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Development of Ex-Ante Analysis Method on Socio-Economic Impact of Infrastructure Project

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ABSTRACT

The increasing need for infrastructure development in order to encourage economic growth and improve people's lives requires proper planning so that the expected benefits can be achieved. PT PII is expected to play an important role in improving the quality of infrastructure projects, not only in the form of providing guarantees but also through improving the quality of project preparation, transactions and implementation, in accordance with best practices that benefit all stakeholders. This paper aims to present the results of research into the development of an economic and social impact analysis model of PPP and Non-PPP infrastructure projects using quantitative and qualitative approach. The study examines 3 PPP projects that have specific service characteristics, namely: air transportation, public street lighting, and special economic zones. The economic impact analysis model used in the analysis uses the impact measurement attributes according to the characteristics of the infrastructure services. Social impact measurement uses an index developed to determine the response of the community to PPP infrastructure project plans. The results of the study indicate that the development of the Komodo Airport and the Mandalika Special Economic Zone are expected to have a positive impact on regional development, especially in tourism activities, while the public street lighting projects have an impact on improving traffic safety and environmental comfort in the city.

Keywords: economic and social impact, infrastructure, public-private-partnership

SARI PATI

Meningkatnya kebutuhan pembangunan infrastruktur dalam rangka mendorong pertumbuhan ekonomi dan peningkatan taraf hidup masyarakat membutuhkan perencanaan yang tepat supaya manfaat yang diharapkan tercapai. PT PII diharapkan dapat memainkan peranan penting dalam meningkatkan kualitas proyek infrastruktur, bukan hanya dalam bentuk pemberian penjaminan tetapi juga melalui peningkatan kualitas penyiapan, transaksi, dan pelaksanaan proyek, sesuai dengan praktik terbaik yang bermanfaat bagi seluruh pemegang kepentingan. Paper ini bertujuan menyajikan hasil penelitian pengembangan model analisis dampak ekonomi dan sosial proyek infrastruktur KPBU maupun Non KPBU menggunakan pendekatan kuantitatif dan kualitatif. Penelitian mengkaji 3 proyek KPBU yang memiliki karakteristik layanan spesifik, yaitu: transportasi udara, penerangan jalan umum, dan kawasan ekonomi khusus. Model analisis dampak ekonomi yang digunakan dalam analisis menggunakan atribut pengukuran dampak sesuai karakteristik layanan infrastruktur tersebut. Pengukuran dampak sosial menggunakan indeks yang dikembangkan untuk mengetahui respon masyarakat terhadap rencana proyek infrastruktur KPBU. Hasil penelitian mengindikasikan bahwa pengembangan Bandara Komodo dan Kawasan Ekonomi Khusus Mandalika diperkirakan akan membawa dampak positif bagi pengembangan wilayah terutama

dalam kegiatan pariwisata, sedangkan pada proyek penerangan jalan umum berdampak pada peningkatan keselamatan lalu lintas dan kenyamanan lingkungan kota.

Kata Kunci: proyek infrastruktur, dampak ekonomi dan sosial, kerjasama pemerintah-badan usaha.

INTRODUCTION

PT. Penjaminan Infrastruktur Indonesia (Persero) (PT PII) plays an important role in increasing the quality of infrastructure project development using the Public Private Partnership (PPP) scheme and therefore it needs to have a solid comprehension regarding the characteristic of services provided by various infrastructure projects initiated under this scheme. In addition, PT PII serves as the guarantor during the assessment of feasibility study of any initiated infrastructure projects. Hence it is crucial that PT PII has deep understanding of the impact of any infrastructure project to the economy.

From both theoretical and empirical point of view, any infrastructure project development will definitely bring economic impact to the surrounding community and area. Under this assumption, the government keeps pushing for more infrastructure project development to create the nation-wide economic benefit. This intention has been explicitly stated by the government in its mid-term development program (RPJMN) 2020-2024. One of the mid-term national development agendas is to strengthen the national and regional infrastructure to support the development of economy and basic services (Bappenas, 2019). In this context, PT PII has a very strategic role in supporting this government effort in implementing the national development agenda through the acceleration of infrastructure project development.

Under the national development framework, infrastructure is one of the essential aspects that can affect the national state of economy. It is undeniable that the rate of national economy growth has a strong connection to infrastructure development. This economy growth in the end is expected to bring contribution the overall wealth of the people.

Any well-planned infrastructure development in a country will have a direct impact to the economic improvement to in a regional scale and smaller, even if the infrastructure is developed in the larger scale, up to the nation level. To put it simply, the presence of infrastructure can boost the economic improvement in a country. The multiplier effect brought by an infrastructure project will facilitate the people with easier access to the economy and will help reduce the overall production cost.

Several ex-ante studies on the socio-economic impact of PPP infrastructure projects have been undertaken. These past studies showcased various economic benefit of PPP infrastructure projects, such as Makassar-Parepare railway development project, Baubau port development project, East-coast Sumatera national road line development project, Cancer treatment specialized hospital RS Dharmais project, Pandaan-Malang toll road project, Palapa Ring and Multifunction Satellite project, drinking water provision system (SPAM) project and Batang coal-fired power plant project. This research will focus on three PPP infrastructure

project plan: Komodo airport development project at Labuan Bajo, basic infrastructure improvement project at Special Economy Zone (KEK) of Mandalika in Central Lombok and public street lighting project in Surakarta. The result of this research will provide valuable information and lesson for PT PII in assessing the potential and the estimation of economic benefit of these infrastructure development projects to be aligned with the relevant development program target in both national and regional level.

LITERATURE REVIEW

Economic Impact of Infrastructure Development

Infrastructure development has become one of the strategic components in the implementation of national mid-term development plan policy (RPJMN) 2020-2024. The presence of infrastructure and its services are expected to boost and lever the economic growth in both national level in general and in regional level in particular, that in the end will help alleviating the general wealth of the people (Bappenas, 2019).

This chapter will give the theory of different impact as the result of infrastructure development in the form of airport, street lighting and the development of special economic zone.

a. Air Transport

The opening of new air transport route in any part of the world will bring a significant impact

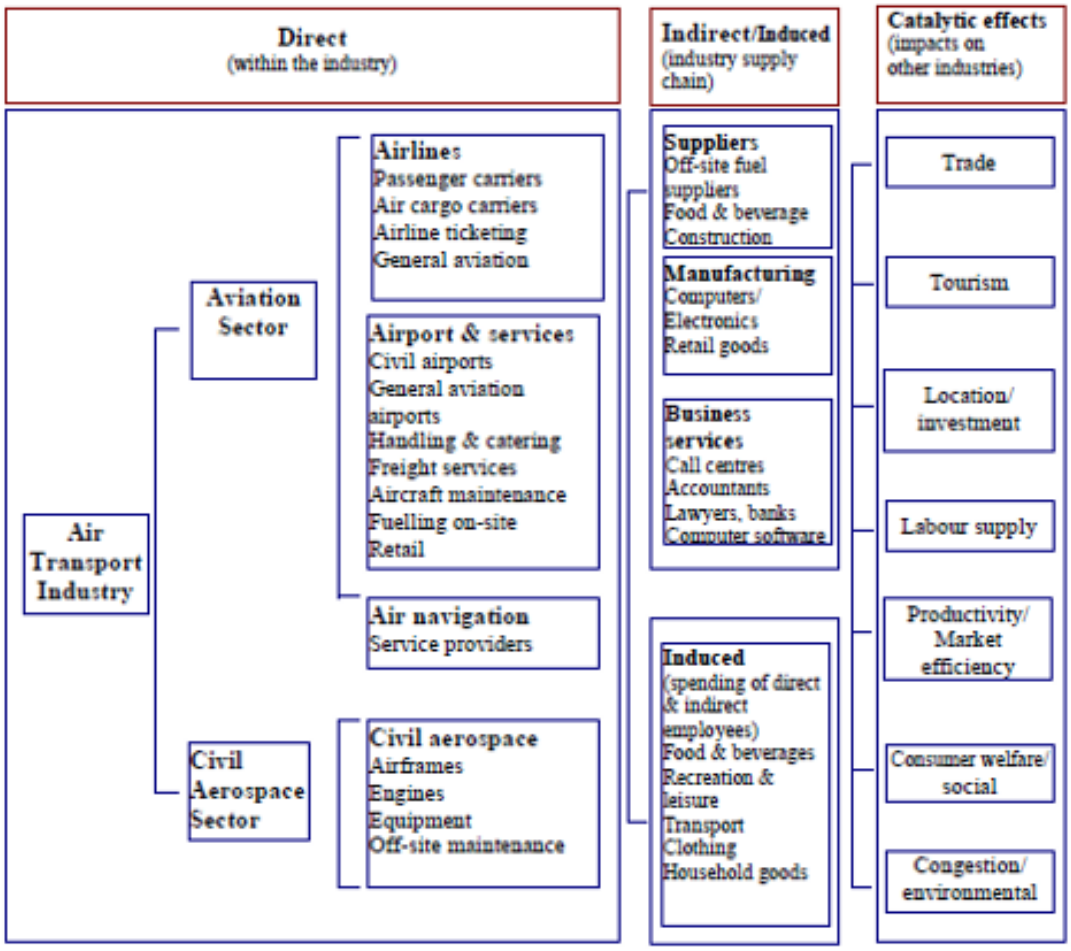

Figure 1. Type of economic impact from air transpor industry
Source: ATAG (2005)

to the demand of public travel and the trend will tend to increase (Rodrigue, 2017). The growth in aviation industry will also create positive benefit to the economy, which in return will affect the aviation industry itself and to the other sector such as labor and other industrial activities (see Figure 1).

On the other hand, the development of air transport industry will also cause indirect impacts to different sectors, such as the creation of economy activity related to aviation industry such as employment in airplane fuel provision service, construction service for airport development, retail business on air transport sector and other supporting and back-office services (IT, accounting, etc). There is also induced impact, meaning the business opportunity that has no direct relation to the aviation industry, such as retail business within the airport, banking services, restauration, etc. Oxford Economic Forescasting/OEF (2004) has provided an illustration on the economy of regional air transport industry in Asia-Pacific. The industry employs 3.2 million labor in total, where the employment directly related to the aviation (direct impact) is estimated at 37% (1.18 million), the employment for indirect impact at 43% (1.37 million) and from induced impact at 20% (0.64 million).

Gurtnera et all (2018) in their research have developed a model to identify the relationship between capacity addition and cost. Cost in this case covers delay cost and other costs associated to the airline company, including the loss in aeronautical and non-aeronautical revenue. The result of the study showed a positive relationship between benefit and capacity addition. On the top of that, the research also find relationship between reliability and punctuality with capacity addition.

b. Public Street Lighting

Public street lighting (hereinafter referred as **PJU**) is a supporting part of overall road infrastructure that is crucial to ensure the effectiveness of the road function. Street lighting can also be categorized as public good where everyone can use and receive the benefit freely without any competition, and as public good that can be utilized with unspent direct cost. This is in line with Law no.23/2014 on Regional Government in which article 357 states that the regional government has the obligation to provide public street lighting under its duty in delivering public facility.

The presence of PJU is intended to create the sense of safety and comfort for the pedestrians, and a good planning of PJU will create a good urban aesthetic, especially in the evening. Jones (1975) in Atkins et.al, (1991) mentioned that with the improvement of street lighting in two areas in New Orline, the local police force found the reduction in crime during nighttime, albeit not drastic. The impact of public street lighting is very “local” as PJU functions to support the performance of other public infrastructure such as urban transport.

The other impact from the development of PJU facility, as highlighted by Planis et al (2006) in *Road Safety Information* (2018), is related to the number of road accident, especially once the night falls. There are several parameter in the above research that showed: (1) in toll road, 2.6% of total accident where PJU is available is categorized fatal accident, compared to 4,3% of fatal accident where PJU does not exist; (2) In the case of intramural city road accident, the fatal accident is 1.3% of total accident where PJU is present, and 1.9% where PJU is not available.; dan (3) Similarly in the case of rural road, 3,1% of total accident counts as fatal accident where PJU is available and 4,9% within area with no PJU.

The revitalization of PJU by replacing old lamps with more energy efficient technology such as

Light Emitting Diode (LED) lamp has a significant impact in reducing the energy consumption and thus the operation cost in electricity use. A study by Ministry of Energy and Mineral Resources (ESDM) on the impact of old lamp replacement with more energy-efficient technology shows a potential of electricity cost reduction by 50%.[1]

Deshpande et.al, (2016) stated that United States in 2020 had a 7% of LED use in its public street lighting and the service consumed a total 52,8 TWh/year of electricity. Meanwhile in 2014, the LED use has already reached 13% and the service only consumed 17,2 TWh/year of electricity. Similar finding can be seen in the case of Los Angeles that has completed its street lighting replacement program by installing more than 150,000 new LEDs, which can help cut 63% of energy consumption or financially saving USD 8 million/year of public spending.

c. Special Economic Zone

Special Economic Zone (hereinafter referred as **KEK**) is defined as a specific area with certain borders within a country that organize an economic function with specific facilities (from the National Board of KEK in http://kek.go.id accessed in April 2020). The management of KEK in Indonesia is set in Law no. 39/2009 on KEK, where the objective of KEK establishment is to accelerate the economic development is certain regions of the country that are considered strategic for the national economy and to ensure a more balanced economy development for every region in a country as part of a unified national economy development.

Zheng (2010) mentioned that in general, the establishment of KEK can give different benefit, such as direct economic benefits in form of employment creation, export growth, government income and foreign exchange revenue; and other indirect benefits such as capacity building, technology transfer and innovation, economy diversity and productivity improvement among local companies. Similar findings were proposed by Wang (2010) who observed that KEK development in the case of China has brought more foreign investment by 58% without reducing the domestic investment and capital ownership and at the same time increasing the productivity by 0.6%. The success of KEK development in China did not only rely on the amount of investment but also the provision of advance technology and solid supporting policy from the government.

The KEK development case in Poland also showed an overall improvement in economy and social component in the country, although the research also saw that different factors may bring different impact (Ambroziak dan Hartwell, 2018). KEK in Poland has the most significant benefit in the asset of the companies and in the poverty reduction, if compared to other regions with no KEK.

CIIP (2017) has conducted analysis on the pattern of KEK development in different countries worldwide, and the analysis indicated that: (1) the growth of KEK area is difficult to sustain in the long run; (2) the KEK added value improvement that focus highly advanced technology showed a lower performance compared to KEK with focus on labor intensive improvement; and (3) KEK zone has more advantage in terms of potential for growth. Spatially speaking, the benefit of KEK development can be significantly felt within the radius of 50 km, after which the effect wanes and becomes weaker to the area outside the radius.

In the Keynesian theory, the investment expenses is expected to affect the aggregate demand, but it will not influence the aggregate supply. Harrod (1939) and Domar (1946) saw the

1 https://www.esdm.go.id/id/media-center/arsip-berita/17000-pju-pintar-segera-terpasang-di-kota-surakarta

impact of investment in a longer frame of time and according to them, the investment expenses do not only affect the aggregate demand through multiplier process, but also affect the aggregate supply through the increase of production capacity. Any spending on investment marks the addition of capital stock which indicates the increase on society's capacity in production and creating output. This model is known as Harrod-Domar (H-D) model that highlight the strong relationship between investment and output (regional revenue).

In H-D model, the output of economic development in a certain region, that can be indicated by the Incremental Capital Output Ratio (ICOR), which is the ration between investment and additional output (regional revenue) that is produced during a certain period of time. By using the ICOR value, one can estimate the investment requirement to achieve the targeted level of growth. With a little modification, one can also see the relationship between the economic growth and the employment rate as indicated by the Incremental Labor Output Ratio (ILOR). ILOR is the parameter of additional labor and employment that is required to increase or to create one additional output unit. The value of ILOR is calculated by comparing the amount of new employment with the new output value which in a sense that ILOR represents the amount of employment absorbed by the economic growth that takes place in a certain region in a certain period of time.

Social Impact of Infrastructure Development

Infrastructure development brings definitive impact to the surrounding community in terms of both economy and social aspect. The social impact from one infrastructure project is most likely different to other infrastructure project, which can be observed from the characteristic and the scale of service from the established infrastructure facilities.

For example, a transport infrastructure development such as airport can have an extensive influence on the social life of the general public, in which the airline services in the said airport that can provide either domestic or international flight. The fact that aerial transport can reach further places compared to other means of transportation such as train service, will give the people with access to a newly constructed airport more possibility to create social interaction with other people in different places, both domestically and internationally.

This outcome was highlighted by Halpern and Brathen (2011) in their research on the impact of an airport construction to the regional development. The study took 2 airport cases in Norway and concluded that the presence of these airports has significant impact to the area, especially those located in remotes places.

Different result can be seen on the social impact of the public street lighting development which can be categorized as public good; therefore the government is obliged to provide this service. This good service of public lighting is expected to bring positive impact in the form of comfort for pedestrians and people in general when doing their activities during nighttime, both economic and social activities.

UNHCR (2017) in its publication mentioned that the presence of good PJU service as the night falls helps to increase the productivity of women in the evening, for example women can sew in comfortable and safe condition. Another positive impact is the increase in family income. Furthermore Gillard et.al, (2019) stated that street lighting reduces the rate of crime on street. In addition, the local informal economy sector is reported to benefit additional income, equal to USD 20 per day.

The research by Xua et.al, (2018) is using the Generalized Least Squares model to prove the

inverse relationship between the coverage of PJU and crime rate. More PJU installation yields in less criminal cases. However, Markvica et.al, (2019) mentioned that the use of new type of lamps does not bring any significant technical improvement in the lighting quality itself.

Several other studies also showed the indication of social impact from KEK development. Macneill and Wozniak (2018) analyzed the relationship between cruise ship tourism and its impact to the economy, social and environment. The research took place before and after the construction of new cruise ship port and the result indicated that KEK development brings the multiplier effect to the job market and labor income, albeit not very significant. Other benefit is the decreasing rate of crime rate with the presence of port management authority. The foot note is that if the tax mechanism and regulation concerning environment are weak, the participation and adaptation of the surrounding community are lacking, such project will bound to fail to be able to give a significant impact to the people, especially if the project size is important.

APPROACH AND METHODOLOGY

Ex-ante approach on the impact of infrastructure project

Australian Government and RMIT University (2015) see that an ex-ante or notional analysis of a project requires deep understanding on the following two fundamental questions:

- What are the possible economic impacts that may occur from the implementation of an infrastructure project?
- What are the usable assumptions to measure these economic impacts?

Meanwhile, Peersman (2015) took the "attribution of cause and effect" approach or generally known as the Theory-Based Impact Evaluation (see figure 2). Parallel to this concept, Gertler, et al. (2016) have developed the impact assessment model named the "Chain Results", which provide theoretical explanation on the cause-effect chain, the factors that influence the impact and the key assumptions used to assess the economic impacts in questions.

Referring to figure 2, an impact is defined as the result (objective) of a process or a chain process (cause-effect relationship). What is conducted in the process/input stage will bring an effect in the output stage, which consequently will affect the outcome stage and will end on the impact.

Attribute of analysis of socio-economic impact of infrastructure project

Broadly speaking, the economic impact attributes that have been used in this research are tangible measures that can be classified into 2 groups of impact: (1) direct impact and (2) indirect and induced impact. In general, the attributes utilized in this study can be summarized in Table 1. The data used in the economic impact analysis are based on the document of the 3 infrastructure projects that have been selected as the study case.

As for the attributes that are used in the social impact analysis of PPP infrastructure project development come from the relevant theories and literature study as shown in Table 2. The social impact analysis uses the primary database from the local stakeholders that include: (1) infrastructure facility management; (2) local government; and (3) local community affected by the project and involved as respondents to this study.

Limit of Study

Each infrastructure project has its own development objectives and these targets have been explicitly mentioned in the project document. Every PPP project also has different project duration. Based on these facts, the economic and social impact analysis in this research will have several limitations in terms of:

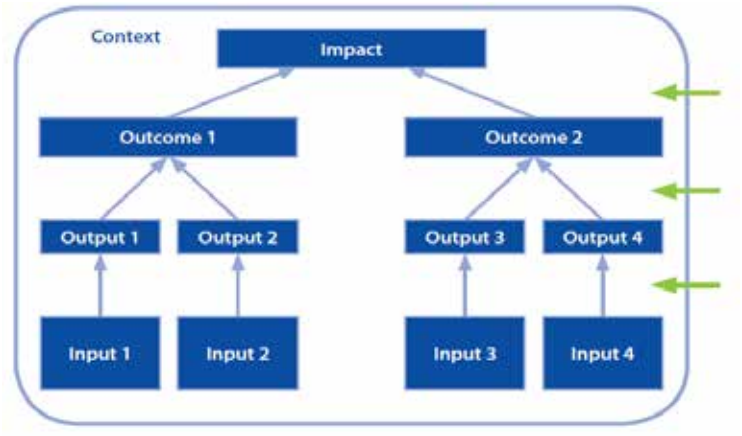

Figure 2. Concept of "Theory-Based Impact Evaluation"
ResInfra@DR project, 2019

Table 1. Economic impact attributes of PPP infrastructure project

Type of Impact	Bandara Komodo Airport	PJU of Surakarta Municipality	KEK Mandalika
Direct impact	• Increase in air transport related service • Increase in tourist influx • Higher employment rate (construction and technical workers, airport service workers)	• Decrease in maintenance cost and electricity cost • Improvement in safety and comfort within the community • Improvement in traffic safety • Reduction in CO_2 emission • New employment	• Increase in tourist influx • Increase in tourism related events and MICE activities • New job market in engineering and construction
Indirect/Induced Impact	• Multiplier effect that increases the tourism-based revenue • Improved income for labor sector	• Economic benefit • Local economy improvement	• Multiplier effect on tourism-related activities • Multiplier effect that boosts the regional economy sector • Improved income for labor sector

Source: author analysis, 2019

Table 2. Social impact attributes of PPP infrastructure project

Social Impact Attributes	Komodo Airport	KEK Mandalika	PJU Surakarta
• Life quality improvement	**V**	v	v
• Relationship with local community	**V**	v	
• Elderly friendly services	**v**	v	
• Zero conflict between local community and facility management	**v**	v	v
• Service quality from the infrastructure facility			v
• Urgency of infrastructure development			v

Source: author analysis, 2019

1. type of PPP infrastructure selected as study case;
2. project duration as the limit to measure the scale of impact;
3. the relevance of the project objective with the regional and national development targets;
4. the attributes of economic impact analysis that are used in the analysis represent positive benefits from the PPP infrastructure project development in question; and
5. the data that are used as baseline to simulate the economic impact calculation are based on the project documents (OBC, FBC) and supported with relevant secondary data, as for the social impact measurement the data used are primary data obtained through on-field sampling.

Analysis framework of social and economic analysis

The framework for economic impact analysis refers to the approach conceptualized in the "theory-based impact evaluation" by using the economic impact measurement attributes explained above. This analysis framework concept for each PPP project can be illustrated in figure 3, figure 4, and figure 5. The economic impact resulted from these PPP infrastructure projects can be projected by calculating the gap between benefit with project and benefit without project.

The social impact analysis utilizes qualitative method through the use of questionnaire given to a certain number of respondents on project site. The measurement of social impact is using

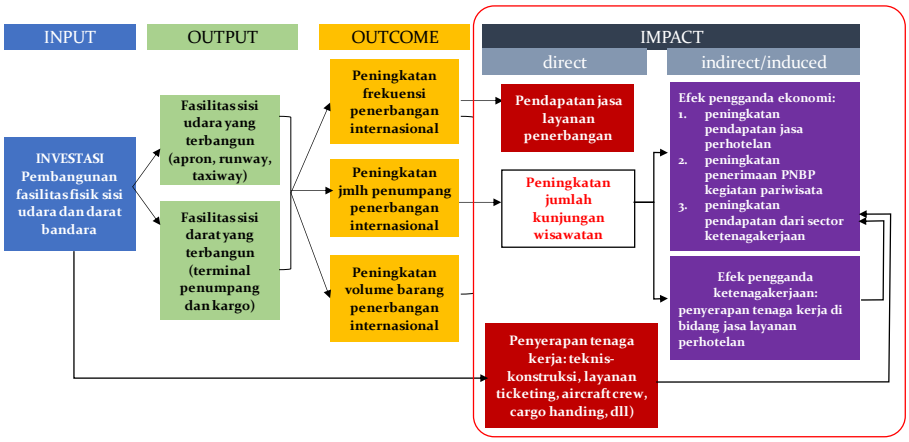

Figure 3. Framework for economic impact analysis of Komodo airport project

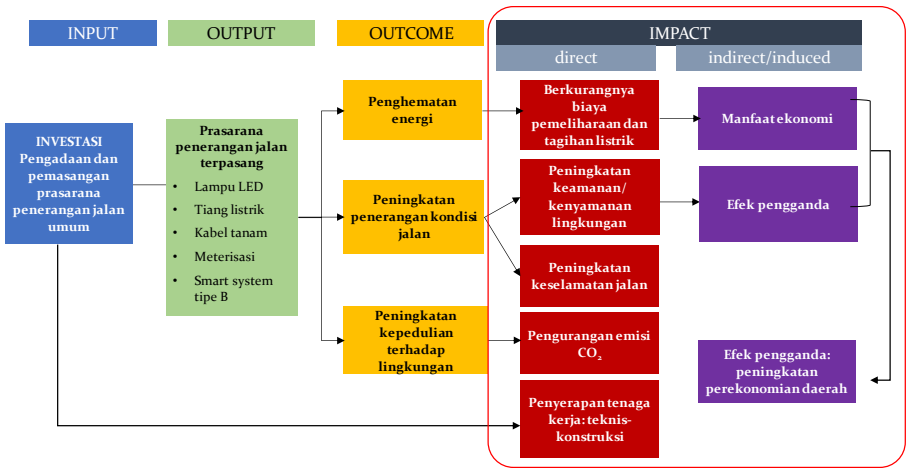

Figure 4. The framework for analyzing the economic impact of the PJU Surakarta project

the aforementioned attributes and comes from the value given by the respondents based on their perception, and hereinafter will be referred as "social impact perception index". This perception index has a range between 0 to 1, in which anything with a value under 0.5 means that the infrastructure project has a negative social impact to its surrounding.

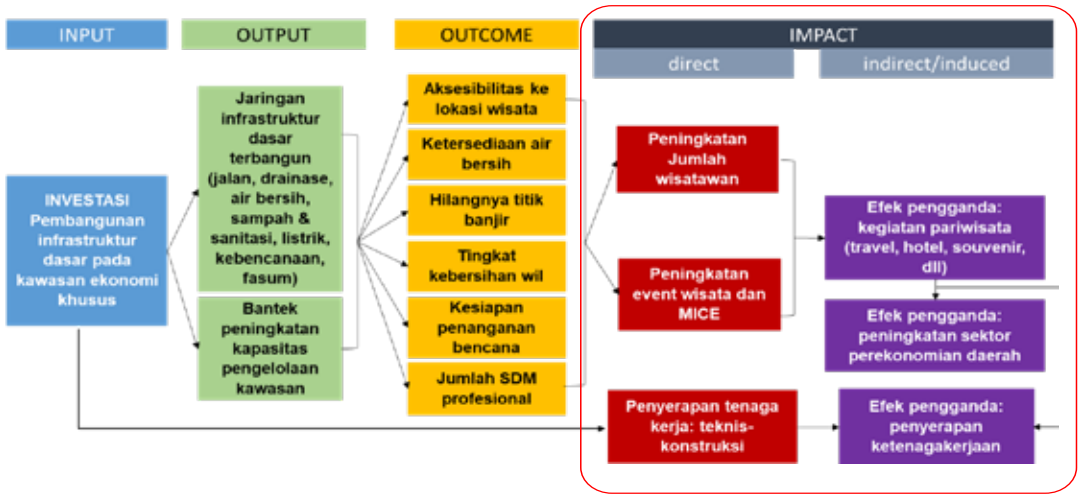

Figure 5. Framework of economic impact analysis on KEK Mandalika project

Table 3. Attribute and assumption in the economic impact analysis on PPP infrastructure project

Project Type	Type of Impact	Impact Attribute	Formula / Assumption
Komodo Airport	***Direct Impact***	• Revenue from air transport service	• Revenue from aeronautic and non-aeronautic services.
	Indirect / Induced Impact	• Multiplier effect in regional economy	• The potential for non-tax state revenue (PNBP) from tourism activities in Komodo island is calculated by using the relationship model between number of visitors and the PNBP rate (in the last 10 years), with the following formula: **y = 347846x-2E + 10** • The potential for hotel business revenue is using the following formula: **Revenue = number of hotel clients × average staying period × daily room tariff** • Number of hotel clients is calculated by relationship model between total number of tourists visit and total number of stay (in the last 10 years), with the following formula: **y = 1,5254x – 67593** • The potential for revenue increase from labor market in hotel business during the operational period of the airport is calculated using the following formula: • **Revenue = total employment × Minimum Regional Wage (UMR) × operational period of airport**

Project Type	Type of Impact	Impact Attribute	Formula / Assumption
		• Multiplier effect in new employment in other sectors	• New employment in tourism is using the correlation approach between number of tourist and new employment in hotel business where: **for 1 additional tourist will provide 0.01 new employment in hotel business** (estimation model on human resources in tourism in East Java, Sanaubar et al., 2017) • The trend of tourist influx to Labuan Bajo (in the last 10 years) is calculated by using a simple regression model: **number of flight passenger and number of visitor to Komodo Island: y = 0,1694x + 51763**
PJU of Surakarta	***Direct Impact***	• Cost saving in street lighting operation	• Cost saving as the impact of reduction in energy consumption as the result from light bulb replacement with LED is using the case of Batang and Semarang where the cost reduction is calculated at 59% and 50% of baseline spending (ADB, 2017), meanwhile in the case of Los Angeles the cost saving is up to 63% (Public Works LA, 2015).
		• Improvement in traffic safety	• The reduction in traffic safety cost due to potential traffic accident is calculated by the assumption that **the presence of PJU can reduce the potential traffic accident by 15%.**
		• Improvement in air quality (CO_2 emission reduction)	• The reduction in CO_2 emission is using the following formula: **emission factor × wattage × number of lamps × operational hours** • **Annual CO_2 emission = emission factor × annual energy consumption**
		• Revenue of labor in construction sector	• New job market for unskilled labor is at **2% of the project value during the construction duration with a conversion factor at 0.80** • New job market for unskilled labor is at **20% of the total labor cost during project duration with a conversion factor at 0.80**
	Indirect / Induced Impact	• Multiplier effect in regional economy	• Based on pre-feasibility study, the PPJ growth is assumed at the rate of 11-13.4 % • Regional capacity fiscal on PJU cost in at IDR 45 billion/year • PJU development with PPP scheme will eventually increase the number of street lighting and improve the lighting quality. This is supported with an Availability Payment (AP) at IDR 65 billion/year • PPJ Revenue = PPJ Income – Available Payment (AP) ; or PPJ Income – Electricity cost
KEK Mandalika	***Direct Impact***	• Economic impact in labor sector	• The investment impact on the economy is estimated by using the Incremental Capital Output Ratio (ICOR) approach during construction period (2 years)

Project Type	Type of Impact	Impact Attribute	Formula / Assumption
		• New employment in construction sector	• Method 1: New employment in construction and during the operation of KEK by approaching the ratio between the requirement for hotel employees and number of available room at 1.81 • Method 2: by Incremental Labor Output Ratio (ILOR) approach during the construction period (2 years)
		• Land rent	• Calculating revenue based on land rent price unit and the area of rented land
	Indirect / Induced Impact	• Multiplier effect on regional economy	• The investment impact on the economy is estimated by using the Incremental Capital Output Ratio (ICOR) approach after construction period (2 years)
		• Multiplier effect of labor sector	• Method 1: Using the assumption that every work will generate 1.95 work in tourism logistic chain (e.g. food and beverages, agriculture, bulk and retail commerce, transport, etc.) • Method 2: Measuring the impact of investment in economy by using the Incremental Labor Output Ratio (ILOR) after construction period (or during operational period)

Source: author analysis, 2019

RESULT AND DISCUSSION

Economic Impact Indication from PPP Infrastructure Development

Based on the analysis framework approach and the assumption and formula used in the analysis, we can find the indicated estimation of economic impact from each PPP infrastructure project.

The table 4 shows that from the three PPP infrastructure project cases, the Komodo airport project and the PJU of Surakarta municipality bring a significant economic impact with where the economic impact ratio is 6 to 8 times higher than the investment value. Meanwhile KEK Mandalika yields the lowest ratio among the three. Based on literature, the investment added value to the regional economy is at the range of 1-4. The above values show that the calculation for KEK Mandalika comes up at the relatively moderate scenario, meanwhile the calculation for Komodo Airport and PJU of Surakarta is placed on optimistic scenario. From labor point of view, KEK Mandalika has a very significant potential in terms of new employment at more than 120,000 new employment opportunity compared to the other two cases. And from the stance of macro economy, the contribution of each PPP infrastructure is quite different, in which the Komodo airport brings the highest contribution versus the other two.

Social Impact Indication from PPP Infrastructure Development

The social impact analysis from the three PPP infrastructure project cases resulted an assessment in the form of a very variative social perception index based on the impact attributes that were used in the research, which can be summarized in the table 5.

Table 4. Estimation of economic impact value of PPP infrastructure projects

Impact Attributes	Unit	Komodo Airport	PJU of Solo	KEK Mandalika
INPUT				
A. Capex	IDR trillion	1.21	0.42	4.59
B. Opex	IDR trillion	1.84	0.19	2.20
Total Input	IDR trillion	**3.05**	**0.61**	**6.79**
IMPACT				
A. Direct impact:				
1. Economic benefit from labor in related construction sector	IDR trillion		0.007	1.43
2. Revenue from established facility	IDR trillion	8.99		
3. Electricity cost saving	IDR trillion		0.04	
4. Traffic safety improvement and traffic accident reduction	IDR trillion		0.46	
5. Reduction in CO_2 emission	Emission of CO_2eq in ton/ year		21,634.52	
6. Additional labor in construction sector	Labor			9,794
B. Indirect/induced impact				
1. Multiplier effect in economy:				
(a) Hotel services	IDR trillion	9.76		
(b) PNBP from tourism services	IDR trillion	1.32		
(c) Labor income from hotel businesses	IDR trillion	0.82		-
(d) Regional economy (GDP) in tourism sector (including lodging and F&B)	IDR trillion			6.58
(e) Benefit in regional economy improvement	IDR trillion		3.6	
2. Multiplier effect in labor sector				
(a) New employment in hotel businesses	Labor	4,235		65,779
(b) New employment in tourism logistic chain	Labor			60,411
3. Land rent	IDR trillion			5.16
Total Impact (excluding new employment)	IDR trillion	**20.89**	**4.17**	**8.01**
Ratio of economic impact to investment		**6.85**	**6.73**	**1.74**
Contribution to GDP	%	**0.0053**	**0.0026**	**0.016**
Impact percentage				
Direct impact	%	43.03%	12.16%	17.85%
Indirect impact	%	56.97%	86.33%	82.15%

Note: GDP baseline is using the 2019's GDP value at IDR15,883.90 trillion

Source: author analysis, 2019

Table 5. Social perception index on the PPP infrastructure projects

Social Impact Attributes	Komodo Airport	PJU of Surakarta	KEK Mandalika
• Life quality improvement	0.70	0.77	0.75
• Relationship with local community	0.72	-	0.68
• Elderly friendly services	0.73	-	0.62
• Zero conflict between local community and facility management	0.58	-	0.38
• Service quality from the infrastructure facility	-	0.38	-
• Urgency of infrastructure development	-	0.76	-
• Zero social problem	-	0.43	-

Note: (a) 0<=0.50: lacking; (b) 0.51 – 0.60: sufficient; (c) 0.61 – 0.80: good; (d) 0.81 – 1.00: very good
Source: author analysis, 2019

CONCLUSION

From the above result and analysis, we can take several concluasions as the following:

a. Investment in Komodo airport project shows a very significant effect on the local economy sector that becomes local focal point of economy which is tourism. This is indicated from the potential increase of revenue in hotel business and other tourism-based non-taxes revenues and from labor in this sector. This economic impact comes in the form of 40% direct economic impact and 60% indirect and induced impact. To optimize the estimated economic impact from this airport development project, both central and regional government need to provide supports in tourism promotion, improve access to touristic sites and tourism-related facilities.
b. In the case of PJU development in Surakarta municipality, the benefit from the this local government investment indicated a more dominant improvement in terms of safety, comfort and environment protection (including the sustainability of environment supporting capacity). The total economic impact comes in the form of 87% direct impact and 13% indirect impact. This is due to the anture of public street lighting as a public service with a service coveerage limited to the improvement of lighting aspect. In addition, this project was undertaken as part of public duty of the municipal government of Surakarta in providing public service quality to its people. A continued systemic affirmation can be further developed to grow related domestic industry which will have a positive effect on the creation of new jobs.
c. The KEK Mandalika project shows that the investment bring a significant benefit notably in new employment in local tourism sector. Specific to this point, both the direct and indirect benefits are significant. The direct benefit comes from tourist influx, increased numbers of tourism events and MICE events, and new jobs opportunity in engineering and construction. Meanwhile the indirect benefit comes from the tourism economic activities that are possible due to the presence of KEK Mandalika. This includes employment in travel agencies, hotels, restorants, souvenir shopa and other tourism-related jobs.
d. The analysis of the three PPP infrastructure project cases shows different scale of impact from each project. This is influenced by the character of services provided by each infrastructure project, the amount of total investment and the project scale that is different one from another.

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