	P	Education Services	4	5	4	4	5	5	27
2	J	Information and Communication	4	4	5	3	4	5	25
3	H	Transportation and Warehousing	3	2	4	5	5	4	23
4	C	Processing Industry	5	2	3	4	5	3	22
5	K	Financial and Insurance Services	3	2	4	5	4	4	22
6	G	Large and Retail Trade & Car and Motorcycle Repair	5	3	3	2	2	5	20
7	I	Accommodations & Food and Drink Services	2	1	5	4	4	4	20
8	Q	Health Services and Social Activities	2	5	5	2	2	3	19
9	A	Agriculture, Forestry, and Fishery	5	5	1	3	3	1	18
10	L	Real Estate	2	4	3	3	3	3	18

The results surprisingly indicated that the sector of Education Services ranked first, followed by Information and Communication. The sector of Education Services has strong competitiveness and

progressive growth. Its competitiveness is indicated by a high Local Share Growth (LS) value, as well as competitive advantage to the similar sector in the East Java GRDP. Yet this sector only has an average contribution to the Tulungagung Regency GRDP of less than 5%, and this is an important consideration. Information and Communication likewise has the same issue with Education Services. Ranking just below the two sectors is the Transportation and Warehousing sector, which has progressive growth but also less contribution to the GRDP.

Some assumptions about the phenomenon can be made from the findings. The dominance of Education Services sector in this assessment could be supported by the expansion of the State Islamic Institute at Tulungagung (IAIN Tulungagung) since 2013. The growth of the sectors of Information and Communication as well as Transportation and Warehousing is part of the global phenomenon of Industrial Revolution 4.0, in which trade and economic activity become more supported by the usage of information technology, such as in online shopping.

The findings also have some consequences for regional and spatial planning, as most of the land use in Tulungagung Regency is allotted to agricultural, forestry, and plantation activities. First, these findings provide a basis for reviewing land use plans, regional planning at the regency and provincial level, and certainly regional spatial plans (RTRW). This means that Tulungagung, East Java, and Indonesia must prepare for structural transformation. They may also need to modernize agriculture, forestry, and fishery to increase sectoral growth in the future.

4. Conclusion

Based on Tulungagung Regency regional development plan documents, the economic sectors that are established as leading economic sectors are Agriculture, Forestry, and Fishery; Processing Industry; and Large and Retail Trade & Car and Motorcycle Repair. These sectors have the biggest contributions to the Tulungagung Regency GRDP value from 2008-2019.

Based on growth criteria, the sector of Agriculture, Forestry, and Fishery was the leading economic sector with the lowest growth among 17 economic sectors. Meanwhile, for the other two leading economic sectors, Large and Retail Trade & Car and Motorcycle Repair ranked ninth in average growth, and Processing Industry ranked tenth. The economic sectors with the highest average growths were Information and Communication, Accommodations & Food and Drink Services, and Health Services and Social Activities. From DLQ analysis results, 14 economic sectors were found to have great potential for growth and competition than the similar economic sectors for the Province of East Java, for which all the leading economic sectors dominated. Based on net shift analysis, the economy of Tulungagung Regency has a position of slow growth, although there are 10 economic sectors with progressive growth. Two leading economic sectors, being Large and Retail Trade & Car and Motorcycle Repair as well as Processing Industry, had positive net shift values, while Agriculture, Forestry, and Fishery had a negative and the lowest net shift value. The three sectors with the largest net shift values were Information and Communication; Large and Retail Trade & Car and Motorcycle Repair; and Education Services.

From the results of LQ analysis, seven sectors were classified as base sectors. Processing Industry was the only leading economic sector that was classified as a non-base sector. Shift-share analysis through the LS component showed that the economy of Tulungagung Regency has weak competitiveness, but 11 economic sectors have strong competitiveness. Large and Retail Trade & Car and Motorcycle Repair was the leading economic sector with weak competitiveness. Processing Industry was the sector with the strongest competitiveness, followed by Transportation and Warehousing, and then Education Services. The economic sectors with the highest total scores and recommended to be new leading economic sectors are Education Services, Information and Communication, Transportation and Warehousing, Processing Industry, and Financial and Insurance Services. Two of the other traditional leading economic sectors placed in the top ten, although they were only sixth and ninth.

This study opens the opportunity for further research. Its finding is of interest, in that the sector of Education Services is ranked first. In the context of Tulungagung, this could be affected by the expansion of the State Islamic Institute at Tulungagung since 2013. However, this conjecture needs to be reviewed

further, and this may be a possible further research agenda, in addition to expanding the criteria for determining sectors. Furthermore, advanced analysis can be performed by reviewing sub-sectors of the economic sectors. For example, it may be possible that a sub-sector of Agriculture, Forestry, and Fishery has progressive growth or strong competitiveness compared to the larger economic sector. Based on this process of determining and identifying leading economic sectors, there are several strategies and policies that can be implemented by local governments. The combination of these new leading economic sectors can lead to new city branding. Then, traditional economic sectors can be modernized to increase their growth.

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References

-. (2012). *Rencana Tata Ruang Wilayah Kabupaten Tulungagung 2012-2032* [Regional Spatial Planning of Tulungagung Regency, 2012-2032].

-. (2019). *RPJMD Kabupaten Tulungagung 2018-2023* []. Bappeda Kabupaten Tulungagung.

-. (2020a). *PDRB Kabupaten Tulungagung 2008-2019* [GRDP of Tulungagung Regency, 2008-2019]. BPS.

-. (2020b). *PDRB Provinsi Jawa Timur Atas Dasar Harga Konstan 2008-2019* [GRDP of the Province of East Java, 2008-2019]. BPS.

Achmad, D., & Hamzani, U. (2015). The Role of Regional Superior Sectors in Creating GDP Value Added, Employment Opportunity, Regional Productivity and Human Development Index. *Procedia - Social and Behavioral Sciences*, *211*, 953–959. https://doi.org/10.1016/j.sbspro.2015.11.126

Achmad, Z. (2018). Determination of economic sector in East Kalimantan, Indonesia. *Journal of Chinese Economic and Foreign Trade Studies*, *11*(3), 182–201. https://doi.org/10.1108/jcefts-01-2018-0001

Ackah, I., Osei, E., Dery Tuokuu, F. X., & Bobio, C. (2019). Oiling the wheels of sub-national development: An overview of development plan implementation in the Western region of Ghana. *Extractive Industries and Society*, *6*(2), 343–357. https://doi.org/10.1016/j.exis.2018.12.002

Alhowaish, A. K. (2015). Location Quotient Technique and Economy Analysis of Regions: Tabuk Province of Saudi Arabia as a Case Study. *International Journal of Science and Research (IJSR)*, *4*(12), 1756–1761. https://doi.org/10.21275/v4i12.nov152375

Anasi, S. N., Ukangwa, C. C., & Fagbe, A. (2018). University libraries-bridging digital gaps and accelerating the achievement of sustainable development goals through information and communication technologies. *World Journal of Science, Technology and Sustainable Development*, *15*(1), 13–25. https://doi.org/10.1108/wjstsd-11-2016-0059

Andhyka, M. (2019). The Development of Region Learning Concept in Increasing Regional Competitiveness. *Eurasia: Economics & Business*, *2*(20), 113–124. https://doi.org/doi.org/10.18551/econeurasia.2019-02

Aryee, B. N. A. (2001). Ghana's mining sector: Its contribution to the national economy. *Resources Policy*, *27*(2), 61–75. https://doi.org/10.1016/S0301-4207(00)00042-8

Attah, A. (2015). Book Review. *The Extractive Industries and Society*, *2*, 603–604. https://doi.org/10.1016/j.exis.2015.03.003

Bappenas. (2018). *Tujuan Pembangunan Berkelanjutan - Sustainable Development Goals*. sdgs.bappenas.go.id

Berawi, M. A., Zagloel, T. Y., Miraj, P., & Mulyanto, H. (2017). Producing Alternative Concept for the Trans-sumatera Toll Road Project Development using Location Quotient Method. *Procedia Engineering*, *171*, 265–273. https://doi.org/10.1016/j.proeng.2017.01.334

Billings, S. B., & Johnson, E. B. (2012). The location quotient as an estimator of industrial concentration. *Regional Science and Urban Economics*, *42*(4), 642–647. https://doi.org/10.1016/j.regsciurbeco.2012.03.003

Budd, L., & Hirmis, A. K. (2004). Conceptual framework for regional competitiveness. *Regional Studies*, *38*(9), 1015–1028. https://doi.org/10.1080/0034340042000292610

Burch, S., Andrachuk, M., Carey, D., Frantzeskaki, N., Schroeder, H., Mischkowski, N., & Loorbach, D. (2016). Governing and accelerating transformative entrepreneurship: exploring the potential for small business innovation on urban sustainability transitions. *Current Opinion in Environmental Sustainability*, *22*, 26–32. https://doi.org/10.1016/j.cosust.2017.04.002

Castán Broto, V. (2017). Urban Governance and the Politics of Climate change. *World Development*, *93*, 1–15. https://doi.org/10.1016/j.worlddev.2016.12.031

Chiang, S. H. (2009). Location quotient and trade. *Annals of Regional Science*, *43*(2), 399–414. https://doi.org/10.1007/s00168-008-0218-y

Chiang, S. hen. (2012). Shift-share analysis and international trade. *Annals of Regional Science*, *49*(3), 571–588. https://doi.org/10.1007/s00168-011-0465-1

Chimhowu, A. O., Hulme, D., & Munro, L. T. (2019). The "New" national development planning and global development goals: Processes and partnerships. *World Development*, *120*, 76–89. https://doi.org/10.1016/j.worlddev.2019.03.013

Chisadza, C., & Bittencourt, M. (2019). Economic development and democracy: The modernization hypothesis in sub-Saharan Africa. *Social Science Journal*, *56*(2), 243–254. https://doi.org/10.1016/j.soscij.2018.10.007

Crawley, A., Beynon, M., & Munday, M. (2013). Making Location Quotients More Relevant as a Policy Aid in Regional Spatial Analysis. *Urban Studies*, *50*(9), 1854–1869. https://doi.org/10.1177/0042098012466601

de Vries, G. J., Erumban, A. A., Timmer, M. P., Voskoboynikov, I., & Wu, H. X. (2012). Deconstructing the BRICs: Structural transformation and aggregate productivity growth. *Journal of Comparative Economics*, *40*(2), 211–227. https://doi.org/10.1016/j.jce.2012.02.004

Delgado, M., Porter, M. E., & Stern, S. (2014). Clusters, convergence, and economic performance. *Research Policy*, *43*(10), 1785–1799. https://doi.org/10.1016/j.respol.2014.05.007

Devkota, S. C., & Upadhyay, M. P. (2016). How does education inequality respond to policy? A method and application to survey data from Albania and Nepal. *Journal of Economic Studies*, *43*(2), 14. https://doi.org/DOI 10.1108/JES-09-2014-0156

Dogru, T., & Sirakaya-Turk, E. (2017). Engines of tourism's growth: An examination of efficacy of shift-share regression analysis in South Carolina. *Tourism Management*, *58*, 205–214. https://doi.org/10.1016/j.tourman.2016.10.021

Frantzeskaki, N., Wittmayer, J., & Loorbach, D. (2014). The role of partnerships in "realising" urban sustainability in Rotterdam's City Ports Area, the Netherlands. *Journal of Cleaner Production*, *65*, 406–417. https://doi.org/10.1016/j.jclepro.2013.09.023

Galland, D. (2012). Is regional planning dead or just coping? The transformation of a state sociospatial project into growth-oriented strategies. *Environment and Planning C: Government and Policy*, *30*(3), 536–552. https://doi.org/10.1068/c11150

Gylfason, T. (2001). Natural resources, education, and economic development. *European Economic Review*, *45*(4–6), 847–859. https://doi.org/10.1016/S0014-2921(01)00127-1

Harmono, ., & Nirwanto, N. (2016). Development of Regional Innovation System Model-Based Economic, Science and Technology, Social and Cultural Factors to Improve Regional Competitiveness in Malang East Java Province – The Republic of Indonesia. *Mediterranean Journal of Social Sciences*, *7*(3), 415–423. https://doi.org/10.5901/mjss.2016.v7n3s1p415

Hölscher, K., Frantzeskaki, N., McPhearson, T., & Loorbach, D. (2019). Capacities for urban transformations governance and the case of New York City. *Cities*, *94*(March 2018), 186–199. https://doi.org/10.1016/j.cities.2019.05.037

Huang-Lachmann, J. T., & Lovett, J. C. (2016). How cities prepare for climate change: Comparing Hamburg and Rotterdam. *Cities*, *54*, 36–44. https://doi.org/10.1016/j.cities.2015.11.001

Imaz, M., & Sheinbaum, C. (2017). Science and technology in the framework of the sustainable development goals. *World Journal of Science, Technology and Sustainable Development*, *14*(1), 2–17. https://doi.org/10.1108/wjstsd-04-2016-0030

Khusaini, M. (2015). A Shift-share Analysis on Regional Competitiveness - A Case of Banyuwangi District, East Java, Indonesia. *Procedia - Social and Behavioral Sciences*, *211*, 738–744. https://doi.org/10.1016/j.sbspro.2015.11.097

Maroto-Sánchez, A., & Cuadrado-Roura, J. R. (2009). Is growth of services an obstacle to productivity growth? A comparative analysis. *Structural Change and Economic Dynamics*, *20*(4), 254–265. https://doi.org/10.1016/j.strueco.2009.09.002

Márquez, M. A., Ramajo, J., & Hewings, G. J. D. (2009). Incorporating sectoral structure into shift-share analysis. *Growth and Change*, *40*(4), 594–618. https://doi.org/10.1111/j.1468-2257.2009.00502.x

Maudos, J., Pastor, J. M., & Serrano, L. (2008). Explaining the US-EU productivity growth gap: Structural change vs. intra-sectoral effect. *Economics Letters*, *100*(2), 311–313. https://doi.org/10.1016/j.econlet.2008.02.017

Mo, S. W., Lee, K. B., Lee, Y. J., & Park, H. G. (2020). Analysis of import changes through shift-share, location quotient and BCG techniques: Gwangyang Port in Asia. *Asian Journal of Shipping and Logistics*, 1–12. https://doi.org/10.1016/j.ajsl.2020.01.001

Morrissey, K. (2014). Producing regional production multipliers for Irish marine sector policy: A location quotient approach. *Ocean and Coastal Management*, *91*, 58–64. https://doi.org/10.1016/j.ocecoaman.2014.02.006

Nations, U. (2015). *Sustainable Development Goals*. Sustainable Development Goals. https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Obeng-Odoom, F. (2013). Resource curse or blessing in Africa's oil cities? Empirical evidence from Sekondi-Takoradi, West Africa. *City, Culture and Society*, *4*(4), 229–240. https://doi.org/10.1016/j.ccs.2013.07.001

Oyewole, P. (2016). Regional Competition in the International Market for Services: A Shift-Share Analysis. *Journal of Global Marketing*, *29*(1), 3–14. https://doi.org/10.1080/08911762.2015.1119918

Purwanto, A., Sušnik, J., Suryadi, F. X., & de Fraiture, C. (2018). Determining strategies for water, energy, and food-related sectors in local economic development. *Sustainable Production and Consumption*, *16*(xxxx), 162–175. https://doi.org/10.1016/j.spc.2018.08.005

Raub, S. P., & Martin-Rios, C. (2019). "Think sustainable, act local" – a stakeholder-filter-model for translating SDGs into sustainability initiatives with local impact. *International Journal of Contemporary Hospitality Management*, *31*(6), 2428–2447. https://doi.org/10.1108/IJCHM-06-2018-0453

Resbeut, M., & Gugler, P. (2016). Impact of clusters on regional economic performance. *Competitiveness Review*, *26*(2), 188–209. https://doi.org/10.1108/cr-09-2015-0078

Sachs, J. D., & Warner, A. M. (1999). The big push, natural resource booms and growth. *Journal of Development Economics*, *59*(1), 43–76. https://doi.org/10.1016/S0304-3878(99)00005-X

Stevens, B. H., & Moore, C. L. (1980). *A Critical Review of Literature on Shift-Share a S a Forecasting Technique*. *20*(4), 419–437. https://doi.org/https://doi.org/10.1111%2Fj.1467-9787.1980.tb00660.x

Sutikno, & Suliswanto, M. S. W. (2015). The Development of Manufacturing Industry Cluster as an Effort of Economic Improvement Expansion in East Java. *Procedia - Social and Behavioral Sciences*, *211*, 992–998. https://doi.org/10.1016/j.sbspro.2015.11.132

Tervo, H., & Okko, P. (1983). a Note on Shift-Share Analysis As a Method of Estimating the Employment Effects of Regional Economic Policy. *Journal of Regional Science*, *23*(1), 115–121. https://doi.org/10.1111/j.1467-9787.1983.tb00788.x

Trappey, A. J. C., Trappey, C. V, Liu, P. H. Y., Hsiao, C. T., Ou, J. J. R., & Chen, K. W. P. (2013). Concurrent Engineering Approaches for Sustainable Product Development in a Multi-Disciplinary Environment. *Concurrent Engineering Approaches for Sustainable Product Development in a Multi-Disciplinary Environment*. https://doi.org/10.1007/978-1-4471-4426-7

Vadlamannati, K. C. (2008). Do Insurance Sector Growth and Reforms Affect Economic Development? Empirical Evidence from India. *Margin*, *2*(1), 43–86. https://doi.org/10.1177/097380100700200102

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Research Paper

Strengthening Community Economy Inclusively through Literacy for Prosperity

National Library of Indonesia's Role to Support Sustainable Development Goals (SDGs)

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Abstract

The term literacy continues to evolve from time to time according to the conditions of a society. At first, UNESCO in 1997 concluded that literacy is the ability to identify, understand, interpret, communicate, and count using printed or other materials, but the meaning of literacy is much more than that, which in the end a literate community can produce something that is beneficial to individuals or society. Therefore, the prosperity of a society can be seen from the number of literate people. National Library of Indonesia has recorded it in the concept of literacy for prosperity in the Social Inclusion-Based Library Transformation program. One of the programs carried out is for the prosperity of the literacy-based economic community that also aims to support SDGs. Until now, the National Library of Indonesia has succeeded in bringing about a positive impact on the community's economy with the concept of as well as support for SDGs. In the future, there are still many things that must be researched by the National Library of the Republic of Indonesia regarding literacy for inclusive prosperity.

Keywords: literacy; social inclusion; SDGs; economy

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1. Introduction

The term literacy is a term that has been widely recognized by the community. Many of these terms are used by the community in making or conducting an activity. For example, health literacy is the capability of being critical of existing health information and practicing it properly. Then there is another term, financial literacy, which is knowledge of improving financial prosperity so that people can make good financial decisions. Literacy essentially means the ability of a community or individual to write or read. UNESCO in 1997 says that literacy is the ability to identify, understand, interpret, create, communicate, and count using printed materials or other writings in various contexts (Montoya, 2018).

Now, the paradigm of literacy is not only about reading and writing, but can also be about knowledge or skills for people to live in society. It is also associated with accessing digital information and using it well by looking at Bloom's Taxonomy, namely remembering, understanding, applying, analyzing, evaluating, and creating. In this 21st century, the definition of literacy has also led to the ability to use technology to use and disseminate information (Pilgrim & Martinez, 2013).

The Australian Literacy Educators Association (ALEA) also stated in 2015 that literacy has a strong definition of Life Skills beyond traditional speaking, listening, reading, and writing. In Australia, one of the literacy capabilities of the community is to be able to respond well and produce important social, cultural, aesthetic, historical, and economic works. Then, what about in Indonesia? Minister of Education and Culture in 2019, Muhadjir Effendi also said so. Reported from *Pikiran Rakyat* news portal, literacy starts from reading, but then makes something good. The process occurs continuously throughout life (Seftiawan, 2019). The point is that literacy is a process of society that can eventually be creative for the benefit of itself and society, after reading. Actually, it is not only from reading, but also from the information that we are able to capture from a workshop.

Regarding literacy, a community can be prosperous if many people are literate. The Journal-Advocate in Sterling (2016) also argues that the point is not just a person, but a whole community. There is no doubt that a literate (at least able to read and write) society is prosperous. Yes, it is true that the ability to read comprehensively and to write smoothly is the key to progress, in addition to understanding the meaning of the reading and being critical. Apart from reading to increase literacy, education to develop community skills can also support prosperity in social and economic aspects. One of the institutions that plays a role in the development of literacy in community is the library, especially the public library. The public library is a lifelong learning facility for the general public regardless of who they are (Sumekar et al., 2011).

In 2018, the National Library of Indonesia executed the concept of strengthening literacy for prosperity that until now is in its national priority program, Transformation of Social Inclusion-Based Library. The concept is to revitalize the function of public libraries in order to become the center of community activities, ultimately leading to community empowerment. Firstly, it was the concept of Coca-Cola Foundation's program, Perpuseru, in 2017 where they revitalized the many functions of public and village libraries. Then in 2018, Coca-Cola Foundation released its concept to the National Library of Indonesia (Yamin, 2018). Finally, by 2019, literacy for prosperity had become a national priority.

Literacy here is not only limited to reading and writing, but is more about how people empower public libraries with all the information and activities organized by them. If viewed, one of the conceptual directions is strengthening the community economy inclusively. An example of this is vocational skills training organized by a public Library that became a conceptual partner of the National Library of the Republic of Indonesia to encourage the community to create business. In the end, the concept supports the empowerment of small and medium enterprises (SMES) so that the community is ensured to be economically prosperous.

The word 'inclusively' refers to social inclusion that has a meaning to enhance the dignity and opportunity of the community or individuals to participate in society regardless of the reeds. Participation is carried out in accordance with the roles the people play. Actually, the concept of social inclusion is carried out to end poverty according to the first concept introduced by Leonir, a French Politician. He put forward the concept of social inclusion in 1975 in Paris during prosperity (Warsilah, 2015). Social inclusion itself appeared after the social exclusion phenomenon, which means the inability of an individual or a group of community to join other communities.

Back to social inclusion, Leonir's idea was then used by the European Union to end poverty in 1975, because the term 'poverty' in that year shifted into 'exclusion' (Rawal, 2008). The concept of social inclusion is currently used to resolve various social problems besides economic problems, but it is still related to efforts to ensure economic prosperity for all levels of society. From this explanation, literacy for prosperity is related to the concept, because the concept leads to community empowerment to be prosperous, but social inclusion places greater emphasis on the potential for exclusion of people such as poor communities.

Strengthening the concept of literacy for prosperity is also to support the Sustainable Development Goals (SDGs) as a national priority that has previously been mentioned. With regard to libraries and the SDGs, IFLA, an organization that coordinates SDGs library support nationwide, has a target that as many as 320,000 libraries in the world, such as national, general, university, school, and special libraries will be regarded as one of the most important organizations because they provide information for all groups of people (IFLA, 2016a). A wide variety of libraries in countries around the world support SDGs in different ways that can be seen on the IFLA website (https://librarymap.ifla.org/stories).

Support from the National Library of Indonesia for SDGs was initially based on the participation of representatives from Indonesia to join the International Advocacy Programme (IAP): SDGs from October 31 to November 1, 2016, on the National Library Board (V-floor), Victoria Street 1401 Singapore. The objectives of the workshop are (1) to provide training and advocacy so that libraries can align their programs with SDGs and (2) to ensure that every library around the world can implement its programs in the national sustainable development agenda. The National Library of Indonesia officially supports the SDGs after the government issued Presidential Regulation Number 59 Year 2017 concerning SDGs (*Peraturan Presiden No.59 tahun 2017 tentang Tujuan Pembangunan Berkelanjutan*).

The concept of literacy for prosperity is supported by the Ministry of National Development Planning or the National Development Planning Agency (BAPPENAS) as the institution that is responsible for the course of SDGs in Indonesia. Until now, the National Library of the Republic of Indonesia continues to develop the function of public libraries in all provinces in Indonesia with the concept that the community can prosper with the existence of a public library as one of the economic sectors. The National Library of the Republic of Indonesia continues to innovate and collaborate in the context of creating a prosperous literacy society.

The purpose of this study is to learn more about literacy and the impact of community prosperity, especially in economic aspect. This has certainly seen a change in the paradigm of literacy from time to time that is only the ability to read and write but is more than that. In addition, the next goal is to learn more about library programs in support of SDGs according to their roles. Considering that SDGs is a national priority, this research was conducted at the National Library of Indonesia.

2. Research Method

The type of research in this paper is qualitative research that is the presentation of data in the form of narratives as well as images from documentation and interviews. The examined aspects are also subjective, namely from the customs or culture of the society (Connaway & Powell, 2010). The method used is a case study, meaning the use of various data sources to study individuals, institutions, or phenomena such as events or programs in a unique environment in an intense and detailed manner (Hariwijaya, 2016; Lawal, 2009).

2.1. Concept

As explained in the research background, the current concept of literacy is closely related to social inclusion-based libraries, especially public libraries. The concept of the research can be seen in Figure 1 below.

The definition of literacy is essentially proficient in reading and writing, as explained earlier. But over time, the understanding of literacy has also developed. In addition to being proficient in reading and writing, literate communities are able to create and perform activities that make them empowered. Meanwhile, the concept of social inclusion aims to empower all levels of society, which are related to literacy because both of them aim at community empowerment.

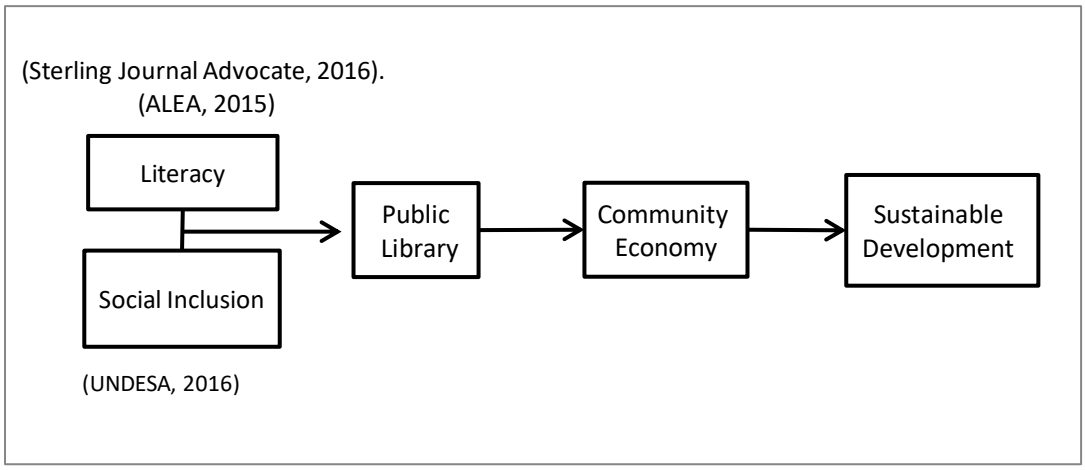

Figure 1: Research concept

Social inclusion means building the community to be open to others, increasing participation in society, especially for those who are potential to be excluded, through increasing opportunities, access to resources, and respect for them (UNDESA, 2016). Potentially excluded societies can be seen in terms of age, gender, disability, race, ethnicity, origin, religion, or economic status or others. Therefore, empowerment can be done to them to increase their confidence in interacting with the community

Empowerment towards them can later encourage social interaction between communities in opening access to participation in all areas of social life (Silver, 2015). Furthermore, empowerment can also be carried out to them based on literacy, for example through reading or accessing information then following training so that they can be empowered. Literacy is not only reading but also being able to receive information from other people and understand it so that in the future they can create something, said Effendi in his research background.

Then, public libraries are the most important institution in realizing a literate community for life. They play an important role in developing the potential of communities by providing access to various knowledge, ideas, and opinions contained therein (IFLA, 2010). Thus, the provision of collections should reflect the conditions of the surrounding society and the procurement of collections must also receive requests from the community. For example, people who want to practice planting plant ask the public library to procure related books. After the books are available, people start to access them by reading on the spot or borrowing them to read at home. Later, they do not just practice and develop interest in reading, but they can also get inspired and create something good.

Related to creation, public libraries as a means of lifelong learning are certainly not only used for reading, but also used for developing learning skills. Public libraries can be utilized by the community as an activity space to create something good or as a makerspace (Safira, 2019). This can also be done by holding public library events in collaboration with other communities to carry out activities in the library. This literacy-based empowerment is also conducted with the concept of social inclusion, considering that public libraries are open to all levels of society. There is no difference in accessing public libraries in terms of race, religion, ethnicity, physical condition, and social and economic status. The libraries are ensured to hold skills training activities that pay attention to community's participation.

People will later think that the library is a good place to accommodate anyone because they believe in the benefits of its existence, so that there will be community confidence that the library is a place for everyone, no one is excluded (Adyannisa & Laksmi, 2018; Vårheim, Steinmo, & Ide, 2008). This will in turn increase community participation in public libraries, both for those who are potentially marginalized and for the general public.

The Head of BAPPENAS for the 2016-2019 period, Bambang P.S. Brodjonegoro, presented the topic of society building with literacy in the 2018 National Seminar on Literacy and Socio-Economic Development. He said that education and literacy are part of human development that can pave the way for breaking

the chain of poverty in community (Afandi, 2018). This means strengthening literacy for prosperity in public libraries can build the community's economy.

Ultimately, these will all lead to sustainable community development. When many people are literate, the next literate community will be born. Therefore, the concept of literacy with social inclusion is implemented in public libraries, which in turn embodies literacy for prosperity for the sake of strengthening the community's economy that leads to sustainable development.

2.2. Data Collection

Data collection techniques in this research were carried out by interviews and documentation. An interview is an activity in which two or more people meet to exchange information and ideas through questions and answers so that they can form the meaning of an existing problem or topic (Sugiyono, 2009). An interview can be done in a semi-structured manner by following existing guidelines but can be revised as new ideas arise (Rachmawati, 2007).

The interview was conducted with J.S, the Head of National Library Law and Planning Bureau, who conceptualized the social Inclusion based library transformation program after being released by PerpuSeru to the National Library of Indonesia. Then, the next interviewee was S.S, the Main Secretary of the National Library of Indonesia, who had participated in the training of SDGs held by IFLA in 2016 in Singapore. Then the supporting resource was A.M. from the Magelang Regency Public Library who was the social inclusion PIC there. The Public Library of Magelang Regency has been ranked 2nd most inclusive regional public library in Indonesia.

The next data retrieval used the documentation method, that is investigating written objects such as books, magazines, regulatory documents, meeting notes, etc (Mamik, 2015). Furthermore, in this developing era, documentation can also be done by investigating information that is electronic in nature. Therefore, retrieving data that is on the Internet is also a documentation (Mustafa, 2013). Documents are generally data that strengthen qualitative research, because they can be evidence of information conveyed by informants or obtained when making observations.

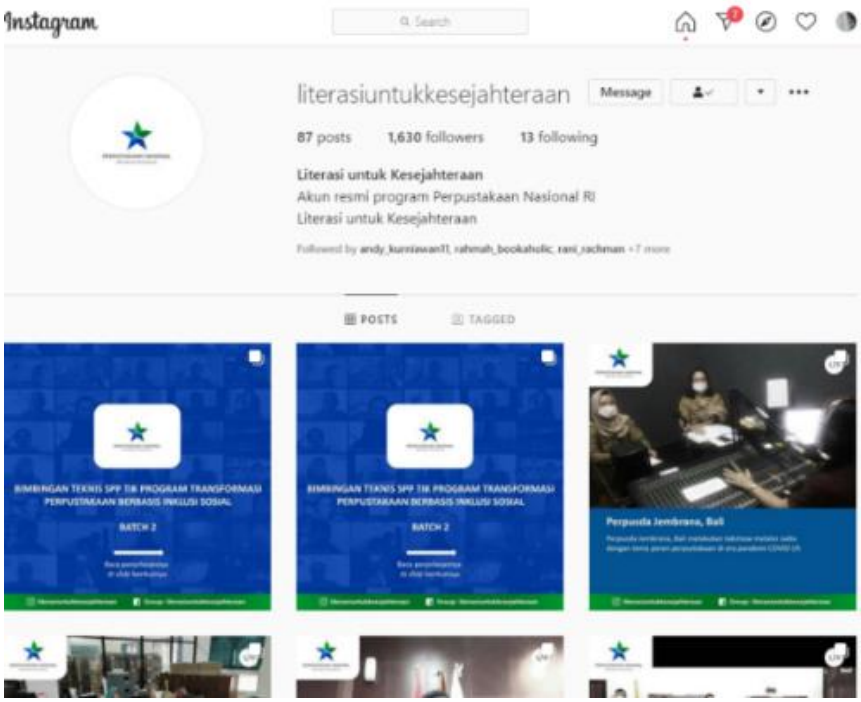

Figure 2: Instagram account of Literasi Untuk Kesejahteraan (@literasiuntukkesejahteraan)

Therefore, this research analyzes the documents provided by the National Library of the Republic of Indonesia regarding the implementation of the concept of literacy for prosperity. In addition to documents from the National Library of the Republic of Indonesia, an analysis was also conducted on documents from the public libraries in partnership with the Transformation of Social Inclusion-Based Library that has implemented the concept of literacy for welfare. Information documents were also obtained from social media, Instagram account, Literacy for Prosperity (@literasiuntukkesejahteraan) which is the media for the National Library of the Republic of Indonesia to promote the impacts received by the community.

Then related to the SDGs, the results of the analysis of the documents and interviews on literacy for prosperity will be attributed to the points in the SDGs, especially in the economic aspect as discussed here, namely the economic empowerment of the community. This refers to the formulation established by the UN in 2015 and IFLA in 2016.

3. Literacy for Prosperity: Strengthening Community Economy

The concept of literacy for prosperity is the impact of literacy paradigm change itself in accordance with the times. The community will be empowered, one of which is from an economic standpoint after they read or participate in activities that are organized by the library. Until now, this has been the focus of the National Library of the Republic of Indonesia in establishing a literate and prosperous community with the existence of libraries. National Library of Indonesia builds public libraries in Indonesia based on social inclusion, so that the community can be economically empowered with the existence of public libraries.

To implement this concept, the National Library of the Republic of Indonesia is in collaboration with government and non-governmental institutions. The institutions that work together include BAPPENAS, the Regional Development Planning Board (BAPEDA), the Community and Village Empowerment Offices, the Offices of Communication and Informatics, the Offices of Industry and Trade, and others such as, private sectors, universities, NGOs/civil society/community organizations, private companies, mass media.

The concept of literacy for prosperity is accepted by public libraries in various regions/cities in developing their services to become the center of community activities. Until now, according to data provided by the National Library of the Republic of Indonesia, as many as 1,050 public libraries in 21 provinces, 59 districts, and 500 villages have implemented the concept of literacy for prosperity. The implementation of the concept has a good impact on the prosperity of society from an economic perspective; for example, many people end up opening a business or upgrading it after attending some workshops or reading the collections that are provided by public libraries.

Regarding collections that can empower the community's economy, there is a success story of a person named Suprayetno. From the information that has been collected from the National Library of Indonesia reports, he is a citizen of Sekip village, Deli Serdang Regency that has been running an ornamental fish business since 2007, but has not had a large turnover and profit because he runs it traditionally. Finally, after Sekip Village library was revitalized with the concept of literacy for prosperity, Suprayetno could directly access a collection about ornamental fish cultivation.

Since he was diligent in reading the book and practicing the cultivation techniques written in the book, Suprayetno succeeded in boosting the turnover of his business. Now with the information in the book he borrowed from the village library, he makes his own fish feed. The fish feed manufacturing business itself is able to reduce the cost of fish production/maintenance which in itself gives additional benefits from the green fish business.

Another success story was experienced by Ariadati, who opened an oyster mushroom business after she read in her village library. She tried the business to help with her family's income because her husband just worked as a security guard. With initial capital obtained from a Village-owned Enterprise (Bumdes) and knowledge that she got from reading in Bener Meriah Village Library, Aceh Province, she managed to open a business of crispy oyster mushroom that helped her family's income. Initially, she got the idea after seeing that not all of the mushrooms that had just been harvested could be sold to the market so that they became leftovers. She wanted to turn the leftovers into snacks that most people liked.

Figure 3. Ariadati (left) and Suprayetni (Right) (National Library of Indonesia Report 2019-2020)

These two phenomena are examples of the strengthening of a literacy-based economy, from reading to applying the recitation and finally improving living standards. In addition, it will also be able to change the paradigm of the current public libraries of counties/towns and villages. The following was narrated by J.S. as the head of the Legal and Planning Bureau, National Library the Republic of Indonesia.

"The literacy for prosperity will change the paradigm of public libraries in the community. People think libraries are just for writing a thesis or reading, but actually more than that. Public libraries must carry out literacy-based community empowerment activities. "

The narrative of J. S means that today's public libraries do not only provide a means of reading but also self-development. It is also in accordance with regulations in Indonesia that public libraries are places for lifelong learning (Sumekar et al., 2011), which also has the meaning of learning and practicing from the books that we read . IFLA (2010) also writes that public libraries provide knowledge and ideas to the community, so that they can lead to the development of educational skills.

Then after adapting the concept of literacy for prosperity, public libraries organized a lot of community empowerment activities. Below are two tables of the top 10 total community empowerment activities in public libraries that implemented literacy for prosperity, during the year 2019.

Table 1. Top 10 Total Activities of City / Regency Public Libraries for community engagement, as of 9 December 2019 (National Library of Indonesia Report)

Province	Region	Total of Activities
Central Java	Magelang	385
South Sumatera	Musi Banyuasin	190
Central Kalimantan	Sukamara	188
North Sumatera	Deli Serdang	168
North Sumatera	Labuhanbatu	149
Riau	Siak	142
Aceh	Aceh Tengah	117
West Nusa Tenggara	Bima	113
South Sumatera	Musi Rawas	98
West Kalimantan	Landak	82

Table 2. Top 10 Total Activities of Village Library for community engagement, as of 9 December 2019 (National Library of Indonesia Report)

Region	Village	Total of Activities
Tulang Bawang	Dwimulyo	290
Batang Hari	Bukit Harapan	220
Musi Banyuasin	Bukit Jaya	195

Kotawaringin Timur	Bagendang Permai	162
Labuhanbatu	Kampung Baru	151
Soppeng	Tellulimpoe	130
Serdang Bedagai	Rambung Sialang Tengah	130
Brebes	Dawuhan	126
Deli Serdang	Sekip	125
Sukamara	Lupu Percua	111

The two tables above show that within a year many libraries continued to hold activities that involved the community there leading to community empowerment. Regarding Community Empowerment, J. S continued his statements as follows.

"In the Public Library of Pamekasan Region, there is a librarian who also works as a farmer, so that he gives books that are agriculture-related to farmers, but not only books; he has also brought experts from the Agriculture Agency to train the farmers as well. As a result, there is collaboration between librarians, farmers, and related agencies. "

It can be concluded from his statement that the public library of Pamekasan Regency, Madura, East Java, which is a partner of the concept of literacy for prosperity, has created a program for farmers. Here, there is collaboration between librarians, farmers, and the agriculture agency to provide agricultural knowledge and skills. In essence, the program has brought back the collaboration between organizations and communities.

Various kinds of community empowerment activities have been conducted by public libraries that implement the concept of literacy of prosperity, in collaboration with other communities or organizations. For example, in Central Java, the Public Library of Magelang Regency has carried out craft training activities for women. A.M, the PIC of Social Inclusion program at the Public Library of Magelang Regency said the following,

"...We also facilitate women according to their needs, to improve their family's economy. They asked for training on making craft from purr ropes. It had 20 people at first but then 33 people in total. We are in cooperation with Magic Hand community. The impact can already be seen, which can increase family's income... "

Figure 4. Massage Workshop for Blind People in Public Library of Kendal Regency (Public Library of Kendal Regency Report, 2019)

Therefore, the training, the activities of which were from creating to marketing the products, partnered with members of the Magic Hand community as resource persons. As a result, their economic condition was helped. In addition, A.M. also said that the library was also concerned with and facilitated the disabled according to their needs. They wanted to learn resin processing and this could lead to a new business.

A workshop to improve the economy of the disabled was also conducted by the Public Library of Kendal District, Central Java. Based on the report, the library, in collaboration with DPC Pertuni, a social organization that empowers the blind, carried out massage training for the blind. In the end, because of the training, many participants of the training successfully opened blind massage services, which helped their economy.

One example of an Indonesian citizen who got the benefits is Imam who is blind, with his blind wife and his normal daughter. He managed to open a massage clinic that he named "Anugrah". Based on the National Library of Indonesia's report, this can be done thanks to the massage training organized by the Public Library of Kendal Regency that he participated in. In one day, he can get 3-6 customers that can make his family better and can meet their daily needs.

In Ponorogo, East Java, there is an online entrepreneurship training organized by the Library and Archives Office of Ponorogo Regency in collaboration with the Ponorogo Bukalapak Community. In addition to empowering the community's economy, this is also in line with the times, because e-commerce is commonplace in today's digital era. Then, there is another skill training for women, a workshop on recycling plastic bags to make a variety of flower arrangements. This activity aims to increase public awareness to be more prudent in the use of plastic bags, and to be more capable of utilizing plastic waste to become items that have sale value.

Community economic empowerment with the concept of literacy for prosperity also takes into account the potential assets that exist in the surrounding environment, so as to increase productivity. In Sodong Village Library, Tangerang Regency, Banten Province, there have been instant ginger-making training activities for the community, especially for women, with tutors who are experts in these activities. Not only that, there was a training on making PVC pipes to be used as ornaments, attended by 5 young people. This is based on research collections in the library. One of the persons who has benefited from this concept is Deni Anggara (30 years old), a layoff victim.

Figure 6. Training activities for women at Sodong Village Library
(Literasi Untuk Kesejahteraan Instagram, 2019)

Based on the National Library of Indonesia's report, he tried to find business opportunities to support his family after layoff. With the intention of utilizing used pipes in his environment, Deni then participated in a training on making ornamental lamps made of pipes, which was organized by Karang Harum Village Library. As a result, he ventured to open an ornamental lamp making business by selling directly and through social media. For two months after the training, Deni received orders of 40 pieces with a turnover of Rp.4 million. He also continues to practice his skills by learning more models of ornamental lamps through YouTube and in the future, he will expand his business to create decorative lamps for brides.

Figure 7. Deni Anggara with his ornamental lamp, created from paralon pipes (National Library of Indonesia Report 2019-2020)

Then, another example from outside Java is purun (a swamp plant) craft training at the library of Lupu Peruca village, Sukamara, Central Kalimantan. Purun is a local asset in Central Kalimantan, because since then the society has been processing purun into bags, mats, hats, and baskets. Based on the National Library of Indonesia's report, the head of the village supports the activities that exist in the village and promotes regional potential assets owned by the community and increases the village library budget; hence, the training of purun crafts, which is a local asset, was carried out in the village.

Figure 8. Mrs. Inor is processing purun (National Library of Indonesia Report 2019-2020)

Mrs. Inor (51 years old) is one of the citizens of the village that cooperated with the library to conduct a purun crafts making workshop to produce bags, mats, etc. She wanted to train herself and other women in the village to create something from purun. Mrs. Inor's activities at the village library went well so that many people in Sukamara Village ordered her creation. As a result, Mrs. Inor's income increased, and so the income of other women who participated in making purun crafts, through orders from the Sukamara community.

Those phenomena are the results of implementing the concept of literacy for prosperity, other examples of which can be seen on the official Instagram account that is managed by the National Library of the Republic of Indonesia, @literasiuntukkesejahteraan (Literasi Untuk Kesejahteraan). The National Library of Indonesia has succeeded in stimulating the growth of community's economy by developing public library services as a center for literacy-based community activities. In the end, public libraries are not considered as eyes, which so far have only been a ' warehouse for books' but have made the community economically literate and empowered.

For the welfare of the community's economy, the National Library of Indonesia collaborates with several organizations, such as unions, investment services, institutions, and Micro, Small and Medium Enterprises (UMKM), to provide assistance such as capital and workshops. Other organizations, such as regional owned enterprises (BUMD) and BUMDES, also provide assistance such as the example in Bener Meriah Village as previously mentioned.

4. Supporting the Economic Pillar of Sustainable Development Goals

The concept of literacy for prosperity in the Transformation of Social Inclusion-Based Library program is also run by the National Library of the Republic of Indonesia to support the Sustainable Development Goals. In RPJMN 2020 – 2024 compiled by BAPPENAS, one of the supports for the development of culture and national character is increasing cultural literacy and developing library services based on social inclusion (Bappenas, 2019). Regarding this matter, the Main Secretary of the National Library of the Republic of Indonesia, S.S. said the following.

"Strengthening literacy for prosperity is supported by BAPPENAS. This is implemented to support SDGs program in particular for Goal 1, No Poverty; Goal 3, Good health and well-being; and Goal 4, Quality Education. This is implemented through the Transformation of Social Inclusion-Based Libraries. "

In the quotes above, S.S. stated that strengthening literacy for prosperity supports three goals of the SDGs but not from the economic pillar. The three goals that she mentioned fall under the social pillar. Literacy for prosperity certainly supports goals 1 and 4, and indirectly supports goal 3, but it also supports many other goals in the economic pillar.

In the economic pillar of the Sustainable Development Goals, there are 4 goals that fall under the pillar. The goals are goal 7 (Affordable and Clean Energy), 8 (Decent Work and Economic Growth), 10 (Reduced Inequalities), and 17 (Partnership for Goals). However, after a review, the National Library of the Republic of Indonesia's support to SDGs through strengthening literacy for prosperity further leads to goals 8, 10, and 17. Only a few indicators from the economic pillar that are supported by the National Library of Indonesia. The following is the review of the indicators.

Literacy for Prosperity and its support to Economy Pillar of Sustainable Development Goals

UN Indicator(s) (2015)	IFLA Indicator(s) (2016b)	Explanation
Goal 8. Decent Work and Economic Growth		
Indicator 8.3 – Promoting development policies that support productive activities, decent job creation, creativity and	Access to information and training skills that people need to find, apply for a job, and succeed in a better job	The impact of the concept implementation by the National Library of Indonesia is the emergence of entrepreneurial activities derived from

innovation, and entrepreneurship, and encouraging the formalization and growth of micro, small, and medium enterprises, including through access to financial services.		workshops by public libraries post the revitalization with that concept. For example, the workshop that was held by the Public Library of Magelang Regency made most of the participants open businesses. Then, at Karang Harum Village Library, there was a pipe workshop training that can make a person open a business after attending the training. Deni, one of the citizens in the village, finally opened a business after participating in that pipe workshop. Then, there was a massage training at the library that encouraged blind people to open a massage business to help their economy. Iman is a citizen of Kendal, Central Java who was inspired by the literacy for prosperity concept, so that he opened a massage service after attending a massage training at the Kendal Regency Public Library. Therefore, it is certainly more than just applying for a job but creating jobs /employment.
Goal 10. Reduced Inequalities		
Indicator 10.2 - Social inclusion and community empowerment continues to be enhanced, then economic and political inclusion for all, regardless of age, gender, disabilities, race, ethnicity, origin, religion or economic ability, or social, political, economic, and other status **Indicator 10.3 -** The possibility of equal opportunity and reducing the gap between communities, it includes removing policies, laws, and activities that lead to discrimination, and **promoting policies related**	a. The neutral and friendly space that makes learning environment accessible to everyone, including groups of displaced persons (potential to be socially excluded) such as migrants, refugees, minorities, indigenous peoples, and people with disabilities. b. Equitable access to information that supports social, political, and economic inclusion	The concept of literacy for prosperity encourages all walks of life to be engaged in activities as well as facilities or services of public libraries that are partners of the National Library of Indonesia. As we have witnessed, many public libraries have policies related to discriminatory enforcement. The National Library of Indonesia has reviewed the impact of the program for those with low economy, those with disabilities, exemplary women at Sodong Village Library, Banten Province. Then at the Public Library of Kendal District, Central Java, there was a workshop that was only for the blind. Likewise, the Public Library of Magelang Regency provided a place to

to discriminatory enforcement.		carry out empowerment activities for people with disabilities. Finally, they lead to strengthening their economy.
Goal 17. Partnership for Goals		
Indicator 17.17- Encouraging and improving the cooperation of government-private and civil society effectively based on experience and sourced in cooperation strategy**.**	A global network of community-based institutions, ready to support local development plans	The National Library of Indonesia collaborates with many stakeholders in realizing the concept of literacy for prosperity from both the government and the private sector. The partners are the National Development Planning Board (BAPPENAS), the Regional Development Planning Board (BAPEDA), Office of Community and Village Empowerment, Office of Communication and Informatics, Office of Industry and Trade, and others, such as the private sector, colleges, NGOs/civil society/community organizations, private companies, mass media, and others. Regarding regional stakeholders, the examples that have been described are the Ponorogo Bukalapak Community and DPC Pertuni in Kendal District.

From the table above, we can see that the National Library of Indonesia has implemented the literacy for prosperity to support the economic pillar in SDGs. The role of the National Library of Indonesia is in accordance with its duties which are described in Law No. 43 Year 2007 concerning Libraries (UU No. 43 tahun 2007 tentang Perpustakaan), namely conducting development, development, evaluation, and coordination of library management. In line with that, S.S said the following.

"We always make an annual report on the implementation of SDGs activities at the National Library and libraries in Indonesia and send it to IFLA. Also, we are planning a survey on the implementation of SDGs in provincial and Regency/city libraries in Indonesia"

This means that they are going to evaluate the development of literacy for prosperity that has been implemented at the public libraries to support SDGs. The National Library of Indonesia has also ensured the availability of lifelong learning facilities for public libraries to improve the economic condition of the community through literacy, as seen from the example described earlier. Regarding the economy, the latest data from the Central Bureau of Statistics (BPS) that were released in February 2020 show that the unemployment rate has decreased from February 2019 by 5.01% to 4.99%. The unemployment decline is also one of the outermost concepts of literacy for prosperity, where they can eventually open a business or work after participating in a wide range of programs in public libraries.

Therefore, when the National Library of Indonesia supports the 3 objectives of the economic pillar that has been outlined, it will also affect the 3 social pillars mentioned by S.S. The concept of literacy for prosperity will ultimately alleviate poverty by providing a variety of trainings (goal 1), and then also by

producing a quality education (goal 4). Education here also includes skills and eventually leads to healthy societies (goal 3).

5. Realizing Social Inclusion through Literacy for Prosperity

Regarding social inclusion, in the previous discussion about the 10th goal of SDGs, Reduced Inequalities is one of the key points of literacy for prosperity. The National Library of Indonesia guarantees the public library as an open place for the prosperity of the society. This has an impact on the creation of an educational space in the form of knowledge and good skills so that the community will be prosperous inclusively.

In addition, the support contained in the 10th goal of SDGs has an impact on other goals that are also supported by the National Library of Indonesia such as education and job creation so as to alleviate poverty. The discussion is in accordance with the indicator layers 10.2 and 10.3 in the resolutions of the United Nations. As explained in the previous example, the National Library of Indonesia has reviewed its impact on the diffable community, low-potential economic groups, and women.

The empowerment of the diffable community is carried out to create an inclusive area/city (Maftuhin, 2017). This will make them feel that they are part of the community and no longer worry about accessing public facilities such as libraries. Literacy-based empowerment is also done in low-potential or low-economic conditions. This is in accordance with the initial concept of social inclusion described by Lenoir in 1975 – 1976, which is poverty alleviation. This is certainly done by ensuring that the programs carried out by the National Library of Indonesia have an impact on job creation or getting employment, so that poverty can be resolved (also spelled out in the 8th goal of SDGs).

In the future, the National Library of the Republic of Indonesia is going to review again the impact of the concept of literacy for prosperity on the community and its role in the SDGs program. Studies are also conducted with attention to other potentially excluded communities because of, for example, racism, religion, and even HIV cases. There is a phenomenon that was reported by Bhaskara (2018), a reporter of Tirto, about a research conducted by the Indonesian National Commission on Human Rights, which recorded approximately 101 cases of ethnic and racial discrimination in the period 2011 – 2018. The discrimination that occurred included the prohibition of public services, the rise of ethnicity or identity politics, the dissolution of traditional rituals, discrimination on land tenure rights for minority groups, and access to unjust employment. These can be studied in relation to the fact that public libraries are inclusive and safe places for all.

For people with HIV, this still sounds sensitive but it also needs to be considered how to empower them to achieve social inclusion. Iswati, Utami, & Matahari (2017) stated in their research that they are not only disease-laden but also mentally induced by many people, so that public libraries as an inclusive place can empower them. The activities of HIV/PLWHA empowerment can be done in collaboration with related institutions. For example, Graha Mitra is an NGO (non-governmental organization) that focuses on empowering the HIV/PLWHA community (Yayasan Pelita Ilmu, 2018). Service for them requires people or institutions that genuinely care or are able to accept their condition (Tursilarini & Hermawati, 2019). That is because usually they have learned the ins and outs of HIV sufferers and how they feel both physically and mentally.

Therefore, when all of these have been considered, a literate community will be realized in all levels of society without reeds. Communities will easily mingle and empower each other regardless of different groups because of race, ethnicity, religion, social and economic status, and even people with HIV. Public libraries can certainly be institutions that can create social cohesion for all levels of society by empowering them all. Finally, they can raise the level of their economic condition.

6. Conclusion

The paradigm shift makes literacy not the ability to read and write, but more than that the ability make something good from reading. Then this literacy can also be in the form of the ability to hear and understand information from other parties so that it can lead to action. The more literate society is, the more prosperous people are. The National Library of the Republic of Indonesia has an interest in adapting the concept of literacy for prosperity that was previously PerpuSeru program to build community welfare.

The head of BAPPENAS for the 2016-2019 period also said that the literacy was instrumental in community development, one of which is alleviating poverty. Therefore, the National Library of Indonesia has built public libraries in Indonesia in order to provide benefits to the community in improving their standard of living, with the concept of literacy for prosperity. This is done by also using the concept of public libraries based on social inclusion to make it more open to all levels of society. The concept of literacy for prosperity places more emphasis on public libraries because it is a lifelong learning tool for all people.

Until now, many communities have prospered economically as the impact of the strengthening of literacy for prosperity by the National Library of the Republic of Indonesia in various public libraries. Some have succeeded in opening a business after simply reading books in the library, as experienced by Suprayetno (Deli Serdang) and Atok (Sekip Village). Then, some others have also opened their businesses after participating in a training or workshop in the library, such as Iman (Kendal), Deni (Bekasi), and Inor (Sukamara), so as the community in the Magelang Regency Public Library and others. All of them are the results of literacy improvement.

The concept of literacy for prosperity is also implemented to support the UN program, Sustainable Development Goals, one of which falls under the economic pillar. The objectives of the pillar supported in the UN program are goal 8 (Decent Work and Economic Growth), goal 10 (Reduced Inequalities), and goal 17 (Partnership for Goals). When these objectives have been supported, it will also eventually reach the 3 goals of the social pillar mentioned by the S.S., namely goal 1 (No Poverty), goal 3 (Quality Health), and goal 4 (Quality Education).

The National Library of the Republic Indonesia continues to build communities by implementing the concept of literacy for prosperity in public libraries that are partners in the Library Transformation Based on Social Inclusion. The National Library of Indonesia continues to conduct studies on the impact of implementing the concept of literacy for prosperity on people who have experienced benefits. This study can also be conducted on potentially excluded people such as victims of racial discrimination and HIV sufferers. This must be done to realize literate societies and economic empowerment for them.

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References

Adyannisa, V., & Laksmi. (2018). Social Capital in the Daily Services of Depok City Public Library = Modal Sosial Dalam Keseharian Layanan Perpustakaan Umum Kota Depok. *Edulib*, *8*(2), 205–221.

Afandi, T. (2018). *Siaran pers: Seminar Nasional Literasi dan Pembangunan Sosial-Ekonomi*. Retrieved from https://www.bi.go.id/id/ruang-media/siaran-pers/pages/sp_165814.aspx

ALEA. (2015). *Literacy in 21st century Australia: the ALEA declaration*. Retrieved from https://www.alea.edu.au/documents/item/1197

Badan Pusat Statistik. (2020). *Keadaan Ketenagakerjaan Indonesia Februari 2020*. Retrieved from https://www.bps.go.id/pressrelease/2020/05/05/1672/februari-2020--tingkat-pengangguran-terbuka--tpt--sebesar-4-99-persen.html

Bappenas. (2019). Rancangan Teknokratik Rencana Pembangunan Jangka Menengah Nasional 2020 - 2024 : Indonesia Berpenghasilan Menengah - Tinggi Yang Sejahtera, Adil, dan Berkesinambungan. *Kementerian PPN/ Bappenas*, 313. https://doi.org/10.1017/CBO9781107415324.004

Bhaskara, I. L. A. (2018). Survei Komnas HAM: Diskriminasi Etnis & Ras Masih Terus Ditolerir. Retrieved April 13, 2020, from Tirto website: https://tirto.id/survei-komnas-ham-diskriminasi-etnis-ras-masih-terus-ditolerir-dahP

Connaway, L. S., & Powell, R. R. (2010). *Basic research methods for librarians* (5th ed.). Oxford: Libraries Unlimited.

Hariwijaya, M. (2016). *Metodologi dan Penulisan Skrispi, Tesis, dan Disertasi untuk Ilmu Sosial dan Humaniora*. Parama Ilmu: Yogyakarta.

IFLA. (2010). The mission and purposes of the public library. In C. Koontz & B. Gubbin (Eds.), *IFLA Public*

Library Service Guidelines (pp. 1–20). https://doi.org/10.1515/9783110232271.1

IFLA. (2016a). Access and Opportunity for all : How libraries contribute to the United Nations 2030 Agenda. *IFLA Journal*, 24. Retrieved from http://www.ifla.org/files/assets/hq/topics/libraries-development/documents/access-and-opportunity-for-all.pdf

IFLA. (2016b). *Libraries Can Drive Progress Across the Entire Un 2030 Agenda United Nations Sustainable Development Goals*.

Iswati, R., Utami, S. B., & Matahari, R. (2017). IbM Pemberdayaan kelompok dukungan sebaya (KDS) ODHA berdaya wujudkan kemandirian dan kesejahteraan. *Media Komunikasi Dan Informasi Hasil Pengabdian Dan Pemberdayaan Masyarakat*, *2*(2).

Lawal, I. (2009). Library and Information Science Research in the 21st Century. *Library and Information Science Research in the 21st Century*. https://doi.org/10.1533/9781780630151

Maftuhin, A. (2017). Mendefinisikan Kota Inklusif: Asal-Usul, Teori Dan Indikator. *Tataloka*, *19*(2), 93. https://doi.org/10.14710/tataloka.19.2.93-103

Mamik. (2015). *Metodologi Kualitatif* (N. Retnowati, Ed.). Sidoarjo: Zifatama Publisher.

Montoya, S. (2018). Defining literacy. In *GAML Fifth Meeting*. Hamburg: UNESCO.

Mustafa, Z. (2013). *Mengurai variabel hingga insturmentasi*. Yogyakarta: Graha Ilmu.

National Library of Colombia. (2017). Mobile libraries for peace. Retrieved October 31, 2019, from Library Map of The Worlds - SDGs Stories website: https://librarymap.ifla.org/stories/sdg/0/Country/Colombia

Pilgrim, J., & Martinez, E. E. (2013). Defining Literacy in the 21st Century: A Guide to Terminology and Skills. *Texas Journal of Literacy Education*, *1*(1), 60–69. Retrieved from http://www.texasreaders.org/volume-1.html

Rachmawati, I. N. (2007). Pengumpulan Data Dalam Penelitian Kualitatif: Wawancara. *Jurnal Keperawatan Indonesia*, *11*(1), 35–40. https://doi.org/10.7454/jki.v11i1.184

Rawal, N. (2008). Social Inclusion and Exclusion: A Review. *Dhaulagiri Journal of Sociology and Anthropology*, *2*, 161–180. https://doi.org/10.3126/dsaj.v2i0.1362

Safira, F. (2019). Peran Perpustakaan dalam Pemberdayaan Perempuan melalui Kegiatan Pelibatan Masyarakat di Perpustakaan Umum Kabupaten Malang. *Jurnal Kepustakawanan Dan Masyarakat Membaca Vol.*, *35*(1), 23–32.

Seftiawan, D. (2019). Literasi bukan hanya membaca. Retrieved June 9, 2020, from Pikiran Rakyat website: https://www.pikiran-rakyat.com/pendidikan/pr-01317946/literasi-bukan-hanya-membaca

Silver, H. (2015). The Contexts of Social Inclusion. *SSRN Electronic Journal*, (144). https://doi.org/10.2139/ssrn.2641272

Sterling Journal Advocate. (2016). Literacy is crucial to prosperity. Retrieved May 19, 2020, from Journal Advocate website: https://www.journal-advocate.com/2016/09/29/literacy-is-crucial-to-prosperity/

Sugiyono. (2009). *Metode Penelitian Kuantitatif, Kualitatif dan R & D.* Bandung: Alfabeta.

Sumekar, S., Salmubi, Perwitasari, Zen, Z., Wuryani, I., Siregar, A. R., … Kismiyati, T. (2011). *Standar Nasional Perpustakaan: bidang perpustakaan umum dan perpustakaan khusus*. Jakarta: Perpustakaan Nasional Republik Indonesia.

Tursilarini, T. Y., & Hermawati, I. (2019). Pendampingan Pekerja Sosial dalam Rehabilitasi Sosial Orang dengan HIV-AIDS = Social Workers Assistance in Social Rehabilitation of People Living With HIV-AIDS Tateki. *Jurnal Penelitian Kesejahteraan Sosial*, *18*(2), 149–166. Retrieved from https://ejournal.kemsos.go.id/index.php/jpks/article/view/1805

Undang - Undang No. 43 Tahun 2007 tentang Perpustakaan. (2007). Retrieved from https://www.perpusnas.go.id/law-detail.php?lang=id&id=170920114322Ir9g6HhRuc

UNDESA. (2016). Identifying social inclusion and exclusion. In *Leaving no one behind: imperative on inclusive development*. https://doi.org/10.18356/5890648c-en

United Nations. (2015). *Transforming Our World: The 2030 Agenda For Sustainable Development A/Res/70/1*. Retrieved from https://sustainabledevelopment.un.org/index.php?page=view&type=111&nr=8496&menu=35

Vårheim, A., Steinmo, S., & Ide, E. (2008). Do libraries matter? Public libraries and the creation of social capital. *Journal of Documentation*, *64*(6), 877–892. https://doi.org/10.1108/00220410810912433

Warsilah, H. (2015). Pembangunan Inklusif Sebagai Upaya Mereduksi Eksklusi Sosial Perkotaan: Kasus Kelompok Marjinal di Kampung Semanggi, Solo, Jawa Tengah. *Jurnal Masyarakat Dan Budaya*, *17*(2), 207–232. https://doi.org/10.14203/JMB.V17I2.283

Yamin, M. (2018). Coca Cola Foundation Lepas Program PerpuSeru kepada Pemerintah. Retrieved June 24, 2020, from Sindonews website: https://nasional.sindonews.com/berita/1319606/15/coca-cola-foundation-lepas-program-perpuseru-kepada-pemerintah

Yayasan Pelita Ilmu. (2018). Social enterpreneurship sebagai upaya pemberdayaan ODHA. Retrieved April 12, 2020, from Yayasan Pelita Ilmu website: http://ypi.or.id/social-enterpreneurship-sebagai-upaya-pemberdayaan-odha/

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Research Paper

The Capacity of Kulon Progo Regency Government in Efforts to Self-Sustaining Economic

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Abstract

As an area with an open economic access, Kulon Progo Regency has many valuable points in the development of its agriculture, manufacturing, trade and services sectors. However, low level of the district public welfare becomes an internal strategic issues that affects its planning process. In the meantime, Kulon Progo District has its own leadership potential with good regional coordination and clear communication with its regional leaders. This potential can be a key element of its regional development as to reduce its internal issues. This leadership type owns by the regional leaders, along with the effective bureaucracy, is a manifestation of the capacity of its regional jurisdiction. This capacity of the Kulon Progo regency government within the framework to achieve self-sustaining economic can be obtained with the following efforts: (1) efforts to mobilize stakeholders in achieving self-sustaining economic by local leaders, (2) determination of local-pro economic policy and priorities program, and (3) implementation of a performance-based planning and budgeting process in an effort to boost the local economy. In practice, the leadership innovation is not strong enough to change the planning and budgeting system that has been institutionalized bureaucratically. Contextual conditions do have great affect to the success of leadership, policy making, and planning and budgeting aspects. Therefore, this study aims to examine the Kulon Progo District Government capacity in encouraging the self-sustaining economy.

Keywords: capacity, sub-national jurisdiction, economic independence

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1. Introduction

Kulon Progo is one of the strategic regencies during development of the Special Region of Yogyakarta (DIY). Its capital is located in Wates with a total area of 58,627.51 Ha. This regency is traversed by two national crossing infrastructures in Java, namely the national road and the national railroad track. From 2010 to 2017, the Human Development Index (HDI) condition of Kulon Progo Regency increased from 68.83 to 73.23 (Central Bureau of Statistics (BPS) Indonesia, 2014-2017). This number of HDI score is quite high when compared to the HDI of *DIY*, but is far above the average of national HDI.

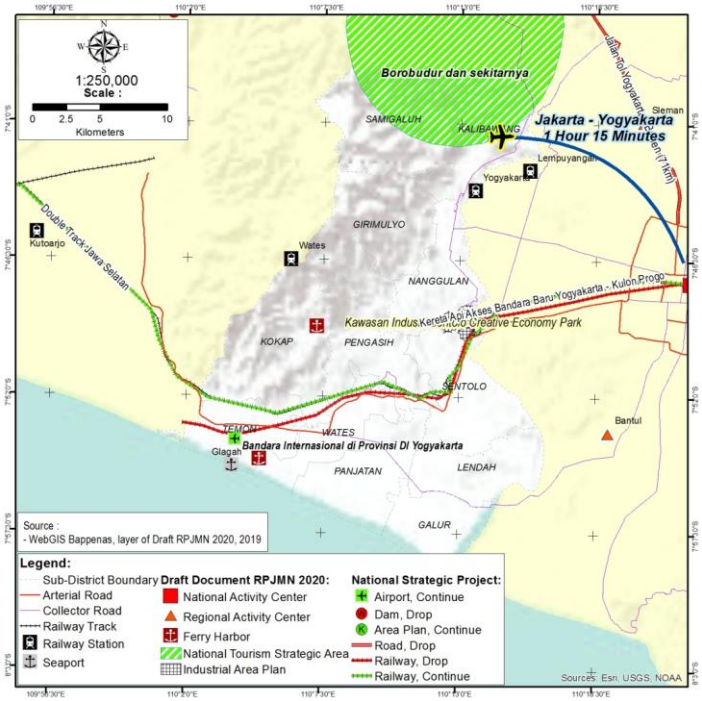


Figure 1. Map of Kulon Progo District

As an area with an open economic access Kulon Progo Regency has an advantage in the development of the agriculture, manufacturing, trade and services sectors. The agriculture, forestry and fisheries sectors brought the largest average contribution to the Gross Regional Domestic Product (GRDP) of Kulon Progo in the period 2010 to 2016 (amounting to 21.43%). Kulon Progo District's economic growth rate *(Laju Pertumbuhan Ekonomi or LPE)* experienced better growth from 2010 to 2016. In 2010, Kulon Progo's LPE was 3.06%. In 2016, Kulon Progo succeeded in increasing its LPE to achieve 4.76% (Kulon Progo District *BPS*, 2013, 2017). This increase in LPE affected in reducing the difference in LPE figures with the *DIY* (5.05%) to 0.29%. Meanwhile, the development of the Gini ratio has fluctuated from year to year, ranging from 0.24 in 2010 to 0.37 in 2016.

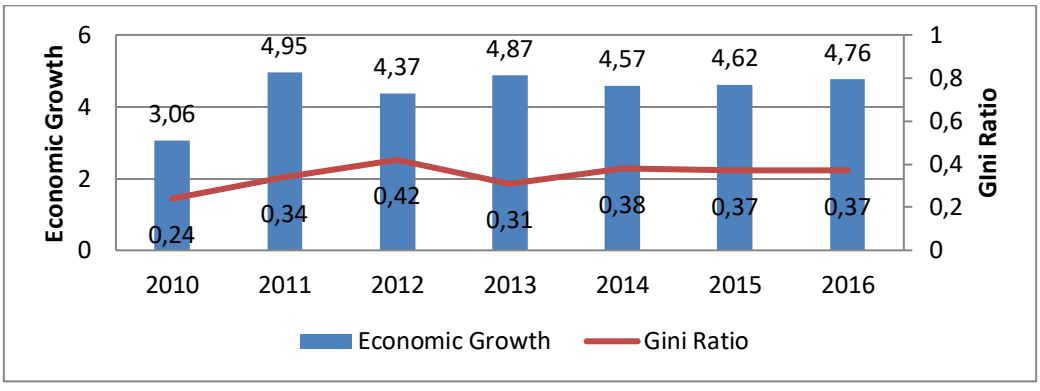


Figure 2. Economic Growth and Gini Ratio of Kulon Progo (Source: BPS Kulon Progo, 2010, 2017)

Kulon Progo Regency has internal strategic issues that affect its planning process. The main issue is the lower level of the regency public welfare. This condition occurs due to low economic growth and slow economic equality that lead to higher level of poverty and unemployment. Poverty and unemployment itself are caused by the lack of job opportunities from inability to attract more investment and low level of regional competitiveness. The low quality of its labor workforce with poor implementation of good governance is also worsening the current situation in Kulon Progo in terms of its public welfare.

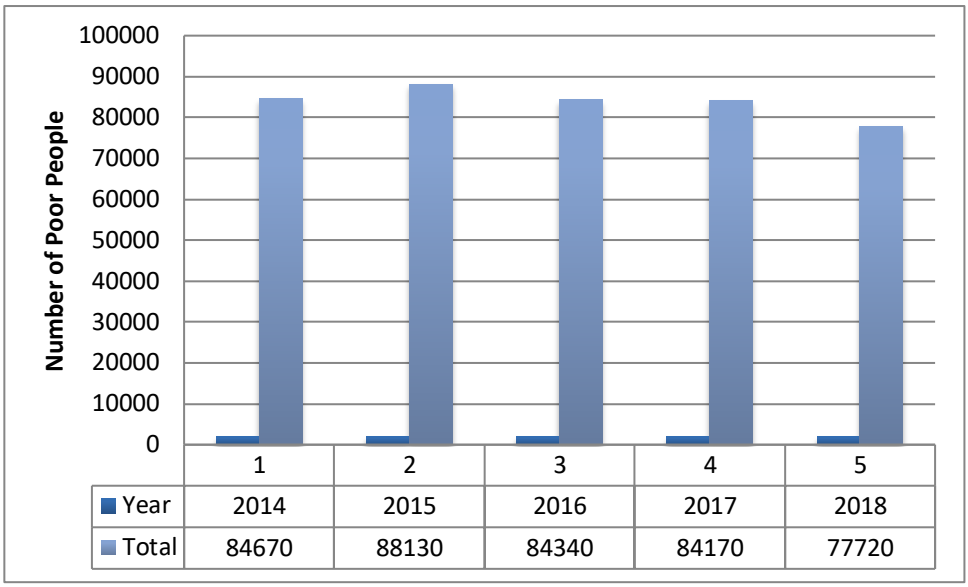


Figure 3. The Number of Poor People in Kulon Progo (Source: BPS Kulon Progo, 2014-2018)

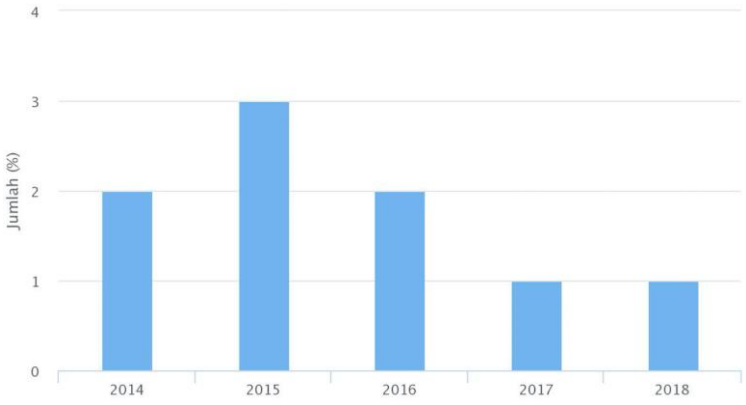


Figure 4. Open Unemployment Rate in Kulon Progo (Source: BPS Kulon Progo, 2014-2018)

Social and economic conditions, along with a variety of internal strategic problems that plagued Kulon Progo, clearly become the challenges in realizing the development within the regency to achieve Sustainable Development Goals (SDGs). In the meantime, Kulon Progo District has its own leadership potential with good regional coordination and clear communication with its regional leaders. This potential can be a potential strength of Kulon Progo District to reduce its internal issues. This type of leadership owns by the local leaders, supported by an effective bureaucracy, is a manifestation of the capacity of the regional jurisdiction.

In practice, the leadership innovation is not strong enough to change the planning and budgeting system that has been institutionalized bureaucratically. Contextual conditions greatly affect the success of aspects of leadership, policy making, and planning and budgeting. Therefore, this study aims to examine the Kulon Progo District Government capacity in encouraging the self-sustaining economy.

2. Methodology

This study used qualitative approaches and method. Primary data collection had completed through field visit, interview, and Focus Group Discussion (FGD). The stages of the study began with a literature review. The literature review focused on the material regarding jurisdictional capacity and regional development profile of Kulon Progo District.

Referring to the main topic of study on the capacity of jurisdiction in efforts to self-sustaining economy, the primary data collection is directed to explore the development of efforts to encourage self-sustaining economy through several innovative programs and policies that are pro to local products. In addition, the direction of data mining is focused on studies of leadership, policy making, and planning and budgeting for programs that provides support to local products. In strengthening the results of primary data collection, supporting secondary data was collected, such as statistical data on the economic growth rate, poverty rate, unemployment rate, and the gini ratio. The time period of secondary data is mainly in the range of 2014-2019, where Mr. Hasto has not become a Regent until he is currently serving as a Regent. This aims to see the progress made by the Regent Hasto.

The sub-national jurisdiction capacity assessment in this study will focus on the capacity of the Kulon Progo District Government in an effort to achieve self-sustaining economic, through breakthrough programs and policies to strengthen the local economy, which can reduce poverty levels and increase regional income. Based on the results of the literature review, several indicators will be used to assess the performance of the administration of local government, such as the results of the Performance Evaluation of Local Government Administration (EKPPD) conducted by the Ministry of Home Affairs (Kemendagri), the results of the assessment of the Performance System of Government Agencies (SAKIP) by the Ministry of Administrative Reform and Bureaucracy Reform (KemenPAN-RB), and the results of financial program audits by the Supreme Audit Board (BPK).

The next stage was collecting primary data through field visit on study location and did interviews with related stakeholders. Field visit was carried out for 4-5 days. The interviews were conducted with resource persons from Local Government Organizations (OPD) selected based on strategic issues related to policies, plans and/or programs (PPPs) that support the achievement of local economic development in the area. The interviewees consisted of resource persons from Bappeda, the Regional Secretary (Sekda), the Agriculture Agency, the Health Agency, the Government Agency of Cooperative Micro, Small and Medium Enterprises (KUKM), the Community's Own Shop (TOMIRA) management, the Regional Water Company (PDAM), Regional Asset and Financial Agency (BKAD), as well as community representatives from Pagerharjo Village. In addition, the selection of resource persons also considered the willingness of them to participate in this study. The result was summarized in a matrix of initial findings which were the subject of discussion at the further FGD at the national level.

The national FGD were carried out through a learning forum. It is a joint learning forum as one of the research approach involving practitioners and policymakers. This learning forum was presented by resource persons from the Directorate General of Regional Autonomy - Ministry of Home Affairs, and the Regional Autonomy Watch Committee (KPPOD). This forum tried to explore the opinions and experiences of stakeholders regarding potential development issues that can affect the jurisdictional capacity of sub-national governments in achieving the regional development target.

The final stage was creating a jurisdictional capacity profile from the case study. The writing of a jurisdictional capacity profile was conducted based on the result of analyzing data and information from the initial findings as well as the results of the learning forum. The results of data and information collection were processed through a qualitative descriptive method by synthesizing key content from various literature reviews and discussions that have been conducted. The results of this analysis are then presented through elaboration: (1) efforts to move stakeholders in achieving self-sustaining economic as a form of leadership and political communication of regional leaders, (2) policy priorities and local-pro economic programs as a picture of policy making and institutional arrangements, and (3) performance-based planning and budgeting processes in an effort to boost the local economy.

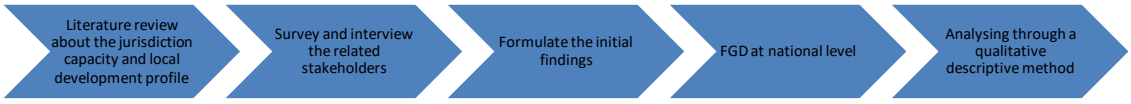


Figure 5. Stages of The Study

3. Framework Thinking of a Jurisdictional Capacity and Local Economic Development

The jurisdiction capacity is the basic concept in this study. This concept simply illustrates how an inherent structure and function of sub-national administration can provide decent public services and economic development in a particular administrative area, while taking into account the regional current condition (from aspects such as social, cultural, economic, ecological and political). The capacity of sub-national jurisdictions is formed from the synthesis of various concepts and approaches. In this study, the concept of sub-national jurisdictional capacity was developed based on the concept of community capacity and the jurisdictional approach. Community itself is a set of institutions, organizations, and behaviors situated between state, business world, and the family. This includes voluntary and non-profit organizations; other forms of social participation and engagement, and the values and cultural patterns associated with them (London School of Economics (LSE), 2004). Meanwhile, according to Chaskin (1999), community capacity is an interaction of social capital between humans and organizations in certain communities that can be used to solve collective problems and improve or maintain the welfare of the community. Factors that influence community capacity include resources, network of relationships, leadership, and support for vehicles through which community members participate in collective action and problem solving. In its implementation, delineation of certain communities is based on the jurisdiction of a territory and administrative area.

Jurisdictional approach is an approach that involves the role of provincial and regency or city governments in implementing a program or activity, as a form of the role of the central government at the local level (TNC, 2014). The components that makes the sub-national jurisdiction approach unique is that there is no absolute way to develop a high-performance sub-national jurisdictional approach. Jurisdictional capacity will be driven by institutions that grow out of society and informal rules that exist within a particular government among a wider network of actors and involved in jurisdictional efforts (GCFTF, 2018). In this particular approach, the regional government plays the role of a state institution that has the responsibility in formulating regulations and intervening the regional development efforts.

As studied by Healey (1999, 2004a, 2006) within the framework of social and non-positivist constructivists, institutions are understood as the ensemble of norms, rules and practices which structure actions in social contexts (Giddens, 1984; Powell & Dimaggio, 1991). Such ensembles are brought into existence and given meaning through continuous active effort, which re-informs and changes both meanings and materialities. Social action is constituted by people acting in relation to others, not just through the pursuit of an individualized "rational calculus". In such interactions, people draw on a (shifting) store of cultural resources through which meanings, values and "knowledge" is shaped (Fischer, 2003; Hall & Taylor, 1996).

In Indonesia, the capacity of sub-national jurisdictions is closely related to the rules of the distribution of duties and authority of regional governments in autonomous regions. Act Number 23 Year 2014 (Act of The Republic of Indonesia) concerning regional government clearly distinguishes jurisdictional boundaries and functions between the central government, provincial governments, and district/city governments. At the same time, Act Number 25 Year 2004 concerning the National Development Planning System provides provisions for the procedures and flow of planning and budgeting, both at the national and sub-national levels. As a state institution, the regional government is an institution consisting of the Organization of Regional Apparatus *(*OPD*)*, where the regional leader acts as the leader and the regional secretary *(Sekda)* acts as the bureaucratic manager.

In carrying out public service efforts, local government institutions formulate development policies, plans and programs (KRP*)* that will be legalized through Regional regulations *(*Perda*)* and other forms of regional regulation. This formulation is carried out through a planning and budgeting process that involves the legislative body as a representative public voice in the formulation of regional regulations. Based on this, the capacity of sub-national jurisdictions in Indonesia is a basic asset of regional governments to determine the *KRP* in an effort to encourage quality and effective public services and to support the achievement of global or national agendas according to regional character and capabilities. The key elements of sub-national jurisdictional capacity consist of: (1) leadership, political communication and effective bureaucratic management; (2) policy making and institutional arrangements; and (3) development planning and budgeting.

Leadership is a profession which much related with individual skills. It is embedded in social capital, where a network is built upon the trust, cooperation, and commitment to others. As Horlings and Padt (2011) stated that sustainable leadership has to work beyond pragmatic, short term, instrumental, and strategic choices. The performance of a leader at least is assisted through eight principal personal attributes (Sorensen and Epps, 1996): (1) Intelligence, (2) Knowledge, (3) Respect, (4) Resource, (5) Energy, (6) Originality, (7) Persuasiveness, and (8) Synoptic thinking. The type of leadership needed is always dependent on the actual context (Harmaakopi, 2007). It means that the time, place, organization, and task determines the type of leadership and skills that must be emphasized. In the regional context, as Judd and Parkinson (1990, see also Judd, 2000), leadership means the capacity to use external and local resources. The most important and pressing issue in the regional development is the delegation of institutional and administrative authority to the regional level, to give them the strength necessary to implement the development policies, plans and strategies (Talmaciu, 2014). Sotarauta and Viljamaa (2002) suggested seven abilities that are important for the network leadership in regional multi-actor networks. These include the ability to:

a. involve people and empower them to act as a network
b. make people work to reach joint separate goals and renew the goals in an ongoing process
c. promote interaction serving as an intermediary in interaction between actors, as well as steering activities towards seeking goals and enabling cooperation
d. connect various actors to the cluster from their own starting points
e. create and utilize creative tension in development and create a sense of drama. This means presenting issues so that people become enthusiastic and excited
f. obtain short-term success so as to sustain motivation
g. form partnerships competently and to efficiently utilize informal relations

For some of regions, most effective leaders appear to have strong extra-regional connections that is developed through two principal forms (Sorensen and Epps, 1996):

1. The presence of helpful contacts, especially in state government, who assist communities with funding for infrastructure of social projects and with dissemination of information about local conditions and needs
2. Knowledge about current economic and social processes in the wider world. The entire corpus of economic development literature suggests that this is crucial both for the perception of realistic opportunity and the development of strategy to achieve.

For the Indonesia's case, the leadership of regional leaders supported by an effective bureaucracy needs to pay attention to political arrangements as reflected in the relationship between the executive branch of the local government and the legislature. The role of effective relations between the executive branch and the Regional House of Representatives (DPRD) as a legislative body is crucial because several KRPs need to be legalized by the regional regulation. From a political perspective, the position of the regional head reflects the interests of supporting political parties. Therefore, an understanding of political communication between the executive and the Regional House of Representatives plays a pivotal role in assessing the effectiveness of leadership and bureaucracy to provide public services and carry out sustainable economic development. Meanwhile, the regional secretary (Sekda) as the bureaucratic manager has the role of assisting the regional leader in the formulation of policies and organizing administrative tasks, as well as in carrying out regional apparatus and administrative services. Regional secretary has authority over OPD across sectors and is responsible for coordinating OPD and local technical institutions in implementing development priorities according to the KRP.

The second component of sub-national jurisdictional capacity is policy making and institutional arrangements because they are influenced by the development goals to be achieved by regional leaders. Policy arrangements can constrain social capital, and vice versa. It can function as a lubricant for the social capital. This requires multi-factors cooperation, cohesion and coordination at the regional level between public actors as well as between public and private actors (Horlings and Padt, 2011). Policy making in Indonesia is based on strategic issues or regional development problems that can be obtained from the leader, all OPDs and also the community, while institutional arrangements are closely related to the bureaucratic system that is to be implemented effectively and efficiently. However, it is difficult to distinguish between the actions of management and the actions of leadership. Leadership emphasizes change, getting people involved and committed. But leadership is not enough in making changes. It requires difficult and large projects, so the proper institutional management is needed. This institutional can also take a role to help the leader. The actions of leadership and of management are analyzed in the context of regional development and seen to have the following characteristics (Harmaakorpi, 2007):

a. the actions of leadership give direction to the organization and groups of people; the actions of leadership motivate and inspire people and bring positive (sometimes dramatic) changes.
b. the actions of the institutional produce plans and budgets, organizing and controls; the actions of management solve the problems, create order, and produce consistency.

Furthermore, the final key component is planning and budgeting. Usui and Alisjahbana (2003) stated that strategic multi-years planning and performance budgeting is inseparably linked with each other. Local government's needs and preferences can be realized through effective fiscal resource allocations, which respond to established priorities, formulated based on people's aspirations. Development plans and budgets should be adjusted to economic and political changes. In planning and budgeting, the direction of regional development goals and objectives from the vision and mission of the regional leader is then articulated in the allocation of time frames, resources, and finance to provide public services and to implement sustainable socio-economic development. In Indonesia, planning and budgeting is a picture of development priorities set by the regional leader based on DPRD's approval. At present, planning and budgeting at the district level proceed on largely separate tracks (Dixon and Hakim, 2009):

a. planning priorities are described in the district's five year plan (RPJMD) and its annual work plan (RKPD), and are determined with limited reference to the cost of implementing the priorities. The planning function is focused on prioritization of spending plans without costing of specific measures for achieving planning priorities.
b. the local budget is determined mechanistically through the detailed costing of inputs, without connecting proposed variations in input levels to achieve planning priorities.

Unfortunately, local governments are still facing difficulties in establishing local priorities (Usui and Alisjahbana, 2003). There are much less linkages between development plans and budgets. Major contributing factors include: 1) lack of general guidelines for local development planning; 2) delayed release of new guidelines for local financial managements; 3) vague expenditure assignments (and also obligatory functions of minimum service standards); and 4) lack of qualified local planning and budgeting officials in local governments. Therefore, refer to the Leigland (1993) suggestion, we need to be more flexible capital planning at the national level, and aggressive central government leadership in developing local capacity to control public revenues, constitute very large 'next steps' in Indonesia's effort to strengthen decentralization. Moreover, to ensure relevance and consistency between planning and budgeting need to pay attention to the following (Hanida, Irawan, and Syamsurizaldi, 2015):

a. programs and activities in RKPD document must be the main reference in the preparation of subsequent documents, to avoid loss of programs and activities in the planning documents or the emergence of new programs and activities in the budget documents.
b. output or target for each activity in the planning process should be clear and measurable.
c. planning board that has function as planning agencies must correct the more thoroughly programs and activities that appear repeatedly in every fiscal year.
d. planning board must improve the functioning of the internal and external coordination in guarding the program and activity that have been planned in the planning documents.
e. parliament and local government must understand that the escort and consistency of the results of the priority planning activity are needed to make synchronization of planning and budgeting documents.

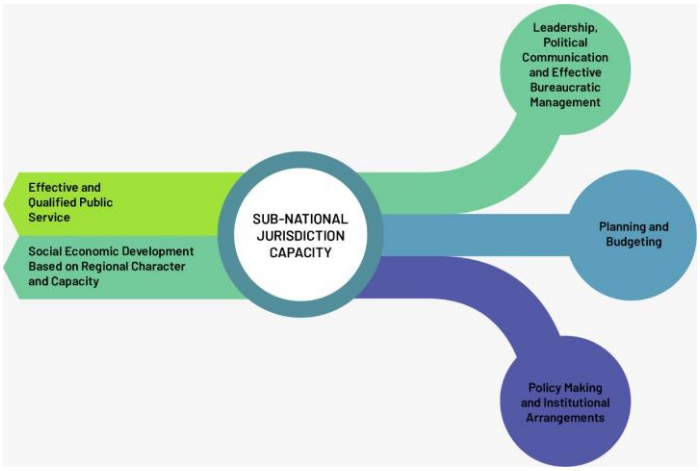


Figure 6. Figure of Sub-National Jurisdiction Capacity (Urban and Regional Development Institute (URDI), 2019)

Generally, a local economic development is affected by all local government activities. As Bartik (2003) stated, the local economic development is usually increasingly regarded as a major local government responsibility. Different from the context of local economic development generally, the local economic development policy is defined more narrowly as specific activities, undertaken by public or private groups, to promote economic development. The economic development programs activities at least consists of two categories (Bartik, 2003):

1. Providing customized assistance targeted at individual businesses that are thought to provide greater economic development benefits
2. Strategic initiatives in which more general tax, spending, and regulatory policies of government are changed to promote local economic development

Even the frame of local economic development is seemed as a self-organizing activity, which carried out by the community, it still needs the government interventions. Public subsidy is one of the interventions. Public subsidy might make sense under any of the following conditions (Bartik, 2003):

a. If the program affects enough businesses to significantly increase local competition in that industry. Under this condition, the program may increase quality and lower prices in that industry, shifting some benefits to local consumers
b. If the program helps businesses or groups whose business success is socially beneficial, for example minorities or women. Some might argue that more small business success is inherently socially beneficial
c. If the program enhances productivity of workers in many jobs, for example training workers in general skills. Under this condition, the program will increase wages
d. If the program increases the productivity of assisted businesses by more than it costs, and the assisted businesses either export outside the local economy or substitute for local imports. Compared to financial incentives, such a program may boost the local economy at a lower cost

The role of leadership, governance quality, and institutions can stimulate the action of economic and social actors for development, and for some extent influence the conomic factor use (Talmaciu, 2014). Even tough the link between those three components (i.e. leadership, governance quality, and institution) is still ambiguous (Feng, 2003 in Talmaciu, 2014), those three elements can catalyze the entrepreneurial initiatives for more effective and efficient use of factorial endowment of the region, or by putting the opportunities appearing in the market to good use, or by creating new opportunities that may contribute to the improvement of the regional economy competitive position.

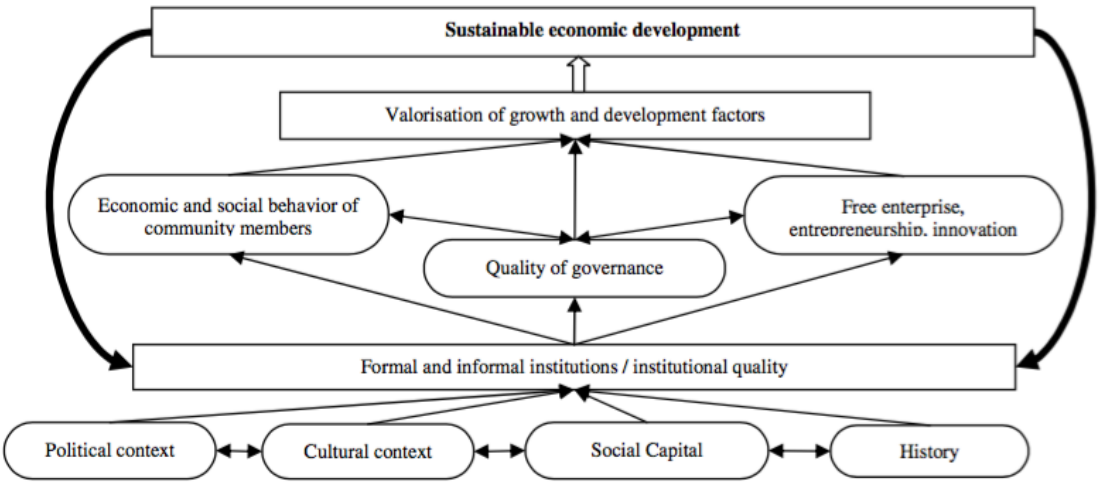


Figure 7. Figure of Relation Between Leadership, Governance Quality, and institution for The Economic Performance and Development (Source: Talmaciu, 2014)

4. Results and Discussions

The results are interpreted into three key components of sub-national jurisdictional capacity: (1) leadership, political communication and effective bureaucratic management; (2) policy making and institutional arrangements; and (3) development planning and budgeting.

Leadership Perspective: Motivation in Mobilizing Stakeholders to Achieve Self-Sustaining Economic

Kulon Progo District has been led by Regent Hasto Wardoyo for two-term periods (2011-2016 and 2017-2022). The main focus (vision) of the development carried out by him is to overcome the internal strategic issues of regional development through the efforts of local economic independence. In the first period of his administration, Hasto sought to improve regional capabilities through the development of local production and consumption. While in the second period of his reign, the achievement of public welfare was more emphasized.

The main challenge of efforts to improve the welfare of the community is poverty, addressed through improving the performance of public sector services. Hasto then issued Regent Decree Number 1 Year 2015 concerning the Role of Regional Apparatus as a Companion for Poor Families. This assistance includes efforts to overcome the problems of food, housing, health, education, clean water and sanitation, job opportunities and disability. In addition, the regional government (Pemda) of Kulon Progo implements "Bela dan Beli Kulon Progo" or local product's consumption movement which aims to encourage the enthusiasm of citizens and local governments to prioritize the consumption of local products in order to grow the local economy (Sekretariat DPRD of the Kulon Progo District, 2018). In "Bela dan Beli Kulon Progo", the regional government of Kulon Progo is launching bottled drinking water called 'AirKU' or 'my water' whose water source is taken from the Kulon Progo regional spring and is processed by Tirta Binangun Regional Water Company (PDAM). In addition, some other initiatives, such as local clothing (batik) program "Geblek Renteng" and Non-Cash Food Aid (BPNT) were introduced, as well as the launching of "Bedah Menoreh" infrastructure program that aims to encourage tourism in the Menoreh hilly area. In the field of food and agriculture, the regional government of Kulon Progo launched a pro-rice program in order to build a people's economy and encourage the recovery of people's production and consumption. In addition, in each village there are groups of female farmers who play a role in helping meet the family's food needs.

The implementation of this breakthrough is inseparable from the support of the role of legislative members (DPRD), local government officials, village officials, and the community. Regent Hasto seeks to establish political communication firmly so that the ideology of using local products is embedded in the

bureaucratic apparatus and legislative members. This ideology then drives the direction of policy formulation, institutional arrangements, planning and budgeting, and implementation. One of the ways in which political communication is built is through the command and control approach to encourage improvement in the quality of the bureaucratic apparatus against the breakthroughs made. Regent Hasto did not hesitate to evaluate the performance of OPD heads on a regular basis every three months, as well as replacing officials who did not have the ideology of using local products and adequate competence through mutation of the bureaucratic apparatus based on their competency.

As Grint (2010) stated in Sotarauta et al. (2017), the development of place is not the rolling-out of logical (technical) plans from the center but the consequence of local agents (leaders) shaping the decisions and interpretations of what is, and is not, possible. For the Kulon Progo's case, Hasto seems understand well the regional resilience. This is similar to the Sotarauta assumption that the understanding of the relationship between place leadership and regional resilience (Bristow & Healey, 2014), entrepreneurship (Fritsch & Storey, 2014), migration (Fratesi & Percoco, 2014), and the role of leaders in responding to periods of recession and crisis (Bailey & Berkeley, 2014; Bailey & De Propris, 2014) is a main capital to a regional development.

In practice, Regent Hasto's efforts to encourage self-sustaining economy encountered many obstacles. The first obstacle is the ideological differences regarding the concept of self-sustaining economy between Regent Hasto and other stakeholders, including bureaucratic apparatus, legislative members, and business actors. The efforts of the Regent Hasto to drive self-sustaining economy in Kulon Progo Dsitrict, through the utilization of local resources, can change the system of regional economic networks that have been formed. The next obstacle is the limited capacity of human resources in managing cooperatives of small and medium businesses as an effort to encourage convenience stores based on local products. The local cooperative has not been able to serve non-cash purchases. Therefore, the cooperation with convenience stores, as a management assistant, is still working. Even this program has not been successfully implemented at the village scale because of the limited capacity of the villagers in managing village-owned enterprises (BUMDES). The following excerpts from interview with the Government Agency of Cooperative Micro, Small and Medium Enterprises (KUKM) of Kulon Progo District, chief manager of Community's Own Shop (TOMIRA), Regional Water Company (PDAM), describe the obstacles faced by the Regent Hasto in encouraging a self-sustaining economy program.

> *"The first trial of the development of a Community's Own Shop (TOMIRA) was carried out by three cooperatives but failed due to limited human resources. In 2 years we always experienced a tug of war. There are 16 TOMIRA which mostly supply convenience stores (Alfamart and Indomaret).."*
>
> *"In fact, the local cooperative has not been able to serve non-cash purchases, i.e non-cash purchases of train tickets, airplanes, etc. Therefore, the TOMIRA's cooperative is still working with Alfamart as a management assistant.."*
>
> *"There are difficulties in marketing AirKU due to limited human resources, inadequate number of marketing fleets, and the inability to reach a wider area.."*
>
> *"There is no cooperation yet with BUMDES by utilizing village funds for the development of self-sustaining economy through TOMIRA in the village. This is because BUMDES itself is still relatively new in Kulon Progo.."*

One of the real impacts of the breakthrough is a significant reduction in the Kulon Progo poverty level. In the period 2010 to 2016, the percentage of the number of poor people in Kulon Progo decreased from 23.15% to 20.30% (BPS of Kulon Progo District, 2017, 2013). Although the percentage of the number of poor people is still relatively high, the regional government of Kulon progo has proven to be able to reduce poverty by 2.75%. This achievement exceeds the average national poverty reduction effort. This willingness to alleviate poverty through these breakthroughs has at least supported the achievement of SDGs for goals 1 'eradicating poverty', 8 'decent work and economic growth', 10 'reducing inequality', and 12 'responsible consumption and production'.

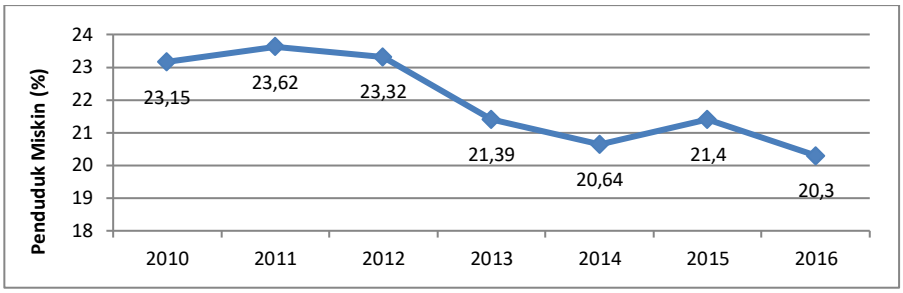


Figure 8. Dynamic Figure of Poor Population in Kulon Progo Regency (Source: BPS Kulon Progo, 2013, 2017)

The leader of Kulon Progo District replaced by its vice regent after the election of Regent Hasto as a Chairman of BKKBN on 1st July 2019. In 11th July 2019, the vice regent of Kulon Progo, Sutedjo, was officially appointed by D.I. Yogyakarta Governor as Regent of Kulon Progo Regency for period 2019-2022. Sutedjo's leadership is expected to continue what had been pioneered by the previous leader, in order to realize the regional welfare. There are some new economic potential developments in Kulon Progo, including: (1) Yogyakarta International Airport and its aerotropolis, (2) acceleration of the Sentolo Industrial Area, (3) airport connectivity infrastructure with the Bedah Menoreh, and (4) the Shouthern Cross Road (JJLS) (Bisnis.com, 2019).

Priority Local-Pro Economic Policies and Programs

As with other regions in Indonesia, policy making and institutional arrangements in Kulon Progo District are directed to achieve the vision and mission set forth in the Regional Medium-Term Development Plan (RPJMD). Based on the 2011-2016 and 2017-2022 RPJMD, one of Kulon Progo's policy directions is towards the development of local and agriculture-based economic independence. This policy direction was revealed in a variety of breakthrough programs and innovative movements. Some of these breakthroughs include: the "Bela dan Beli Kulon Progo" movement consisting of the development of a Community's Own Shop (TOMIRA); local bottled water production labeled AirKu; encouraging local rice consumption for Civil Servants (PNS) and program for the poor population; BPNT; the use of local clothing (batik) "Geblek Renteng"; and "Bedah Menoreh" or Menoreh Mountains expeditions.

In order to encourage the policy, the regional government of Kulon Progo has formulated various Regional Regulations and Decrees of Regional leaders related to program and movement breakthroughs. Some of these regulations include: (1) Perda Number 12 Year 2013 concerning Regional Government Capital Participation of PDAM Tirta Binangun, (2) Perda Number 19 Year 2015 concerning Poverty Alleviation, (3) Perda Number 5 Year 2016 concerning Protection of Local Products, (4) Perda Number 16 Year 2016 concerning Protection and Empowerment of Cooperative Micro, Small and Medium Enterprises (UMKM), and (5) MOU-01/12000 /XII/2013 concerning agreements between the regional government of Kulon Progo and the Indonesian Bureau of Logistics (branch) DIY regarding the provision of Raskin (rice for poor people) through Rasda. Based on the interview result with the Kulon Progo Agriculture Agency, the main objectives of the Rasda policy are: to overcome quality problems, to sufficient local rice needs, to increase the transportation fee, to alleviate farmer's poverty, and encourage rural economic growth.

In formulating policies and breakthrough programs, the Regent coordinates with the Regional Development Planning Agency (Bappeda) as the in-charge of the planning and budgeting process, the Sekda as managerial managerial responsibility for the government, the DPRD as the institution that has responsibility for the validation of the Regional Regulations and programs, and the relevant OPD that plays a role in implementing the program. Some of the main OPDs are the Government Agency of Trading; Government Agency of Cooperative Micro, Small and Medium Enterprises; Regional Water Company (PDAM) Tirta Binangun; Department of Agriculture and Food; and Government Agency of Public Works, Housing and Settlement Areas (PUPKP).

On the other hand, the Kulon Progo District Government faces several governance and institutional challenges that can reduce the optimal implementation of the breakthrough policies and programs that have been prepared. Some of the challenges include (1) regional planning is still not well targeted in answering existing problems, (2) village government performance is not yet optimal, and (3) public service management information system that has not been integrated. The results of the Performance Evaluation of the Regional Government Administration (EKPPD) conducted by the Ministry of Home Affairs for Kulon Progo District in 2012 to 2017 showed a downgrade in the Kulon Progo District from 1st in 2012 to 37th in 2017. However, Kulon Progo's government performance accountability tends to increase. This is evident from the A (excellent measurement) owned by Kulon Progo in the SAKIP evaluation conducted by Ministry of Administrative Reform and Bureaucracy Reform (KemenPAN-RB), in 2018 (KemenPAN-RB, 2019).

Some of the efforts that have been made to overcome governance challenges include increasing the capacity of human resources and public service infrastructure and improving the performance of regional government officials through regular quarterly evaluations and mutation of the bureaucratic apparatus based on their competencies.

Performance-Based Planning and Budgeting in Achieving Priority Programs

The process of regional planning and budgeting is a chain cycle that starts from policy formulation to program implementation. This cycle consists of the process of formulating the Regional Long-Term Development Plan (RPJPD), the Regional Medium-Term Development Plan (RPJMD), Regional Development Work Plan (RKPD), Strategic Plan (Renstra), General Policy on Regional Expenditure Budget and Temporary Budget Ceiling Priority (KUA-PPAS), Work Plan and Budget (RKA), Regional Revenue Expenditure Budget (APBD Perda). The points that most determines the implementation of the program is the discussion phase of RKA and KUA-PPAS with the DPRD. Basen on the interview with the Regional Secretary of Kulon Progo (Sekda), there are usually systematic problems regarding the main tasks and objectives, at the RKA preparation.

Meanwhile, at the KUA-PPAS stage, the budget allocation for program implementation will be discussed in detail. Political commitment and communication are needed to maintain the pre-determined superior program. So far, the obstacles of political communication between the regional head of Kulon Progo District and legislative members have tended to be overcome. Even though there are still some differences of opinion in deciding KUA-PPAS. Special efforts are needed from a regional head to be able to convince legislators about the development innovations that will be applied. As quoted from the results of interviews with Bappeda and Regional Asset and Financial Agency (BKAD) officials as follows.

> *"The RKPD becomes the Regent's policy derived from the vision and mission and priority programs listed in the RPJMD document. The RKPD was then derived to KUA-PPAS, where there was a memorandum of understanding between the Regent and the DPRD or legislative members. There are constraints when discussing with the legislature but not too significant and are dynamic."*

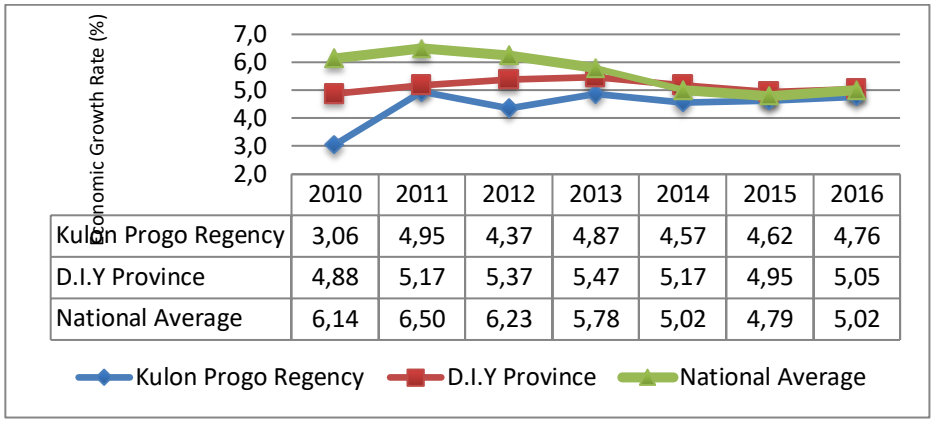
> *"When the RKA is formed, there is another working meeting with the DPRD, it is very possible there is a new policy from the central government. So it is very possible that KUA-PPAS is different from RKPD because of the policy of the central government. in addition, even when the APBD is ready and there is still an evaluation from the Governor, it is still very likely to change."*

In compiling regional budgeting planning, the regional government of Kulon Progo tried to apply the principle of money follow program. This principle encourages budget allocation to support the achievement of priority programs that are directly related to the vision of regional development. Based on the budget allocation data on RKPD, PPAS and APBD documents in the period 2014 to 2017, the biggest budget allocation in 2018 was Wates Regional Hospital (± 29.19%), PUPKP Office (± 20.94%) and the Youth Education Office and Sports (± 13.85%). The Trade Office and the KUKM Service received ± 1.95% and ± 0.12% of the total budget allocation. Aside from being sourced from the APBD, the regional development

budget is also sourced from non-APBD, such as CSR (Corporate Social Responsibility) as well as coordination of donation funds.

This non-APBD source is intended to support district development priority budgeting programs that cannot be fully funded from the APBD, such as increasing agricultural production (from the DIY Province APBD), enhancing the quality of MSME institutions (from the DIY Provincial APBD), routine weekly house renovation for residents (from coordinating donated funds by community care forums), and road maintenance and development (from the Special Allocation Fund). The implementation of the Kulon Progo District budgeting has proven capable of producing an unqualified opinion (WTP) from BPK regarding accountability of regional financial management in 2013 to 2018 (Kulon Progo District Government, 2018).

Overall, the efforts of self-sustaining economy policies through several pro-local product programs have a significant positive impact to Kulon Progo. 'Bela Beli Kulon Progo' movement succeeded in increasing local economic development performance. In the 2012-2016 period, the local cooperative turnover of Kulon Progo increased by Rp. 150,366,300. In 2012, the cooperative's turnover was Rp. 388,353,800 and increased to Rp. 538,720,100 in 2016. In addition, the increased of local clothing (batik) "Geblek Renteng" production encourage the job opportunities through industrial development (Retnandari, 2017).



	2010	2011	2012	2013	2014	2015	2016
Kulon Progo Regency	3,06	4,95	4,37	4,87	4,57	4,62	4,76
D.I.Y Province	4,88	5,17	5,37	5,47	5,17	4,95	5,05
National Average	6,14	6,50	6,23	5,78	5,02	4,79	5,02

Figure 9. Comparison of Economic Growth Among Kulon Progo Regency, Yogyakarta Province, and National (Sources: BPS Kabupaten Kulon Progo, 2013, 2017)

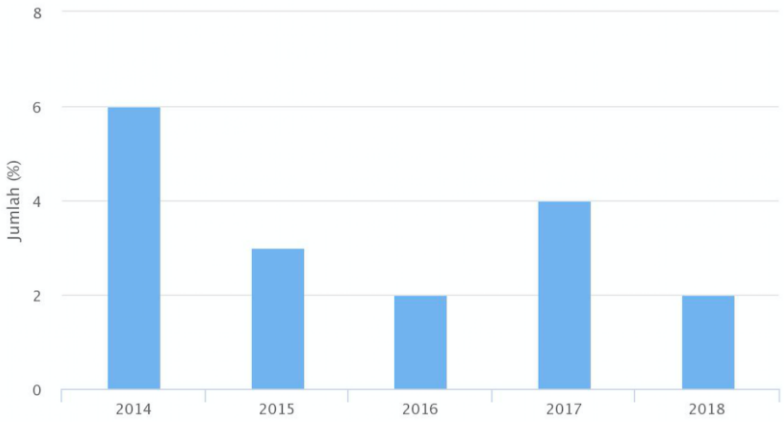


Figure 10. Kulon Progo District Inflation Rate (Sources: BPS Kabupaten Kulon Progo, 2014-2018)

5. Conclusions

As a state institution that is bound by the law on planning and budgeting procedures and the distribution of authority, the implementation of regional government is scanned in a complex framework with interaction between diverse stakeholders, particularly with legislative institutions. Therefore, efforts need to be made to increase the capacity of local governmenmt through empowering leadership, bureaucracy, and political communication. Kulon Progo District has leadership potential that can encourage the capacity of other local governments in the effort to achieve local economic independence. Effective leadership from the regional leaders in Kulon Progo has a strong influence to produce regional development policies that are suitable in responding to the current internal issues, managing proportional institutions in accordance with their main tasks and functions, and determining the inclusion of priority development programs that are in accordance with the vision and mission of regional development to in the planning and budgeting process. In practice, the leadership innovation is not strong enough to change the system of planning and budgeting that has been institutionalized bureaucratically. Contextual conditions greatly affect the success of aspects of leadership, policy making, and planning and budgeting.

In the administration of regional government, mandatory functions and governance choices can contribute to the achievement of effective public services and if carried out optimally by taking into account the balance of =economic and social aspects. The government's political will has an important role in supporting the implementation of innovation because it is related to policymaking and its inclusion in the planning and budgeting process. In addition, communication and coordination between parties is also needed to establish cooperation and increase participation in implementing innovation so that the benefits can be felt directly by various parties.

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References

Bappeda Kabupaten Kulon Progo. (2011). *Rencana Pembangunan Jangka Menengah Daerah Tahun 2011-2016.* Kulon Progo: Bappeda Kabupaten Kulon Progo.

Bappeda Kabupaten Kulon Progo. (2017). *Rencana Pembangunan Jangka Menengah Daerah Tahun 2017-2022.* Kulon Progo: Bappeda Kabupaten Kulon Progo.

Bartik, T. J. (2003). Local Economic Development Policies. Upjohn Institute Working Paper No. 03-91. Kalamazoo, MI:W.E.Upjohn Institute for Employment Research.

Bisnis.com. (2019). Sutedjo Resmi Jabat Bupati Kulon Progo, Gantikan Hasto Wardoyo. https://semarang.bisnis.com/read/20191107/535/1167958/sutedjo-resmi-jabat-bupati-kulon-progo-gantikan-hasto-wardoyo, accessed on 27th April 2020.

BPS Kabupaten Kulon Progo. (2013). *Kabupaten Kulon Progo Dalam Angka Tahun 2013.* Kulon Progo: BPS Kabupaten Kulon Progo.

BPS Kabupaten Kulon Progo. (2017). *Kabupaten Kulon Progo Dalam Angka Tahun 2017*. Kulon Progo: BPS Kabupaten Kulon Progo.

BPS. (2014). *Indeks Pembangunan Manusia menurut Kabupaten/Kota Tahun 2014.* https://www.bps.go.id/dynamictable/2017/09/05/1271/indeks-pembangunan-manusia-menurut-kabupaten-kota-2014-metode-baru-.html, accessed on 27th February 2019.

BPS. (2015). *Indeks Pembangunan Manusia menurut Kabupaten/Kota Tahun 2015.* https://www.bps.go.id/dynamictable/2017/09/05/1270/indeks-pembangunan-manusia-menurut-kabupaten-kota-2015-metode-baru-.html, accessed on 27th February 2019.

BPS. (2016). *Indeks Pembangunan Manusia menurut Kabupaten/Kota Tahun 2016.* https://www.bps.go.id/dynamictable/2017/09/05/1269/indeks-pembangunan-manusia-menurut-kabupaten-kota-2016-metode-baru-.html, accessed on 27th February 2019.

BPS. (2017). *Indeks Pembangunan Manusia menurut Kabupaten/Kota Tahun 2017.* https://www.bps.go.id/dynamictable/2018/04/16/1297/indeks-pembangunan-manusia-menurut-kabupaten-kota-2017-metode-baru-.html, accessed on 27th February 2019.

BPS. (2017). *Indeks Pembangunan Manusia menurut Provinsi Tahun 2010-2017.* https://www.bps.go.id/dynamictable/2016/06/16/1211/indeks-pembangunan-manusia-menurut-provinsi-2010-2017-metode-baru-.html, accessed on 28th February 2019.

Chaskin, Robert J. (1999). *Defining Community Cpacity: A Framework and Implications from a Coprehensive Community Initiative.* Chicago: Chapin Hall Center for Children at the University of Chicago.

Dixon, G. & Hakim, D. (2009). Making Indonesia's Bugdet Decentralization Work: The Challenge of Linking Planning and Budgeting at The Local Level. International public Management Review, Vol. 10, Issue I, 2009.

Fischer, F. (2003). *Reframing Public Policy: Discursive Politics and Deliberative Practices.* Oxford: Oxford University Press.

GCF Task Force (GCFC). (2018). *GCF Task Force And UNDP Releases Guidance On Norway Pledge.* https://gcftf.org/news/2018/2/16/gcf-task-force-releases-guidance-on-norway-pledge, accessed on 9th March 2019.

Giddens, A. (1984). *The Constitution of Society.* Cambridge: Policy Press.

Hall, P. & Taylor, R. (1996). Political science and the three institutionalisms. Political Studies, XLIV(5), pp. 936–957.

Hanida, P.R., Irawan, B., Syamsurizaldi. (2015). The Analysis of Planning and Budgeting policy for Making More Significant Local Government Planning Policy in Indonesia. IJASOS-International E-Journal of Advances in Social Sciences, Vol. I, Issue 2, August 2015.

Harmaakorpi, V. (2007). Leadership in Different Kinds of Regional Development Networks. Baltic Journal of Management, Vol. 2, No. 1.

Healey, P. (1999). *Institutionalyst Analysis, Communicative Planning and Shaping Places.* Journal of Planning Education and Research, 19(2), pp.111-122.

Healey, P. (2004). *The treatment of space and place in the new strategic planning in Europe.* International Journal of Urban and Regional Research, 28(1), pp. 45–67.

Healey, P. (2006). *Transforming Governance: Challenges of Institutional Adaptation and A New Politics of Space.* European Planning Studies, 14:3, pp.299-320.

Horlings, Ina & Padt, Frans. (2011). Leadership for Sustainable Regional Development in Rural Areas: Bridging Personal and Institutional Aspects. Sustainable Development. Wiley Online Library. DOI: 10.1001/sd.526.

Judd, D. (2000), "Strong leadership", Urban Studies, Vol. 37 Nos 5/6, pp. 951-61.

Judd, D. and Parkinson, M. (1990), "Leadership and urban regeneration", Cities in North America and Europe Urban Affairs Annual Reviews,Vol. 37, Sage, London.

Kementerian Pedayagunaan Aparatur Negara dan Reformasi Birokrasi. (2019). *Rapor SAKIP A, Kulon Progo Hemat Anggaran RP 113 M.* https://www.menpan.go.id/site/berita-terkini/rapor-sakip-a-kulon-progo-hemat-anggaran-rp-113-m, accessed on 1st March 2019.

Keputusan Menteri Dalam Negeri Nomor 100-53 Tahun 2018 tentang Peringkat dan Status Kinerja Penyelenggaraan Pemerintahan Daerah Secara Nasional Tahun 2017.

Keputusan Menteri Dalam Negeri Nomor 120-10421 Tahun 2016 tentang Penetapan Peringkat dan Status Kinerja Penyelenggaraan Pemerintahan Daerah Secara Nasional Tahun 2015.

Keputusan Menteri Dalam Negeri Nomor 120-251 Tahun 2014 tentang Penetapan Peringkat dan Status Kinerja Penyelenggaraan Pemerintahan Daerah Secara Nasional Tahun 2012.

Keputusan Menteri Dalam Negeri Nomor 120-4761 Tahun 2014 tentang Penetapan Peringkat dan Status Kinerja Penyelenggaraan Pemerintahan Daerah Secara Nasional Tahun 2013.

Keputusan Menteri Dalam Negeri Nomor 800-35 Tahun 2016 tentang Penetapan Peringkat dan Status Kinerja Penyelenggaraan Pemerintahan Daerah Secara Nasional Tahun 2014.

Leigland, James. (1993). Decentralization the Development Budget Process in Indonesia: Progress and Prospect. Public Budgeting and Finance/Fall 1993.

Pemerintah Kabupaten Kulon Progo. (2014). Lembar Perencanaan Murni Kabupaten Kulon Progo Tahun 2014. http://kulonprogokab.go.id/v3/, accessed on 2nd March 2019.

Pemerintah Kabupaten Kulon Progo. (2015). Lembar Perencanaan Murni Kabupaten Kulon Progo Tahun 2015. http://kulonprogokab.go.id/v3/, accessed on 2nd March 2019.

Pemerintah Kabupaten Kulon Progo. (2016). Lembar Perencanaan Murni Kabupaten Kulon Progo Tahun 2016. http://kulonprogokab.go.id/v3/, accessed on 2nd March 2019.

Pemerintah Kabupaten Kulon Progo. (2017). Lembar Perencanaan Murni Kabupaten Kulon Progo Tahun 2017. http://kulonprogokab.go.id/v3/, accessed on 2nd March 2019.

Pemerintah Kabupaten Kulon Progo. (2018). Kulon Progo Raih Opini WTP ke-Lima Kalinya dari BPK. https://kulonprogokab.go.id/v3/portal/index.php/web/view_berita/4986/Kulon-Progo-Raih-Opini-WTP-ke-Lima-Kalinya-dari-BPK, accessed on 2nd March 2019.

Pemerintah Kabupaten Kulon Progo. (2018). Lembar Perencanaan Murni Kabupaten Kulon Progo Tahun 2018. http://kulonprogokab.go.id/v3/, accessed on 2nd March 2019.

Powell, W. W. & Dimaggio, P. J. (Eds). (1991). *The New Institutionalism in Organizational Analysis.* Chicago, IL: University of Chicago Press.

Retnandari, Dwi, N. (2017). Bela Beli Kulon Progo as A Policy for Strengthening The Capacity of Local Economy. Policy

Sekretariat Dewan Kabupaten Kulon Progo. (2018). Bela Beli Kulon Progo, Program Bupati Memilih Produk Lokal. http://setwan.kulonprogokab.go.id/index.php?pilih=news&mod=yes&aksi=lihat&id=259, accessed on 28th February 2019.

Sorensen, T. & Epps, R. (1996). Leadership and Local Development: Dimensions of Leadership in Four Central Queensland Towns. Journal of Rural Studies, Vol.12, No. 2, pp. 113-125. Elsevier Science Ltd.

Sotarauta, M., Beer, A., & Gibney, J. (2017). Making Sense of Leadership in Urban and Regional Development. Regional Studies, 51:2, 187-193.

Sotarauta, M. & Vilijamaa, M. (2002). Leadership and management in the development of regional innovation environments", paper presented at Conference Report at the 42nd Congress of the European Regional Science Association (ERSA), Dortmund, Germany.

Talmaciu, Mihai. (2014). Study on the Relationship Between Institutions, Governance, and Leadership and Regional Development Policy in Romania. Procedia Economics and Finance 15 (2014) 1281-1288.

The Nature Conservancy (TNC). (2014). *Jurisdictional Approaches to Green Development Learning Exchange 2014.* https://www.conservationgateway.org/ConservationPractices/ClimateChange/ForestCarbon/Pages/jakarta2014.aspx, accessed on 8th March 2019.

Usui, N. & Alisjahbana, A. (2003). Local Development Planning and Budgeting in Decentralized Indonesia: Update. International Symposium on Indonesia's Decentralization Policy: Problems and Policy Directions, September 4-5, 2003.

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Policy Paper

A Review of Suramadu Regional Development Acceleration towards Sustainable Development Concept

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Abstract

Based on the Surabaya Madura Regional Development Agency Master Plan 2010-2024, Madura Island has a strategic position as part of the *Gerbangkertosusila* Urban National Strategy. There is still, however, a development disparity between Madura Island and East Java. This can be seen from the economic performance of Madura Island which is quite low compared to other districts or cities in East Java Province. Madura Human Development Index (HDI) is below the East Java on average, and the percentage of poor people in Madura is the highest in East Java. Therefore, the development of Surabaya-Madura (Suramadu) must be integrated through regional development, such as development of connectivity systems. The research used descriptive analysis to assess the characteristics of a program and to adjust the characteristics with sustainable development theory that consists of three components, namely: environmental, economic, and social developments. These can ultimately be used to sharpen the development target to be achieved in the next 5 (five) years. Data were collected using secondary survey instruments through existing literature studies and policy reviews, such as National Medium-Term Development Plan 2020-2024 and Regional Medium-Term Development Plan of East Java Province.

Keywords: *Suramadu Region, Sustainable Development, Descriptive Analysis*

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1. Introduction

National development is an effort to utilize all components of the nation to achieve the goal of the formation of the Unitary State of the Republic of Indonesia. To achieve this development goal, planning activities are carried out through long-term, medium-term, and annual planning policies implemented in stages. Madura Island is an inseparable region of East Java Province with a large economic potential which attracts attention for investors. This potential has been indeed outlined in the Suramadu Region development plan which is inseparable from the development of the East Java Region as stipulated in Regional Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Daerah-RPJMD*) of East Java Province to improve the economy and the welfare of the community at large.

The development plan of Surabaya-Madura region after the construction of the Suramadu Bridge is in line with the establishment of institutions that have the authority and responsibility in developing the Surabaya-Madura region, namely the Suramadu Regional Development Agency as outlined in Presidential Regulation Number 27/2008 on the Surabaya-Madura Regional Development Agency. Surabaya-Madura Regional Development Agency consists of a Steering Board and an Implementing Agency tasked with preparing the Master Plan and plan activities for the development of facilities and infrastructure as well as the development activities of the Suramadu area. Surabaya-Madura Regional Development Agency is also tasked with synchronizing the policies of the Central Government and Regional Governments relating to the development of the Suramadu region.

Through the development concept contained in the Master Plan for the Acceleration of Suramadu Regional Development, it is expected that development weaknesses that occur in the Suramadu region do not cause development disparity between regions, which is caused by the uneven distribution of human and natural resources due to infrastructure limitations. Development disparity between regions in East Java Province does not only occur between the North Coast and South Coast areas of East Java, but this condition also occurs between Madura Island and East Java. This can be seen from the economic performance of Madura Island which is quite low compared to other regencies/cities in East Java Province. Retrieved from the 2019 statistical data, economic growth in Madura was 0.14 -1.42% below the East Java on average (5.52%), except Pamekasan Regency. In fact, the target of economic growth in Madura until 2024 is expected to be close to the economic growth of East Java Province, i.e. 6.0-6.5%. Another indicator is that the Madura Human Development Index (HDI) of 61.94-66.22 is also below the East Java on average (71.50). Furthermore, the percentage of poor people in Madura is the highest in East Java, where Sampang Regency is ranked first at 20.71% then followed by Sumenep Regency at 19.48%.

Conceptually, the development of Madura Island needs to be integrated with the development of the City of Surabaya and its surroundings to encourage economic development in the Madura Island and to reduce the bias of urban investment in the City of Surabaya and its surroundings. Therefore, the development of Surabaya-Madura (Suramadu) must be integrated through regional development (industry, warehousing, trade in services, tourism, public facilities and settlements), development of connectivity systems through infrastructure support, human resource development, and development of leading economic clusters based on the local economy to become a major necessity.

So far, the development of the Suramadu region through the acceleration development program of the Suramadu Region has been compiled and implemented by integrating the central, sector (transportation, public works, marine and fisheries, agriculture, and tourism and creative economy) and regional (provincial and district/city) policies. At this point, the implementation of the development of the Suramadu region is guided by the Master Plan for the Acceleration of the Development of Suramadu Region (RIP2WS) as a general policy and implementation guide for BPWS, sectors, and regions. This is to integrate the medium-term program and harmonization of the annual program into the implementation of the accelerated development program of the Suramadu Region through coordinating with the East Java Provincial Government together with the BPWS Implementing Agency.

In addition, the implementation of development refers to strategic planning in 2015-2019. The development in Suramadu Region is increasingly complex and there are many changes in the strategic environment. Therefore, it needs to sharpen and adjust the direction of development both to accommodate the needs of new initiatives that have not been listed in the Master Plan and to accelerate The Development of Suramadu Region or Agency Medium Term Strategic Plan of 2020-2024 and synergy

with the National Medium-Term Development Plan of 2020-2024. In addition, the direction of development has been done as a form of harmony in the Agency Medium-Term Strategic Plan of 2020-2024 with the concept of sustainable development, realizing regional development oriented to economic development by taking into account the sustainability of natural/environmental resources and social development.

Sustainable development is a development that satisfies current needs without reducing the ability of the future generation to supply their own needs (Silva et al., 2020). Sustainable development is a social construction with decision-making rules based on values related to current and future development, which must be understood in the context of a dynamic environment, inseparable from society (He et al., 2019). This means that there is a need for optimization between the achievement of economic goals (growth and efficiency), social goals (equity, participation, and harmony), and the environment such as carrying capacity and biodiversity (Szopik-Depczyńska et al., 2018). Minimizing the impact of economic growth on the environment often results in disrupted environmental conditions and ecosystems (Kroll & Zipperer, 2020). Therefore, regional economic growth needs to be harmonized with the need to conserve the environment (Heidenreich, 2003). Given the attraction of interests that are not always in line, effective government intervention is needed to realize optimal sustainable development (Munda & Saisana, 2011).

To respond these challenges, the Roadmap for Suramadu Regional Development Acceleration to Increase Community Welfare will be carried out through the development of integrated and sustainable local potential in realizing National Priorities in the RPJMN 2020-2024. As a result, the implementation is necessary to consider the concept of sustainable development which can ultimately be used to sharpen the development target to be achieved in the next 5 (five) years.

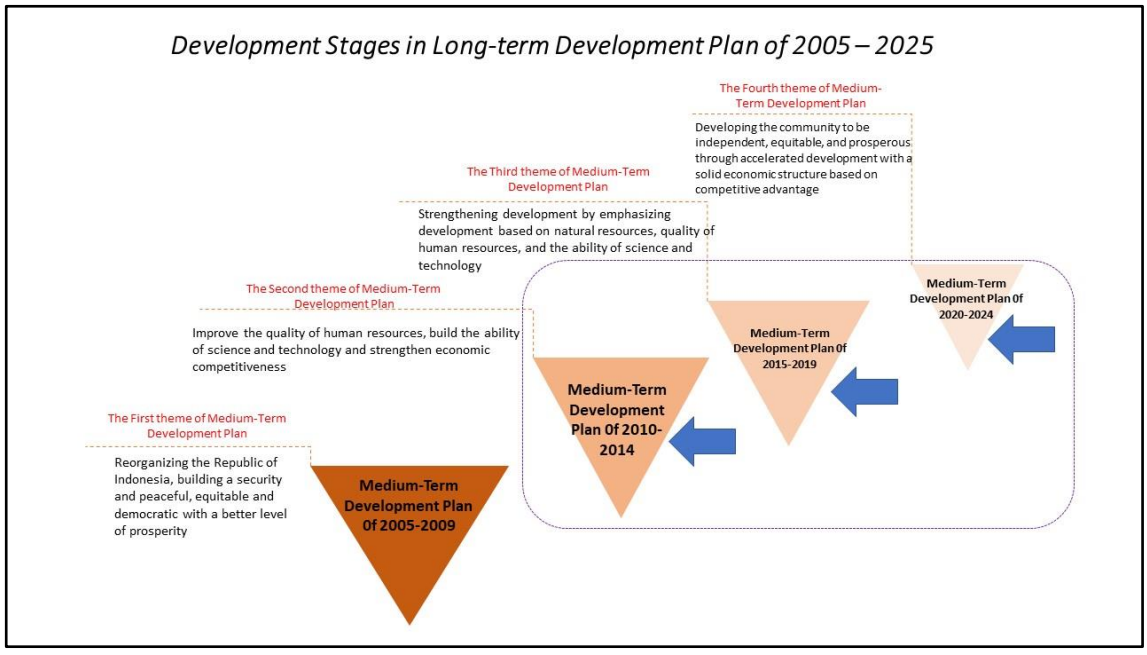

Figure 1. Development Stages in Long-term Development Plan of 2005 – 2025

The preparation of this road map is intended to provide inputs related to the direction of the development of the Suramadu Region in the upcoming national priorities to be in line with the Medium-Term Development Plan of 2020-2024. The research method used the descriptive analysis by explaining the suitability of policy directives with the theory of sustainable development.

2. Methodology

The research method of this case study used descriptive analysis specifically using the analysis of conformity with the concept of sustainable development. Descriptive analysis was conducted by assessing the characteristics of a program and adapted to the characteristics of the sustainable development theory consisting of three components, namely: environmental development, economic development, and social development. The research sites were in Suramadu Area consisting of (1) foot area of Surabaya-Madura bridge covering the area on the Surabaya side about 600 hectares and the area on the side of Madura around 600 hectares, and (2) Specific area in Madura Island covering approximately 600 hectares in a single unit with a container port area with housing and industry including its access road. The research sites are shown in **Figure 2.**

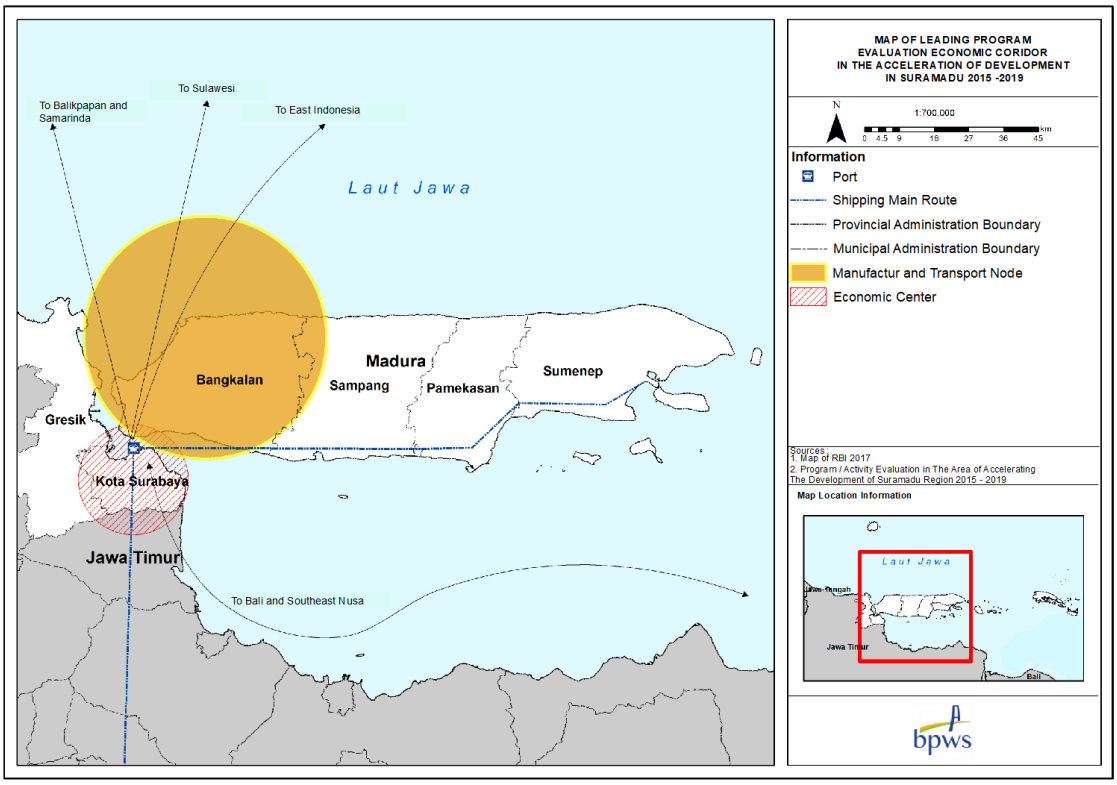

Figure 2. Suramadu area seen from the Java Economic Corridor, Masterplan Acceleration and expansion of development Indonesia economic 2011-2025

Data were collected using secondary survey instruments through existing literature studies and policy reviews. Based on the results of analysis, recommendations were compiled for inputs in determining the development direction of development acceleration of Suramadu area following the concept of sustainable development. The secondary data needed in this study is explained in **Table 1.**

Table 1: Secondary Data Needs

No.	Data Source	Data Needs
1	Coordinating Ministry for Economic Affairs	• Masterplan Acceleration and expansion of development Indonesia economic 2011-2025
2	Ministry of National Development Planning/National Development Planning Agency	• National Medium-Term Development Plan of 2020-2024
3	Development Planning Agency of East Java	• East Java Spatial Plan • Long-Term Development Plan of East Java
4	Surabaya-Madura Regional Development Agency	• Agency Medium Term Strategic Plan of 2020-2024 • Master Plan for the Acceleration of Suramadu Regional Development 2010-2024
5	Development Planning Agency of Surabaya	• Surabaya Spatial Plan

2.1 Analysis

Descriptive analysis that was carried out in this research was the conformity analysis of Surabaya-Madura Regional development agency strategic plan to the sustainable regional development concept. The conformity analysis aimed to explain the suitability of development planning policy with the sustainable development concept. Therefore, first, it was necessary to identify the programs contained in The Ministry/Institutions which in this case is Surabaya-Madura Regional Development Agency. The program produces several activities that will be carried out in order to achieve development targets. After identifying activities of the program, the next steps were determining activities that meet the rules of sustainable development theory through a checklist in the table column and conducting descriptive analysis to explain the suitability of the program to the concept of sustainable development. The results of conformity analysis were used to determine the development direction, so that the sustainable development targets can be achieved in the next five years.

3. Results and Discussions

3.1 Suramadu Area Development of the Surrounding Territories

In an archipelago, Suramadu area consists of several islands that are mutually affected by both the export and import activities between the islands and the needs of residents by its inhabitants, besides having its ecological functions that are important and need to be kept (Simsek et al., 2020). Based on the Master Plan for the Acceleration of Suramadu Regional Development 2010-2024, the development of Suramadu region is directed to be the strategic area of the economic field in Java-Bali region that serves as economic growth centers and have an economic scale with national and international competitiveness based on industry sector and national services, creative Economic Development Center, as well as one of the world's best tourist destination gateways, geared towards the development of food and beverage industry, textiles, transportation equipment, telematics, chemistry, alumina, and iron steel. One of the focuses of strategic area development in Java-Bali region is the development of Suramadu region as the economic mobilizer of the periphery area. Accelerating the development of strategic areas is conducted through the following strategies:

1. Development of the potential of Suramadu bridge foot of Madura side and the area of Suramadu bridge foot of Surabaya side, and a specific area in Madura Island.
2. Acceleration Strengthening of connectivity through the construction of access road industrial area in Madura to the container port.

Based on the Masterplan of acceleration and expansion of Indonesia Economic development 2011 – 2025, the development of Suramadu area as a strategic area of other regions in national scope plays a role in supporting Java corridor for national industry and services. Industries and services developed include manufacturing industry, textile, transportation machinery, shipping, defense primary equipment, telematics, and metropolitan development of Jabodetabek. The city of Surabaya is in the Java corridor as one of the main infrastructure nodes in East Java with the international main port of *Tanjung Perak* and the main line to the outside corridor to the south of Surabaya, while eastwards to Madura Island. The existence of the international main port and main line in the city of Surabaya which is adjacent to Madura Island will have an impact on the economy if the development of Suramadu strategic area is implemented well.

When it is reviewed from the ecological function, both areas in Surabaya and Madura have similarities such as directly adjacent to the waters of Madura Strait, so that in Surabaya and Madura region there is a coastal area. Coastal areas have always received impact, both from activities in the upstream and in the coastal areas themselves. Therefore, the development of Surabaya-Madura region should pay attention to the aspects of environmental conservation so that activities in both areas do not adversely affect the waters of Madura Strait and coastal areas in the vicinity of potential as a provider of fishery resources, tourism, sea transportation, etc.

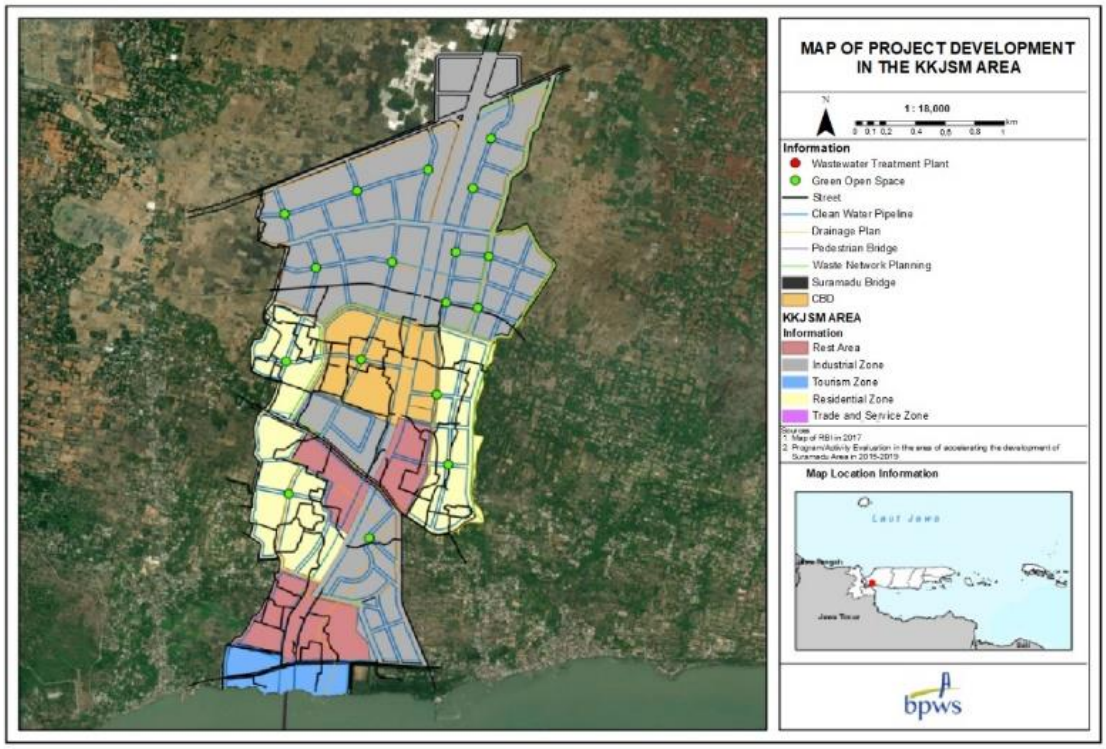

Figure 3. Development of Strategic area Project Suramadu, access toll road Suramadu and the port of container Tanjung Bulu Pandan -(Perpres 27/2008 Article 12 letter B, C, D), according to the reference Space (spatial Unit), Master Plan for the Acceleration of Suramadu Regional Development 2010-2024

3.2 The Concept of Sustainable Development

Sustainable development is a social construction with the rules of decision-making based on values related to current and future development, which must be understood in the context of a dynamic environment, inseparable from society (De Zeeuw et al., 2010; Eustachio et al., 2019). Sustainable development conducts development to meet current needs without compromising the need for future generations with an emphasis on environmental support, achievement of social justice, sustainable economics (Janković Šoja et al., 2016). The Followings are the policies and research findings obtained in supporting sustainable development in the Surabaya-Madura Region.

3.2.1. Environmental development

Environmental development is the achievement of sustainable natural resources and environmental management as the buffer of the whole life (Opon & Henry, 2019; Ramos, 2009). Environmentally sustainable means keeping the environment comfortable and safe through zero-emission (Feola et al., 2020; Shen et al., 2013). In environmental development, the main aspects that need to be considered are water quality, air quality, environmental management, and biodiversity (Kono et al., 2018; Torabi Moghadam et al., 2017). The development concept of Surabaya-Madura region that supports environmental development is shown in the provision of clean water network infrastructure, and wastewater and waste management infrastructure.

The Surabaya City Regulation No. 12/2014 on spatial planning of the city of Surabaya shows that environmental development is directed at optimizing the utilization of surface water resources and other water sources; increasing water catchment through optimization of the reservoir function for water tourism, environmental arrangement, conservation; managing the city's domestic waste to reduce the environmental pollution level, through the provision of centralized wastewater treatment plant (WWTP) installation and integrated communal WWTP; and optimizing the function of landfill and facility of hygiene

infrastructure and develop the environmentally friendly waste technology. Madura Island regions, especially those located on the north coast, need to support water resources development. In 2019, clean water treatment capacity available in Madura Island reached 1,300 liters/sec while water resources potential of 33,500 liters/second. In 2019, the fulfilment of the needs of drinking water in Madura Island still reached 20.93% of the total population, such as: Users of local water supply utilities by 12.98%, Drinking Water User Population Association by 0.78%, users of WSLIC (Water Sanitation for Low-Income Communities) by 1.7%, and users of shallow well by 5.5%.

When associated with the program at the strategic planning document of Surabaya Madura Regional Development Agency, in the development program of Suramadu Strategic area, there are infrastructure development activities of Madura area infrastructure development of 14 priority tourism destinations and development of 6 strategic industry priorities. Thus, infrastructure development needs to be prepared for service activities in industrial areas. The research results show that some SPAM has been functioning properly while others are still not able to function optimally. Then, clean water network for the preparation of industrial area especially in Suramadu area has met the standard of Permenperin 35/2010 on industrial Area technical guidelines stating that the minimum standard of clean water in an industrial area is 0.55 L/sec/Ha. This was obtained by looking at the suitability between potential land area development of drinking water supply system by Surabaya-Madura Regional Development Agency and the preparation of industrial areas, especially in the working area of Surabaya Madura Regional Development Agency with the amount of clean water needed to support industrial activities in the Surabaya-Madura region.

Table 2: Estimation of the need for clean water network for industrial Area plan in Madura

Clean water supplies Industrial Area	Industrial Area around the foot of Suramadu Bridge	Industrial Area of Madura Special Area	Unit
Land	600	600	Ha
Standard Requirements	0.55	0.55	L/sec/Ha
Total needs	1090.90	1, 090,90	L

Source: Analysis result, 2019

The fulfilment of clean water needs can be served by PDAM, however for optimized result, each industrial area that is close to water resources, such as rivers, can make water treatment plant itself. Besides, the infrastructure that must be prepared to serve the Development Plan 6 Strategic Industries is the provision wastewater treatment plant (WWTP) installation so that it can be done for waste management before it is disposed to drains, rivers, and seas so as not to cause environmental pollution. The provision of waste facilities is also required by providing a waste system to serve industrial area by utilizing environmentally friendly technology.

3.2.2 Economic development

Sustainable economics means a development activity should be able to generate economic growth, capital preservation, resource usage, and investments (Nogués et al., 2019). Economic sustainability also means maintaining stable economic growth by restructuring productive systems to conserve resources and energy (Haider et al., 2018; Horsley et al., 2015).

Economic development in the Suramadu region is carried out through the development of economic growth centers based on the potential and superiority of each region, both existing and potentially to be developed as well as strengthened by the regional development policy document such as National Medium-Term Development Plan, National Spatial Plan, Long-Term Development Plan of East Java, Local Spatial Plan, Surabaya and Madura Spatial Plan. The development of the economic growth center is accompanied by strengthening connectivity cross growth centers and between economic growth center and the location of economic activities as well as infrastructure and its supporting human resources (Kempenaar et al., 2016). The development of Suramadu region also needs to be synchronized with the surrounding area, through the integration of Growth Center development in Suramadu region with the growth area in Java Island, integration of urban system development in Suramadu region with the urban system in Java Island, and integration of economic and transportation system in Suramadu region with the surrounding region.

The concept of economic development to support the accelerating development of a strategic region of Surabaya-Madura is conducted through the development of Economic growth center of Madura. This is done with the development of core regional and local economic clusters so as it can create the development of Suramadu economic corridor in network connectivity cross-district and regional East Java.

1) The core region consists of:
   - The Region around the foot of Suramadu Bridge is Madura as the gateway and marketing-orientation of Madura.
   - Madura Special Region as a Madura main port's support that is outward-oriented in the National logistics system.

2) Flagship cluster consists of:
   - Development of core region is a marketing-oriented which requires the support of the center of production and processing. Thus, the development of new growth center of Madura must be done thoroughly, with attention to the upstream and downstream sectors.
   - Development of economic clusters as upstream and downstream link of Madura economic development aims to increase productivity and added value of natural resources management through the expansion and creation of chain activities from upstream to downstream sustainably serve the industrial area by utilizing environmentally friendly technology.

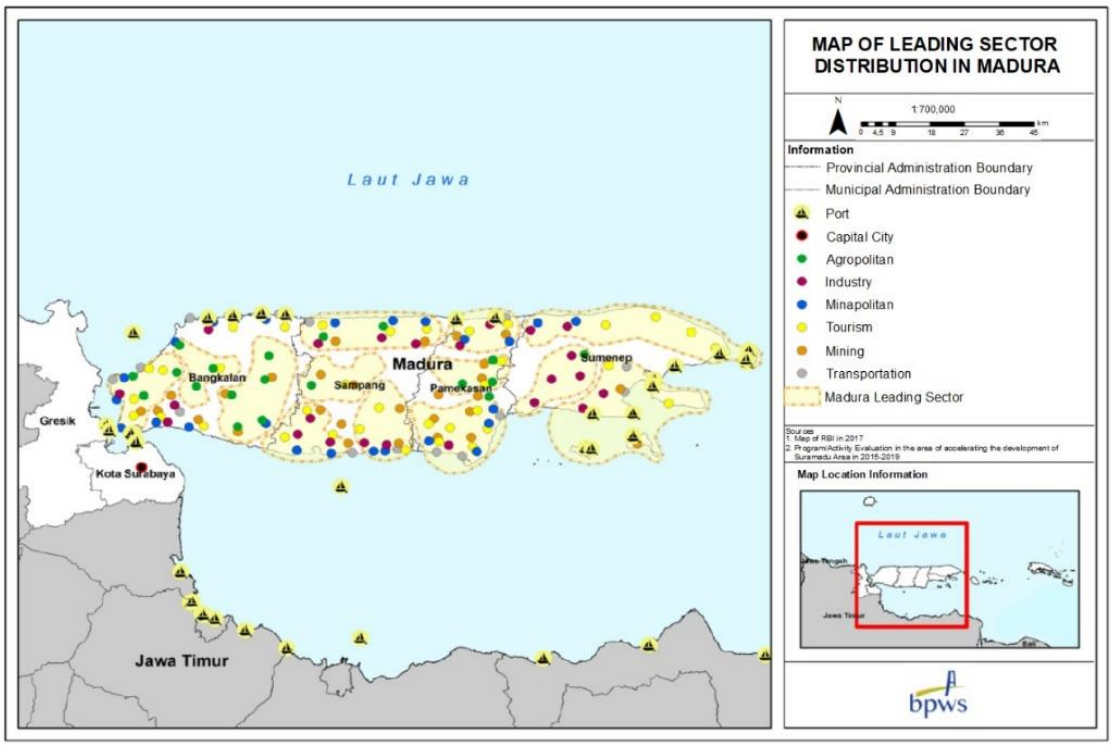

Figure 4. Division of Madura flagship cluster Source, 2019

The development of the core region (The Region around the foot of Suramadu Bridge and Madura Special Region) is part of the national strategic region of *Gerbangkertosusila* and the strategic region of East Java province for economic development and the strict control area of East Java province. Therefore, the development of the two regions, besides having to pay attention to its strategic value, pays attention to its functions in the national and regional scope. In the regional sphere, region development is realized through the development of urban centers as the center of marketing and distribution products to other regions supported by the connectivity of urban systems-its supporting areas (hinterland) **(Jain & Tiwari, 2017)**. Meanwhile, the scope of national development is realized through the development of the main transport nodes.

On the other hand, the development of Madura's flagship cluster is done by strengthening the production centers (agriculture, fisheries, etc.) which are based on local potentials and strengthening the market through the empowerment of cultivation and agribusiness/business activities upstream to the downstream, institutional system development and related system of the villages (*Urban-Rural linkage*). The interconnectedness system aims to develop mutually beneficial interactions between cluster centers and production centers that can provide added value for production so that it can spur regional development, increase productivity and quality of superior products, improve the income and welfare of people in the *hinterland* area, development of the center of regional economic growth that will eventually suppress the pace of urbanization. Cluster development in the Madura region focuses on strategic sectors of agriculture, marine and fisheries, tourism and industry/trade services.

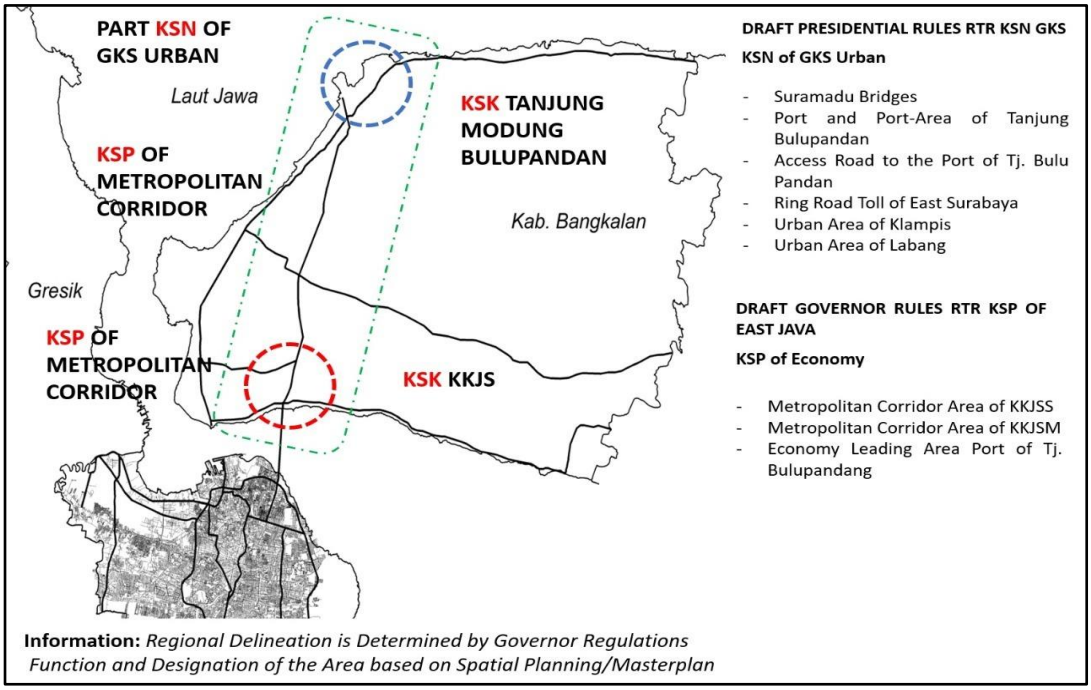

Figure 5. Suramadu region position in spatial planning, adopted from the master plan of Surabaya-Madura Regional Development Agency 2010-2024 and strategic planning of Surabaya-Madura Regional Development Agency 2015-2019

Economic development through growth centers in Madura is expected to contribute to the economic stability in Madura by using efficient human resources and investment. When associated with programs at the Strategic Planning of BPWS, aspects of economic development have been accommodated in the management support program and the implementation of other technical tasks through the development of professional internal HR to manage and build the strategic region of Suramadu. The Suramadu's Strategic Region Development Program in supporting aspects of economic development has been accommodated through the activities of investment in the area and development of Suramadu's human resources, the infrastructure development of Madura region, infrastructure development of 14 priority tourism destinations, and infrastructure development of 6 strategic industries in Madura. The implementation of investment activities, human resources, and infrastructure development will provide added value to support the economy in the strategic area of the Surabaya-Madura region and make an impact on the surrounding area especially the suburbs (coastal Strait of Madura).

3.2.3 Social development

The Social aspect is an attribute that does not belong to an individual, but it belongs to the community that reflects how much society is ready to face its problems and seeks solutions that drive sustainability (Saldaña-Márquez et al., 2018). Social development is the achievement of fair and equal quality human rights to improve welfare for the whole community (Harun, n.d.). Social sustainability means ensuring

social justice in the distribution of wealth and social services, therefore development must be evenly and perceived by all parties (Hák et al., 2016).

Suramadu Bridge Development Policy is an effort to improve the unity of Madura Island with Java Island and encourage economic development towards Madura Island in order not avoid the development gap between Madura and East Jawa, i.e. the economic condition of Madura Island is quite low compared to other districts in East Java province. Madura economic growth is directed in a framework of development that is based on the balance cross regions, i.e. the development of growth centers where growing areas are continuously improved while relatively less developed areas continue to be driven by the infrastructure development to strengthen national, regional and local connectivity systems. Strengthening the connectivity system will be able to improve the flow of goods, services, and information, lower the cost of logistics, reduce the high economic costs, create equitable access throughout the region and realize the synergy between the centers of economic growth.

Social development is realized through the easiness of accessibility with the Suramadu bridge which unites the economic development region of Java and Madura in one corridor. The strengthening of the Suramadu region infrastructure is carried out integrated into one system, i.e. transport vertices (ports, terminals, airports, distribution centers, and warehousing areas) are integrated into the network of infrastructure that is effectively and efficiently connected. Strengthening the connectivity of supporting infrastructure is done by linking among the centers of economic activities (production, processing, and marketing) in the cluster/region, cross the centers of the cluster economic activities/areas to the service centers and *outlet* doors that will impact the smooth flow of goods and the effectiveness of economic activities.

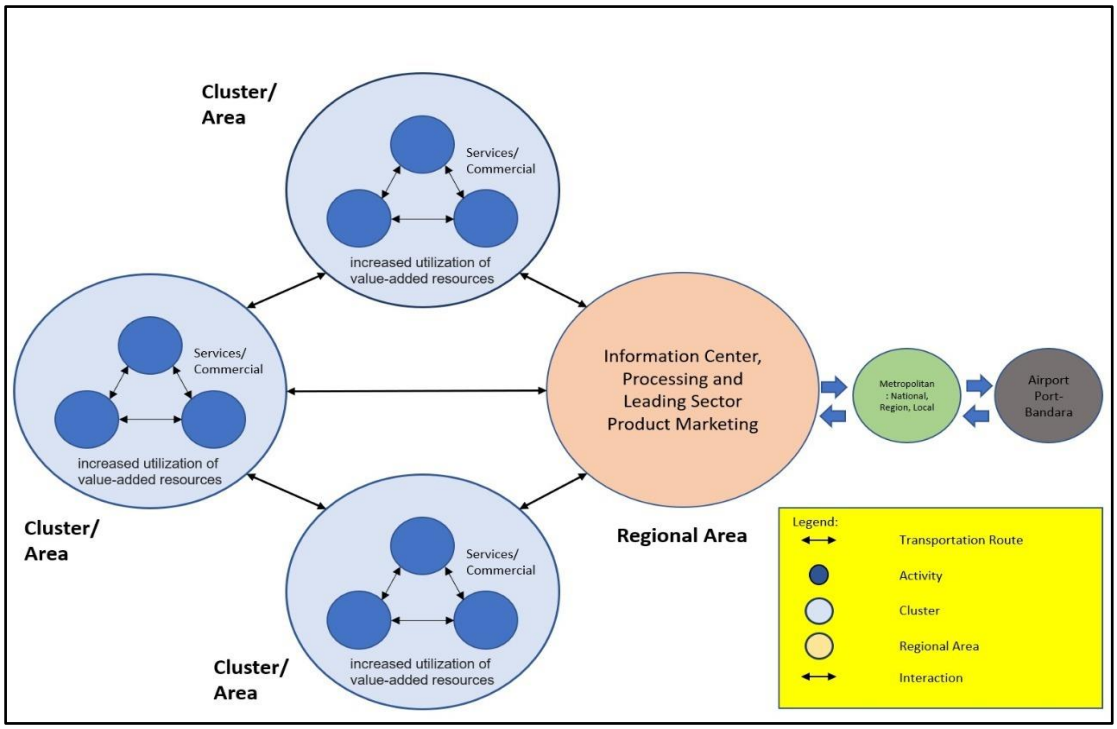

Figure 6. The concept of development of Madura cluster, Adopted from the master plan of Surabaya-Madura Regional Development Agency 2010-2024

The development of the superior economic clusters in Madura is supported by the infrastructure development that supports the production, processing, and marketing activities. The development of infrastructure and facilities depends on the category, typology, and role of the cluster to be developed. Infrastructure and cluster facilities development is intended to provide coaching, enhancement, and added value concerning internal and external cluster activities. Trading activities/services to support

the marketing of excellent products/commodities (external) and small-medium industries and trade/support services activities of production processing (internal). The development of such infrastructure and cluster facilities needs to be supported by inter-cluster transport network connectivity and in clusters.

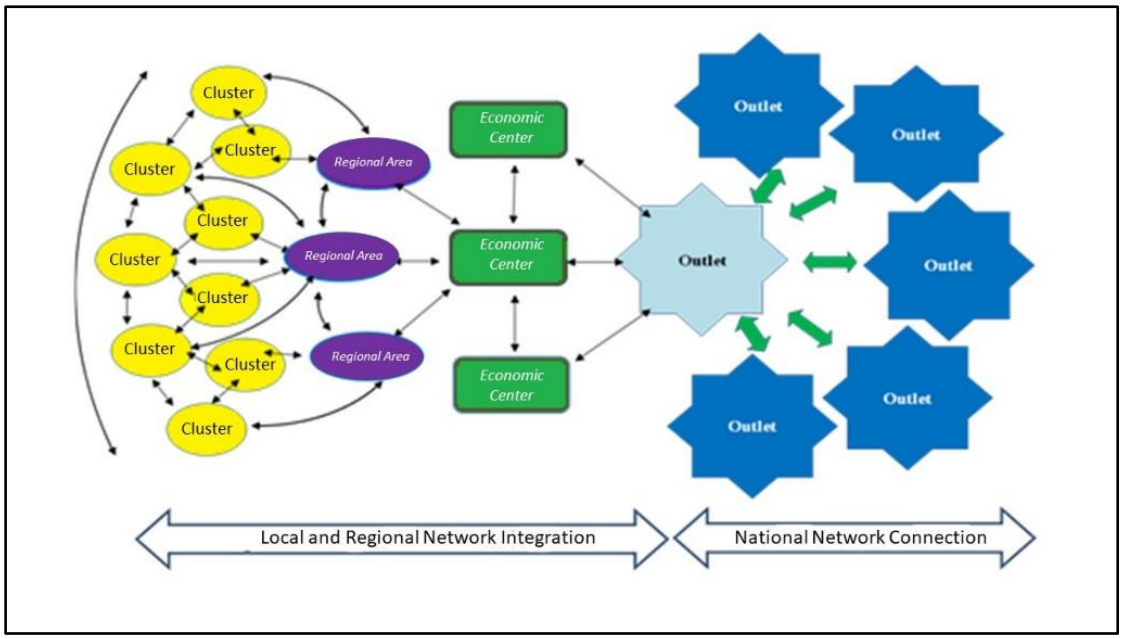

Figure 7. The Network of National Connectivity Systems, adopted from the master plan Surabaya-Madura Regional Development Agency 2010-2024

When associated with programs at the Strategic Planning of Surabaya-Madura Regional Development Agency, the implementation of the program needs to be based on **Social development** aspect that can be realized through the easiness of accessibility of the community in utilizing educational facilities, health facilities and other public facilities so that it is expected to create a quality society. The Suramadu's Strategic Region Development Program in supporting aspects of social development has been accommodated through the activities of investment in the region and development of Suramadu's human resources, the infrastructure development of Madura region, infrastructure development of 14 priority tourism destinations, and infrastructure development of 6 strategic industries in Madura. Implementation of investment activities and human resources and infrastructure development needs to be focused on the unconnected well regions so that the development of community infrastructure can have the easiness to move towards fulfilling the daily needs. The implementation of support programs and other technical management also needs to be adapted to the aspects of social development where it needs the improvement of internal HR quality to provide professional human resources so that they can perform their job well.

3.3 Conformity analysis of Surabaya-Madura Regional Development Agency Strategic Plan to the Concept of Sustainable Development

The conformity analysis of Surabaya-Madura regional development agency strategic plan on the sustainable regional development concept is conducted by comparing the sustainable regional development concept consisting of social development, economic, and environmental toward programs on Surabaya-Madura Regional Development Agency strategic plan; so that, it can get the development

direction for the implementation of these programs that are in in line with the sustainable regional development concept.

Table 3: Conformity analysis of the Strategic Plan Programs to Sustainable Development Concept

Components of sustainable regional development	Surabaya-Madura Regional Development Agency Strategic Plan Programs	Conformity to Sustainable Development Concept		Conformity analysis of the Surabaya-Madura Regional Development Agency Strategic Plan Programs to the Sustainable Development Concept	Development Direction
		Appropriate	Inappropriate		
Environmental development	Suramadu Strategic Area Development Program	√		The conformity of the programs to the aspect of environmental development can be realized by using environmental management to the implementation of Suramadu Strategic Area development programs activities which consist of infrastructure development of The Madura region, infrastructure development of 18 priority tourist destinations, infrastructure expansion of 6 strategic industries and regional investment.	• The implementation of environmental-based infrastructure development activities can be done by providing infrastructure to prevent degradation of environmental quality such as providing a clean water system, throw-outs system, waste management, and maintaining the protected area from development. • Based on environmental development aspects, internal management support is required to plan and manage the environment management and apply it in the development of The Suramadu region.
Economic development	Suramadu Strategic Area Development Program	√		The conformity of the program to the aspect of economic development can be manifested by developing the new economic growth centers in undeveloped areas so that economic activity is not only in some areas but also in all areas by utilizing local potentials.	• Along with the growth of the new economic centers, infrastructure expansion must be adjusted by focusing on the development of both core and clusters to support the economic growth centers. • The economic development can be implemented through the expansion of professional internal human resources in managing and establishing strategic areas of Suramadu to build stable economic growth.
Social development	Suramadu Strategic Area	√		Suitability of The Suramadu strategic area development program to support of social development aspect can be	• The implementation of development program in Suramadu area based on social development can

Components of sustainable regional development	Surabaya-Madura Regional Development Agency Strategic Plan Programs	Conformity to Sustainable Development Concept		Conformity analysis of the Surabaya-Madura Regional Development Agency Strategic Plan Programs to the Sustainable Development Concept	Development Direction
		Appropriate	Inappropriate		
	Development Program			manifested with the regional investment and Suramadu human resources development, infrastructure development in the Madura region, 14 priority tourism destinations infrastructure development, expansion of 6 strategic industries in Madura. The practice of undertaking regional investment activities and human resources along infrastructure development needs to be focused on areas that did not connect well; thus, with the infrastructure development, people can have the ease to move towards fulfilling the daily needs.	be implemented by developing the accessibility in utilizing public facilities. It can be expected to increase the life quality of the community through that ease of accessibility to facilities of educational, recreational facilities, health facilities, etc. • Based on the social development aspect, internal HR support is required to plan and manage the development that leads to equitable development that can be felt by the whole society. The practice of communication management activities, public information, risk management, and area control is conducted based on the social development aspects that prioritize the community interest above the particularistic groups.

Source: Analysis results, 2020

4. Conclusions

In the **environmental development** component, the results of the study show that there has been a policy direction that leads to environmental sustainability such as the provision of clean water network system, the final processing place (TPA) optimization to resolve the waste problems, the manufacture of wastewater management installations and environmentally friendly technology. Therefore, it is necessary to optimize the strengthening and integration of policies or programs by both the provincial government and local governments (Curtis & Scheurer, 2010). The recommendation based on this research has required the implementations of detailed plan of facility and infrastructure development that supports environmental sustainability and can accommodate policies regarding the priority of tourism destinations infrastructure development and strategic industries. This means the detailed plan must contain the readiness of infrastructure to fulfill the needs of the region when the strategic industry and priority tourist destination are developed.

In the components of **economic development**, the results of the study show that there has been a policy direction that leads to economic sustainability by developing the new economic growth centers in some regions that are divided into core and prime clusters according to the regional potential. The optimization of local potentials in each region is expected to provide the value of production and build mutually beneficial interactions among the region so that the maintenance of capital can be implemented

by the community. To strengthen the realization of the policy, there needs to be a policy integration by the central, provincial and Regency/city governments considering the development of core areas is a part of the national strategic urban area of Gerbangkertosusila and the strategic area of East Java province for economic development and strict control areas of East Java province. Based on this research, it is necessary to have a detailed plan in realizing the policy of development of economic growth centers in the core and the prime clusters such as developing models of production processing, marketing and promotion and developing regional facilities such as public social facilities, regional terminals, regional warehousing areas, regional trade in the provincial strategic area.

In the **social development** component, the results of the study show there has been a policy direction that leads to social sustainability such as strengthening the Suramadu regions connectivity infrastructure that carried out integrated with one system, where the transport nodes (ports, terminals, airports, distribution centers, and warehousing areas) were integrated into the infrastructure network that was effectively and efficiently connected. Therefore, there needs to strengthening the optimization and integration of policies or programs either by the central, provincial, or local governments. This research recommends a detailed plan which contains the regional connectivity development system from the production area to the marketing in the regions, the development of a network of railways to improve the region accessibility to the port as well as the development of other supporting infrastructure by linking the centers of economic activities (production, processing, and marketing) in clusters/regions, interregional/interactivities of the cluster economic centers to service centers and outlet doors. Therefore, this will impact the flow of goods and the effectiveness of economic activities.

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References

Curtis, C., & Scheurer, J. (2010). Planning for sustainable accessibility: Developing tools to aid discussion and decision-making. Progress in Planning, 74(2), 53–106. https://doi.org/10.1016/j.progress.2010.05.001

De Zeeuw, F., Franzen, A., Aalbers, K., Van Hal, A., & Dulski, B. (2010). Designing the Future. Sustainability, 2(4), 902–918. https://doi.org/10.3390/su2040902

Eustachio, J. H. P. P., Caldana, A. C. F., Liboni, L. B., & Martinelli, D. P. (2019). Systemic indicator of sustainable development: Proposal and application of a framework. Journal of Cleaner Production, 241, 118383. https://doi.org/10.1016/j.jclepro.2019.118383

Feola, G., Suzunaga, J., Soler, J., & Wilson, A. (2020). Peri-urban agriculture as quiet sustainability: Challenging the urban development discourse in Sogamoso, Colombia. Journal of Rural Studies, S0743016719310721. https://doi.org/10.1016/j.jrurstud.2020.04.032

Haider, H., Hewage, K., Umer, A., Ruparathna, R., Chhipi-Shrestha, G., Culver, K., Holland, M., Kay, J., & Sadiq, R. (2018). Sustainability assessment framework for small-sized urban neighbourhoods: An application of fuzzy synthetic evaluation. Sustainable Cities and Society, 36, 21–32. https://doi.org/10.1016/j.scs.2017.09.031

Hák, T., Janoušková, S., & Moldan, B. (2016). Sustainable Development Goals: A need for relevant indicators. Ecological Indicators, 60, 565–573. https://doi.org/10.1016/j.ecolind.2015.08.003

Harun, U. R. (n.d.). MODEL PERENCANAAN PENGEMBANGAN WILAYAH KEPULAUAN NUSA TENGGARA. Jurnal Perencanaan Wilayah dan Kota, 14.

He, Z., Jiang, L., Wang, Z., Zeng, R., Xu, D., & Liu, J. (2019). The emergy analysis of southern China agro-ecosystem and its relation with its regional sustainable development. Global Ecology and Conservation, 20, e00721. https://doi.org/10.1016/j.gecco.2019.e00721

Heidenreich, M. (2003). Regional Inequalities in the Enlarged Europe. Journal of European Social Policy, 13(4), 313–333. https://doi.org/10.1177/09589287030134001

Horsley, J., Prout, S., Tonts, M., & Ali, S. H. (2015). Sustainable livelihoods and indicators for regional development in mining economies. The Extractive Industries and Society, 2(2), 368–380. https://doi.org/10.1016/j.exis.2014.12.001

Jain, D., & Tiwari, G. (2017). Sustainable mobility indicators for Indian cities: Selection methodology and application. Ecological Indicators, 79, 310–322. https://doi.org/10.1016/j.ecolind.2017.03.059

Janković Šoja, S., Anokić, A., Bucalo Jelić, D., & Maletić, R. (2016). Ranking EU Countries According to Their Level of Success in Achieving the Objectives of the Sustainable Development Strategy. Sustainability, 8(4), 306. https://doi.org/10.3390/su8040306

Kempenaar, A., Westerink, J., van Lierop, M., Brinkhuijsen, M., & van den Brink, A. (2016). "Design makes you understand"—Mapping the contributions of designing to regional planning and development. Landscape and Urban Planning, 149, 20–30. https://doi.org/10.1016/j.landurbplan.2016.01.002

Kono, J., Ostermeyer, Y., & Wallbaum, H. (2018). Investigation of regional conditions and sustainability indicators for sustainable product development of building materials. Journal of Cleaner Production, 196, 1356–1364. https://doi.org/10.1016/j.jclepro.2018.06.057

Kroll, C., & Zipperer, V. (2020). Sustainable Development and Populism. Ecological Economics, 176, 106723. https://doi.org/10.1016/j.ecolecon.2020.106723

Munda, G., & Saisana, M. (2011). Methodological Considerations on Regional Sustainability Assessment Based on Multicriteria and Sensitivity Analysis. Regional Studies, 45(2), 261–276. https://doi.org/10.1080/00343401003713316

Nogués, S., González-González, E., & Cordera, R. (2019). Planning regional sustainability: An index-based framework to assess spatial plans. Application to the region of Cantabria (Spain). Journal of Cleaner Production, 225, 510–523. https://doi.org/10.1016/j.jclepro.2019.03.328

Opon, J., & Henry, M. (2019). An indicator framework for quantifying the sustainability of concrete materials from the perspectives of global sustainable development. Journal of Cleaner Production, 218, 718–737. https://doi.org/10.1016/j.jclepro.2019.01.220

Ramos, T. B. (2009). Development of regional sustainability indicators and the role of academia in this process: The Portuguese practice. Journal of Cleaner Production, 17(12), 1101–1115. https://doi.org/10.1016/j.jclepro.2009.02.024

Saldaña-Márquez, H., Gómez-Soberón, J. M., Arredondo-Rea, S. P., Gámez-García, D. C., & Corral-Higuera, R. (2018). Sustainable social housing: The comparison of the Mexican funding program for housing solutions and building sustainability rating systems. Building and Environment, 133, 103–122. https://doi.org/10.1016/j.buildenv.2018.02.017

Shen, L., Kyllo, J., & Guo, X. (2013). An Integrated Model Based on a Hierarchical Indices System for Monitoring and Evaluating Urban Sustainability. Sustainability, 5(2), 524–559. https://doi.org/10.3390/su5020524

Silva, J. da, Fernandes, V., Limont, M., & Rauen, W. B. (2020). Sustainable development assessment from a capitals perspective: Analytical structure and indicator selection criteria. Journal of Environmental Management, 260, 110147. https://doi.org/10.1016/j.jenvman.2020.110147

Simsek, Y., Santika, W. G., Anisuzzaman, M., Urmee, T., Bahri, P. A., & Escobar, R. (2020). An analysis of additional energy requirement to meet the sustainable development goals. Journal of Cleaner Production, 272, 122646. https://doi.org/10.1016/j.jclepro.2020.122646

Szopik-Depczyńska, K., Cheba, K., Bąk, I., Stajniak, M., Simboli, A., & Ioppolo, G. (2018). The study of relationship in a hierarchical structure of EU sustainable development indicators. Ecological Indicators, 90, 120–131. https://doi.org/10.1016/j.ecolind.2018.03.002

Torabi Moghadam, S., Delmastro, C., Corgnati, S. P., & Lombardi, P. (2017). Urban energy planning procedure for sustainable development in the built environment: A review of available spatial approaches. Journal of Cleaner Production, 165, 811–827. https://doi.org/10.1016/j.jclepro.2017.07.142

Program Evaluation Report on Monitoring and Evaluation of the 2019 Madura Regional Development Acceleration Program

Presidential Regulation No. 23/2009 concerning Amendment to Presidential Regulation No. 27/2008 concerning Badan Pengembangan Wilayah Surabaya – Madura

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Policy Paper

Sustainable Development of Energy Supply Planning For Productive Economy in Isolated Island

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Abstract

This paper describes the sustainable development of energy supply planning for productive economy in border, small, and isolated island using case study in the region of Sitaro Island, North Sulawesi. This paper describes that energy supply planning must be sufficient, secure, reliable, and affordable for users by using local potency of energy resources that are renewable and unlimited. The paper identifies local energy potential demand of energy, current productive economy, current system of electricity, and infrastructure of energy. It finds that the local potential of energy resources is photovoltaic. The demand of energy of Islands is primary for lighting, ironing, and entertainment. The existing economy of islands is dominated by fisheries, agriculture, and tourism. The total of electricity generated is about 6.000 kW that is all supplied using PLTD. The infrastructure of energy is covered by PLN using 4 system of distributions that are System of Siau, System of Makalehi, System of Tagulandang dan System of Biaro. The local government is concerning to build up industrial cluster of fisheries for domestic and abroad markets and also to create the exotics tourism. With a serious commitment and high awareness among government, industries, and society, it is possible to increase the economy and social welfare because they have enough energy potential, abundant fish in the sea, and good tourism prospect in the future. It concludes that the energy supply should meet the demand sufficiently, securely, reliably, and affordably. In terms of productive economy, the energy should create the value added in society and increase the welfare. It recommends that in the border, small, and isolated island, the abundant and renewable of energy resources, photovoltaic, can be substituted to PLTD. Since it is only available in daylight. In order to make it useful in midnight, we need a power storage as a back-up of energy resources.

Keywords: *planning, energy, resources, productive and economy*

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1. Introduction

One of the main current issues in the development of small islands is the limited basic infrastructure of the community (Marulitua et.al, 2019). The intended infrastructure includes the availability of social and economic facilities such as electricity, clean water, fuel and fisheries facilities. Although the government has various interventions, the needs and problems of small islands are very complex and need a cross-sectoral approach to deal with them. Problems in the management of facilities and infrastructure on small islands are related to the institutional capacity of the community and the support of local government. Islands Economic Development must be based on the biophysical conditions of the region and the island's socio-economic conditions. Like small islands, they will be vulnerable to environmental changes caused by the construction of living facilities. Therefore, the development carried out must consider the environment. In an effort to achieve economic development on the leading islands, the researcher of Research and Development Centre for Electricity Renewable Energy and Conservation Technology examines the development of renewable energy for productive economic activities on the leading islands. The study indicates the productive potential of the economy needs to be supported by new renewable energy that locally available. The hybrid scenario between conventional plants (PLTD, PLTU, PLTG) and new renewable energy plants (PLTS, PLTMH, Biomass) is expected to be a solution for the development of electricity in small islands. Based on the previous study of productive economic fisheries, the development of centralized solar power plants using batteries or hybrids with diesel-fired diesel generators on small islands is the best solution as local energy utilization.

This paper describes the energy supply planning for productive economy in border, small, and isolated island using case study in the region of Sitaro Island, North Sulawesi. The purpose of this paper is that energy supply planning is created to fulfill the demand of energy with sufficient, secure, reliable, and affordable for users by using local potency of energy resources that are renewable and unlimited. The paper identifies local energy potential demand of energy, current productive economy, current system of electricity, and infrastructure of energy.

2. Methodology

The methodology of this paper is on site survey and collecting primary and secondary data ini Sitaro Island. Those data are processed using analytical data by PVSyst and meteonorm software. PVSyst provides performance assessment of a simulation model for PV modules of any available technology. Meteonorm provides data of Irradiation and other climate data for any location on earth as typical years. Primary data is collected using interview and secondary data is based on latest data in Central Bureau of Statistics. The cost of PLTS hybrid energy is calculated using the Life Cycle Analysis (LCA) method. The LCA is a method used to evaluate the environmental impact of a product through its life cycle encompassing extraction and processing of the raw materials, manufacturing, distribution, use, recycling, and final disposal. It calculates a comparison of the total cost used to produce energy with the amount of energy produced during the life of the PLTS.

The paper analysis what local energy potential resources, quantify the demand of energy, analysis current productive economy that is the top three of the largest Gross Domestic Product (GDP), the existing system of electricity, and infrastructure of energy. The top three of GDP is focused to develop as main issues of productive economy. The existing system of electricity as baseline of the supply of energy infrastructure. Those data are combined and evaluated in order to meet that energy supply planning should be sufficient, secure, reliable, and affordable for users or demand of energy from now and further.

3. Results and Discussions

The location of this research activity was carried out in one outermost districts in North Sulawesi province, namely Kabupaten Sitaro Islands (Siau Tagulandang Biaro) which borders directly and has international waters boundaries with Davao del Sur province, Philippines. This district was the expansion of the Sangihe and Talaud Islands Districts, where Kab. Talaud blooms in 2000, and Kab. Sitaro bloomed in 2007, while Sangihe is the parent district of the island region (BPS, 2020).

Figure 1. Region of Siau Tagulandang Biaro Island in North Sulawesi

Source: BPS, 2020

System of Electricity in Sitaro Islands

System of electricity in Sitaro Islands is provided by PT. PLN Branch Tahuna, Siau and Tagulandang. It consists of four electricity systems namely Siau System, Makalehi System, Tagulandang System and Biaro System. Electricity system in Sitaro is powered by diesel power generation (Pembangkit Listrik Tenaga Diesel - PLTD in Indonesia language), both PLTD owned by PLN and PLTD rented by Independent Power Producers (IPP). Only one Solar Energy System (PLTS) is located in Makalehi system with 260 kW capacity. Totally, system of electricity in Sitaro Islands had installed capacity 11,610 kW.

Potency and Future Planning of Productive Economy in Sitaro Islands

The potential economy in Sitaro Islands is captured by fisheries, plantations and tourism. In 2019 there were 2,538 fisheries businesses, which were fishing with various types of equipment and vehicles as presented in the table 1 below.

Table 1. Various types of vehicle and equipment of Fisheries in Sitaro Island

Year	Non Motorized Vessels				Out-Board Motor Boat	In Board Motor Boat	Total
	Jukung	Small	Medium	Large			
2015	70	418	81	17	2885	28	3499
2016	70	499	100	14	2920	43	3646
2017	70	584	120	14	3219	85	4092
2018	0	499	13	14	1332	15	1873
2019	316	0	0	0	2179	43	2538

Source: BPS, 2020

The potential of plantation products in Sitaro Islands is quite large, especially in 3 types of plantations, namely Nutmeg, Coconut and Cloves. The area of land and the amount of plantation production based on BPS data in 2019 shows that coconut and nutmeg plants are still the dominant of the community in plantations. As presented in Table 2 below, the area of coconut reaches 4435.05 hectares with production of 3239.88 tons, while Pala has a land area of 4619.13 hectares with production of 3207.85 tons. From data on land area and plantation production per sub-district, it can be seen that the main centers of plantation crops are still on Siau Island, although for coconut plants, Tagulandang Island is also the main center because it is known as a coconut producer. However, because the area of Tagulandang island is not too large, it is difficult to increase the area of plantations in Tagulandang Island.

Table 2. The production of Plantation in Sitaro Islands

Subdistrict	Coconut		Clove		Nutmeg	
	2018	2019	2018	2019	2018	2019
Biaro	203.1	203.1	70.07	38.22	41.93	41.93
Tagulandang Selatan	711.98	711.98	47.65	47.65	363.55	363.55
Tagulandang	857.9	857.9	51.84	51.84	413.36	533.36
Tagulandang Utara	485.69	485.69	37.02	37.02	243.45	243.45
Siau Barat Selatan	345.8	345.8	19.83	19.83	438.27	438.27
Siau Timur Selatan	339.35	339.35	33.06	33.06	511.14	511.14
Siau Barat	354.1	354.1	48.92	48.92	508.2	508.2
Siau Tengah	225.8	225.8	32.12	32.12	342.33	342.33
Siau Timur Selatan	436.18	436.18	43.97	43.97	944.05	944.05
Siau Barat Utara	475.15	475.15	117.64	117.64	692.85	692.85
Total	**4435.05**	**4435.05**	**502.12**	**470.27**	**4499.13**	**4619.13**

Source: BPS, 2020

Potency of tourism in Sitaro Islands is very large, but the management, tourism facilities and infrastructure are still left behind. Tourism data shows that during 2019 the number of tourist visits to Sitaro was 2440 people consisting of 2161 domestic tourists and 279 foreign tourists from several countries such as the United States, Canada, England, Germany, France, Russia, China, Japan etc. This number continues to increase from year to year as shown in Table 3 below. However, this number is still very small compared to more famous tourist destinations such as Bunaken in Manado with totally 87312 tourists in 2019, even though there are many comments from tourists, the coral reefs of Sitaro are more beautiful than Bunaken.

Table 3. The number of Tourists visits Sitaro Islands

Tahun	Domestic Tourists	Foreign Tourists
2015	1.196	228
2016	1.268	235
2017	2.776	462
2018	2.120	556
2019	2.161	279

Source: BPS, 2020

Model of Infrastructure Energy in Sitaro Islands

The figure 2 shows the profile of energy demand for fisheries product in Sitaro Islands. We can get data for processing centers and cold chain systems in Sitaro island need 2538 kWh / day. This profile describes the energy demand in along day. It clearly shows a peak load of 146 kW.

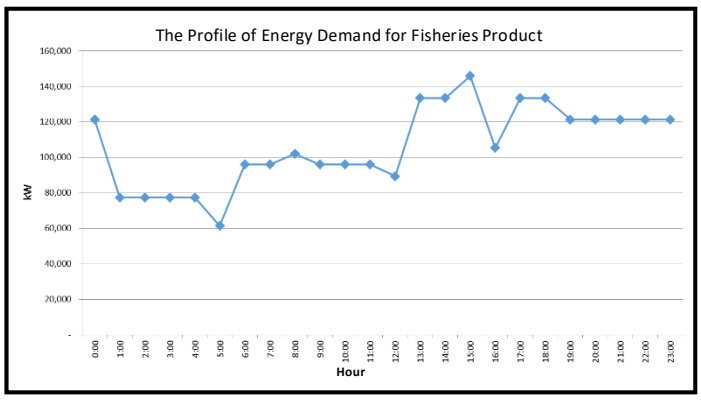

Figure 2. The profile of energy demand for plantation product in Sitaro Islands.

Table 5 shows the profile of energy demand for plantation product. Mainly, the energy demand comes from Drier of Pala with totally consumes 1152 kW/day, Blower and Compressor consume 230 kWh/day, and Shell Breaker consumes 157 kWh/day. Therefore, in overall we can get data for processing centers of plantations in Sitaro islands need 1540 kWh / day with a peak load of 128 kW.

Table 5. Detail Profile of Plantation Electricity Demand

No	Equipment	Capacity			Component	Power per Unit	Total Power	Work hour/ day	Total Demand of Energy			Unit Price, Rp
		Unit of Capacity	Number	Ton/ hour					Per Hour	Per Month	Per Year	
1	Drier Chamber of Nutmeg 10 Ton/cycle	10 Ton/week	6	8.57	Heater Coil	16	96	12	1,152	34,560	414,720	130,000,000
					Blower	0.3	9.6	10.6	230			
					Kompressor	0.3						
					Motor	1						
2	Shell Breaker	200 kg/hour	6	8.4	Motor	3.73	22.38	7	157	3,133	37,598	60,000,000
Total Capacity of Energy							127.98		1,539	37,693	452,318	
							128 kW		1,540 kWh/day			

The figure 3 shows the profile of energy demand for hotels product in Sitaro Islands. From the profile, we can get data for operating hotels in Sitaro islands need 7946.27 kWh / day with a peak load of 569.15 kW

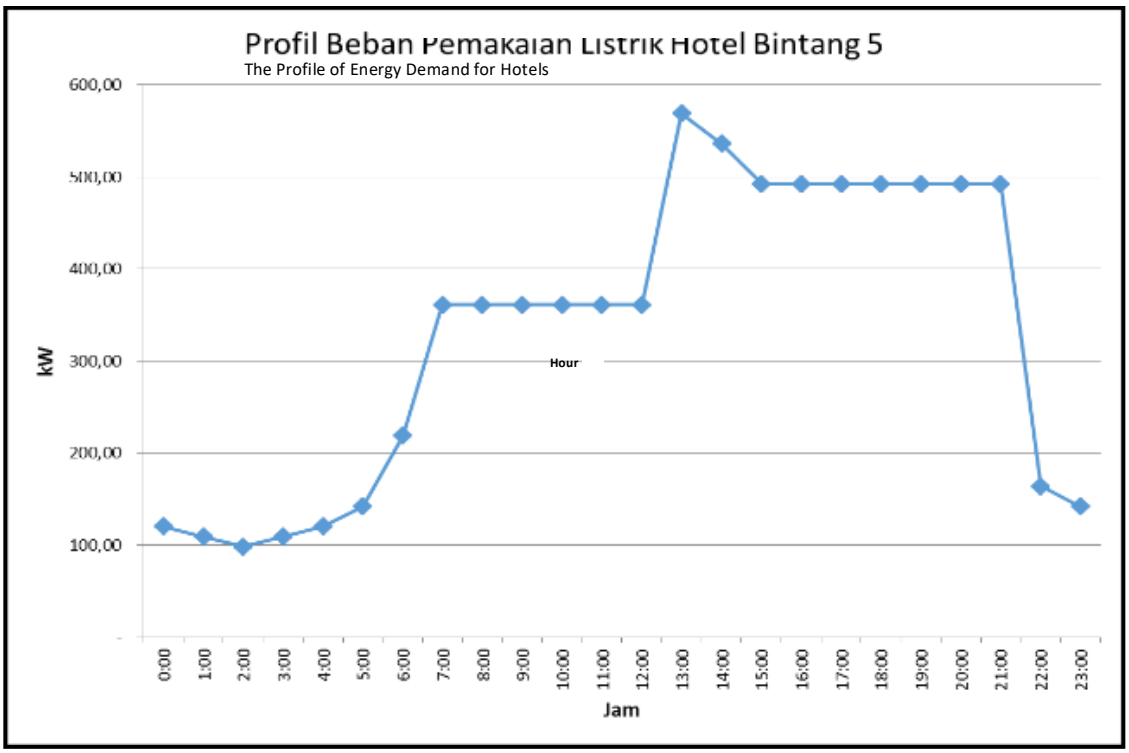

Figure 3. The profile of energy demand for hotels

Total demand of electricity from fisheries, plantation, tourism, and customers seen in table 6. Assuming that the growth of the electricity demand from non-productive economy is supplied by the PLN power plant reserves, the addition of the electricity demand from the productive economic and their growth must be considered for the addition of the power plant. Addition of power plants must consider availability from fuel sources. Currently, the existing conditions the only available fuel source is diesel oil (PLTD), while for Renewable energy that available is solar energy. Therefore, the generation scenarios that can be used are hybrid generation between PLTS and PLTD.

Table 6. Demand of Electricity

Load of Productive Economy	Demand of Power, kW	Demand of Energy, kWh	Type of Customers PLN, kVA
Fisheries	146.00	2,538.00	250
Plantation	128.00	1,540.00	250
Tourism	569.15	7,946.27	1,000
Total	**843.15**	**12,024.27**	**1,500**

The planning of PLTS hybrid generator aims to reduce diesel oil consumption by utilizing the potential of solar energy which is 5,0 kW/m^2/day with equivalent 5 Sun Hours. The planned power plant must be able to supply a maximum load of 844 kW and electrical energy of 12,025 kWh / day. With the current technology, the maximum PV penetration in a hybrid PLTD-PLTS system is 60% peak load. With this system the electrical energy generated by the PLTS is directly supplied to the load so that the PLTS only serves to reduce the supply of generators when the sun is there or in other words reduce fuel consumption generator set. While there is no sunlight, the load is entirely borne by the generator set.

The solar panel used as material for this analysis is 255 Wp 30.7 V-DC with 15.5% efficiency. Planned PLTS capacity of 20% of the peak load during the day is 844 kW, which is 169 kWp. Using the same methodology by calculating the PLTS components above, the number and capacity of solar panels, PV inverter capacity and generator capacity calculated. All panel components are the same as the components in the PLTS design, except for the inverter, which have a lower capacity of 20 kW and an input voltage rate of 580 V and MPP voltage ranges between 580 - 800 V-DC. The number of PV inverters used is one inverter. The calculation results can be seen in Table below.

Table 7. Generating system component of PLTS Hybrid with Generator or PLTD (20:80)

No	Component of Power Generation					
1	**SOLAR PANELS**					
	Spesification of PLTS					
	Panel PV Capacity	255	Wp			
	Panel PV Voltage	30.7	Vdc			
	Efficiency of PV Inverter	98.4	%			
	Efficiency of battery Inverter	no battery	%			
	Efficiency of battery	no battery	%			
	Depreciation PV Power	90	%			
		88.56	%			
	20% capacity of demand PLTS	169	kW			
	System of Panel Capacity PLTS	190.4	kW			
	Potency of radiation in Sitaro	5	kW/m2/day			
	Production of Energy per day	952.07	kWh/day			
	Power Capacity PLTS	190.4	kWp	=	191	kWp
	Number of Panel PLTS	746.72	Panels	=	747	Panels
2	**INVERTER PV**					
	Spesification of Inverter PV					
	Capacity	25	kW		191	kW
	Input Vdc rate	600	Vdc			
	Number of Inverter PV	7.64	units	=	**8**	**Units**
	Number of Panel PV per Inverter	94				
	PLTS series	20				
	Parallel	5				
	Correction of Numbers PLTS	**764**	**units, Capacit**		**194.82**	**kWp**
	Correction of Energy Production PL	**862.66**	**kWh/day**			
3	**GENERATOR SET**					
	Spesification					
	Capacity	1,000	kVA			
	Spesific Fuel Consumption SFC	0.286	litre/kWh			
	Required of Energy Generation per	11,161.61	kWh/day		4,073,988	kWh/year
	Diesel Oil Consumption per day	3,195	litre/day			
	Diesel Oil Price	8,800	Rp/litre			

We can see from the table 7, Hybrid system of power generating using 20% of PLTS and 80% of PLTD indicates the number of solar panels is 764 units and PLTS Power Capacity is 194 kWp with a daily

production of 862.66 kWh / day. The number of inverters is eight units with 94 panels / inverter. Generator capacity is 1000 kVA with SFC 0,286 liters / kWh, Energy generated per day 11,161.61 kWh / day with fuel consumption of 3,195 liters / day.

Calculation of PLTS Hybrid Costs

The cost of PLTS hybrid energy is calculated using the Life Cycle Analysis method, which is a comparison of the total cost used to produce energy with the amount of energy produced during the life of the PLTS. The initial investment cost of PLTS hybrid for this system is divided into the cost of the PV system and the cost of the Generator system. The details of the initial investment costs of 194 kWp PLTS and 1000 kVA generator system are shown in Table below.

Table 8. The Initial Investment cost of PLTS Hybrid

Component	Quantity	Unit	Price, Rp	Total Price, Rp
Generator set 1000 kVA	1	Unit	3,764,880,000	3,764,880,000
Installation, powerhouse and accessories	1	Unit	1,129,464,000	1,129,464,000
Power at STC 255 Wp	754	Unit	6,160,000	4,706,240,000
SMA Sunny Tri-power STP 25000TL-30	8	Unit	59,803,800	478,430,400
Balance of Systems (BoS), 35% of Total Utility	1	Set	1,814,634,640	1,814,634,640
Total				**11,893,649,040**
*1 USD = Rp 13,500			Rp/kWp	61,049425,32

The total initial investment cost is Rp.11,893,649,040. The cost of PLTS system is the biggest cost reaching around 60% of the total investment cost, and the Generator system cost is 40%. In the PLTS Hybrid, there are 4 components of operational and maintenance costs: O&M PLTS, inverter replacement costs, O&M Generator costs and fuel costs. Assuming an operating period of 25 years and a fixed rate of 4.25%, the calculation shown that the COE of the 20% Hybrid PLTS + Generator is Rp.2,801.02 / kWh or 20.75 cent $ US / kWh.

Therefore, the calculation the contribution of PLTS and Generator in the PLTS Hybrid system seen in the table below.

Table 9. The Contribution of PLTS and Generator in the PLTS Hybrid System

Supply of Energy PLTS Hybrid	Component of Cost				Rp/ kWh
	Investment	Fuel	O&M	Others	
PLTS 20%/ 199.92 kWp	11,893,649,040	141,206,921,647	23,478,210,284	1,107,789,100	2,801
PLTS 40%/ 398.82 kWp	18,859,690,080	130,350,400,214	23,842,419,522	2,215,578,199	2763
PLTS 20%/ 597.66 kWp	25,778,259,990	119,436,739,195	24,184,224,093	3,184,893,662	2,720

Based on the calculation above, the increasing of PLTS capacity will reduce the cost of energy. It shows that the lowest of COE is 60% PLTS and 40% Generator. The COE is Rp.2720,58/kWh or 20.15 cent $US/kWh.

4. Conclusions

The main issues in the development of isolated area is the limited basic infrastructure include energy sectors. The important things of developing infrastructure of energy is sufficient, secure, reliable, and affordable for users or society. In order to achieve the goals, identification of local energy potential demand of energy, current productive economy, current system of electricity, and infrastructure of

energy are vitals aspects. The case study in the region of Sitaro Island, North Sulawesi can be represent of Sustainable Development of Energy Supply Planning For Productive Economy in Isolated Island.

System of electricity in Sitaro Islands had installed capacity 11,610 kW which is provided by PT. PLN. It consists of four electricity systems namely Siau System, Makalehi System, Tagulandang System and Biaro System. Electricity system in Sitaro is powered by diesel power generation (PLTD). The local potential of energy resources is photovoltaic with intensity of radiation 5,0 kWh/m2 per day. The demand of energy of Islands is primary for lighting, ironing, and entertainment. The top three economy of islands based on Gross Domestic Product is dominated by fisheries, agriculture, and hotel tourism (BPS, 2020). The existing conditions, the only available fuel source is diesel oil (PLTD), while for renewable energy is only from solar energy. Therefore, the generation scenarios are hybrid generation between PLTS and PLTD that will be connected in grid PLN. The solar panel used as material for this analysis is 255 Wp 30.7 V-DC with 15.5% efficiency. Based on the calculation, the increasing of PLTS capacity will reduce the cost of energy, which the lowest of COE is 60% PLTS and 40% Generator. The COE is Rp.2,720.58/kWh or 20.15 cent USD/kWh.

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References

Bien, L.E., Kasim, L, Wibowo, W. (2008). Perancangan Sistem Hibrid Pembangkit Listrik Tenaga Surya dengan Jala-jala Listrik PLN untuk Rumah Perkotaan. JETri Volume 8. No. 1 : 37-56.

BPS. (2020). Kabupaten Kepulauan Siau Tagulandang Biaro Dalam Angka 2019. Kabupaten Kepulauan Siau Tagulandang Biaro

BLU P3TEK. (2018). Laporan Proyek Pemasangan PLTS Rooftop di Gedung BPH Migas

Denholm, P., and Margolis, R. (2006). Very Large-Scale Deployment of Grid-Connected Solar Photovoltaics in the United States: Challenges and Opportunities. Conference Paper NREL/CP-620-39683.

Direktorat Jenderal Ketenagalistrikan, Kementerian ESDM. (2019). Statistik Ketenagalistrikan 2019. Jakarta

Halim, A. (2009). Analisis Kelayakan Investasi Bisnis. Yogyakarta : Graha Ilmu.

Joule Bergerson and Lester Lave. (2004). Life Cycle Analysis of Power Generation Systems. Encyclopedia of Energy. Pages 635-645

Marulitua Situmorang, Dokman & Ayustia, Rissa. (2019). Model Pembangunan Daerah 3T: Studi Kasus Daerah Perbatasan Kabupaten Bengkayang. MBIA. 18. 49-64. 10.33557/mbia.v18i1.321.

Mermoud, A and Lejeune, T. (2010). Performance Assessment of A Simulation Model for PV Modules of Any Available Technology. 25th European Photovoltaic Solar Energy Conference – Valencia, Spain

Messenger, R.A. (2005). Ventre, J. Photovoltaic Systems Engineerin, 2nd edition, Boca Raton, FL, CRC Press.

Ministry of Energy and Mineral Resources. (2019). Keputusan Menteri ESDM Nomor 1567 K/21/MEM/2018 tentang Pengesahan Rencana Usaha Penyediaan Tenaga Listrik (RUPTL) PT PLN (Persero) Tahun 2018 s.d. 2027.

Ministry of Energy and Mineral Resources. (2018).Peraturan Menteri ESDM No. 49 tahun 2018, tentang Penggunaan Sistem Pembangkit Listrik Tenaga Surya atap oleh Konsumen PT Perusahaan Listrik Negara (Persero)

Widayana G. (2012). Pemanfaatan Energi Surya. JPTK, UNDIKSHA, Vol. 9, No. 1, Januari 2012: 37 – 46

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Commentary Paper

Ensuring Sustainable Urban Transformation in Indonesia:

Toward Indonesia Emas 2045

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Urbanization and Urban Transformation in Indonesia

Of the many important events that occurred in the two decades of the 21st century, the process of accelerating urbanization—especially in third-world countries—became something quite phenomenal. It's never even happened before. In the early 2000s only about 45 percent of the population in the third world countries lived in urban areas, by 2020 the number gained about 55 percent. Between now and 2035 the percentage of the population living in urban areas will reach about 85 percent in developing countries. Meanwhile, it will reach about 65 percent in developing countries. By 2035, it is also predicted that about 80 percent of the world's urban population would live in developing countries' cities.

In Indonesia, the rate of urbanization will increase in the upcoming two to three decades. Although currently still below Latin American countries, the urbanization level in Indonesia has actually surpassed some countries in the Asian region such as Burma, Vietnam, Cambodia, and the Philippines. As seen in Table 1, in 2045—when Indonesia will celebrate as the 100th year of Indonesian independence or the Indonesian Golden Year—it is predicted that about 70 percent of Indonesia's population will live in urban areas. This means there are about 220 million inhabitants (Table 1 and Chart 1). This number is certainly very high and therefore it takes the thought of urban planning and management that is not only inclusive, safe, and resilient, but also sustainable.

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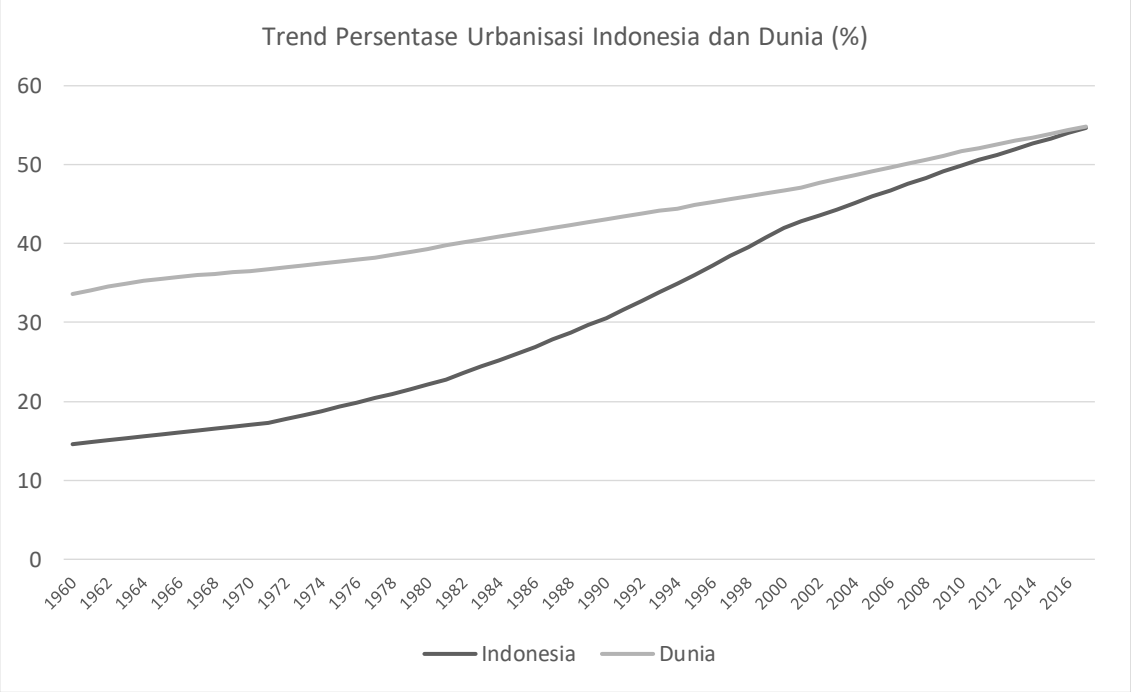
Chart 1. Trends of Urbanization: Indonesia and the world.



Source: World Bank, 2019 (https://data.worldbank.org/indicator/SP.POP.TOTL/view=chart)

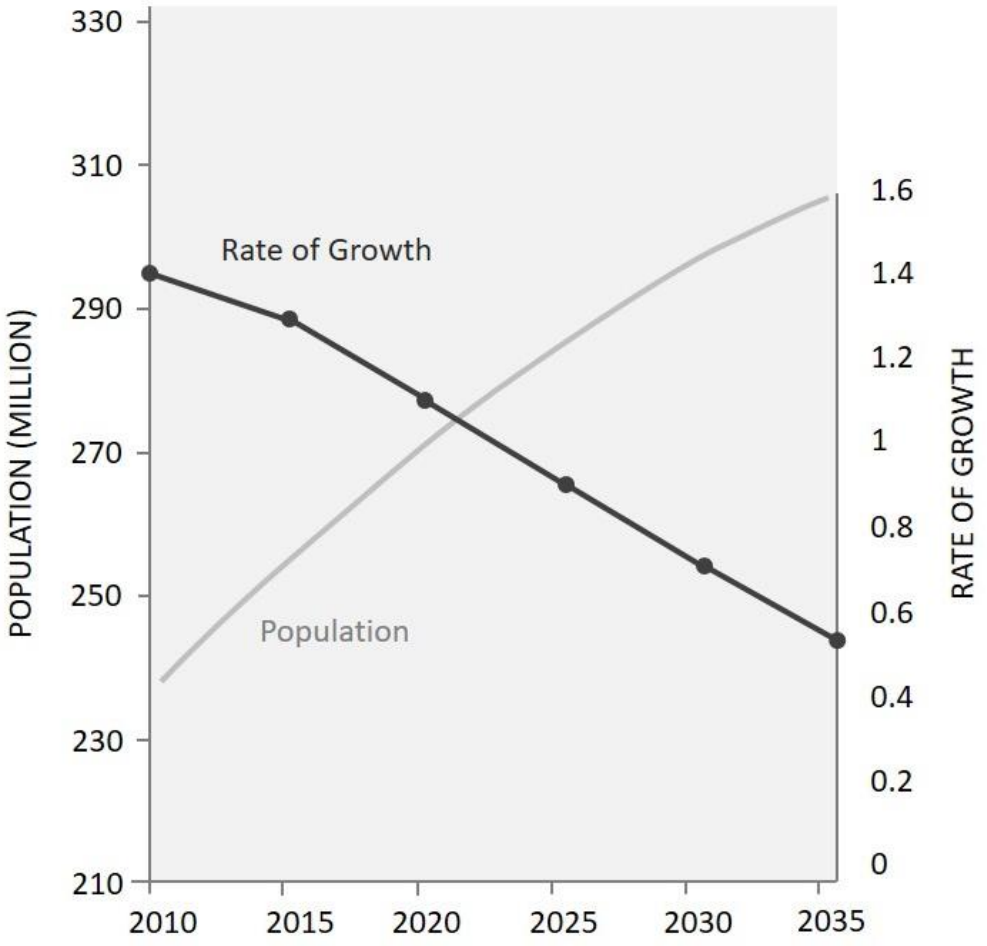
As an illustration, when Indonesia gained independence in 1945, indonesia's urban population was only about one-eighth of the total population of Indonesia living in urban areas. This equates to about 8.6 million people (World Bank, 2019). In 2045, BPS (2019) predicted indonesia's population would be 319 million people. This figure indicates an increase of 52 million compared to the current population—as many as 267 million. That year, if the urbanization rate is about 70%, there will be about 223 million Indonesians living in urban areas (BPS, 2019).

Table 1. Urban and Rural Population (2010-2045)

No.	Year	Urban Population (million)	Rural Population (million)
1	2010	118,8	119,7
2	2015	136,2	119,3
3	2020	153,7	117,4
4	2025	170,9	113,9
5	2030	187,9	108,5
6	2035	203,6	102,1
7	2040	210,4	98,8
8	2045	223,3	96,2

Sumber: The 2010 – 2035 Indonesian Population Projection, UNFPA

Chart 2. Population Projection: Indonesia.



Source: The 2010 – 2035 Indonesian Population Projection, UNFPA

The important thing to note from the increase in urbanization in Indonesia is that when viewed from time to time, there is an interesting trends. Although the increase in urbanization was quite high—about 3% in the 1980s to 1990s—in the 2000s to the present, there was a downward trends. At this time, the urbanization level in Indonesia is similar to the increase in urbanization in the 1950s to 1960s. and Brazil (86.3%) according to the World Bank (2019).

In terms of geographical area, although the average urbanization rate in Indonesia is already higher than 50%, there is certainly a major difference. As can be seen in Table 2 below, Java and Bali have much higher rates of urbanization than other regions in Indonesia. Some areas outside Java and Bali whose urbanization rate is quite high and equivalent to in Java are Riau, East Kalimantan, and North Sulawesi. This data appears to be related to a World Bank study indicating that the concentration of urbanization in Indonesia occurs in metropolitan areas.

Although all regions in Indonesia are experiencing increased urbanization, about 57% of the population of urban area in Indonesia is currently concentrated in metropolitan areas in Indonesia such as Jabotabekjur, Greater Bandung, Semarang, Surabaya and surrounding areas, Medan, and Makasar. The rest, 43% live outside the major metropolitan areas, including in medium and small towns spread from

Sabang to Merauke. Meanwhile, in terms of improvement, Sulawesi, Java, and Bali are the regions have the highest acceleration rates.

Context, Urbanization Opportunities, and Urban Transformation in Indonesia

More than just demographic figures, the issues and challenges of urbanization and urban growth in Indonesia require special attention and understanding. That's due to Indonesia's unique spatial and environmental characteristics. There are at least 5 characteristics of urbanization and urban growth in Indonesia—as the largest maritime country in the world. *First*, urbanization in Indonesia occurred in the context of Indonesia as the second mega-diversity after Brazil—unfortunately, it is now in a threatened state. These characteristics are very important to understand that the urbanization process must be carried out with minimal threat to the preservation of Indonesia's biodiversity which has a global role.

Second, urbanization and urban growth in Indonesia also occurs in the context of Indonesia as the country with the second largest tropical forest in the world. In these circumstances, the presence of tropical forests that contribute greatly to the preservation of the world's environment needs to be monitored. Urbanization and urbanization processes should also be minimal, putting pressure on tropical forest conservation efforts that are strongly linked to global climate change issues.

Third, urbanization and urban development in Indonesia also occur in Indonesia's environment as the world's largest maritime, with 17,508 islands and coastlines along 54,716 km. This situation has real implications for the distribution, development, and shape patterns of cities in Indonesia characterized by: 1) the large number of coastal cities—with a high level of vulnerability to sea level rise; 2) quite a large number of cities located in remote areas with poor accessibility; 3) the size of the opportunity for coastal cities to utilize existing marine resources. The specific characteristics of cities in Indonesia in the context of maritime countries are very important to consider in the formulation of urban development policies and strategies in Indonesia.

Fourth, urbanization and urban development in Indonesia also occur in the context of countries or regions that are vulnerable to various types of natural disasters, whether volcanic eruptions, earthquakes, tsunamis, and other natural disasters. This condition has caused many cities in Indonesia to have a high level of vulnerability or also a high risk of natural disasters. This does not include the possibility of unnatural disasters. The formulation of urban development policies and strategies in Indonesia should pay attention to this aspect and make the toughness of the city one of the main objectives.

From the social aspect, urbanization and urban development increase social and economic problems, ranging from urban poverty, social imbalance, intolerance and urban social conflict, terrorism, urban crime, and urban corruption. In terms of economy, urbanization and urban development are not accompanied by significant increases in local income. Most cities in Indonesia still rely on development financing in the allocation of funds from the central government and most cities in Indonesia have not optimally increased the productivity of their cities. In addition, in terms of institutions and governments, cities in Indonesia have not been fully effective and innovative because incompetent human resources and governments are exacerbated by inadequate and less innovative local leadership capacity.

In the midst of the challenging context as described above, the urbanization and transformation of cities in Indonesia is also accompanied by positive opportunities that need to be optimized. Demographic bonuses are one of the opportunities that should be optimized in Indonesia. If accompanied by competent and competitive development of human resources, Indonesia will become a country with large production and consumption power. As an illustration, in 2020 there are approximately 269.6 million people in Indonesia. Of these, the unproductive age category (0-14 years) is 66.07 million people, the productive age (15-64 years) is 185.34 million people, and the age is already unproductive (65+ years) 18.2 million people. Indonesia's population is predicted to grow to about 319 million by 2045.

Based on the data, Indonesia will experience a demographic bonus period until 2045. This is characterized by a greater number of productive age populations than the unproductive (unproductive and unproductive) population. The number of productive ages by 2020 reaches 68.75% of the total

population. The abundance of human resources of this productive age should be utilized by improving quality, both education and skills in order to meet the Industrial Era 4.0.

Furthermore, the consolidation of democracy and decentralization that has been and continues to occur and is expected to be stronger and provide opportunities for the improvement of public services as well as the progress of regional development. This will reduce regional inequality and strengthen Indonesia's unity in the global competitive arena.

The diversity of people in Indonesia from Sabang to Merauke has proven in Indonesia's history as a republic with the principle of unity and diversity. It is just as important and a major force to make Indonesia progressive and competitive at the global level. Ultimately, the consistent and promising economic potential and development in Indonesia is a great opportunity that must be optimized to encourage urbanization and sustainable transformation of the city.

From this perspective, Indonesia must truly understand and take advantage of the various opportunities that arise from the urbanization and transformation process that occurs. As the spirit of The New Urban Agenda/The NUA (2016) document is "... capitalizing opportunities of urbanization" encourages us to no longer see urbanization as something negative, but rather a view that should be more optimistic and open. Urbanization and urban transformation opportunities in Indonesia should be seen as an effort to prosper the entire nation while also maintaining Indonesia's environment and sustainability.

Leveraging Urbanization Opportunities and Ensuring Sustainable Urban and Transformation

With an overview of the level, process, context, and challenges of urbanization and urban development in Indonesia as described above, the next question is how we then address the inevitable process. In the 1960s-1970s, we still remember that policy-making attitudes and even some academics viewed urbanization and urban development as preventable because they produced more problems than solutions. This attitude is even implemented in some form of policy of limiting the influx of residents into a city.

Perhaps, these attitudes and policies could be understood in the context of those days—during the early urbanization and end of the Cold War and the fall of socialist states that brought and dreamed of 'returning to the village'. However, in the current context, such attitudes and policies tend to be increasingly abandoned. The Chinese state—one of the great socialist-leaning powers of the pre-1960s/1970s era—instead pioneered a more urban development-oriented policy. Officially, even the Chinese Government started development programs by mandating urbanization opportunities and making urbanization a trigger for economic growth, improved welfare, and poverty reduction. The result is tremendous economic progress in China, as well as poverty reduction which reaches a fantastic figure: 500 million.

China may always be different, but some writers and researchers have empirically documented that urbanization and urban environments prove to be highly conducive to competition, entrepreneurship, creation, and innovation, as well as vertical mobilization both socially and economically (Glaeser, 2011). World Bank data (2019) also shows a positive and significant link between increased urbanization and an increase in per capita income. In Indonesia, any 1 percent increase in urbanization will lead to a 4 percent increase in per capita income. In some countries in Asia the impact is even greater, including in Thailand (7 percent), Vietnam (8 percent), and China which reaches 10 percent.

The lesson that can be taken is that although urbanization has so far contributed to the development of the national economy and the well-being of society, those contributions can still be optimized. In other words, the pace of Urbanization of Indonesia has not been offset by the same rapid improvement in development and prosperity. Furthermore, although more than half of Indonesia's population lives in urban areas, Indonesia remains a lower middle-income country. Going forward—especially in order to achieve the targets in SDGs and The NUA and Indonesia Emas 2045—optimization of the contribution of

urbanization to economic growth, increase per capita income, poverty reduction, economic equalization of people, and the overall welfare of Indonesians must be ensured.

It is from these glasses that we must better understand the spirit of The NUA or the New Urban Agenda set by the United Nations in Quito in 2016. In the Habitat III conference—encouraged to further maximize the opportunities that arise from urbanization—further explored the four principles of urban development, namely: 1) inclusiveness; 2) safe; 3) resilient; and 4) sustainable.

Not only because the Indonesian government is a un citizen who must and famously always agree with various UN agreements, then we adopt the agreement. Nor is it because we are hosting at Prep-Com Habitata III in Surabaya which prepares the final draft of the Urban New Agenda a year before the establishment in Quito. However, we must believe that the spirit of utilizing urbanization opportunities is just right and should be maximized by Indonesia. With some 'homework' on regional inequality, poverty, competition, environmental damage, and vulnerability, Indonesia must adopt, and more importantly, localize the implementation of the New Urban Agenda for the benefit of Indonesia.

In 2045, Indonesia will celebrate the 100th proclamation of 1945 – Indonesia Emas, the golden Indonesia. As the name suggests, of course we want to realize the golden age of Indonesia in that year. A golden age in which Indonesia is increasingly dignified, strong, prosperous, just, and sustainable.

Urban Research Forum: Inclusive Platform Dedicated for Sustainable Urban Transformation in Indonesia: Toward Indonesia Emas 2045

Enhancing sustainability of urban transformation in Indonesia requires looking at a city holistically: understanding the systems that make up the city and its interdependencies and risks they may face. By strengthening the underlying fabric of a city and better understanding the potential shocks and stresses it may occur, a city can improve its development trajectory and the well-being of its citizens. With that being said, a city needs to engage a broad range of stakeholders to understand its context holistically.

One way to understand the dynamics of urban transformation in Indonesia can be achieved through research and innovation development, which is undertaken by extensive stakeholders cross-level as well as cross-disciplines. For this reason, Graduate Program of Urban and Regional Planning Universitas Gadjah Mada (MPWK-UGM) established Urban Research Forum – an inclusive research platform, facilitating academia, scholars, professionals, and policy makers to share and to enrich their knowledge and experiences on Indonesian urban transformation.

One of its main activities is organizing regular online seminar, under a general idea of "Sustainable Urban Transformation in Indonesia: Towards *Indonesia Emas* 2045". Th objectives of Urban Research Forum Seminar Series are: 1) To explore potential research ideas from first-hand experiences of extensive Urban Stakeholders; 2) To improve capacity of urban researchers and to bridge the gap knowledge and experiences with practitioners and policy makers; and 3) To promote sustainable urban transformation in Indonesia.

On August 18, 2020, the first online seminar was succesfully done partipated by more than 400 participants – showing how great and entuastic are all stakeholders related to urban planning and development in Indonesia. In that seminar, entitled **"**Research Agenda on Sustainable Urban Transformation in Indonesia: Beyond Pandemic Covid-19 and The New Normal," Dr. (H.C.) Ir. H. Suharso Monoarfa - Minister of National Development Planning of Indonesia, has delivered his views on sustainable urban transformation in Indonesia. He stated that it is very crucial to look at a more longer and broader perspective on Indonesia urban future. The dream for Indonesia Emas 2045, could only be achieved if we can guarentee sustainable urban transformation in Indonesia.

At the same time, sustainable urban transformation in Indonesia can only be guarantee, if it is supported by more research and knowledge on urban transformation process in Indonesia. He suggested that there are at least six main topics to be explore for helping us to guide sustainabkle urban transformation in Indonesia (Table 2).

Table 2. Potential Topic for Research to Support Sustainable Urban Transformation in Indonesia

National Long and Medium Term Plan: 1) Frontier technologies (AI, digital technology, cyber security, advance materials, defense and security, etc.) 2) National Health System Reform 3) Social Safety Net Reform	**National Urban Policy 2045:** 1) Inclusive urban design (cities for all: women, child, disabled, elderly, poor) 2) Private cities integration 3) Urban planning reform to support investment 4) Migration, urban poor, and resolving urban disparities 5) The Role of Small and Medium Cities to support tourism and industrial sector	**Metropolitan:** 1) Housing Affordability Index for Metropolitan Areas, urban land, TOD 2) Metropolitan Area Leading Sectors in the national logistics system context 3) Study of Future Urban Agricultural Concepts
Smart Cities: 1) Smart urban services 2) Urban digital governance and inclusive participation 3) Smart Cities and City Branding: How ICT Impacts Urban Development and Representation? 4) Concept of inclusive economy in the smart city era 5) City cluster concept in preventing urban sprawl	**Urban Infrastructure:** 1) Urban mobility & integrated intelligent transport system 2) Smart Grid Water Management, 3) Smart Grid Energy Management 4) Smart grid system and energy conservation management, lightweight structure for mass transportation	**Supporting Topics:** 1) Urban heat island 2) Post-oil/post-mining cities 3) Managing rural-urban reclassification and societal transformation in urban culture 4) Urban Ecological Footprint

Source: Minister of National Development Planning, PPT Presentation on URF, 18 August 2020

Built on the very succesful first seminar on August 18, 2020, URF will organize the second online To continue the very succesfful-first seminar on 18th of August, 2020, we will organize the second online seminar entitled "Urban Planning in The Era of Disruption: Towards *Indonesia Emas*, 2045" on September 15, 2020. This will then followed by monthly online seminar on: Climate Change and Disaster: Implications for Indonesia Cities (October, 2020); Urban Heritage/Conservation and Urban Regeneration in Indonesia (November, 2020); and Regional Development Corridors: Urban-Rural Linkages (December 2020). It is hope that through these online seminar series, we could consolidate ideas and collaborations among stakeholders working on urban planning and development in Indonesia. Such ideas, knowledges, and experiences will then helping us to ensure sustainable urban transformation, toward Indonesia Emas 2045 – a properous and just society.

References:

BPS. 2018. *Statistik lingkungan hidup Indonesia 2018*. Jakarta

Monoarfa, Suharso. 2020. *Urban Development In Indonesia: Potential Field For Research*. PPT Presentation delivered at Urban Research Forum UGM 2020, August 18th 2020.

World Bank. 2019. *Time to Act: Realizing Indonesia's Potential.* World Bank Group. Jakarta.

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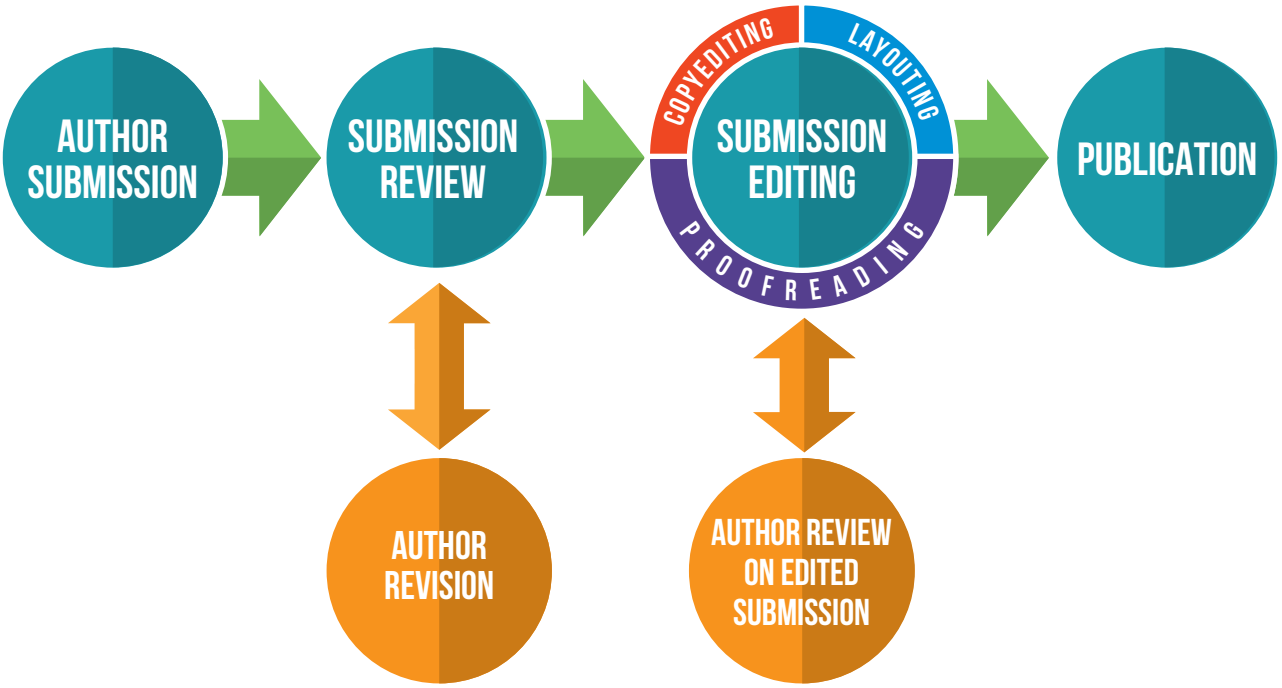

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