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The Impact of New Yogyakarta International Airport (NYIA) Development for Economic Growth in Special Region of Yogyakarta

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Abstract

Development plan of New Yogyakarta International Airport (NYIA) in Kulon Progo District developed based on Airport City concept, has expected could be growth center and new regional development in Kulon Progo District and it can push development region in around. The New Yogyakarta International Airport planned have capacity of 28 aircraft and 11 avio bridge. The Airport designed with runway 5,400 meters, and able to accommodate large bodied aircraft. Terminal will be expanded can accommodate around 24 million passangers per year. Development of New Yogyakarta International Airport Access is estimated requires 5,087 trillion rupiah. Beside of road support, development of railway also planned to increase access towards new airport. The new growth center has expected that region become a city of its own and can evolve to become the equity of growth between district in Special Region of Yogyakarta. By use analysis tools of input output (I-O Analysis), this article purposes to analyze the impact of New Yogyakarta International Airport (NYIA) for economic growth in Special Region of Yogyakarta.

Keywords: New Yogyakarta International Airport, economic growth, infrastructure

Abstrak

Rencana pengembangan Bandar Udara Internasional Yogyakarta di Kabupaten Kulon Progo yang dikembangkan berdasarkan konsep Airport City, diharapkan bisa menjadi pusat pertumbuhan dan pengembangan wilayah baru di Kabupaten Kulon Progo dan dapat mendorong wilayah pembangunan di sekitarnya. Bandar Udara Internasional Yogyakarta direncanakan memiliki kapasitas 28 pesawat dan 11 jembatan avio. Bandara dirancang dengan landasan pacu 5.400 meter, dan mampu menampung pesawat berbadan besar. Terminal akan diperluas dapat menampung sekitar 24 juta penumpang per tahun. Pembangunan akses Bandar Udara Internasional Yogyakarta diperkirakan membutuhkan Rp. 5,087 triliun. Selain dukungan jalan, pengembangan kereta api juga direncanakan untuk meningkatkan akses ke bandara baru. Pusat pertumbuhan baru ini mengharapkan kawasan itu menjadi kota tersendiri dan dapat terjadi pemerataan pertumbuhan antar kabupaten di Daerah Istimewa Yogyakarta. Dengan menggunakan alat analisis input output (Analisis I-O), penelitian ini bertujuan untuk menganalisis dampak Bandar Udara Internasional Yogyakarta bagi pertumbuhan ekonomi di Daerah Istimewa Yogyakarta.

Kata kunci: *Bandar Udara Internasional Yogyakarta, pertumbuhan ekonomi, infrastruktur*

INTRODUCTION

Infrastructure influence on national economies and the recent global economic challenges, many national governments, including South Africa, instituted formal and structured infrastructure development programs especially designed to: stimulate and catalyse economic growth, improve the quality of life of citizenry, create jobs, address environmental challenges and strategically position their economies more globally competitive (Mutamba, 2015). Different thresholds of different landscapes do exist and can be identified by the area of their key elements of green infrastructure. Integrating these thresholds into a social–economic context, it is shown where and how social–economic variables can be manipulated quantitatively to achieve development targets with respect to green infrastructure in individual towns and the entire district (Liu, Holst, et.all, 2014). Development is one of main function must to run by government as one of policy takers. Based on development concept, for consisting of allocation of resources, regulation and community empowerment. In this perspective, development should be able to expand public access to get resources needed to reach community prosperity, take it easier of public access, to get and enjoy various of basic service facilities (education, health, water, electricity, security, and others); and guarantee for infrastructure availability and resources continuity for community life of sustainability.

Regional policy, co-ordinated at national and regional level, consisting of spatial, agricultural and infrastructure planning which in particular should have included public and individual mobility networks became highly important in the decades of fastest economic growth, mass motorisation and suburbanisation in such a federal system of government (Tschopp and Axhaus, 2008). To realize of community prosperity, one of important aspect that need to be done is enhancement of quality economic growth. It mean hat enhancement of economic growth accompanied by decrease of the poor ratio (pro-*poor*), decrease of unemployment number (pro-*job*), decrease of imbalance in income distribution (pro-*equality*), and development that has no negative impact for living environment (pro-*environment*). To get that economic growth need of physical capital availability (*physical capital*) and human resources (*human capital*).

Based on study of Central Bureau of Statistics (Badan Pusat Statistik, BPS) Special Region of Yogyakarta, the calculation results of *inclusive growth index* (IGI) 2016 in Special Region of Yogyakarta show that Special Region of Yogyakarta IGI value amount 6,18, while IGI value of District is arround on level 5,33–6,70, so that still classified in satisfying economic growth category. However, despite the IGI achievements of Districts in Special Region of Yogyakarta is categorized as satisfactory but it seems a bit implies about inclusivity of imbalance beetwen district in Special Region of Yogyakarta. Yogyakarta City and Sleman District were reach the highest IGI value with acquisition of each index 6,70 and 6,50 in 2015. Bantul District take the thirth highest position with amount value 6,34. That three districts were above of IGI value Special Region of Yogyakarta. The otherwise, two of districts that have achievement under of Special Region of Yogyakarta index, that are Kulon Progo and Gunungkidul District with IGI achievement amount 5,69 and 5,56, it adrift far enough both Province value nor the three of the other districts. Based on this condition, it is necessary to study that aimed for analyze of infrastructure development benefits have been planned for economic development in Special Region of Yogyakarta, especially to know the magnitude of impact that might be created by development of various facilities and infrastructure have been planned.

In theories of economic development and practical economic policies alike, infrastructure has long been regarded as essential to growth and prosperity (Canzier, 2008). Given that modern societies still are calibrated overwhelmingly in terms of growth, infrastructural development acquiters a pivotal role. Urban comprehensive transportation planning is a systematic and comprehensive study of urban traffic and urban traffic and urban development and land use layout. The city traffic planning and city land development to establish and perfect matching city traffic system, the coordination of city road traffic system and city relationship relationship with the city, the layout of the external transport system, coordinate the relationship between the city traffic mode (Yufang and Xiangjjian, 2017)

Municipal infrastructure is a fundamental facility for the operation and development of an urban city and is of significant importance for improving the residence environment, city support capability and operation efficiency as well as for the stable progress of sustainable urbanization. According to Li and Zheng (2017) In recent years, research on municipal infrastructure has achieved substantial progress in the following areas: 1) assessment of transport infrastructure systems, including the cost-benefit of urban transport network and its environmental effect, reliability and management mechanism, 2) study of urban water supply and drainage systems, including the influencing factors of the drainage system and its impact on urban river pollution, and the reliability of water and electric power supply system; 3) study of urban energy infrastructure, including the requirements for urban energy infrastructure and its impact on the environment; 4) urban environment and sanitation infrastructure, including the sustainability of municipal environment and sanitation infrastructure systems and its impact on the environment; and 5) study

of ecological infrastructure in urban areas, including green area systems and green space in urban areas.

According to Todaro (2007) infrastructure is he underlying amount of physical and financial capital embodied in roads, railways, waterways, airways, and other forms of transportation and communication plus water supplies, finacila instituons, electricity, and public services such as health and education. The level of infrastructural development in a country is a crucial factor determing the pace and diversity of economic development.

Kodoatie (2003) was identify about infrastructure as physical facilities that developed or needed by public agents for government functions on water provide, electricity, waste disposal, transportation and the other services for facilitate the economic and social purposes.

The spatial perspective of infrastructure planning has recently turned to understanding the importance of interdependency between different infrastructure sectors across different territories (Cutter et al., 2008). Give support that facilities provide by various of infrastructure are positive externalities and can increase the productivity of all input in production proses. Positive externalities on infrastructure is the form of spillover effect in from of companies production increase and farming sector without must to increase capital of labor/increase technology level too. With the built of infrastructure, company productivity level and farming sector will be increase.

Special Region of Yogyakarta as a city of culture and city of education need a usable infrastructure to support main sector growth that contribute on economy, that is tourism sector. Infrastructure availability, such as road, port, airport, electric power provide system, irrigation, water provide system, sanitation, etc that are *social overhead capital*

have a very strong linkage with region growth level, which among others characterized by economic growth rate and community prosperity. It can be seen from reality that region which have better infrastructure system completeness, have better economic growth rate level and community prosperity too more than with region which have limited infrastructure.

The importance of transport infrastructure in the general picture of tourism competitiveness is confirmed by organizations like The World Economic Forum, and is the basis of the study of tourism competitiveness of 141 countries, including through the analysis of the pillars regarding the air, land and port transport infrastructure (Costea, Hapenciuc, and Arionesei, 2016). According to Paicu and Hristache (2013) Romania can be proud of a variety of landscapes, a relatively rich cultural and historical heritage, and of the existence of some natural monuments and unique landmarks, some of them being UNESCO heritage sites. With a vast expertise, including the tourism field, OECD published in April 2013, through the tourism committee coordinated by Dupeyras and MacCallum (2013), a list of indicators useful for national governments in the analysis of the competitiveness of the tourism sector, air transport being among them. In the context of the study of competitive advantage, Municipal infrastructure is a fundamental facility for the normal operation and development of an urban city and is of significance for the stable progress of sustainable urbanization around the world, especially in developing countries (Le and Zeng, 2017)

Modern cities and towns embody an extremely complicated and vibrant process, in which infrastructure plays an important mediating role between flow, movement and exchange (Wong and Webb, 2014). Thus defines infrastructure as 'a long-lasting network connecting producers and service providers with a large number of users through standardised (while variable) technologies, pricing, and controls that are planned and managed by coordinating organizations'.

Infrastructure indirectly will be influence economic growth through household lines (through prosperity enhancement) and company (through degression of cost and market expansion) the next will take an effect together to economic growth. Infrastructure have benefit to motivate various of economy sector because it considered as *social overhead capital.*
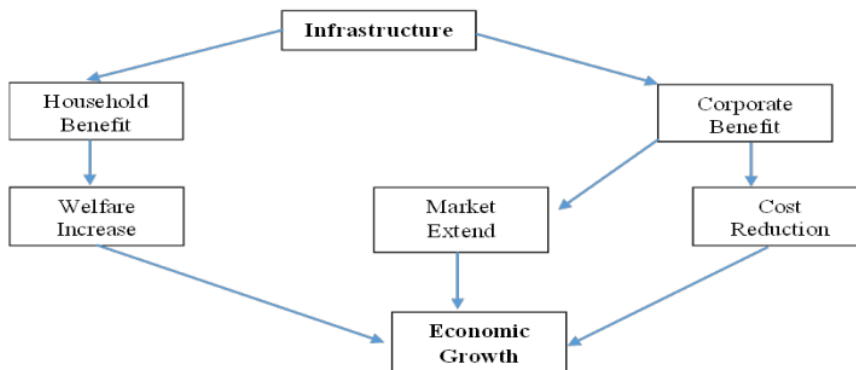

Figure 1.
Infrastructure and Economic Growth

Based on description above show that infrastructure development with economic development close related relationship and interdependence with each other. Infrastructure improvement in general can improve population mobility, accelerate the rate of transporting goods, quality improve from the transporting service, increase quality and quantity of development facilities, and increase efficiency of development facilities uses. Infrastructure improvement will be increase investment and economic growth, this growth economic and a number of new investments will be absorbing labor. A good infrastructure is also will stimulate community income enhancement, because the increasing economic activity as effect from production factor mobility and increasing trading activities.

The New Yogyakarta International Airport planned have capacity of 28 aircraft and 11 avio bridge. The Airport designed with runway 5.400 meters, and able to accommodate large bodied aircraft. Terminal will be expanded can accommodate around 24 million passangers per year. Development of New Yogyakarta International Airport Access is estimated requires 5,087 trillion rupiah. Beside of road support, development of railway also planned to increase access towards new airport. Development of this railway are a part of overall railway enhancement plan in Special Region of Yogyakarta. Railway to the new airport continued from exixting station (Kelundang Station).

Airport development that based of Airport City concept was not did in region have been to be city before, but airport development with airport city concept was did far outside of the main city. With build the new growth center that form the airport, the next it expected that region become own city and it's able to evolve so resulting in equity. From the Airport City concept will be able to growth the region in around. Airport development plan concept in Kulon Progo

expected able to create growth center and new development in Kulon Progo District and it able to push region development in around. Airport city, it push the area to build hotel, hospital, shopping center and other facilities.
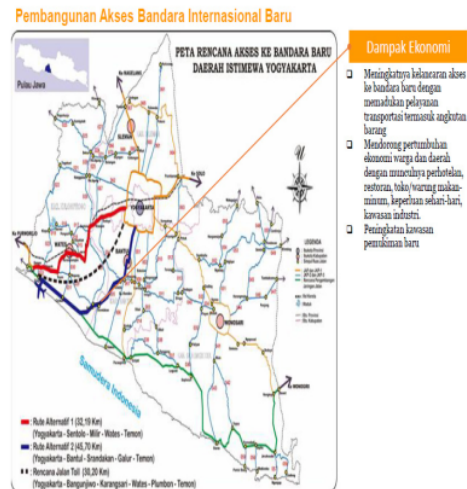

Figure 2.
Access Plan to New Airport in Special Region of Yogyakarta

Development of New Yogyakarta International Airport Access can give impact for community economic life, such as:

1. Enhancement of access to new airport by combine of transportation service including freight transport.
2. Push the citizens economic growth and region will be build the hotels, restaurants, food-drink stores, daily necessity, industry area.
3. Enhancement of new habitation area.

METHOD

To analyze of New Yogyakarta International Airport development impact for economic growth in Special Region of Yogyakarta, analysis technic used is input

output analysis (I-O analysis). I-O analysis is statistic description in matrix that presents an information about service and goods transaction and interconnection between units of economic activities (sector) in an area and on specific time period. Essay as long a line in matrix are show about how an output in economic sector allocated to others sector for comply middle demand and final demand, while the essay in column show that middle input usage and primary input by a sector in production prosses.

Where x_{ij} = Value of service and goods flow from i sector to j sector

F_i = Total final consumption

V_j = Value added

M_i = Import

To start of further analysis, the early step that need to be done is calculate the magnitude of input coefficient value that defined as follows:

$$a_{ij} = \frac{x_{ij}}{X_j} \qquad\qquad\qquad (3)$$

Table 1.
Input Output Transaction Table

Input Structure	Output Allocation	Middle Demand				Provision		
		Production Sector				Final Demand	Import	Output Amount
Middle Input		**Quadrant I**				**Quadrant II**		
Sector 1	x_{11}	x_{12}	x_{13}	...	x_{183}	F_1	M_1	X_1
Sector 2	x_{21}	x_{22}	x_{23}	...	x_{283}	F_2	M_2	X_2
Sector 3	x_{31}	x_{32}	x_{33}	...	x_{383}	F_3	M_3	X_3
.					.	.	.	.
.					.	.	.	.
.					.	.	.	.
Sector 83	x_{831}	x_{832}	x_{833}	...	x_{8383}	F_{83}	M_{83}	X_{83}
		Quadrant III						
Primary Input	V_1	V_2	V_3	...	V_{83}			
Input Amount	X_1	X_2	X_3	...	X_{83}			

From the input output transaction table (table 1) can get the relation of balance sheet equation that balanced between row and column. If be read according to row, can be written in equation below:

$$\sum_{j=1}^{n} x_{ij} + F_i - M_i = X_i \qquad \forall_i = 1, \dots n \qquad (1)$$

If be read according to column, can be written in equation below :

$$\sum_{i=1}^{n} x_{ij} + V_j = X_j \qquad \forall_j = 1, \dots n \qquad (2)$$

or

$$x_{ij} = a_{ij} X_j \qquad\qquad (4)$$

where:

a_{ij} = Input coefficient sector to i by sector to j

x_{ij} = Input usage sector to i by sector to j (in rupiah value)

X_j = Output sector to j (in rupiah value)

Substitute (4) to (1) so:

$$\sum_{j=1}^{n} a_{ij} X_j + (F_i - M_i) = X_i \qquad \forall_i = 1, \dots, n \qquad (5)$$

or in matrix can be written as below:

$$AX + F^d = X \quad \text{.. (6)}$$

where: $a_{ij} \in A_{nxn}\,; (F_i - M_i) \in f_{nx1}\,; dan\ X_i \in X_{nx\,1}$

so will obtained basic relationship from input output table, as follows:

$$(I - A^d)^{-1} F^d = X \quad \text{............................... (7)}$$

where $(I-A^d)^{-1}$ is *Leontief Inverse Matrix* or output multiplier matrix.

Simple method to know about annual economic growth can be written as follows:

$$r_{(t-1,t)} = \frac{PDRB_t - PDRB_{t-1}}{PDRB_{t-1}} X100\% \quad \text{.......... (8)}$$

Where r is annual economic growth. To calculate economic growth level on longer periods, so growth level per year have to calculate first and then evenly align (for example for three years) as follows:

$$r = \frac{r_{(t-1-t)} + r_{(t-1+t)} + r_{(t+1-t-2)}}{3} \quad \text{.................... (9)}$$

RESULT AND DISCUSSION

From data analysis used is input output analysis (I-O analysis), find out that airport development has impact to economic growth to Special Region of Yogyakarta. Base on table 2. Show that expenditure which give economic growth contribution in Special Region of Yogyakarta that great enough are Expenditure of Household Consumption and Expenditure of Government Consumption with contribution between around 0.60% until 4.00%.

To reach higher growth needed a hard effort to increase rapid growth on 6.0-7.0 percent level, for example by increase investment, increase, increase government expenditure, push export, and increase main sector productivity. Seen from trading volume between regions in Special Region of Yogyakarta more open with outside region of Special Region of Yogyakarta.

Table 2.
Economic Growth in Special Region of Yogyakarta according to 2012-2016 (%)

Expenditure Component	2012	2013	2014	2015	2016	Average
1. Household Consumption	6.45	6.44	4.85	5.08	4.87	5.31
2. Nonprofit Private Institutions Comsumption	13.89	8.90	10.42	10.58	2.90	8.16
3. Government Conpsumption	4.60	5.91	5.90	4.35	5.32	5.37
4. Gross fixed capital formation	4.44	5.28	5.12	5.78	4.34	5.13
5. Inventory Change	-18.37	-1.02	3.44	11.78	4.73	4.63
6. Services and Goods Export	5.82	8.90	5.64	6.82	4.70	6.50
7. Services and Goods Import	6.27	9.85	5.08	7.02	4.37	6.56
Economic Growth	**5.21**	**5.37**	**5.47**	**5.16**	**4.94**	**5.24**

Source: BPS of Special Region of Yogyakarta Yogyakarta

Table 3.
Economic Growth Contribution in Special Region of Yogyakarta According to Expenditure
2012-2016 (%)

No.	Demand side	2012	2013	2014	2015	2016
1	Expenditure of Household Consumption	3.97	3.92	2.93	3.07	2.94
2	Expenditure of LNPRT Consumption	0.36	0.24	0.28	0.29	0.08
3	Expenditure of Government Consumption	0.69	0.9	0.8	0.66	0.81
4	Gross fixed capital formation	1.2	1.41	1.37	1.54	1.17
5	Inventory Change	-0.19	0.36	0.14	0.13	0.06
6	Export Abroad	0.12	0.21	0.85	0.97	0.17
7	Import Abroad	-0.03	0.59	0.47	1.3	0.63
8	Net Exports Between Regions	-0.88	-1.01	-0.43	-0.21	0.34
	Economic Growth Contribution	**5.21**	**5.37**	**5.47**	**5.16**	**4.94**

Source: BPS in Special Region of Yogyakarta

Economic growth base on each district in Special Region of Yogyakarta show that economic growth rapid of district in Special Region of Yogyakarta on 2016 located on range 4.64-5.31 percent. Compared to the previous year, gap of growth between district increasingly narrowed. The highest economic growth is Sleman District, that is amount 5.31 percent, then Yogyakarta City that growth amount 5.16 percent. Bantul District on the thirth with growth amount 5.0 percent. On 2016, economic growth rapid of Gunungkidul District still faster than Kulon Progo District. Bantul District and Sleman District and Yogyakarta City growth slowdown than 2016, while Kulon Progo District and Gunungkidul District growth faster.

Seen from region capability side, difference PDRB value between district very dependent on natural resources and human resources owned and supported with the available technology. Gunungkidul District with the total area reaches 46.63 percent from Special Region of Yogyakarta area, PDRB total value reached on 2015 amount 13.8 trillion rupiah or 13.61 percent from PDRB total of Special Region of Yogyakarta. Kulon Progo that its area amount 18.40 percent from special Region of Yogyakarta area just

capable to dig up of PDRB total amount 7.6 trillion rupiah, and percentage for PDRB total of Special region of Yogyakarta is lowest that is 7.54 percent. Sleman District that its area 18.04 percent from Special Region of Yogyakarta area produce of PDRB total amount 33.76 trillion rupiah or around 33.22 percent from PDRB total of Special Region of Yogyakarta. Beside that, Yogyakarta City with its area only 1.02 percent from Special Region of Yogyakarta area, but because of it is a economic activities center besides category of agriculture and excavation so PDRB total value that produce reach 26.89 trillion rupiah or around 26.46 percent for PDRB total of Special Region of Yogyakarta.

Special Region of Yogyakarta economic growth on 2016 amount 4.94 percent, Sleman District give the highest growth contribution amount 1.72 percent and from Yogyakarta City amount 1.33 percent, and Bantul District contributed 0.93%. Power growth of economic activities currently developing in Kulon Progo and Gunungkidul District have not given much of role for economic growth in Special Region of Yogyakarta.

The impact of New Yogyakarta International Airport development for economic growth. The biggest impact felt

by building construction sector and civil buildings (sector code 59) amount 77.62%, followed as continued by goods industry form cement (sector code 49) amount 44.79%, and goods industry from the other metal (sector code 50) amount 37.73%. The New Yogyakarta International Airport development project will give addition for amount Rp5.180.676,24 million.

Table 4. explain about impact of New Yogyakarta International Airport development for economy output increase. Three sector with the biggest output amount produce by buldings civil and building construction sector (sector code 59) amount 75.34%, followed by big trading sector and retail besides car/motorcycle (sector code 61) Amount 2.63%, and other metal goods industry (sector code 50) amount 1.95%. The new international airport development project will increase economy output amount 12,407,424.75 million rupiahs.

Table 4.
The Big Ten of Sector with The Biggest Gross Added Value Impact on New Yogyakarta International Airport Development Plan

Sector Descriptions	Before Investation (Rp Million)	After Investation (Rp Million)	Growth
Civil Buildings and Building Construction	4,525,857.53	8,038,728.27	77.62
Goods Industry from Cement	179,206.93	259,467.38	44.79
Other Metal Goods Industry	247,504.75	340,880.58	37.73
Mirror Industry and Goods from Mirror	8,991.00	12,043.79	33.95
Other Non-Metalic Minerals Industries	78,223.98	103,686.15	32.55
Plastic Goods Industry	126,354.73	167,001.65	32.17
Law Service, Accountant, Consultant, Architec, Research	268,052.05	337,241.45	25.81
Home Furnishings Industry and other fromWood/ Bamboo besides Furniture	195,493.85	241,240,48	23.40
Mining, Coarse Salt, and others Mining 406,710.30		496,479.09	22.07
Forestry and Logging	404,708.40	475,227.89	17.42
Sub Total	6.441,103.51	10,471,996.73	
Others	54.518.160.44	55,667,943.45	
Total	60,959,263.95	66,139,940.19	8.50
Average of Sector			6.62

Source: Result of Input-Output Analysis Calculation

Table 5.
The Big Ten Sector with Impact of The Biggest Output Impact on New International Airport Development Plan

Sector Description	Value (Rp Million)	% Total
Civil Buildings and Building Construction	9,347,990.82	75.34
Big Trading and Retail beside car/motorcycle	326,167.25	2.63
Other Metal Goods Industry	241,664.55	1.95
Food and Drink Provision	216,118.88	1.74
Land Transportation,Sea,River,Lake & Crossing	189,562.91	1.53
Information and Communication	166,987.69	1.35
Goods from Cement Industry	153,112.34	1.23
Goods from Plastic Industry	138,666.38	1.12
Mining, Coarse Salt, and Others Mining	134,915.96	1.09
Real Estate	116,908.15	0.94
Sub Total	11,032,094.93	88.92
Others	1,375,329.82	11.08
Total	12,407,424.75	100.00
Average of Sector	149,487.05	1.20

Source: Result of Input-Output Analysis Calculation

Table 6.
The Big Ten Sector with Impact of The Biggest Labor Absorption on New International Airport Development Plan

Ranking	Sector Description	Value (People)	% Total
1	Civil Buildings and Building Construction	64,855	57.49
2	Big Trading and Retail Besides Car/Motorcycle	13,994	12.41
3	Forestly and Logging	4,135	3.67
4	Mining, Coarse Salt, and Others Mining	3,172	2.81
5	Other Metal Goods Industry	3,147	2.79
6	Food and Drink Provision	2,383	2.11
7	Car Trading, Motorcycle, and Car/Motorcycle Reparation	2,137	1.89
8	Goods from Cement Industry	1,994	1.77
9	Goods from Plastic Industry	1,806	1.60
10	Others Service	1,551	1.38
	Sub Total	99,175	87.92
	Others	13,628	12.08
	Total	112,803	100.00
	Average	1,359	1.20

Source: Result of Input-Output Analysis Calculation

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Table 6. explain impact of new international airport development for labor absorption. Three sector with the biggest increase in labor absorption are building construction sector and civil buildings (sector code 59) amount 57.49%, big trading sector and retail besides car/motorcycle (sector code 61) amount 12.41%, and forestly sector and logging (sector code 18) amount 3.67%. New international airport development project can absorb additional labor as much 112.803 people.

CONCLUSION

1. Impact of Economic Growth. The biggest impact of New Yogyakarta International Airport development are in civil buildings and building construction sector (sector code 59) amount 77.62%, goods from cement Industry (sector code 49) amount 44.79%, and others goods from metal industry (sector code 50) amount 37.73%. New Yogyakarta International Airport development project will give additional for PDRB amount Rp5,180,676.24 million.

2. Impact of Economy Output. The three sector with the biggest output produced by civil buildings and building construction sector (sector code 59) amount 75.34%, followed by big trading sector and retail besides car/motorcycle (sector code 61) amount 2.63%, and others metal goods industry (sector code 50) amount 1.95%. New international airport development project will increase economy output amount Rp 12.407,424.75 million.

3. Impact of Household Income. Three sector with the biggest increase in household income revenue are civil buildings and building construction sector (sector code 59) amount 68.49%, big trading sector and retail besides car/motorcycle (sector code 61) amount 4.73%, and food and drink provision sector (sector code 68) amount 2.42%. New International airport development project will increase household income amount 1,712,211.01 million rupiahs.

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